



Free-Ranging Cat Management Plan Environmental Assessment

August 2023

US DEPARTMENT OF THE INTERIOR, NATIONAL PARK SERVICE

SAN JUAN NATIONAL HISTORIC SITE

FREE-RANGING CAT MANAGEMENT PLAN ENVIRONMENTAL ASSESSMENT

The National Park Service (NPS) has prepared this environmental assessment (EA) to evaluate the impacts of managing free-ranging cats at San Juan National Historic Site (park) in San Juan, Puerto Rico. The plan would bring the park into compliance with existing authorities for invasive species, reduce human health and safety concerns, align the visitor experience with the purpose of the park, protect park resources, alleviate nuisance issues, and reduce impacts on native wildlife species associated with free-ranging cats. **This plan would only address the free-ranging cat population within the boundaries of the park and would not address cats within Old San Juan or other areas outside the jurisdiction of the National Park Service.**

This EA presents two action alternatives for managing free-ranging cats, and a no-action alternative to describe the current conditions and management activities. The EA describes the affected environment that could be impacted by the alternatives if they were implemented, as well as an analysis of potential environmental consequences that could result from each alternative. Under the no-action alternative (alternative 1), no changes would be made to the current management of free-ranging cats. Under the original proposed action (alternative 2), the National Park Service would enter into an agreement with an organization(s) or agency(s) to remove the cats (herein “removal agency”) and feeding stations from the park. Following public scoping, the National Park Service added an alternative that revised the original proposed action. The revised proposed action (alternative 3 / NPS preferred alternative) would allow an animal welfare organization six months to trap and remove cats from the park with the use of the current feeding stations, after which time the feeding stations would be permanently removed from the park. If monitoring indicates that a cat population persists at the park, the National Park Service would then enter into an agreement with a removal agency for further management of the cats. Ongoing monitoring and management would be anticipated under both action alternatives.

This EA has been prepared in compliance with the National Environmental Policy Act (NEPA) of 1969, as amended and to provide the decision-making framework that 1) analyzes a reasonable range of alternatives to meet the objectives of the proposal, 2) evaluates potential issues and impacts on the park’s resources and values, and 3) identifies mitigation measures to reduce the degree or extent of these impacts.

How to Comment

We invite you to comment on this Free-Ranging Cat Management Plan EA during the 30-day public review period. The National Park Service is seeking public review and comments under NEPA and in accordance with Section 106 of the National Historic Preservation Act.

The preferred method of providing comments is through the NPS Planning, Environment, and Public Comment (PEPC) website for the project at: <https://parkplanning.nps.gov/PaseoCatPlan>.

You may also submit written comments to:

SAJU Superintendent
Attn: Paseo Cats
501 Calle Norzagaray
San Juan, PR 00901

Please submit your written comments postmarked no later than 30 days from the posting of the availability of the EA, which will be posted on the PEPC website. Please be aware that your entire comment will become part of the public record. If you wish to remain anonymous, please clearly state that within your correspondence; however, the National Park Service cannot guarantee that personal information, such as email address, phone number, etc. will be withheld.

CONTENTS

- Chapter 1: Purpose of and Need for Action 1**
 - Purpose and Need 1
 - Applicable Laws, Regulations, and Policies 2
 - Project Area..... 2
 - Background of Free-Ranging Cat Management at the Park 5
 - Issues and Resource Topics Retained for Detailed Analysis..... 7
 - Issues and Resource Topics Dismissed from Detailed Analysis 8

- Chapter 2: Alternatives 11**
 - Elements Common to All Alternatives.....11
 - No-action Alternative (Alternative 1) 12
 - Development of the Action Alternatives..... 12
 - Elements Common to the Action Alternatives (Alternatives 2 and 3)..... 13
 - Original Proposed Action (Alternative 2) 14
 - Revised Proposed Action (Alternative 3 / NPS Preferred Alternative)..... 15
 - Alternatives and Alternative Elements Considered but Dismissed..... 16

- Chapter 3: Affected Environment and Environmental Consequences 24**
 - Visitor Experience..... 24
 - Affected Environment..... 24
 - Environmental Consequences..... 27
 - Wildlife and Wildlife Habitat..... 30
 - Affected Environment..... 30
 - Environmental Consequences..... 33
 - Free-ranging Cats 36
 - Affected Environment 36
 - Environmental Consequences..... 39

- Chapter 4: Consultation and Coordination..... 43**
 - Public Participation 43
 - Agency Consultation..... 43
 - Stakeholder Outreach..... 44

- References..... 46**

Appendix A: Applicable Laws, Regulations, and Policies	53
Appendix B: Cat Inventory Methods and Results	56
Appendix C: Past, Present, and Reasonably Foreseeable Future Actions	61
Appendix D: Zoonotic Diseases	65
Appendix E: Flora and Fauna Species Lists	70

LIST OF FIGURES

Figure 1. Location of San Juan National Historic Site	3
Figure 2. Location of the Project Area, Paseo del Morro, Feeding Stations, and Cameras	4

LIST OF TABLES

Table 1. Comparison of the Three Alternatives for the Free-Ranging Cat Management Plan at San Juan National Historic Site	21
Table 2. Visitation to San Juan National Historic Site, 2015 to 2022	25

ACRONYMS AND ABBREVIATIONS

APHIS	Animal and Plant Health Inspection Service
CFR	Code of Federal Regulations
EA	Environmental Assessment
Ear tip or tag	Removal of the tip of one ear of a spayed/neutered cat for easy identification
El Cañuelo	Fortín San Juan de la Cruz
El Morro	Castillo San Felipe del Morro
ESA	Endangered Species Act
IPaC	Information for Planning and Consultation
MOU	Memorandum of Understanding
NEPA	National Environmental Policy Act
NPS	National Park Service
Park	San Juan National Historic Site
Paseo	Paseo del Morro National Recreational Trail
PEPC	Planning, Environment, and Public Comment
Removal Agency	Organization(s) or Agency(s) Performing Cat Removal
SAG	Save a Gato
San Cristóbal	Castillo San Cristóbal
SHPO	State Historic Preservation Office
TNR	Trap-Neuter-Return
USFWS	US Fish and Wildlife Service

CHAPTER 1: PURPOSE OF AND NEED FOR ACTION

San Juan National Historic Site (the park) is the only national park unit in Puerto Rico. The park is in the city of Old San Juan and includes Castillo San Felipe del Morro (also known as El Morro), Castillo San Cristóbal (San Cristóbal), Fortín San Juan de la Cruz (also known as El Cañuelo), and most of what remains of the fortress wall that surrounds Old San Juan, (figure 1). These fortifications exemplify important developments in military architecture and engineering spanning almost five centuries (16th through 20th centuries) and represent the oldest fortifications of European design in the United States. The US Secretary of the Interior designated the fortifications a national historic site in 1949 through the *Establishment Order for San Juan National Historic Site*, and they were transferred to the National Park Service (NPS) and the Commonwealth of Puerto Rico in 1961.

The Paseo del Morro National Recreational Trail (Paseo) follows the western coast of the island along the base of the historic fortification walls from the San Juan Gate to El Morro (figure 2). Originally, this path served as a maintenance access route. The original dirt walk was constructed in 1995, and the paved walking path known as the Paseo was built in 1999 with funds from the Puerto Rico Tourism Company through a cooperative agreement between the agency and the National Park Service. The Paseo was designated a national recreation trail in 2001 (NPS 2021). The trail is 1.5 miles round-trip and has interpretive waysides for visitors to learn about the history of the walls and fortifications (NPS 2013).

Shortly after the construction of the Paseo, a population of free-ranging cats (*Felis catus*) began to colonize the area. Free-ranging cats are those that spend time outside with the ability to roam freely and may or may not have an owner. Feral cats are free ranging but are unowned and have little interaction with people, often avoiding or exhibiting aggressive behavior toward people (USDA 2021). This document will use the term “free-ranging cats” to discuss the cats that live in or use the habitats within the park.

The free-ranging cat is an invasive species in any habitat. Management of the cats at the park and the Paseo is a long-standing issue among the park, commonwealth, municipality, and the community of San Juan. The National Park Service is proposing to develop a plan for the management of free-ranging cats at the park.

Free-ranging Cats – Cats, regardless of ownership status, that spend time outside with the ability to roam freely.

Feral Cats – Free-ranging cats that do not have owners and have little interaction with people, often avoiding people or exhibiting aggressive behavior toward people.

Purpose of the Park

“Representing 500 years of history and the importance of the island’s strategic location in the Caribbean, San Juan National Historic Site preserves, protects, and interprets the oldest and largest Spanish fortification system in the United States” (NPS 2013).

Purpose and Need

The purpose of and need for this plan is to address free-ranging cat populations within San Juan National Historic Site to improve the safety of its visitors and employees, protect park resources and reduce impacts to native wildlife species associated with free-ranging cats, alleviate nuisance issues, align the visitor experience with the purpose of the park, and bring the park into compliance with existing authorities for invasive species.

Applicable Laws, Regulations, and Policies

A number of laws, regulations, and policies influence the development and implementation of a free-ranging cat management plan for the park. NPS *Management Policies 2006* articulates service-wide policy for the National Park Service, and Section 4.4.4.2, *Removal of Exotic Species Already Present* provides that invasive species will be managed – up to and including eradication – where control is prudent and feasible, and where the invasive species impacts resources, hampers management of the park unit, or poses a health or safety hazard (NPS 2006). Appendix A identifies and briefly summarizes this and other general authorities, as well as relevant laws, regulations, and policies that were considered during development of this plan. The list presented in appendix A is not exhaustive but relates directly to the preparation of this free-ranging cat management plan and EA.

Project Area

The city of Old San Juan is located on the 615-acre San Juan Island, which is connected by causeways to the greater metropolitan area. The city serves as both the capital of Puerto Rico and the headquarters for the municipal government. Old San Juan is a congested urban center consisting predominantly of mixed commercial and high-density residential areas with little open space. The park's 75 acres provide the largest open green space in Old San Juan and are host to a variety of recreational activities enjoyed by city residents and visitors, including exploring the historic structures, walking the trails, jogging, birdwatching, stargazing, picnicking, and kite flying (NPS 2013).

Most of the park sits on a rocky peninsula rising over 80 feet above sea level with the Atlantic Ocean on the north side and San Juan Bay at the west and southwest edges of the park boundary. Much of the park boundary includes shoreline. The park's grounds are mostly mowed/maintained; however, the park provides habitat for a variety of deciduous and evergreen trees, shrubs, vines, and herbaceous species. The dominant species along the Paseo, aside from turf grasses, are seagrape (*Coccoloba uvifera*) and snake plant (*Sansevieria trifasciata*).

Currently, seven cat feeding stations are located along the Paseo. These feeding stations are managed by Save a Gato (SAG), a local non-profit organization that cares for the cats of Old San Juan (figure 2). Because of these feeding stations, the free-ranging cats are concentrated along the Paseo. They can be found on or near the Paseo near the fortification wall, often using the vegetation on either side of the path for shade and shelter. Therefore, cat management efforts would focus on the Paseo but could also occur in other areas of the park.



The Paseo del Morro National Recreational Trail is a 0.75-mile-long trail that provides visitors an opportunity to experience the natural resources of the park and view the fortification walls from the waterfront.

Figure 1. Location of San Juan National Historic Site



Figure 2. Location of the Project Area, Paseo del Morro, Feeding Stations, and Cameras

Camera traps were used for the 2021 cat inventory at the park. These cameras were motion activated and only operated between 7 pm and 7 am when visitors were not present at the park. The cameras were removed in June 2021 at the end of the data collection.



Background of Free-Ranging Cat Management at the Park

In 2003, the US Department of Agriculture Animal and Plant Health Inspection Service (APHIS) Wildlife Services completed the *Management of Feral and Free-Ranging Cat Populations to Reduce Threats to Human Health and Safety and Impacts to Native Wildlife Species in the Commonwealth of Puerto Rico Environmental Assessment* with cooperation from the National Park Service. APHIS signed a Finding of No Significant Impact for this effort in December 2003 (USDA 2003). The environmental assessment (EA) analyzed alternatives for managing discrete free-ranging cat populations in the Commonwealth of Puerto Rico with the goal of reducing threats to human health and safety and impacts to native wildlife species. The alternative selected for implementation included a combination of lethal and non-lethal cat management methods.



The free-ranging cat is an invasive species in any habitat.

In 2004, the National Park Service and APHIS Wildlife Services began discussions regarding a free-ranging cat management program at the park. Due to public concerns, the National Park Service did not move forward with efforts to remove cats from the park, despite entering into an agreement with the Puerto Rican Tourism Company, which would sponsor most of the cost. SAG, the Puerto Rican Feral Cats Association, the Society for the Prevention of Cruelty against Animals of Puerto Rico, and Animal Control Solutions developed a plan to work together to implement a trap-neuter-return (TNR) program for the management of free-ranging cats at the Paseo (SAG et al. 2004).

A TNR program works to reduce free-ranging cat populations by removing kittens and socialized cats for adoption and stabilizing the remaining population by sterilizing cats, thus ending reproduction. Cats are live trapped, assessed by a veterinarian, spayed or neutered, vaccinated, and released to the location where they were trapped. While under sedation for the spay/neuter surgery, the tip of one of the cat's ears is removed so that altered cats can be easily identified as sterilized in the field (ear tip or tag). During the veterinary assessment, cats may be humanely euthanized due to health issues. TNR programs often involve the development of feeding stations because feeding the cats can help volunteers trap the cats and monitor the population.



One of the feeding stations on the Paseo has two food containers inside of a covered plastic bin with a hole cut in the side for cats to enter. A container for water sits beside it.

In 2005, the park signed a Memorandum of Understanding (MOU) with SAG for feeding, trapping, surveying, and removing free-ranging cats from the park. The cat population baseline was estimated to be 120 at the time and five feeding stations were approved. Under the original MOU (NPS 2005), SAG agreed to remove 12 cats from the Paseo within a year, immediately remove untagged cats (those without ear tips) from the park, conduct quarterly population surveys with written reports, and meet quarterly with the National Park Service. A subsequent agreement between the National Park Service and SAG noted a population of 95 cats at the park and expanded the number of approved feeding stations to eight (NPS 2008). All other requirements remained the same, including trapping, surveying, and removing cats from the park and reporting to and meeting with the National Park Service. At the

request of the National Park Service, SAG has since removed feeding station #8 at the western-most point of the Paseo, leaving seven feeding stations currently (see figure 2). The expectation of the TNR program was that the number of cats would decrease through attrition to a point of no cats within the park.

Surveys of the cat population at the park have been sporadic. To obtain an accurate and unbiased count of free-ranging cats at the park, the National Park Service conducted a camera trap survey in the summer of 2021 (NPS 2022; appendix B). Six motion-activated cameras were installed around the park and recorded images for two weeks between 7 pm and 7 am when cat activity is the greatest and when the park is closed to the public. NPS Biological Resources Division scientists reviewed the images downloaded from the cameras and identified individual cats using fur color/pattern, body shape, size (relative to surrounding permanent objects), and other defining features (e.g., presence of collars, ear-tip). NPS scientists were able to identify nearly 200 individual cats during the survey.

A summary of the methods used for this survey and the results are available in appendix B. NPS scientists made the following observations during the analysis of the photographs:

- Many of the same cats were seen throughout the two weeks of recording, and some of the cats are using multiple feeding stations along the Paseo, indicating they are unlikely to be territorial.
- There were approximately 26 cats observed that are pregnant or were recently pregnant.
- There were nine kittens observed.
- At least three unneutered male cats were observed.
- It was difficult for NPS scientists to identify the number of cats in the photographs with ear tips; however, NPS staff routinely observe cats with ear tips in the park.
- Rats (*Rattus* spp.) (an invasive species) were observed eating at feeding station #1, just inside the San Juan gate, indicating that the rats are likely coming to the Paseo from the city of Old San Juan to eat the food. Cats and rats were observed eating from the feeding station at the same time. There was no indication that the cats were preying on the rats at the Paseo.
- Green iguanas (*Iguana iguana*), another invasive species, were observed at feeding station #3 when NPS scientists were testing the cameras; however, the camera at this feeding station failed early during monitoring and was not included in the official survey. The rest of the stations are in shaded areas, which is not preferred habitat for iguanas.



A photograph from the 2021 camera trap survey shows rats at one of the feeding stations.

The total number of cats and the number of pregnant/recently pregnant cats documented during the 2021 camera trap survey suggest that the TNR program is not working to reduce the cat population at the park. In 2005, the population was estimated to be 120 cats. The current population of nearly 200 cats may not be significantly larger, but the population is not decreasing, contrary to the objectives of the TNR program and NPS policies for management of invasive species.

Issues and Resource Topics Retained for Detailed Analysis

Identifying issues — potential problems, concerns, conflicts, obstacles, or benefits that would result if an action were implemented — is an important part of the environmental review process. It is standard practice to organize issues by resource topics. Resource topics for this proposed project have been identified based on federal laws, regulations, and orders; the NPS National Environmental Policy Act (NEPA) Handbook (NPS 2015), NPS *Management Policies 2006* (NPS 2006), and NPS knowledge of resources at the park.

Issues should be retained for consideration and discussed in detail if:

- the environmental impacts associated with the issue are central to the proposal or of critical importance.
- a detailed analysis of environmental impacts related to the issue is necessary to make a reasoned choice between alternatives.
- the environmental impacts associated with the issue are a big point of contention among the public or other agencies.
- there are potentially significant impacts on resources associated with the issue.

Impact topics that are being carried forward for further analysis are identified below.

Visitor Use and Experience (including Human Health and Safety)

The NPS proposal to manage free-ranging cats at the park would affect visitor experience, as well as the health and safety of park staff and visitors. The park receives an average of one million visitors per year. The Paseo, where the cats are concentrated, is a popular recreational pedestrian path that is used by locals and other visitors for sightseeing, walking, running, and bird and wildlife watching. The Paseo provides a natural resources experience, as well as providing the unique experience of seeing the fortification walls from the San Juan Bay front (NPS 2021). Although some visitors complain about seeing the cats and the feeding stations and the smell associated with them, as evidenced by complaints received by the park (NPS 2019), others expect to see and enjoy seeing the cats when visiting. These varying visitor perspectives make the management of free-ranging cats at the park challenging.

Free-ranging cats can pose a health issue for humans (and wildlife), as their feces carry *Toxoplasma gondii*, which can cause toxoplasmosis, a chronic disease without a cure (Pedersen et al. 2012). Cats can also carry other diseases that can be transmitted to humans and wildlife, including rabies, cat scratch fever (bartonellosis), plague, ringworm, hookworm, leptospirosis, and COVID-19 (Blanton et al. 2007, Bowman et al. 2010, Gerhold and Jessup 2012, Kanine and Mengak 2014, Lepczyk et al. 2015, Shi et al. 2020).

For these reasons, the impacts of the alternatives on visitor use and experience will be fully analyzed.

Wildlife and Wildlife Habitat

Cats are an invasive species that become predators when allowed to roam across the landscape. They are indiscriminate in what they kill, and they are often surplus killers, not always eating what they kill. The effect of cats on wildlife has become a global problem, causing an incredible number of bird, mammal, and reptile deaths (Loss et al. 2013), and contributing to the extinction of at least 63 native species,



A black cat site on the riprap between the Paseo and San Juan Bay.

including 40 birds, 21 mammals, and two reptiles (Doherty et al. 2016). In addition to direct mortality, cats can affect native wildlife by pushing them out of their native range and transmitting disease. Native species, such as birds and rodents, affected by *T. gondii* become more curious, rendering them more prone to predation. As noted in the previous section, cats carry numerous other diseases that can be harmful to native wildlife.

A natural resource inventory has not been completed for the park; however, native flora and fauna occur at the park. The impacts of free-ranging cats on wildlife are well documented and are likely occurring at the park. This resource topic will be carried forward for full analysis.

Free-ranging Cats

As mentioned above, cats are not native to Puerto Rico, and they can have adverse impacts on native wildlife. Free-ranging cats also face a number of welfare concerns. In addition to the potential diseases discussed previously, cats are at risk of obtaining parasites, becoming injured or killed due to traffic, fights with other cats,

predation, or ingestion of toxins. Free-ranging cats live much shorter lives than owned cats (Jessup 2004). Although cats at the park are fed and are relatively safe from traffic injuries and predators, the cats at the park do not have an easy life when compared to owned cats. Implementation of the proposed action could result in changes to the cats' welfare. The impacts of the alternatives on the welfare of free-ranging cats will be fully analyzed.

Issues and Resource Topics Dismissed from Detailed Analysis

Several issues were initially considered but were ultimately dismissed from detailed analysis. These dismissed issues are not potentially significant, are not critical to choosing among alternatives, or are not controversial. These issues are described below, including the reason(s) why further analysis was not warranted.

Cultural Resources

San Juan National Historic Site is a well-preserved, complex of Spanish colonial masonry military fortifications. The park, in conjunction with La Fortaleza (another feature of the early Spanish military occupation of San Juan), were designated a World Heritage Site in 1983 for the significance and integrity of the resources (NPS 2021). The park consists of five distinct historic properties associated with Spain's military fortification system — San Cristóbal, El Morro, El Morro Esplanade, San Juan City Wall, and El Cañuelo. The Old San Juan Historic District encompasses the fortifications and city walls of the park, and the Paseo is a contributing element to the historic district. There are known archeological resources within the park associated with its deep history, as well as the potential for as-yet-identified archeological resources to be present.

The action alternatives would not result in adverse effects on cultural resources and would be beneficial for cultural resources within the park over the long term. The removal of the cats and feeding stations would minimize non-contributing elements of the cultural landscape and reduce the potential for free-ranging cats to have adverse impacts on archeological resources.

Consultation with the Puerto Rico State Historic Preservation Office (SHPO) is currently underway regarding this potential free-ranging cat management plan and the park's determination of no adverse effect. Cultural resources will not be carried forward for detailed analysis in this document for the reasons described above; however, should unknown archeological resources be uncovered during implementation, work would be halted in the discovery area and park staff would consult with the Puerto Rico SHPO regarding treatment.

Water Resources

The results of the 2021 camera trap survey show that the free-ranging cats in the park are concentrated along the Paseo, which is immediately adjacent to the shoreline. Although no site-specific studies on water quality have been performed, cat waste is likely affecting San Juan Bay. *T. gondii* not only affects terrestrial species, it also infects aquatic species, including manatees and sea otters (Bossart et al. 2012; Miller et al. 2004; Miller et al. 2023; Conrad et al. 2005; Mazzillo et al. 2013). As *T. gondii* is shed by cats, it is carried into aquatic habitats by upland runoff, and it is very persistent in the environment (Shapiro et al. 2019). The impacts of *T. gondii* on aquatic wildlife will be covered under the "Wildlife and Wildlife Habitat" resource topics; therefore, water resources has been dismissed as a stand-alone resource topic.



The fortifications and city walls are contributing elements to the cultural landscape at the park.

Special-status Species

The Endangered Species Act of 1973 (ESA), as amended, provides for the protection of rare, threatened, and endangered species. The National Park Service reviewed information available on the US Fish and Wildlife Service (USFWS) Information for Planning and Consultation (IPaC) system, which identified the following federally protected species as potentially occurring within the park boundary: West Indian manatee (*Trichechus manatus*, threatened), green sea turtle (*Chelonia mydas*, threatened), hawksbill sea turtle (*Eretmochelys imbricata*, endangered), leatherback sea turtle (*Dermochelys coriacea*, endangered), loggerhead sea turtle (*Caretta caretta*, threatened), olive ridley sea turtle (*Lepidochelys olivacea*, threatened), and Puerto Rican boa (*Chilabothrus inornatus*, endangered). There is no designated critical habitat within the park.



The Paseo del Morro National Recreational Trail, where the cats are concentrated, is adjacent to San Juan Bay.

Sea turtles would not be affected because they do not occur in or near the project area. The roseate tern (*Sterna dougallii dougallii*, threatened within the Caribbean) could occur within San Juan Bay; it has been observed in the park (eBird 2023a), though the observation was an unofficial record, reported by citizen scientist(s). The roseate tern is a migratory seabird and does not nest in the area, but the roseate tern would benefit from the removal of a potential invasive predator from the park (note also that this species does not appear on the USFWS IPaC list for the project area). The manatee is expected to benefit from the action alternatives because removing or relocating the cat colony away from the Paseo, and therefore the bay, could reduce the risk of

toxoplasmosis. The Puerto Rican boa does not occur in the project area and would not be directly affected by the action alternatives. As part of the implementation plan under the preferred alternative, the National Park Service would require that cats are not relocated into sensitive wildlife habitat or areas where there are listed species (see the “Revised Proposed Action (Alternative 3 / NPS Preferred Alternative)” section of chapter 2 for more details on the implementation plan). Therefore, increased risks associated with cats (i.e., displacement of native wildlife, predation, toxoplasmosis) in relocation areas under alternative 3 would be considered discountable.

The potential indirect impacts on protected species and other native wildlife are discussed in the “Wildlife and Wildlife Habitat” section of chapter 3; therefore, special-status species was dismissed as a standalone topic. Consultation with the USFWS is ongoing; see chapter 4 for additional details of Section 7 consultation.

Socioeconomics

Tourism is an important source of income for Puerto Rico and specifically Old San Juan. Visitors to San Juan from off-island have access to the Luis Muñoz Marín International Airport, as well as a cruise ship terminal. Attractions in Old San Juan include restaurants, shops, beaches, and the park and its historic resources. Similar to the park, there are free-ranging cats throughout Old San Juan, and residents leave food for the cats in many areas of the city. The cats have become so well known that some shops in the city carry cat-related merchandise for tourists. Some visitors enjoy seeing the cats in Old San Juan. Conversely, some visitors do not enjoy seeing the cats, as they are not native and often appear in poor health; this has led to some tourism companies complaining about the cats. Implementation of the action alternatives would remove the cats from the park. Some of the cats that spend time at the park could also roam freely throughout Old San Juan. The removal of the cats at the park would not noticeably affect the population of cats in Old San Juan and would therefore not result in any large or long-term changes to the economics of the local community. For these reasons, socioeconomics was dismissed from full analysis.

CHAPTER 2: ALTERNATIVES

This document presents three alternatives for the management of free-ranging cats at the park — the no-action alternative (alternative 1), the original proposed action (alternative 2), and the revised proposed action (alternative 3 / NPS preferred alternative). The no-action alternative provides a baseline for comparing the impacts of existing efforts in managing the free-ranging cats with the impacts of increasing management efforts under the two action alternatives. Best management practices have been incorporated into the action alternatives. These alternatives are detailed below, and table 1 at the end of this chapter presents a comparison of the three alternatives being considered.

During development of the alternatives and following public scoping, the National Park Service also considered other alternatives or alternative elements that were dismissed due to unacceptable resource impacts, because they did not meet the purpose of and need for the project, or because they were outside of the scope of this project. These alternatives/alternative elements are summarized in this chapter.

Elements Common to All Alternatives

The following elements are common to the no-action alternative and the two action alternatives:

- The abandonment and introduction of new cats within the park are prohibited and would continue to be prohibited under all alternatives.
- Free-ranging cats are an island-wide issue in Puerto Rico that requires collaboration. The National Park Service is committed to continue collaborating with the Municipality of San Juan, the Governor’s office, the Tourism Company, animal welfare organizations, veterinary professionals, shelter personnel, the community, universities, and other interested parties to the extent possible. However, the National Park Service only has jurisdiction over the park and cannot stipulate actions outside park boundaries or for the Puerto Rican government or other organizations. The National Park Service is implementing this plan to bring the park into compliance with NPS policies and regulations related to invasive species, wildlife, and feeding animals within the park.
- The National Park Service would continue educational efforts through messaging, informing visitors about issues associated with abandoning cats, including abandonment in national park units.
- The park currently institutes security measures — the gate at the entrance to the Paseo is closed at night and security guards are present when the Paseo is open (under an agreement with the Department of Tourism). To provide additional security, the park is currently installing a new lighting system along the Paseo. These measures minimize safety concerns and should help reduce the potential for people to abandon their pets at the Paseo.

This plan would only address the free-ranging cat population within the boundaries of the park and would not address cats within Old San Juan or other areas outside the jurisdiction of the National Park Service.

No-action Alternative (Alternative 1)

The no-action alternative would not change the current management direction or level of management intensity. Under the no-action alternative, the park would continue with its current but limited efforts in managing the free-ranging cats. The National Park Service would continue working with SAG (or another animal welfare organization) on the management of free-ranging cats through the TNR program. The no-action alternative would include the following with the ultimate goal being the reduction of free-ranging cats by natural attrition, such that feeding stations would no longer be needed:

- Maintain continued access to the Paseo for feeding, trapping, and population surveys
- Maintain the existing feeding stations along the Paseo and work with the National Park Service to reduce the number of feeding stations with the goal of elimination
- Tag (ear tip) the cats once spayed or neutered for identification
- Remove untagged cats
- Prohibit the introduction of cats to the Paseo except for those returned under the TNR program
- Conduct quarterly population surveys with NPS representatives and provide the park with a written report
- Meet with park management quarterly, or as needed

NPS *Management Policies 2006* Section 4.4.4.2, *Removal of Exotic Species Already Present* provides that invasive species will be managed – up to and including eradication – where control is prudent and feasible, and where the invasive species impacts resources, hampers management of the park unit, or poses a health or safety hazard. Although feeding of animals is prohibited by NPS regulations (36 Code of Federal Regulations [CFR] 2.2), the feeding stations have been allowed at the park for management of the free-ranging cats through the TNR program with the intent to reduce and ultimately eliminate both the cats and feeding stations from the park.

The National Park Service is unable to select the no-action alternative, as it violates NPS policies and regulations related to invasive species, wildlife, and feeding animals within the park.

The no-action alternative provides a basis for comparison, but the National Park Service is unable to select this alternative for implementation because it violates NPS regulations and policies related to invasive species, wildlife, and feeding animals within the park. See the text on long-term TNR in the “Alternatives and Alternative Elements Considered but Dismissed” section for more information on why a TNR program cannot be selected.

Development of the Action Alternatives

Through an internal scoping process, the NPS planning team developed the proposed action (the original proposed action, alternative 2), which would enlist an organization(s) or agency(s) to remove cats from the park (herein “removal agency”). The National Park Service presented the proposed action to the public during the public scoping period through a newsletter and public meetings (see chapter 4 for more information on public scoping). Some commenters were concerned about the fate of the cats and requested that SAG be able to continue management of the cats at the park. As noted above, the no-action alternative is not a viable alternative, but in response to these comments, the National Park Service created an additional alternative (the revised proposed action, alternative 3), which the National

Park Service has identified as the preferred alternative. This alternative would allow an animal welfare organization additional time to trap and remove the cats from the park and would give that organization some discretion on how to manage the cats after removal. However, in accordance with NPS policy and regulations, the feeding stations would be removed, and the National Park Service would not allow the cats to be returned to the park. The National Park Service would also require that the animal welfare organization relocate cats in compliance with Puerto Rico animal welfare and invasive species laws, including obtaining applicable permits, and not relocating cats into sensitive wildlife habitats or areas where there are protected species (see appendix A for summaries of applicable Puerto Rico laws and regulations). These two action alternatives are described in the following sections.

Elements Common to the Action Alternatives (Alternatives 2 and 3)

The two action alternatives present different phased approaches to removing free-ranging cats from the park. This section presents elements that would be similar for the two action alternatives; however, under the revised proposed action (alternative 3 / NPS preferred alternative), some of these methods would only be used if animal welfare organizations were unable to remove the cats in other ways in the time allotted.

- Management actions would only be used on the localized population of free-ranging cats at the park. Other free-ranging cat populations throughout San Juan and the rest of Puerto Rico would not be affected by this management plan.
- Releasing cats back into the park that were trapped as part of the removal efforts would be prohibited.
- Applicable permits would be obtained, as needed, for management and relocation of cats (for example, a relocation permit from the Puerto Rico Department of Natural and Environmental Resources).
- Feeding cats within the park would only be allowed to aid in initial trapping efforts, after which all feeding stations would be removed. All unauthorized feeding would be prohibited.
- The following strategies could be used to remove cats from the park and/or discourage cats from returning to the park:
 - **Live Trapping.** Live trapping devices (e.g., walk-in cage traps, soft net traps, and padded leg-hold traps) could be baited, scented, or placed along common travel lanes for the cats and would capture and restrain animals. Live trapping would likely be the primary method of removal. Use of these devices would be dependent on weather conditions, when they could be checked at least twice per day, and in accordance with applicable federal and Commonwealth laws.
 - **Denning.** Dens could be sought out to capture adult cats and kittens. This method of finding a pregnant female or a female that has just given birth is time- and effort-intensive; however, this method could be used if feasible.
 - **Habitat Modification.** Habitat modification involves changing the landscape to reduce the availability of food, water, and shelter. This method would be limited by the cultural landscape at the park. If used, this method would likely be implemented to discourage cat migration back into the park.

- **Exclusion Devices.** Exclusion devices can be used to keep cats from using buildings as shelter or for rearing kittens and include wire mesh or other material used to cover holes and other building and structure openings.
- **Repellents.** The US Environmental Protection Agency has approved several chemicals that provide a bitter taste and are used to keep cats away from items, such as garbage cans. Repellents could be used as a means of concentrating cats into certain areas to aid in trapping.
- The following trapping guidelines would be followed:
 - Lures, trap placements, and capture devices would be strategically placed at locations likely to capture cats and minimize the potential of non-target animal captures.
 - Any non-target animal captured in live traps would be released unless it is determined that the animal would not survive and/or cannot be released safely.
 - Removal efforts would be conducted primarily during early morning or evening hours when the park is closed to the public, which would minimize impacts on park visitors. If removal activities must be conducted during daytime hours, the National Park Service would close visitor access to the target area to ensure worker and visitor safety.
 - Conspicuous, bilingual warning signs would be installed alerting visitors to the presence of and reason for the live traps, when needed. The signs would be placed at major access points to areas where active cat management operations are being conducted, so long as the signs would not impact the efficacy of the removal efforts.
- The permanent removal of cats at the park may not be attained during the initial effort. If long-term monitoring indicates that a cat colony is becoming established at the park (noted by a sustained presence of cats), additional removal efforts would be required under either alternative.
- The National Park Service would increase educational efforts through additional messaging, addressing the reasons cats cannot be abandoned in the park, and noting that the park does not provide food for abandoned cats.

Original Proposed Action (Alternative 2)

Under the original proposed action, the National Park Service would enter into an agreement with a removal agency for the management of free-ranging cats in the park. The approach would be phased, as described below.

Cat Removal. The removal agency could use one or more of the strategies described in the “Elements Common to the Action Alternatives” section above to humanely remove the free-ranging cats from the park. Handling of the cats trapped in the park would be defined in the agreement between the National Park Service and the removal agency. The removal agency would assess the health and adoptability of the cats as they are trapped. Cats suitable for adoption could be relocated to a foster or adoptive home, an animal shelter, or an animal welfare organization facility for adoption; however, this would be dependent on available space in these locations at the time of the removal. Cats that are determined to be unadoptable due to health or behavioral concerns would be humanely euthanized. Cats may also be euthanized due to a lack of kennel space.

Feeding Station Removal. After the removal agency has completed trapping efforts in an area, the appropriate feeding stations would be immediately removed in that area to concentrate the remaining cats for trapping and removal. In this manner, all feeding stations would be gradually removed as trapping and removal efforts progress.

Monitoring and Additional Removal Efforts. Following removal of the feeding stations, the park would monitor to assess the presence, absence, and trends of any remaining cats within the park. The purpose of monitoring is to confirm that the removal efforts have been effective, such that there is no cat colony within the park. This monitoring would inform future management needs, including additional removal efforts. A sustained presence of cats would trigger additional cat removal efforts. In this situation, the removal agency would return to the park to conduct additional removal efforts. It is anticipated that multiple removal efforts would be needed.

Revised Proposed Action (Alternative 3 / NPS Preferred Alternative)

The revised proposed action would provide a phased approach for management of free-ranging cats, which would include continued trapping and removal efforts, removal of all feeding stations in the park, monitoring, and additional removal efforts if deemed necessary. At any time, the park could employ the habitat modification, exclusion device, and repellent strategies described in the “Elements Common to the Action Alternatives” section above to deter further colonization of the park by cats.

The National Park Service would publish a request for letters of interest from any animal welfare organization interested in working with the park to perform cat removal. The request would include the National Park Service’s implementation plan for the cat and feeding station removal actions under this alternative. This implementation plan would include the 6-month timeline for cat and feeding station removal, permit and reporting requirements, and basic guidelines for management of the cats, including compliance with Puerto Rico animal welfare and invasive species laws (see appendix A). Letters of interest must be received within one month of the request to be considered, and the National Park Service would select the animal welfare organization within one month of that deadline. If no legitimate animal welfare organizations show interest, the National Park Service would move to the last phase of this alternative, which would be employing a removal agency to remove the cats from the park, as described for alternative 2.

Under alternative 3, the implementation plan would require that the animal welfare organization comply with all Puerto Rico laws regarding animal welfare and invasive species.

Continued Trapping and Removal Efforts and Removal of Feeding Stations. Under the revised proposed action, an animal welfare organization would continue to humanely trap and remove cats from the park. The National Park Service would defer to the animal welfare organization to determine the best practice for removal of the cats, including the methods described in the “Elements Common to the Action Alternatives” section.

The animal welfare organization would be able to provide food to the cats in the park via continued use of the existing feeding stations for a discrete period of time (up to 6 months) to aid in the trapping and removal efforts. During this time, the animal welfare organization would gradually remove the feeding stations with all feeding stations within the park eliminated by the end of the 6-month period. At least one feeding station would be removed per month until all feeding stations have been removed. During this 6-month period, no new feeding stations would be added, and existing feeding stations would not be allowed to increase in size. The feeding stations would be removed completely and permanently from the park.

The animal welfare organization would be required to remove the cats from the park within the first 6 months of the implementation of the plan. The cats would be assessed for health and adoptability, transferring socialized cats to an adoptive or foster home, animal shelter, or animal welfare organization facility for adoption if kennel space is available at the time of removal/relocation. Using best professional judgment, the animal welfare organization would determine the appropriate outcome for unsocialized, under-socialized, or unhealthy cats. All cat relocation would be conducted in accordance with the implementation plan and could include euthanasia, similar to current practices. No cats – whether trapped in the park or elsewhere – would be returned to or released in the park. The animal welfare organization would be required to provide monthly status reports to the National Park Service, documenting the removal of the feeding stations and cats. If the animal welfare organization is making substantial progress with removing the cats from the park, as determined by the National Park Service, the National Park Service would consider providing a 6-month extension, allowing the organization to continue to trap and remove cats from the park. Feeding stations or any other method of providing food for the cats in the park would not be permitted after the initial 6 months.

If the animal welfare organization fails to meet the deadlines described here and detailed in the forthcoming implementation plan, the National Park Service would terminate the implementation plan and move to the last phase of this alternative, employing a removal agency to remove the cats from the park, as described in alternative 2.

Post-feeding Station Removal Monitoring. Following removal of the feeding stations, the park would monitor to assess the presence, absence, and trends of any remaining cats within the Paseo. The purpose of monitoring is to confirm that the continued management by the animal welfare organization and the removal of feeding stations to reduce the cat population has been effective, such that there is no cat colony within the park after the initial 6-month period. This monitoring would inform future management needs (including removal).

Additional Removal Activities. If the monitoring indicates that there is a sustained presence of cats inside the park, a removal agency other than the animal welfare organization would be employed to remove the cats. The removal agency could use the strategies described in the “Elements Common to the Action Alternatives” section to remove cats from the park, and placement of the cats would be the same as described for alternative 2. It is anticipated that multiple removal efforts would be needed.

Alternatives and Alternative Elements Considered but Dismissed

During the initial planning for this project, the National Park Service considered other options for free-ranging cat management, including ideas suggested by the public during the public scoping period. The following alternatives or alternative elements were considered for project implementation but were dismissed from further analysis because these options would result in unacceptable resource impacts, did not meet the purpose of and need for the project, or because they were outside of the scope of this project.

Removing Feeding Stations Only. Population densities of free-ranging cats have been found to be highest where resources, such as food and water stations, are abundant (Helback and Libezeit 2021; Tennent and Downs 2008). Removing the feeding stations at the park as a stand-alone action without removal of cats could cause the cats to disperse around the park or possibly other parts of Old San Juan, rather than concentrating them near the feeding stations. The park provides some habitat where cats can shelter, and in the absence of the feeding stations, the cats could switch to preying on native wildlife, such as reptiles or birds. Removing the feeding stations without removing the cats would likely reduce the cat population from its current levels, given the substantial reduction in food sources within the park, but this could also increase the impacts on park resources. Removing the feeding stations would also present a hardship for the cats that have gotten accustomed to having food provided on a daily basis. These

cats would have to learn to find or hunt for food and would likely have to compete with other cats for resources. For these reasons, removing the feeding stations only was dismissed from consideration.

Other Strategies for Removing Cats. The following removal methods were considered but dismissed as part of the proposed action. The rationale for dismissing these alternatives is provided for each method.

Long-term TNR – TNR programs are designed to reduce free-ranging cat populations by removing kittens and socialized cats for adoption and stabilizing the population by sterilizing cats, thus ending reproduction, as described in the “Background of Free-Ranging Cat Management at the Park” section of chapter 1.

TNR programs are supported by many animal welfare organizations and communities as an ethical alternative to euthanasia. Supporters also note that surgically altering the cats improves body condition, diminishes behaviors (e.g., mating, fighting), reduces disease transmission, reduces odors from spraying or marking, and stabilizes local populations by preventing the vacuum effect, where a new cat will take the place of a euthanized cat (Alley Cat Allies 2023; Horn et al. 2011; Hosie et al. 2009; Johnson and Cicielli 2014; Levy et al. 2014; Zito et al. 2018). However, other scientific literature disputes these claims (Barrows 2004; Jessup 2004; Longcore et al. 2009; Roebing 2014).

TNR is most effective in a closed system, and an exceptionally high rate of individuals within a population needs to be sterilized for TNR to be successful (Jessup 2004). In a population that is not isolated, such as the one at the park, TNR is not effective. New cats come into the colony from other populations and from being abandoned by owners. Though some cats may stay within one population, it is typical for free-ranging cats to travel among populations. Although TNR programs may be able to reduce free-ranging cat populations in some instances, TNR does not address other impacts of having free-ranging cats on the landscape, including disease transmission, predation, and odors from urine and feces in public areas (Castro-Prieto and Andrade-Núñez 2018).



A cat at one of the feeding stations appears to be pregnant or recently pregnant.

The TNR agreement with SAG has been ongoing since 2005, but the cat population has grown since the agreement was initiated with an estimated 120 cats. The 2021 survey identified nearly 200 individual cats in the population in the park (NPS 2022). The size and growth of the colony, even with the TNR program, suggests a growing population.

Employing a long-term TNR program as a stand-alone tactic would require that the feeding stations remain in use, and based on recent counts showing an increasing population, the cats would persist in the park and may even continue to increase in abundance. The TNR program on its own is unable to bring the park into compliance with existing authorities for invasive species, wildlife, and feeding animals within the park. For this reason and the others stated above, TNR as a stand-alone and long-term method of removing cats was dismissed.

Trap and Relocate into Other Areas – Some programs capture free-ranging cats, tranquilize them, and relocate them to other locations, including natural areas. When cats are relocated to a new area, they may have to compete with cats and other wildlife that are already established in that area. This practice is considered inhumane and ecologically unsound; the relocated cats may be forced to compete for resources with cats that are already established in the area, and depending on the area, it could create new impacts on resources where the cats are released. Relocating cats to an area unsuitable for cats is different than transferring cats to a shelter or animal rescue for adoption, where they would be cared for by people. Additionally, abandoning cats is prohibited by Puerto Rico Act Number 154, *Animal Protection and Welfare Act*. For these reasons, the National Park Service dismissed the relocation of the cats from the park to another area.

Under the revised proposed action (alternative 3 / NPS preferred alternative), the National Park Service would allow the animal welfare organization to use its best professional judgment to relocate the cats trapped at the park, but the relocation would be carried out in accordance with the implementation plan. Through the implementation plan, the National Park Service would prohibit the release of the cats back into the park and require that relocation comply with Puerto Rico animal welfare and invasive species laws, including obtaining a permit for relocation, if required. The animal welfare organization could relocate the cats to shelters or cat rescues where the cats have the potential to be adopted; however, shelters and animal rescues in Puerto Rico are already overwhelmed due to the number of stray and free-roaming animals on the island. If cats are released in areas outside Old San Juan, they could cause or face the adverse impacts discussed in the above paragraph, and abandoning cats in this manner would be in violation of Puerto Rico Act Number 154.

The animal welfare organization may choose to continue to provide feeding stations for the cats, including moving the feeding stations to an area close to the park in Old San Juan. In this scenario, some cats would likely move on their own to be near a reliable food and water source. It is expected that some cats could relocate to Old San Juan with minimal disruption to the existing cat populations or natural resources. The implementation plan would still require that the animal welfare organization comply with Puerto Rico animal welfare and invasive species laws, including obtaining a permit for relocation, if needed. The population of cats in the park is estimated at nearly 200 cats and relocating this number of cats to any one area could have adverse impacts on the cats already living in that area, the relocated cats, the native wildlife, and the community, depending on the area selected. These impacts are discussed in chapter 3.

Ground Shooting – Ground shooting can be used to selectively remove invasive species and typically involves the use of shotguns or rifles. The National Park Service dismissed this method as inappropriate within a small park area located adjacent to a city and to protect historic structures from potential harm.

Frightening Devices. Frightening devices include electronic guards, pyrotechnics, propane cannons, and lights. These devices are intended to haze free-ranging cats to stop behaviors or scare them from using certain areas. Cats can become habituated to frightening devices, making them ineffective, or the devices can have adverse impacts on other, non-target species, including native wildlife. Additionally, frightening devices that use sound or lights could affect visitors or neighbors to the park. Because frightening devices are not effective and have the potential to affect humans and other wildlife, this method was dismissed from consideration.

Biological Control and Poisoning. Biological control is the introduction of a natural enemy to control a pest population. Biological control is often a pathogen imported from the pest's native environment (USDA 2014). To date, no pathogens are known that would affect free-ranging cats that would not harm pet cats. Similarly, poisoning is not species-specific and would have the prospect of affecting a range of other species. For these reasons, biological control and poisoning were dismissed as methods of removal.

Create a Sanctuary. During public scoping, the public provided several suggestions for creating a sanctuary for the Paseo cats (e.g., declare the Paseo a sanctuary, purchase a building and turn it into a sanctuary, develop structures to house the cats at the Paseo). The Paseo is not and cannot be a sanctuary for the cats, as it is part of the San Juan National Historic Site, a national park system unit. As noted in chapter 1, the National Park Service has an obligation to protect park resources in accordance with existing authorities for invasive species and wildlife. Feeding, providing habitat, and protecting an invasive species, including providing funding for a cat sanctuary outside of the park, were dismissed from consideration due to the National Park Service's goal of complying with existing authorities for invasive species and wildlife. These suggestions would also not meet the purpose and need for this plan.

Modifications of the Existing Conditions. During the public scoping period, commenters provided a number of suggestions to modify the current conditions at the Paseo. The following are examples of these suggestions:

- Minimize and/or locate feeding stations in places less frequented by visitors
- Install litter boxes in areas away from the trail to reduce odors
- Install feeding stations that will exclude rats (e.g., stainless steel containers with magnetized doors, feeders and drinkers using PVC pipes)
- Limit the amount of food left out to only that which will be eaten by the cats in a day
- Use eco-friendly stations instead of plastic to reduce the visual intrusion
- Create areas attractive to cats to use for litter areas
- Create a daily cleaning plan using products that remove the smell of cat urine and collect waste with bags and shovels.
- Use machines and enzymatic cleaners to clean the heavily soiled areas to reduce odors
- Install hand-washing stations so people can wash their hands after interacting with the cats to decrease the chances of disease transmission
- Install water fountains to aid in the cleaning of feeding stations.

These suggestions were dismissed from consideration due to the National Park Service's goal of complying with its existing authorities for invasive species and wildlife. These suggestions would also not meet the purpose and need for this plan.

Other Educational Materials and Efforts. Public scoping comments suggested a variety of educational materials and efforts, including the following:

- Educational materials could be placed at the park stating the cultural significance of the Paseo cat colony, how the colony is managed by volunteers, how TNR works, and ways to help. The park could create an interpretive program to educate visitors on the history and lore of the Paseo cats.
- The park could create a museum with educational materials and allow artists to exhibit their cat-related crafts, with a portion of the sales being donated to SAG. Similarly, local artists could sell their art in the park gift shop. The museum should have a donation box and assign an area where visitors can meet the cats that are ready for adoption.

The proposed action would include an educational element, using signs or other materials to inform visitors of the issues associated with free-ranging cats. However, suggestions such as the ones above do not meet the purpose and need of the plan or are out of scope and were therefore dismissed from consideration.

Veterinary Services. Public scoping comments suggested that veterinary services for cat owners be increased. Suggestions included reinstating mass sterilization events that had been stopped due to the COVID-19 pandemic, establishing additional veterinary clinics throughout Puerto Rico, providing incentives for cat owners that sterilize their cats, and providing testing for life-threatening diseases. These suggestions are valid and could help to reduce the free-ranging cat populations in Puerto Rico and reduce abandonment; however, these suggestions are outside of the scope of this plan and beyond the jurisdiction of the National Park Service to implement. For that reason, these suggestions were not carried forward for analysis.

Tourist Attraction. Public comments recommended using the cats as a tourist attraction. Suggestions include creating a cat café where people could visit and adopt cats, selling merchandise celebrating the cats to support TNR efforts, and providing stations where visitors could purchase food to feed the cats. These suggestions are outside the scope of this plan and do not meet the purpose and need. Further, feeding cats within the park is prohibited and would make visitors susceptible to being bitten or scratched by the cats. For these reasons, these suggestions were dismissed from consideration.

Table 1. Comparison of the Three Alternatives for the Free-Ranging Cat Management Plan at San Juan National Historic Site

Table 1 compares elements of the three alternatives for free-ranging cat management. These alternatives pertain only to the cats within the park. The National Park Service would continue to collaborate with the Municipality of San Juan, the Governor’s office, the Tourism Company, animal welfare organizations, veterinary professionals, shelter personnel, the community, universities, and other interested parties regarding the island-wide free-ranging cat issue to the extent possible, but the alternatives presented in table 1 would not be applied to cats outside the park’s boundaries. The no-action alternative is presented here as it provides a basis for comparison, but the National Park Service is unable to select this alternative for implementation because it violates NPS regulations and policies related to invasive species, wildlife, and feeding animals within the park.

Alternative Element	Alternative 1 No-action Alternative	Alternative 2 Original Proposed Action	Alternative 3 Revised Proposed Action (NPS Preferred Alternative)
Organization Performing Cat Management	– SAG or another animal welfare organization	– Removal agency	– Animal welfare organization selected by the National Park Service, followed by a removal agency, if necessary
Authorization for Performing Cat Management in the Park	– Continuation of the TNR program	– Agreement with the NPS	– NPS implementation plan
Abandoning Cats in the Park	– Prohibited	– Same as alternative 1	– Same as alternative 1
Introducing New Cats to the Park	– Prohibited	– Same as alternative 1	– Same as alternative 1
Feeding Stations in the Park	<ul style="list-style-type: none"> – The existing feeding stations would be allowed for the continuation of the TNR program with the goal of eventually eliminating the cats and feeding stations from the park. – No new feeding stations would be added. – The size of existing feeding stations would not be expanded. 	<ul style="list-style-type: none"> – Continued use of the existing feeding stations would be allowed to help trap and remove cats – No new feeding stations would be added. – The size of existing feeding stations would not be expanded. – Feeding stations would be gradually removed as the cats in an area are trapped and removed. – All feeding stations would be removed following initial cat removal efforts. 	<ul style="list-style-type: none"> – Continued use of the existing feeding stations would be allowed for up to 6 months to help trap and remove cats. – No new feeding stations would be added. – The size of existing feeding stations would not be expanded. – Feeding stations would be gradually removed as the cats in an area are trapped with a minimum of one feeding station removed per month. – All feeding stations would be removed at the end of 6 months.

Alternative Element	Alternative 1 No-action Alternative	Alternative 2 Original Proposed Action	Alternative 3 Revised Proposed Action (NPS Preferred Alternative)
Potential Methods for Trapping Cats	<ul style="list-style-type: none"> – Live trapping 	<ul style="list-style-type: none"> – Live trapping – Denning – Habitat modification – Exclusion devices – Repellents 	<ul style="list-style-type: none"> – Same as alternative 2
Placement of Cats after Trapping	<ul style="list-style-type: none"> – Trapped cats would continue to be spayed or neutered, ear-tipped, and vaccinated. – The animal welfare organization would continue to assess the cats. – Socialized cats may be adopted, and unsocialized or under-socialized cats would be returned to the park. – Cats that are too ill or too old to be released are euthanized. 	<ul style="list-style-type: none"> – The removal agency would assess the health and adoptability of the trapped cats. – Socialized cats may be relocated to an adoptive or foster home, animal shelter, or animal welfare organization facility for adoption if kennel space is available at the time of removal/relocation. – Unsocialized, under-socialized, or unhealthy cats would be humanely euthanized. Cats may also be euthanized due to lack of appropriate kennel space. 	<ul style="list-style-type: none"> – The animal welfare organization would assess the health and adoptability of the trapped cats. – Socialized cats may be relocated to an adoptive or foster home, animal shelter, or animal welfare organization facility for adoption if kennel space is available at the time of removal/relocation. – Placement of unsocialized, under-socialized, or unhealthy cats would be determined by the best professional judgment of the animal welfare organization, in accordance with the NPS implementation plan and Puerto Rico animal welfare and invasive species laws, and could include euthanasia, similar to current practices.
Timeline Allowed for Trapping and Removal	<ul style="list-style-type: none"> – Trapping and removal by the animal welfare organization would be ongoing as part of the TNR program. 	<ul style="list-style-type: none"> – Trapping and removal by the removal agency would be completed as quickly as possible. 	<ul style="list-style-type: none"> – Trapping and removal by the animal welfare organization would occur over a 6-month period with the potential for a 6-month extension if substantial progress is being made.

Alternative Element	Alternative 1 No-action Alternative	Alternative 2 Original Proposed Action	Alternative 3 Revised Proposed Action (NPS Preferred Alternative)
Monitoring	<ul style="list-style-type: none"> – The animal welfare organization would conduct population surveys quarterly and provide written reports to the park. 	<ul style="list-style-type: none"> – The park would monitor for cats after removal of the feeding stations and initiate additional removal efforts by the removal agency if there is a sustained presence of cats inside the park. 	<ul style="list-style-type: none"> – The park would monitor for cats after removal of the feeding stations and initiate removal efforts by a removal agency other than the animal welfare organization if there is a sustained presence of cats inside the park.
Additional Trapping and Removal	<ul style="list-style-type: none"> – Not applicable – the TNR program would continue. 	<ul style="list-style-type: none"> – Multiple removal efforts are anticipated. – Placement would be the same as described for “Placement of Cats after Trapping” for alternative 2. 	<ul style="list-style-type: none"> – Multiple removal efforts are anticipated. – Placement would be the same as described for “Placement of Cats after Trapping” for alternative 2.
Security Measures to Reduce Cat Abandonment	<ul style="list-style-type: none"> – The gate at the entrance to the Paseo is closed at night. – Security guards are present when the Paseo is open. – The National Park Service is installing a new lighting system. 	<ul style="list-style-type: none"> – Same as alternative 1 	<ul style="list-style-type: none"> – Same as alternative 1
Education Related to Free-ranging Cats	<ul style="list-style-type: none"> – Education would continue through messaging, informing visitors about issues associated with abandoning cats. 	<ul style="list-style-type: none"> – Educational efforts would be increased through additional messaging, addressing the reasons cats cannot be abandoned in the park, and noting that the park does not provide food for abandoned cats. 	<ul style="list-style-type: none"> – Same as alternative 2

CHAPTER 3: AFFECTED ENVIRONMENT AND ENVIRONMENTAL CONSEQUENCES

This chapter describes the existing condition of resources retained for analysis that could be impacted by implementing the alternatives, as well as a description of the potential impacts. The “Affected Environment” section is presented first for each resource. The trends and past actions with ongoing effects and reasonably foreseeable future actions on NPS lands and throughout the Commonwealth of Puerto Rico were identified and are summarized in appendix C. The “Affected Environment” section includes a discussion of past, present, and reasonably foreseeable future actions and trends that affect each resource topic.

The “Environmental Consequences” section evaluates direct, indirect, and cumulative effects of the implementation of each alternative. A description of the direct and indirect effects provides the reader with an understanding of how the current and expected future condition of the resource would likely change as a result of implementing the alternatives. Cumulative effects are effects that result from the incremental effects of the action when added to other past, present, and reasonably foreseeable actions and trends, as discussed in the “Affected Environment” section. The impacts of the alternative being analyzed were combined with the impacts of other past, present, and reasonably foreseeable future actions and trends to determine the cumulative impact of each alternative. The cumulative effects are presented at the end of each impact topic discussion. Finally, a comparative conclusion of the alternatives is included for each impact topic. These impact analyses and conclusions are generally based on a review of existing literature, studies, and research performed by park staff, information provided by experts within the NPS and other agencies and institutions, professional judgment, park staff expertise and insights, and public input.

Visitor Experience

Affected Environment

The purpose of the park is to preserve, protect, and interpret the oldest and largest Spanish fortification system in the United States (NPS 2013), and most visitors come to the park to learn about the history of the park’s fortifications (Boyd and Hollenhorst 2011). Table 2 presents visitation numbers for the park between 2015 and 2022. The park was closed for long periods between 2020 and 2021 due to the COVID-19 pandemic, and the visitation statistics during these years are not representative of a typical year. Therefore, data for these years are not included in the following discussion.

The park receives an average of 1.2 million visitors per year (NPS 2023); however, visitation estimates do not account for visitors to all park areas. Visitors to El Morro and San Cristobal are directly counted, but because visitors can access the park grounds (the 23-acre grassy area located in front of El Morro is popular with visitors for picnicking and kite flying) in multiple locations, the park does not have an accurate way to count those visitors. Visitors to the park



A visitor reads an interpretive sign in the background, and a cat crosses the Paseo in the foreground.

grounds are calculated as a portion (approximately 84%) of the El Morro visitors. Visitors to the Paseo are not counted and are not factored into these estimates.

Table 2. Visitation to San Juan National Historic Site, 2015 to 2022

Year	Total Visitors to the Park	Visitors to the Grounds	Visitors to El Morro	Visitor to San Cristobal
2015	1,532,818	467,818	556,934	508,059
2016	1,456,553	452,136	538,263	466,149
2017	1,188,780	370,066	440,561	378,147
2018	910,405	285,205	339,537	285,657
2019	1,197,345	383,751	456,851	356,739
2020	357,100	70,072	83,421	77,952
2021	798,188	240,434	286,235	141,296
2022	1,027,264	307,308	365,849	210,111

Source: NPS 2023

The park provides a variety of recreational opportunities other than visiting the fortifications. The Paseo, where the cats are concentrated, is a popular recreational pedestrian path that is used by locals and other visitors for sightseeing, walking, running, and bird and wildlife watching. The Paseo allows visitors to experience the natural resources along the shoreline and provides the unique experience of seeing the fortification walls from the San Juan Bay front (NPS 2021). Cats are concentrated along the Paseo, often seen on the Paseo and amongst the vegetation on either side of the trail. The feeding stations are tucked into the vegetation, mostly hidden by shrubby vegetation; however, the odor of cat waste is prevalent in the areas close to the feeding stations, and some stations are easily seen from the Paseo. Visitors often leave food for the cats separate from the feeding stations, including piles of kibble and cat food cans on the NPS sign at the entrance to the Paseo, on the riprap adjacent to the Paseo, and on or behind the low stone walls along the Paseo.

The National Park Service conducted a visitor study in February 2010, distributing questionnaires in both English and Spanish to visitor groups throughout the park (Boyd and Hollenhorst 2011). Nearly 500 questionnaires were returned, providing insight into the preferences of the park’s visitors. Many questions asked visitors to choose answers from a list of responses, often with an open-ended option (“other”), while others were completely open-ended. The questionnaire did not offer free-ranging cats as a response to any questions, but visitors included cats in their responses in several situations. Cats were identified as a topic that visitors would want to learn more about on future visits to the park. Cats were also mentioned as the element that visitors liked the least and removing the cats/cat odors was offered as a suggestion for managing the park. The park has received written complaints from visitors regarding the presence of the cats and the feeding stations, and the smell associated with them (NPS 2019). Although some visitors complain about seeing the cats and the feeding stations, others enjoy seeing the cats when visiting.



Cat food cans sit behind a low wall along the Paseo apart from the feeding stations.

This spectrum of preferences was well-represented in the comments received during public scoping for this project. Commenters in support of retaining the free-ranging cats at the park stated that the cats are

part of the experience and removing them would be a destruction of history and culture. These visitors and residents are comforted by the efforts of SAG to care for the cats by providing food and water, trapping the cats to be sterilized and vaccinated, and providing vet care for sick animals. Others in opposition to the cats at the park stated that they represent an example of how colonialists carried cats, rats, and diseases across the globe, harming Indigenous peoples and native wildlife. These commenters noted that the number of cats is too high, there are many cats in poor overall health, and the presence of cats and cat waste at the Paseo and around the fortifications detracts from the cultural experience.

The cats of the Paseo are occasionally mentioned in travel blogs (e.g., Cruise Port Advisor [2020], My Cruise Stories [2018], Frommer's Media [2022]). During public scoping, some commenters claim that the cats are vital to tourism, and without the cats, tourism to Old San Juan and specifically the park would suffer. Conversely, some commenters believe that the presence of the free-ranging cats and feeding stations, the odors associated with the cats, and seeing the cats in poor health leave a bad impression on both residents and visitors.



Cats eat from piles of kibble that were left on the base of the NPS sign at the entrance to the Paseo.

Another issue facing park visitors and staff is the potential health risks because free-ranging cats carry diseases that can be transmitted to humans and wildlife (zoonotic diseases), such as toxoplasmosis, rabies, bartonellosis, plague, murine (flea-borne) typhus, and COVID-19 (Blanton et al. 2007; Gerhold and Jessup 2012; Lepczyk et al. 2015; Shi et al. 2020). Maintaining free-ranging cats on the landscape may increase the risk of disease transmission (Aguirre et al. 2019); the increased population density centered around feeding stations and supplemental feedings could affect the prevalence of pathogens (Hwang et al. 2018). See appendix D for more information on potential diseases that could be transmitted to humans by cats.

Past, Present, and Reasonably Foreseeable Future Actions and Trends

Past, present, and reasonably foreseeable future planned actions and trends can have adverse or beneficial effects on visitor experience. The park has one recently completed project (maintenance on the northwest walls of El Morro) and several ongoing actions that would affect visitor experience (replacement of the lights along the Paseo, stabilizing the cliff at San Fernando Bastion, and rehabilitation of the Paseo and El Morro nature trail, as well as routine maintenance of vegetation and historic structures in the park). These actions may require closures that would affect visitors for short periods; however, in the long term, these projects would benefit visitors, providing safer access to park resources.

Park visitation is also affected by local actions, including the ongoing plans to improve the San Juan cruise port, which will expand and modernize the port. These upgrades will double the port's capacity, likely resulting in increased visitation to the park from cruise passengers. However, changing travel conditions and events such as increasing storms or damage to the San Juan port could change the cruise ship schedule and the port's ability to receive ships, which could result in a reduction in visitation to the park.

Island ecosystems are particularly sensitive to changes in climate patterns. Increasing temperatures, changing precipitation patterns, more frequent and more intense storm events, and rising sea levels are climate change threats that will impact Puerto Rico and park resources. The park's historic structures are located along the shoreline making them vulnerable to storms, flooding, and sea level rise. Puerto

Rico's economy relies heavily on tourism, and the main attractions of the park are the fortifications. The continued threats presented by climate change will continue to put the fortifications at risk from flooding and erosion, and increased vegetation growth in cracks and at the base of the fortification walls can weaken them. If the National Park Service is unable to maintain the fortifications, visitation may decrease and the experience for those that visit could be diminished. Rising temperatures may dissuade visitation to the park during certain times of the year due to the increased frequency of hot days. The park's topography and the maintenance of the military viewshed do not provide ample shade, and hot days can be unhealthy and dangerous for some visitors. Finally, hurricanes, storms, and high tide events require that the park close the Paseo two to three times per month during hurricane season and additionally throughout the year due to storm surges and flooding from storm events. These closures are conducted to keep visitors safe, but the weather conditions and the closures affect visitation.

Environmental Consequences

As described in the previous section, visitors have expressed a wide range of reasons to support or oppose the presence of free-ranging cats at the park. To keep the analysis concise, these visitors were grouped into those that want to retain the park's cat population and those that would prefer the cats be removed.

Impacts of the No-action Alternative (Alternative 1) on Visitor Experience

Under alternative 1, the current management of free-ranging cats within the park would continue. Impacts on visitor experience would be the same as described above, in the "Affected Environment" section. The cats and the feeding stations would remain in the park, particularly on the Paseo, and the odors associated with the concentrated cat population would persist. Visitors would be either adversely or beneficially affected by the continued presence of cats at the park, depending on their stance on free-ranging cats. Some visitors would be adversely affected, as they may not want to see invasive species in the park or may have concerns about the poor condition of the cats. Others would benefit from the knowledge that a group of volunteers is caring for the cats by providing food and water and attempting to trap the cats to be spayed/neutered and vaccinated. By allowing the cats to remain in the park, the potential for visitors and park staff to contract a zoonotic disease from the cats would continue.

Impacts of the Original Proposed Action (Alternative 2) on Visitor Experience

Alternative 2 would result in the removal of free-ranging cats from the park through the efforts of a removal agency. These actions are likely to have a range of effects on visitors. Although most efforts would be conducted in the evenings when cats are most active and the park is closed to visitors, this alternative may require some short-term closures, specifically along the Paseo, resulting in adverse impacts on visitors. These impacts would only occur during closures, though repeated closures may be required during the initial and follow-up trapping efforts.

As noted above, visitors are divided on how the presence of the cats at the park affects their experience. For those that enjoy seeing the cats, alternative 2 would present a worst-case scenario. The removal agency would evaluate cats as they are trapped to determine which may be suitable for adoption. Although many of the cats may be habituated to humans due to sharing the Paseo with visitors and interactions with volunteers that feed them, most cats are likely not suitable for adoption and living in a home because they are not well socialized. As a result, many of the cats would face humane euthanasia. The ability to place cats in animal care facilities (e.g., animal shelters, animal welfare organizations, foster/adoptive homes) would be dependent on open kennel space. This is an ongoing issue in Puerto Rico, as animal care facilities are consistently overwhelmed with homeless animals. If there is a lack of appropriate kennel space at the time of removal, some adoptable cats may also be euthanized under

alternative 2. Although the cats would be removed from the park, visitors seeking an experience involving free-ranging cats would be able to do so by walking through Old San Juan or other areas of Puerto Rico, as alternative 2 would only apply to the cats within the park boundary, but overall, the knowledge that the cats would be euthanized and the subsequent absence of cats in the park would represent an adverse impact on the visitor experience for those that support the presence of the cats.

Other visitors that do not like seeing the cats at the park would benefit overall from the actions of alternative 2. Some visitors support NPS efforts to control invasive species at the park, others do not want to see free-ranging cats in poor health, see the feeding stations, cans of cat food, and piles of kibble, and smell the odors from cat waste. Others note that the cats detract from the historic context of the park's cultural resources. Removal of the cats and feeding stations from the park's landscape would provide a beneficial effect on the experience at the park for these visitors.

Regardless of a visitor's preference for having free-ranging cats at the park, the risks of transmitting a zoonotic disease would be reduced by alternative 2. Although wildlife species and other invasive species also carry diseases that could be transmitted to visitors, removing the cats from the park would remove a potential disease vector, resulting in beneficial impacts on the health and safety of park staff and visitors.

Impacts of the Revised Propose Alternative (Alternative 3 / NPS Preferred Alternative) on Visitor Experience

Alternative 3 would have the same ultimate outcome as alternative 2 — removal of all free-ranging cats and feeding stations from the park — but an animal welfare organization would have the opportunity to remove cats from the park before a removal agency (if necessary).

Although the experience of visitors that enjoy seeing the cats at the park would be adversely affected by this alternative, this alternative would provide some benefit to these visitors from the knowledge that some of the cats would be removed by the animal welfare organization. If the organization has the capacity to house the cats, whether in shelter kennels, in their own facility, or foster homes, there may be a greater chance for the cats to be evaluated and placed into homes for adoption. As with alternative 2, the placement of cats would be limited to open kennel space in animal care facilities; however, an animal welfare organization would likely have a larger pool of animal care facilities to call upon than a removal agency and may be able to transfer some cats to animal care facilities off-island. Some cats would inevitably be euthanized due to a lack of socialization, poor health, and potential lack of appropriate kennel space. The ability of citizens to track each cat's fate would be at the discretion of the animal welfare organization. Similar to alternative 2, visitors would have the opportunity to experience free-ranging cats in Old San Juan or other areas of Puerto Rico, as alternative 3 would only remove cats from the park.

Visitors with a preference for removing the cats would benefit from removal actions under alternative 3, and likely from the knowledge that some of the cats suitable for adoption would have that opportunity. The removal efforts would take longer than under alternative 2, and these visitors may not approve of letting an animal welfare organization use their discretion when determining placement for the cats. Through the implementation plan, the National Park Service would require that the animal welfare organization comply with Puerto Rico laws regarding animal welfare and invasive species. Specifically, the National Park Service would require that cats not be relocated into sensitive wildlife habitats or areas where there are listed species. These restrictions will help ensure appropriate placement for the free-ranging cats, but the National Park Service cannot rule out the potential for the cats to be released in San Juan or another location in Puerto Rico. Although this plan is specific to the cats at the park, the same cats could influence tourism and potentially affect visitors throughout Puerto Rico if they are released outside in another location.

Alternative 3 would be similar to alternative 2 in that the ultimate removal of the cats from the park would remove a potential vector of zoonotic diseases, resulting in beneficial effects on visitors and park staff. Short-term closures of portions of the park may also be required for trapping efforts. Because alternative 3 would first allow an animal welfare organization to trap and remove cats, then require actions by a removal agency if needed, a greater number of temporary closures, and possibly closures at different times of day, may be needed in comparison to alternative 2.

Cumulative Impacts on Visitor Experience

The impacts on visitor experience from the current free-ranging cat management at the park, as well as past, present, and reasonably foreseeable future actions and trends would be as described above in the “Affected Environment” section. There would be no new impacts on visitor experience under alternative 1.

Under alternative 2, there would be impacts on visitor experience from short-term closures and the removal of the free-ranging cats. Although there would be benefits from removing a potential disease vector, the removal of the cats could be adverse or beneficial, depending on the visitor’s perception of cats at the park. When considered with other past, present, and reasonably foreseeable future planned actions and trends (which would not have a substantial impact on the visitor experience at the park), alternative 2 would contribute beneficial or adverse impacts to the cumulative effects on the visitor experience at the park.

Alternative 3 would have similar short- and long-term impacts on visitor experience at the park; however, the intensity of the impact of removing the free-ranging cats from the park would be less due to the potential for the cats to be placed elsewhere through adoption or transfer to an animal shelter or animal welfare organization facility. Considering the relatively small impacts on visitor experience from other past, present, and reasonably foreseeable future planned actions and trends, alternative 3 would contribute adverse or beneficial impacts – depending on the visitor’s perception of cats at the park – though the impact would likely be less than that for alternative 2.

Conclusion for Visitor Experience

Under alternative 1, management of free-ranging cats would remain the same as current conditions, and the visitor experience within the park would be unchanged; alternative 1 would not result in new impacts on visitor experience nor contribute to cumulative impacts on visitor experience.

Alternatives 2 and 3 would ultimately remove cats from the park, thus removing a potential disease vector from the park, benefiting all visitors. Both alternatives may require short-term closures of parts of the park during trapping efforts, which would have temporary adverse effects on visitation.

The impact of the action alternatives would vary depending on the visitor’s perspective on cats in the park. If a person enjoys seeing the cats at the park and perceives them as part of the park experience, the action alternatives would have an adverse impact. Conversely, the action alternatives would result in beneficial effects on visitors who would prefer that cats were absent from the park. Under both alternatives, visitors would still be able to experience the free-roaming cats of Old San Juan or other parts of Puerto Rico; this cat management plan would only apply to lands under NPS jurisdiction and would not have a noticeable impact on the cat populations outside of the park.

Cats would be assessed for adoption under alternative 2, and cats that are unsocialized, under-socialized, or in poor health would be humanely euthanized. Given the overall lack of appropriate kennel space in Puerto Rico, the removal agency may have fewer options for placement of adoptable cats, and a larger number of cats would likely be euthanized at the time of trapping. For visitors that support cats in the park,

alternative 2 would be more adverse than alternative 3 for this reason. Alternative 2 would not result in indirect impacts on tourism or visitor experience outside of the park. When considered with other past, present, and reasonably foreseeable future planned actions and trends, alternative 2 could affect visitor experience at the park, either beneficially or adversely.

The impact of alternative 3 on visitors in support of free-ranging cats at the park may be less adverse since an animal welfare organization would have the opportunity to remove the cats and find appropriate placement (e.g., a home, shelter kennel, spot in the organization's facility) for them. Although the potential for placement under both alternatives may be limited due to an ongoing lack of kennel space for homeless animals in on-island animal care facilities, an animal welfare organization would likely have connections with a larger number of facilities that could take cats removed from the park, resulting in fewer cats being euthanized. However, there is the potential for indirect adverse impacts on tourism and visitor experience outside of the park, depending on the animal welfare organization's placement of cats following removal from the park. When considered with other past, present, and reasonably foreseeable future planned actions and trends, alternative 3 could have an adverse or beneficial impact on visitor experience at the park.

Wildlife and Wildlife Habitat

Affected Environment

Vegetation at the park has been highly manipulated for over 400 years with the construction of the fortifications, and there is no resemblance to the native vegetation patterns of the coastal plains physiographic region. The entire area is considered a designed historic landscape, and the vegetation within the park is maintained to preserve the historic landscape. Vegetation that grows on or near the base of the park's historic structures can cause damage to the stability and structural integrity of the structures and is routinely removed. The open lawns also provide spaces for recreational activities, demonstrations, and special events. Trees and shrubs grow adjacent to the lawns in areas and scrub-shrub vegetation grows on the steep sea cliffs, which can be quite dense in areas.

The Paseo — where the feeding stations are located — winds between the San Juan city wall and the San Juan Bay. Much of the inland area is maintained lawn; however, clumps of seagrape and snake plant also grow in this area. This landscaping is routinely maintained by the park. Shrubs, tree saplings, and vines colonize the riprap that edges the Paseo along the shoreline (NPS 2021). The cats are concentrated along the Paseo, as this is where the feeding stations are located, and use the vegetation as shelter.

The National Park Service has never completed a natural resources assessment, as cultural resources are the focus of this national park unit; a natural resources inventory was identified in the park's Foundation Document (NPS 2013) as a data gap. In the absence of survey information, the best available data are those collected by citizen scientists. Appendix E provides a list of flora and fauna collected by citizens (some of whom are likely to be scientists and naturalists) through iNaturalist, "a crowdsourced species identification system and an organism occurrence recording tool" (iNaturalist 2022) and eBird, online database of bird observations used by experts and amateurs (eBird 2023b). The tables in appendix E note whether the species identified are native or invasive.

The waters of Puerto Rico support 18 species of whales, dolphins, and manatees (Weil 2005). The West Indian manatee is listed as a federally threatened species under the ESA and has been observed in portions of San Juan Bay. The only terrestrial mammal species native to Puerto Rico are bats (Gannon et al. 2022).

Twenty-five amphibian species have been identified on the island (six of which have been introduced), as well as 56 reptile species, including four introduced species (Joglar et al. 2007). The Puerto Rican



The landscape in the El Cañuelo area of the park consists of mainly mowed turf.



Seagrape is the dominant vegetation between the city wall and the Paseo.



Vines and shrubs grow among the riprap adjacent to the Paseo.

boa, a federally endangered species under the ESA, has the potential to occur within the park, though it has never been observed there.

Puerto Rico also provides diverse habitats for approximately 354 bird species. Forty-five of these species are invasive, and 133 of these species reproduce on the island (Castro-Prieto et al. 2021). The roseate tern is a threatened species in the Caribbean and has been observed in the park (eBird 2023b); though the observation was an unofficial record, reported by citizen scientists. The roseate tern is a migratory sea bird that does not nest in or near the park. The Paseo provides suitable habitat for a variety of birds; however, bird activity is generally low. During a January 2022 site visit, the following species were observed: American oystercatcher (*Haematopus palliatus*), bananaquit (*Coereba flaveola*), Caribbean martin (*Progne dominicensis*), gray kingbird (*Tyrannus dominicensis*), greater Antillean grackle (*Quiscalus niger*), house sparrow (*Passer domesticus*), magnificent frigatebird (*Fregata magnificens*), northern mockingbird (*Mimus polyglottos*), royal tern (*Thalasseus maximus*), and Zenaida dove (*Zenaida aurita*). All these species are native or endemic to Puerto Rico except for the house sparrow.

Many domesticated mammals have been purposefully introduced to the island, including cats, dogs (*Canis familiaris*), goats (*Capra hircus*), pigs (*Sus scrofa*), horses (*Equus caballus*), donkeys (*Equus asinus*), and cattle; others — black and Norway rat (*Rattus rattus* and *R. norvegicus*) and house mouse (*Mus musculus*) — have been accidentally introduced (Gannon et al. 2022). The Indian mongoose (*Herpestes auro-punctatus*) was introduced to control the rodent population, and in turn, has adversely affected native reptile and bird species (Gannon et al. 2022) and continues to be the largest threat of transmitting rabies to other wildlife and humans (Ma et al. 2022). Free-ranging cats are routinely observed concentrated along the Paseo and more sporadically throughout other areas of the park.

One invasive reptile species, the green iguana, is routinely observed throughout the Paseo and the rest of the park. Although green iguanas have not been studied at the Paseo, observations recorded between 2008 and 2009 at Parque Lineal and Canal Blasina in San Juan and Carolina, respectively, noted high densities of iguanas and high reproductive success (López-Torres et al. 2012a), and the estimated population of green iguanas in Puerto Rico was 4 million in 2012 (López-Torres et al. 2012b). Green iguanas inhabiting the habitats in the park are likely reproducing, as mating behavior and burrows were observed during the

2022 site visits. Green iguanas cause a variety of impacts in the park, including damaging vegetation, generating waste in highly visited areas (creating health hazards and maintenance issues), and potentially displacing native species, such as Caribbean hermit crabs (*Coenobita clypeatus*), blackback land crabs (*Gecarcinus lateralis*), and various species of birds. Iguanas also dig burrows for nesting and refugia, which causes erosion that undermines infrastructure and aggravates erosion in coastal areas. Green iguanas and cats are typically not observed coexisting, except where they can be separated by height, meaning that although both species are plentiful along the Paseo, they generally self-segregate.

During public scoping for this project, rats and iguanas are two invasive species of concern noted by commenters. Although iguanas are conspicuous on the landscape, rats are generally nocturnal. The 2021 camera trap survey captured both rats and iguanas eating from the feeding stations provided for the free-ranging cats. As noted in chapter 1, rats were only observed eating from the station just inside the San Juan gate (station #1, see figure 2), indicating that the rats are likely coming to the Paseo from the city of Old San Juan to eat the food. Iguanas were only observed at feeding station #3, which is in direct sunlight; the rest of the stations are in shaded areas, which is not preferred habitat for iguanas. This indicates that the supplemental food is benefiting invasive species other than cats, though this benefit may be limited. It should be noted that there are limitations to the observations made during the survey, as not all of the feeding stations were monitored.

Free-ranging cats can transmit zoonotic diseases to wildlife, including toxoplasmosis, rabies, bartonellosis, plague, and parasites. Recently, there has been evidence of *T. gondii* in Antillean manatees (*Trichechus manatus manatus*) in Puerto Rico (Bossart et al. 2012). With a colony of cats at the park concentrated along the Paseo near San Juan Bay, runoff could carry feces containing *T. gondii*, which would present a threat to manatees and other aquatic mammals.

Free-ranging cats also impact wildlife populations through predatory behavior. The scientific literature reports a wide range of prey species from large birds to small insects, including at least 248 species consumed — 27 mammals, 113 birds, 34 reptiles, 3 amphibians, 2 fish, and 69 invertebrates (Bonnaud et al. 2011). Cats have contributed to the extinction of at least 63 native species, including 40 birds, 21 mammals, and two reptiles through predation, competition, and disease transmission (Doherty et al. 2016). In island environments, free-ranging cats are directly responsible for extinctions (Medina et al. 2011). One of the main threats to neonate (recently hatched) and juvenile Puerto Rican boas is free-ranging cats (USFWS 2021). The impacts of cats on birds and other wildlife in Puerto Rico has not been directly studied; however, one visitor noted a lack of birds at the Paseo in a letter to the superintendent (NPS 2019), and multiple commenters expressed concern for birds in relation to the free-ranging cats during the public scoping comment period. In addition to predation, some native wildlife may avoid using habitats where cats are present.



Green iguanas are abundant in the habitats along the Paseo.



Green iguana burrows are present in the ground adjacent to the Paseo.

Past, Present, and Reasonably Foreseeable Future Actions and Trends

Past, present, and reasonably foreseeable future planned actions can have adverse or beneficial effects on wildlife and wildlife habitat. The park has several ongoing actions that would affect vegetation, including rehabilitation of the Paseo and El Morro nature trail and routine maintenance of vegetation in the park. These actions involve trimming vegetation to retain the historic landscapes for which the park was established and to provide safe trail access for visitors. Although these actions would result in adverse impacts on vegetation from removal, these actions protect the fundamental resources and values of the park.

The effects of climate change as discussed under the “Visitor Experience” section — increasing temperatures, changing precipitation patterns, more frequent and more intense storm events, and rising sea level — would also impact Puerto Rico’s wildlife and wildlife habitat. Despite the projection for more intense and more frequent storms, Puerto Rico is expected to become drier in the future, which could result in an uptick of habitat-altering events, such as wildfires, weather extremes, and wildlife diseases. These factors can influence the distribution of vegetation and wildlife species, potentially providing opportunities for nonnative species to become established and outcompete native species.

More than 150 invasive species have been identified in Puerto Rico. There is a plan in place to reduce or remove discrete problem populations of certain mammal and reptile species on the island. There is also a plan to reduce the island-wide population of green iguana, and the National Park Service is proposing to develop a park-specific iguana management plan. Although these plans work or will work to reduce impacts of invasive species, Puerto Rico faces a host of challenges from repeated disasters (e.g., storms, earthquakes, COVID-19 pandemic), which reduces the priority of invasive species management. Invasive species continue to have adverse impacts on Puerto Rico’s ecosystems, exasperated by climate change.

Environmental Consequences

Because the park does not have a comprehensive natural resources inventory, and the effects of the free-ranging cats on the wildlife and wildlife habitat in the park have not been studied, this section discusses the impacts of the alternatives qualitatively, using scientific literature for support where available.

Impacts of the No-action Alternative (Alternative 1) on Wildlife and Wildlife Habitat

Under alternative 1, the current management of free-ranging cats within the park would continue. Impacts on wildlife and wildlife habitat would be the same as described above, in the “Affected Environment” section. The cats and the feeding stations would remain in the park, particularly on the Paseo, and the odors associated with a concentrated population of cats would persist. Impacts of the cats on local wildlife through displacement, predation, and potential disease transmission would persist. Cats are not likely impacting the maintained vegetation, but it is likely that they are having an adverse impact on insects, birds, and reptiles of the park and may be contributing toxoplasmosis to the aquatic environment. Although there are no site-specific studies documenting cats preying on wildlife in the park or contributing to *T. gondii* in the environment, there is a large amount of literature available that supports the impacts of cats on native wildlife. Additionally, visitors have noted a lack of wildlife at the park, which may be attributed to the cat colony. Meanwhile, other invasive species (iguanas and rats) would continue to opportunistically eat at the cat feeding stations and from unauthorized feeding where people leave piles of kibble or cans of cat food in the park.

Impacts of the Original Proposed Action (Alternative 2) on Wildlife and Wildlife Habitat

Under alternative 2, the free-ranging cats would be removed from the park by a removal agency as quickly as possible. The cats would either be placed in an animal welfare facility for adoption or humanely euthanized.

During public scoping, commenters noted the “vacuum effect” where there is a short-term reduction in the numbers of the overall population after removal efforts, but other individuals of the same species eventually move into the habitat to take advantage of the available resources (Alley Cat Allies 2023). Because of the number of cats that currently live in Old San Juan, cats from the city would likely enter the park after the existing cats are removed. However, using an integrated pet management approach, where a variety of methods are used to reduce impacts of a species to tolerable levels, reduces the potential for other cats to move into open habitats (Hildreth et al. 2010). As noted in chapter 2, alternative 2 would incorporate a variety of management techniques in addition to removal efforts, including removal of feeding stations, habitat modification, exclusion devices, repellents, and denning. Through this integrated approach and continued monitoring, the National Park Service would prevent a new free-ranging cat colony from forming in the park. If monitoring indicates a sustained presence of cats in the park, this would trigger additional removal actions as needed. It is anticipated that multiple removal efforts would be needed under alternative 2.

Ultimately, the cats would be removed completely from the environment, benefiting native wildlife and wildlife habitat. By eliminating cats from the habitats in the park, the National Park Service is providing an ecological niche for other wildlife to occupy, including native wildlife that may have been displaced by the presence of the cats. This alternative would also remove a potential disease vector from the park, another benefit to native wildlife, including the federally protected West Indian manatee that is known to occur in San Juan Bay. Given the prevalence of free-ranging cats throughout San Juan and Puerto Rico, cats would remain an issue for native wildlife outside the park, but there would be no indirect impact on wildlife and wildlife habitat outside the park from implementation of alternative 2.

Public scoping comments also noted concerns that removal of the cat population at the park could provide an opportunity for other invasive species, namely iguanas and rats, to move into the spaces where the cats were. Iguanas are already found throughout the park, including along the Paseo where the cats are currently concentrated, but there is a lack of literature defining the relationship between iguanas and cats in situations where both species are invasive. Although removal of the cats under alternative 2 could create an open niche for rats to occupy, this is not expected to occur at the park. Some studies show that removing cats from the landscape does not result in growth of the rat population. This could be because there are still enough cats within the larger population to keep rat populations stable (Page 2020). Another explanation is that rat populations may be resource-limited (based on competition) and not controlled by cat predation (Page 2020; Ruscoe et al. 2011). Another study noted low rates of cats preying on rats, which suggests that feral cats are not effective in rodent control. Instead, the rats avoid using the same areas when cats are present. This could give the public the perception that cats are controlling the population (Parsons et al. 2018). During the 2021 camera trap survey, NPS scientists noted the presence of rats at feeding station #1 and observed cats and rats feeding at the same time, but there was no evidence that cats are preying on rats on the Paseo (NPS 2022; appendix B). This one survey does not provide conclusive evidence that cats do not prey on rats; however, it does indicate that cats in the park are not controlling the rat population through predation and that rats are opportunistically eating food provided for the cats. With removal of the feeding stations and the abundant supply of food in Old San Juan (i.e., trash from homes, restaurants, and businesses), rats would likely still search the park for food opportunities but would remain concentrated where food is more readily available. Rats and iguanas would continue to cause an adverse impact on native wildlife and wildlife habitat at the park, but

the impact would not increase due to the removal of the free-ranging cats and could decrease due to the removal of the feeding stations.

Impacts of the Revised Proposed Alternative (Alternative 3 / NPS Preferred Alternative) on Wildlife and Wildlife Habitat

Alternative 3 would likely require more time for removal of the free-ranging cat colony at the park compared to alternative 2, but the impacts in the park would ultimately be the same as described for alternative 2. Native wildlife would have the opportunity to use the habitat in the park without the stress of having an invasive predator and potential disease vector present in the same habitat. Other invasive species, specifically rats and iguanas, would continue to impact native wildlife and wildlife habitat, but the removal of the cats is not expected to cause an increase in populations of these invasive species or their distribution in the park and could decrease due to the removal of the feeding stations.

Another indirect impact that could occur is related to how the animal welfare organization handles the placement of the cats once they are trapped and removed from the park. The National Park Service would require (through the implementation plan) that the animal welfare organization relocate cats in compliance with Puerto Rico animal welfare and invasive species laws, including obtaining applicable permits, and not relocating cats into sensitive wildlife habitats or areas where there are protected species. If the cats are placed in shelter kennels, inside the organization's facility (if one exists), or in a foster or adoptive home, the impacts would remain the same as those discussed under alternative 2 – beneficial for wildlife inside the park and no indirect impact on wildlife outside the park. In a scenario where the cats are removed from the park and released elsewhere outside, the cats could have indirect adverse impacts on the wildlife in that area. Releasing the cats in San Juan or another urban area could have increased, though limited, adverse impacts on local wildlife, given the existing prevalence of cats in these areas. However, if the cats were to be released in a more natural area, ranging from another urban park to a protected ecosystem, the cats could have damaging effects on the native wildlife in that area, including federally listed species such as the Puerto Rican boa and West Indian manatee. The number of cats in the park population is estimated to be nearly 200 cats, and relocating this number of cats to any one area would have adverse impacts on the cats already living in that area, the relocated cats, the native wildlife, and the community, depending on the area selected. As noted in the scientific literature, cats can have devastating effects on native wildlife that have not evolved to avoid predation by a mammalian predator. Because there are many invasive species in Puerto Rico, and free-ranging cats are already present throughout Puerto Rico, the adverse effects on native wildlife species would be additive.

Cumulative Impacts on Wildlife and Wildlife Habitat

Under alternative 1, the impacts on wildlife and wildlife habitat from the current free-ranging cat management at the park, as well as past, present, and reasonably foreseeable future actions and trends would be as described above in the "Affected Environment" section. There would be no new impacts on wildlife and wildlife habitat under alternative 1.

Alternative 2 would remove the park's free-ranging cat colony, removing an invasive predator and potential disease vector and allowing native species the opportunity to return to the park's habitat, resulting in beneficial effects on wildlife and wildlife habitat. Given the park's urban setting and the presence of other invasive species, the incremental beneficial impacts of alternative 2 would have only a small contribution to the overall adverse cumulative impacts on wildlife and wildlife habitat when considered with other past, present, and reasonably foreseeable future actions and trends.

Alternative 3 would have the same beneficial impacts on the park's wildlife and wildlife habitat as described for alternative 2. However, depending on how the animal welfare organization manages the

disposition of the cats after removing them from the park, alternative 3 could adversely affect wildlife outside of the park. Free-ranging cats are already present throughout Puerto Rico. Therefore, the incremental adverse impacts of alternative 3 would have only a small contribution to the overall adverse cumulative impacts on wildlife and wildlife habitat when considered with other ongoing past, present, and reasonably foreseeable future actions and trends.

Conclusion for Wildlife and Wildlife Habitat

Under alternative 1, management of free-ranging cats would remain the same as current conditions, including impacts on wildlife and wildlife habitat from past, present, and reasonably foreseeable future actions and trends. This would include displacement, predation, and potential disease transmission, as well as supplemental feeding of other invasive species (i.e., rats and iguanas) through continued use of the feeding stations.

Alternatives 2 and 3 would ultimately remove the free-ranging cat colony from the park, thus removing an invasive predator and potential disease vector from the park, which would benefit native wildlife. Although native wildlife would have the opportunity to use the habitat currently occupied by cats, other invasive species would have the same opportunity. However, scientific literature indicates that removal of the cats would not necessarily cause an increase in populations of other invasive species. Overall, alternative 2 would have a beneficial impact on wildlife and wildlife habitat in the park and no indirect impact on wildlife and wildlife habitat outside the park. When considered with other ongoing actions and environmental trends, the beneficial effects of alternative 2 on wildlife or wildlife habitat would only have a small contribution to the overall cumulative impacts on wildlife and wildlife habitat.

Alternative 3 would have the same beneficial impact on wildlife and wildlife habitat in the park but could have an indirect adverse impact on wildlife and wildlife habitat outside of the park, depending on the actions of the animal welfare organization following removal of the cats from the park. If the cats from the colony at the park are released in other areas of Puerto Rico, the cats could have an adverse impact on wildlife where they are released, including protected species. The potential for adverse impacts would be reduced by the terms in the implementation plan, which would require that cats are relocated in compliance with Puerto Rico animal welfare and invasive species laws, including obtaining applicable permits, and not relocated into sensitive wildlife habitats or areas where there are listed species. Alternative 3 is likely to have an incremental adverse impact on wildlife or wildlife habitat when considered with other past, present, and reasonably foreseeable future actions and trends.

Free-ranging Cats

Affected Environment

The domestic cat is valued by humans as a companion animal and for its ability to hunt household small pests; however, the free-roaming cat — whether owned and allowed outdoors, stray, or feral — is an invasive species in all habitats. Estimates of free-ranging cat populations vary greatly. Scientific literature estimates that the global population of free-ranging cats ranges from 400 to 600 million cats (Dauphiné and Cooper 2009; Castro-Prieto and Andrade-Nunez 2018) and estimates of the US population ranges between 30 and 100 million in 2004 (Loss et al. 2013; Anderson et al. 2004; Jessup 2004). Following Hurricane Maria in 2017, the Humane Society of Puerto Rico estimated that there were approximately one million free-ranging cats in Puerto Rico (Jagoda 2019). In Old San Juan, Puerto Rico and at the Paseo, the presence of free-ranging cats is well documented; however, the size of the entire population is unknown.

Castro-Prieto and Andrade-Nunez (2018) estimated the population of free-ranging cats within a portion of Old San Juan using data collected in May 2013. The survey covered approximately 121 acres of the city but excluded La Perla, La Puntilla, and most of the Paseo. Based on a two-day visual encounter survey, the researchers estimated a population of 178 cats. Cats were observed clustering near feeding stations. Approximately 70% of the cats observed were spayed/neutered (noted by an ear-tip), but more than 40 cats were unaltered and pregnant cats and kittens were also observed. The population size is likely underestimated — the observations were collected during the day (8 am to 1 pm) and cats are more active in the evenings and when volunteers attend the feeding stations. This survey included a small portion of the Paseo, and at the time of the survey, it appears that two of the Paseo feeding stations (stations 1 and 2) were incorporated into the observations.

At the time of the first MOU between the park and SAG, the free-ranging cat population at the park was estimated to be 120 (NPS 2005). To get a complete and current estimate of the free-ranging cat population at the park, the National Park Service installed six motion-activated cameras (figure 2) and recorded images for two weeks in the summer of 2021 between 7 pm and 7 am, when cat activity is the greatest. From these data, NPS Biologic Resources Division staff estimated a population of nearly 200 cats. This survey also noted the presence of pregnant or recently pregnant cats and kittens, as well as unaltered male cats. The observations of pregnant females, kittens, and unaltered males both on the Paseo and in the city of Old San Juan indicates that these populations will continue to grow.

The reproductive capacity of free-ranging, unaltered cats is high. Female cats become sexually mature between 6 and 12 months of age (Nutter et al. 2004; Ogan and Jurek 1997) with an average of 1.4 to 1.5 litters per year. Pregnancies have been observed during all months of the year with an average litter size of 3 to 4 kittens (Nutter et al. 2004; Levy and Crawford 2004). Kitten mortality is also high with approximately 75% dying or disappearing before 6 months of age (Nutter et al. 2004). However, at these rates, each reproductive female could contribute at least one kitten to the population per year surviving to at least 6 months of age when the kittens themselves would begin reaching reproductive maturity.

During site visits to the Paseo in January and November 2022, many cats were observed along the Paseo, resting in the shade provided by the vegetation and stone benches, using the feeding stations, and moving among the



A cat uses a water trough provided at one of the feeding stations along the Paseo.



A cat stands in the shade of a lighting fixture on the Paseo.



Three cats sleep in the shade provided by a low stone wall along the Paseo.

vegetation. NPS staff and contractors observed several cats in poor physical condition, noting cats with obvious ear infections and scars, likely from fighting. Free-ranging cats have a lower quality of life than indoor-only pet cats, often suffering higher rates of injury and disease (Jessup 2004). Although threats of vehicle trauma and predation are likely lower for free-ranging cats at the Paseo, they are at risk of threats from severe weather, especially during hurricane season. The American Veterinary Medical Association has noted an average lifespan of 2 years for free-ranging cats, in comparison to the mean lifespan of 10 years for owned cats (Jessup 2004). Feeding stations concentrate cats and may increase the risk of disease transmission within and across species (Winter 2004). Despite the challenges faced by free-ranging cats, SAG provides care to the cats in the park. In addition to providing a consistent source of food for the cats, SAG volunteers trap intact cats (identified as those without ear tips) and take them to veterinary clinics for spay/neuter surgery and vaccinations. Because SAG volunteers feed the cats regularly, they can note cats that appear to be in poor health or have injuries. They make efforts to trap unhealthy or injured cats and provide veterinary care for them. Cats that are too ill or too old to be released are humanely euthanized. This level of care improves the quality of life for the cats at the park.

Past, Present, and Reasonably Foreseeable Future Actions and Trends

Cats are one of 158 recorded invasive species in Puerto Rico. Invasive species can damage agricultural resources, natural resources, and property and pose threats to human health and safety. Once established, these species are difficult to control.

Discrete populations of cats and other nuisance mammal and reptile species can be managed through the APHIS plan for *Managing Damage Caused by Mammal and Reptile Species in Puerto Rico*; only green iguanas have an island-wide management plan (*Comprehensive Action Plan to Control the Green Iguana's Population*; Lopez-Ortiz et al. 2012b). Volunteer-led TNR programs occur in San Juan and elsewhere in an attempt to control the free-ranging cat population in Puerto Rico, estimated to be approximately one million cats in 2017 (Jagoda 2017). Puerto Rico is facing a variety of issues contributing to the problem of overpopulation of free-ranging cats.

Abandonment of pet cats occurs regularly due to a lack of access to affordable veterinary care, natural disasters that force people to leave Puerto Rico for the mainland and leave their pets behind, and the misconception that organizations like SAG will care for their abandoned cats. These cats are often not sterilized, which leads to unwanted litters. There are few shelters in Puerto Rico and both municipal and private shelters are overcrowded, under-staffed, and unable to keep up with the number of unowned cats. With repeated hardships, such as hurricanes, earthquakes, and the COVID-19 pandemic, some pet owners cannot care for their cats. Knowing the conditions of the shelters and the services provided by animal welfare organizations, pet owners often opt to release their cats instead of taking them to shelters. These same hardships make it difficult for the Commonwealth of Puerto Rico to address the issue of free-ranging cats (and other invasive species), when residents are facing houselessness and utilities and infrastructure are in disorder. These factors lead to an abundance of free-ranging cats in Puerto Rico, the city of San Juan, and the park. Based on the compounding issues that the island faces, Puerto Rico requires a comprehensive, collaborative effort to properly address its free-ranging cat situation. As noted above, cats can cause ecological damage, including contributing to extinction of native species, but these cats often do not have a good quality of life, suffering from competition for resources, disease and injury, and lack of veterinary care.

Climate change effects, as described in the “Wildlife and Wildlife Habitat” section, may affect free-ranging cats differently. Cats have proven that they are able to adapt to a variety of habitats and food sources, evidenced by their presence on all continents except Antarctica (Trouwborst et al. 2020). Cats are also intensive breeders as noted in the “Affected Environment” section. Warming temperatures make it possible for cats to extend their breeding season, but cats in Puerto Rico likely breed year-round currently

due to the consistently warm temperatures. Although unlikely for the cats that are living in San Juan and specifically the park, climate change may push cats into new habitats in search of shelter and food (Aguilar et al. 2015); this could become an issue in more natural areas of Puerto Rico. Free-ranging cats may also be affected by more frequent and intense storm events, resulting in flooding and storm surges. The cats most likely flee to higher ground when they sense a storm approaching, but when the Paseo must be closed for public safety during storms, volunteers are unable to reach the feeding stations, so the cats must find their own food and water for the duration of the closures.

Actions at the park (past, present, and reasonably foreseeable future planned actions) can have adverse or beneficial effects on free-ranging cats at the park. The improvement and maintenance projects summarized in appendix C may have some negligible temporary impacts on the free-ranging cats in the park from disturbance during these projects. The cats are habituated to human presence on the Paseo but may be displaced from sheltering locations if park staff are in areas where visitors do not typically travel, such as the base of the city walls. Once completed, the project to install lighting along the Paseo may be of benefit to individual cats. The lighting could reduce the number of cats abandoned within the park; the lighting may make pet owners more concerned about being caught abandoning their cats, which is illegal under Puerto Rico Act Number 154, *Animal Protection and Welfare Act*.

Environmental Consequences

Impacts of the No-action Alternative (Alternative 1) on Free-ranging Cats

Under alternative 1, the current management of free-ranging cats within the park would continue. As a result, impacts on free-ranging cats within the park would be the same as described above in the “Affected Environment” section. The feeding stations would remain and continue to be used by an animal welfare organization to help with the TNR program. The goal of any TNR population is to sterilize the cats and allow the colony to reduce through attrition, but based on the history of cats at the park under this program, the population at the park would remain stable or grow slightly due to abandonment of unaltered pet cats or reduced TNR efforts. Under alternative 1, cats that are trapped would be sterilized and vaccinated, and the cats would be monitored by the animal welfare organization, giving them the opportunity for additional veterinary care if deemed necessary and the potential for socialized cats to be adopted. The cats that are unable to be adopted would remain outdoor cats, exposed to the elements, communicable diseases, competition, and fighting, among other stressors. The support provided by SAG (i.e., food, water, veterinary care) help reduce some of these stressors, compared to free-ranging cats in areas without human care.

Impacts of the Original Proposed Action (Alternative 2) on Free-ranging Cats

Free-ranging cats would be removed from the park by a removal agency under alternative 2 using the methods described in chapter 2. In most cases, cats would be captured using live traps (e.g., walk-in cage traps, soft net traps, and padded leg-hold traps), and other methods, such as habitat modification, exclusions devices, and repellents, would be used to concentrate cats into areas where they would be more easily trapped. The live traps would cause stress, but the stress would be temporary, as the traps would only be set in appropriate weather conditions and when they can be checked at least twice within a 24-hour period. The other methods may also cause some stress because they would prevent the cats from using resources that they are accustomed to having access to, such as shelter.

When a cat is trapped, the removal agency would assess the cat and determine if they are appropriate for potential adoption. Any cats eligible for adoption would be transferred to an animal shelter or other organization where they would be sterilized, vaccinated, and receive veterinary care before being placed

into an adoptive home. Placement into an animal care facility would be dependent on kennel space being available at the time of removal. The animal care facilities in Puerto Rico are consistently overwhelmed with homeless animals, and this would likely be the case when the removal agency completes the removal efforts. Alternative 2 would result in a portion of the population being humanely euthanized due to their lack of socialization and lack of kennel space, but all cats would receive humane treatment throughout the trapping and removal process.

There are different interpretations of what is considered humane treatment, and this should be addressed. Cats at the park that do not have an ear tip identifying them as spayed or neutered are routinely trapped under the existing TNR program. The trapping that is proposed under alternative 2 would likely be similar to that which is currently used; therefore, the level of stress experienced by the cats would not differ from current conditions. Those cats that appear to be candidates for adoption would receive the same treatment as the animal welfare organization is currently providing for cats that would be sent out for adoption. SAG currently performs humane euthanasia for those cats with serious health concerns, and the same would occur under alternative 2. The concern about humane treatment would be for those cats that are euthanized due to a lack of socialization or a lack of kennel space. While some may see this as inhumane, the life experienced by a homeless cat is often of lower quality. This lower quality of life is coupled with the need to bring the park into compliance with existing authorities for invasive species, the lack of suitable indoor spaces for cats of this temperament, and the overpopulation of free-ranging cats in Puerto Rico.

Once the existing colony is removed, removal of the feeding stations and continued use of habitat modification, exclusion devices, and repellents should reduce the potential for another free-ranging cat colony to become established at the park, but it is expected that additional removal efforts would be required over the long-term. Alternative 2 would have adverse impacts on the cat population in the park but would not have a noticeable effect on Puerto Rico's free-ranging cat population; this is a relatively small colony of cats compared to the number of cats in Puerto Rico.

Impacts of the Revised Proposed Alternative (Alternative 3 / NPS Preferred Alternative) on Free-ranging Cats

Alternative 3 would ultimately remove the cat population from the park, but an animal welfare organization would have time to trap and remove cats from the park with the aid of the feeding stations for a discrete period of time. The animal welfare organization would have the opportunity to try to find placement for the cats, which could include a sanctuary setting, a kennel in a local animal shelter or one on the mainland, a space in the organization's facility, or in a foster or adoptive home. Similar to alternative 2, the placement of cats in animal care facilities would be dependent on available kennel space at the time of removal efforts. However, an animal welfare organization may have a relationship with a broader range of animal care facilities, giving them a better chance of finding open kennel space in Puerto Rican facilities, as well as facilities off-island. Additionally, the trapping and removal efforts under alternative 3 would likely be more gradual than those under alternative 2, giving the animal welfare organization more time to secure placement for the cats. It is possible, however, that potentially adoptable cats could be euthanized under alternative 3 if the animal welfare organization is unable to find placement for them.

When trapped, the cats would experience the same stress as described for alternative 2, and the cats available for adoption or placement of some kind would likely receive the same benefits from sterilization, vaccination, and additional veterinary care. If cats remain in the park after the animal welfare organization's efforts, the National Park Service would have a removal agency remove the remaining cats, with similar impacts related to trapping and humane treatment as previously discussed under alternative 2, including placement of adoptable cats if possible and euthanasia of the remaining cats.

Under this alternative, similar concerns exist for the humane treatment of cats as discussed for alternative 2. Though the National Park Service would require that the cats are released in accordance with Puerto Rico laws regarding animal welfare and invasive species, the National Park Service cannot rule out the potential for the cats to be released in San Juan or another location in Puerto Rico. If cats from the colony currently living at the park are released in San Juan, they may return to the park, since it is a familiar location that has provided shelter, food, and water in the past. In this case, the cats would have to be removed from the park a second time, resulting in repeated stress for the cats. If cats are released in San Juan and do not return to the park, they may be fed by volunteers from the animal welfare organization or other citizens. These cats may settle into this new area seamlessly or they could face competition with other cats for resources, which could result in injuries from fighting and a lack of food and water. If cats are released in other areas of Puerto Rico, they may not have the same resources (shelter, food, and water) that they were accustomed to in the park. Because cats are prevalent across Puerto Rico, these relocated cats would likely have to compete with other cats for resources. Any cats released in areas where volunteers are not actively providing care would not have access to veterinary care and would have a lower quality of life.

Relocating the entire population of cats from the park (nearly 200 cats) to any one area could have adverse impacts on the cats already living in that area, as well as the relocated cats, and the community, depending on the area selected. Though, given the large number of free-ranging cats within Old San Juan and environs, alternative 3 would not have a noticeable effect on the overall population.

Cumulative Impacts on Free-ranging Cats

The impacts on free-ranging cats from the current free-ranging cat management at the park, as well as past, present, and reasonably foreseeable future actions and trends would be as described above in the “Affected Environment” section. There would be no new impacts on free-ranging cats under alternative 1.

Under alternative 2, a removal agency would trap and remove all cats from the park with some cats being transferred to a shelter or other organization for adoption and unsocialized or unhealthy cats being humanely euthanized. Depending on the reader’s perspective of humane treatment for free-ranging cats, this alternative would have adverse or beneficial impacts on the cats. However, alternative 2 would contribute adversely to the overall adverse cumulative impacts on free-ranging cats in the park when considered with other past, present, and reasonably foreseeable future actions and trends.

Alternative 3 would also remove all cats from the park; however, it is likely that the animal welfare organization may opt to euthanize fewer cats than the removal agency, which could be perceived as beneficial or adverse for the cats, depending on the placement/release of the cats and the reader’s perspective of humane treatment. Alternative 3 would contribute adversely to the overall adverse cumulative impacts on free-ranging cats in the park when considered with other past, present, and reasonably foreseeable future actions and trends.

Conclusion for Free-ranging Cats

Under alternative 1, management of free-ranging cats would remain the same as current conditions, including the impacts on the cat colony within the park from past, present, and reasonably foreseeable future actions and trends. Beneficial effects of alternative 1 would include food provided at the existing feeding stations and minimal veterinary care provided by an animal welfare organization, and adverse impacts would continue from lower quality of life from living outside, potentially contracting communicable diseases, and competition and fighting with other free-ranging cats.

Alternatives 2 and 3 would ultimately remove cats from the park, adversely affecting the population of cats in the park, but would not have a noticeable effect on the overall population of free-ranging cats in Puerto Rico. The impacts on the free-ranging cats from trapping would be the same under alternatives 2 and 3 as they would be under alternative 1 since the same type of equipment would be used; there would be stress involved during the trapping and handling of the cats. These alternatives differ in which organizations would remove the cats and how those organizations would handle the disposition of the cats once they are removed from the park. The impacts associated with the fate of the cats depend on the interpretation of humane treatment. Cats would be euthanized under both alternatives, but likely more so under alternative 2. Humane euthanasia could be seen as a beneficial impact because it is preventing a cat from living a harsh life outdoors. It could also be interpreted as an adverse impact because it is ending a viable life. When considered with other past, present, and reasonably foreseeable future actions and trends, alternative 2 would adversely affect free-ranging cats.

Under alternative 3, the animal welfare organization would have the opportunity to place cats into indoor scenarios to prepare them for adoption, and perhaps has more connections than a removal agency to provide cats with this opportunity. The implementation plan would require the animal welfare organization to comply with Puerto Rico laws on animal welfare and invasive species; however, if the animal welfare organization chooses to release cats in other areas, such as in Old San Juan outside of the park, those cats may face new challenges in the form of competition, lack of resources, fighting, injury, and a lack of veterinary care, all of which would create a low quality of life. Alternative 3 would result in adverse impacts on the free-ranging cats in the park and those outside the park, locally in Old San Juan or island-wide in Puerto Rico, depending on relocation efforts; however, the overall number of cats being relocated is small compared to the larger free-ranging cat population within Old San Juan and environs and would not have a noticeable effect on the overall population of free-ranging cats in Puerto Rico. When considered with other past, present, and reasonably foreseeable future actions and trends, alternative 3 would adversely affect free-ranging cats.

CHAPTER 4: CONSULTATION AND COORDINATION

This chapter summarizes the consultation and coordination process for the free-ranging cat management plan.

Public Participation

Public Scoping. The National Park Service notified the public of its intent to develop this plan through a newsletter on October 24, 2022 that was posted on the NPS Planning, Environment, and Public Comment (PEPC) website, as well as social media. The newsletter was provided in both Spanish and English and included information on the background, the purpose of and need for action, the preliminary alternatives, and the resources that could be affected by the plan. The National Park Service held two meetings at the park's visitor center on November 2 and 3, 2022 from 6:30 to 8:30 pm. The National Park Service intended to provide open house style meetings with banners providing information on the plan; however, at the request of the participants at the first meeting, the National Park Service implemented a hearing-style meeting where participants could express their thoughts on the proposed plan through public remarks. All participants that provided oral comments at the meetings were encouraged to also submit their comments in writing, with each speaker being provided a comment form and reminded to comment in writing. Comment cards were also available at the meeting, and commenting instructions were presented in the newsletter, as well as on the banners at the meeting. The meeting materials also notified interested parties of the 30-day comment period that was open through November 22, 2022. The National Park Service received a request for an extension of the comment period and approved this request, accepting comments through December 12, 2022. The National Park Service received 2,511 individual correspondences from individuals in all 50 states and Washington, DC, as well as 17 other countries. The National Park Service received comments in support of and opposition to the preliminary proposed action. Commenters also provided suggestions for free-ranging cat management at the park. These comments were considered when developing the alternatives in this EA. Alternative 3, the revised proposed action, was developed as a result of the public scoping comment analysis.

Public Review. This EA will be on formal public and agency review for 30 days and has been distributed to a variety of interested individuals, agencies, and organizations. It also is available on the NPS's PEPC website at: <https://parkplanning.nps.gov/PaseoCatPlan>.

Agency Consultation

Puerto Rico State Historic Preservation Office. As required by Section 106 of the National Historic Preservation Act, the National Park Service consulted with the Puerto Rico SHPO to assess the effect of the project on cultural resources. The National Park Service initiated consultation with the SHPO in August 2023, requesting concurrence on the determination of *no effect* from the preferred alternative.

Section 106 requires a federal agency notify the public of proposed projects and offer the public an opportunity to provide input in a timely manner. The National Park Service is using the NEPA public meeting process for review of the EA to satisfy this requirement.

US Fish and Wildlife Service. As required by Section 7 of the ESA, the National Park Service consulted with the USFWS regarding the potential effects of the preferred alternative on federally listed species. The NPS initiated consultation for this project with the USFWS in August 2023 with a letter introducing the project and summarizing the potential impacts on protected species. As noted in chapter 1, the National

Park Service analyzed potential impacts on eight federally protected species that could occur within the park boundary: West Indian manatee, roseate tern, green sea turtle, hawksbill sea turtle, leatherback sea turtle, loggerhead sea turtle, olive ridley sea turtle, and Puerto Rican boa. There is no designated critical habitat within the park.

Sea turtles would not be affected because they do not occur in or near the project area. The roseate tern has been observed in the park (eBird 2023a), though the observation was an unofficial record, reported by citizen scientist(s). This species does not appear on the USFWS IPaC list for the project area. This is a migratory seabird that does not nest in the area, but the roseate tern would benefit from the removal of a potential invasive predator from the park. The manatee is expected to benefit because removing the cat colony away from the Paseo, and therefore the bay, could reduce the risk of toxoplasmosis. The Puerto Rican boa does not occur in the project area and would not be directly affected by the action alternatives. As part of the implementation plan under the preferred alternative, the National Park Service would require that cats be relocated in compliance with Puerto Rico laws regarding animal welfare and invasive species, including not releasing cats into sensitive wildlife habitat or areas where there are listed species and obtaining a permit prior to relocation, if required. Therefore, increased risks associated with cats (i.e., displacement of native wildlife, predation, toxoplasmosis) in relocation areas under alternative 3 would be considered discountable.

The National Park Service requested concurrence from the USFWS on its determinations on listed species – the free-ranging cat management plan would have *no effect* on roseate tern, green sea turtle, hawksbill sea turtle, leatherback sea turtle, loggerhead sea turtle, and olive ridley sea turtle; and the plan *may affect but is not likely to adversely affect* West Indian manatee and Puerto Rican boa. Consultation with the USFWS is ongoing.

Stakeholder Outreach

The following agencies, elected officials, and organizations were contacted and invited to participate in the planning process.

Federal and State Agencies

- US Department of Agriculture, APHIS
- US Fish and Wildlife Service
- State Historic Preservation Office
- Institute of Puerto Rican Culture
- Municipality of San Juan
- Puerto Rico Department of Public Health
- National Oceanic Atmospheric Administration, National Marine Fisheries Service
- Advisory Council on Historic Preservation
- Puerto Rico Department of Natural and Environmental Resources

Elected Officials

- José L. Dalmau Santiago, President of the Senate of Puerto Rico
- Jenniffer González, Congressperson
- Henry Neumann, Senator, District of San Juan

- Nitzza Morán, Senator, District of San Juan
- Eddie Charbonier, Representative, San Juan District #1
- Miguel A. Romero Lugo, Mayor of San Juan
- Cesar Hernandez Alfonzo, Capitol Superintendent
- Pedro Pierluisi, Governor, Puerto Rico

Environmental Groups

- Conservation Trust
- Sustainable Environment Organization
- Rangers LLC

Recreation Groups

- Discover Puerto Rico
- Comerciantes Pro Barcos de Turismo

Animal Advocacy Groups

- Save a Gato
- Amigos de los Animales Animal Shelter
- Humane Society of Puerto Rico

Community Organizations

- La Perla Community Board
- Urban/Historic Center of Old San Juan
- Old San Juan Neighborhood Association

General Stakeholders

- Park visitors
- Community members
- Friends of San Juan National Historic Site
- Puerto Rico Chamber of Commerce

REFERENCES

Aguilar, G.D., M.J. Farnworth, and L. Winder

- 2015 Mapping the stray domestic cat (*Felis catus*) population in New Zealand: Species distribution modelling with a climate change scenario and implications for protected areas. *Applied Geography* 63: 146–154.

Aguirre, A.A., T. Longcore, M. Barbieri, H. Dabritz, D. Hill, P.N. Klein, C. Lepczyk, E.L. Lilly, R. McLeod, J. Milcarsky, and C.E. Murphy

- 2019 The one health approach to toxoplasmosis: epidemiology, control, and prevention strategies. *EcoHealth* 16(2): 378–390.

Alley Cat Allies

- 2023 “The Vacuum Effect.” Available online: <https://www.alleycat.org/resources/the-vacuum-effect-why-catch-and-kill-doesnt-work/>. Accessed on April 18, 2023.

Andersen, M.C., B.J. Martin, G.W. Roemer

- 2004 Use of matrix population models to estimate the efficacy of euthanasia versus trap-neuter-return for management of free-roaming cats. *Journal of the American Veterinary Medical Association* 225(12): 1871–1876.

Barrows, P.L.

- 2004 Professional, ethical, and legal dilemmas of trap-neuter-release. *Journal of the American Veterinary Medical Association* 225: 1365–1369.

Blanton, J.D., C.A Hanlon, and C. E Rupprecht

- 2007 Rabies surveillance in the United States during 2006. *Journal of the American Veterinary Medical Association* 231: 540–56.

Bonnaud, E., F.M. Medina, E., Vidal, M., Nogales, B., Tershy, E., Zavaleta, C.J. Donlan, B. Keitt, M. LeCore, and S.V. Horwath

- 2011 The diet of feral cats on islands: a review and a call for more studies. *Biological Invasions* 13(3): 581–603.

Bossart, G.D., A.A. Mignucci-Giannoni, A.L. Rivera-Guzman, N.M. Jimenez-Marrero, A.C. Camus, R.K. Bonde, J.P. Dubey, and J.S. Reif

- 2012 Disseminated toxoplasmosis in Antillean manatees *Trichechus manatus* from Puerto Rico. *Diseases of Aquatic Organisms* 101: 139–144.

Bowman, D.D., S.P. Montgomery, A.M. Zajac, M.L. Eberhard, and K.R. Kazacos

- 2010 Hookworms of dogs and cats as agents of cutaneous larva migrans. *Trends in Parasitology* 26: 162–167.

Boyd, W.F. and S.J. Hollenhorst

- 2011 *San Juan National Historic Site Visitor Study, Winter 2010*. Natural Resource Report NPS/NRPC/SSD/NRR2011/393/106444. National Park Service, Fort Collins, Colorado.

Castro-Prieto, J. and M.J. Andrade-Núñez

- 2018 Health and ecological aspects of stray cats in Old San Juan, Puerto Rico: Baseline information to develop an effective control program. *Puerto Rico Health Sciences Journal* 37(2):110–114.

Castro-Prieto, J., J. Wunderle, J.A. Salguero-Faria, S. Soto-Bayo, J.D. Crespo-Zapata, and W A. Gould

- 2021 *The Puerto Rico Breeding Bird Atlas*. Gen. Tech. Rep. IITF-53. Rio Piedras, PR: US Department of Agriculture Forest Service, International Institute of Tropical Forestry, 53, 1-311.

Conrad, P.A., M.A. Miller, C. Kreuder, E.R. James, J. Mazet, H. Dabritz, D.A. Jessup, F. Gulland, and M.E. Grigg

- 2005 Transmission of *Toxoplasma*: clues from the study of sea otters as sentinels of *Toxoplasma gondii* flow into the marine environment. *International Journal for Parasitology* 35(11-12): 1155-1168.

Cruise Port Advisor

- 2020 “8 Hours in San Juan... What to See & Do.” Available online: <https://cruiseportadvisor.com/8-hours-in-san-juan-what-to-see-and-do/>. May 13, 2022.

Dauphiné, N. and R.J. Cooper

- 2009 Impacts of free-ranging domestic cats (*Felis catus*) on birds in the United States: a review of recent research with conservation and management recommendations. In *Proceedings of the fourth international partners in flight conference: tundra to tropics*. Vol. 205.

Doherty T.S., A.S. Glen, D.G. Nimmo, E.G. Ritchie, and C.R. Dickman

- 2016 Invasive predators and global biodiversity loss. *Proceedings of the National Academy of Sciences* 113(40): 11261–11265.

eBird

- 2023a “Hotspot: Viejo San Juan--El Morro.” Available online: <https://ebird.org/hotspot/L853622>. Accessed on June 13, 2023.
- 2023b “About eBird.” Available online: <https://ebird.org/about>. Accessed on July 28, 2023.

Frommer’s Media

- 2022 “10 Favorite Experiences in Old San Juan.” Available online: <https://www.frommers.com/slideshows/847905-10-favorite-experiences-in-old-san-juan>. May 13, 2022.

Gannon, M.R., M. Rodríguez-Durán, A. Kurta, and M.R. Willig

- 2022 “The Mammals of Puerto Rico.” University of Connecticut, Department of Ecology and Evolutionary Biology. Available online: <https://hydrodictyon.eeb.uconn.edu/people/willig/Research/Puerto%20Rico/prmammals.html>. Accessed May 17, 2022.

Gerhold, R.W. and D.A. Jessup

- 2012 Zoonotic diseases associated with free-roaming cats. *Zoonoses and Public Health* 60: 189–195.

Helback, O. and J. Liebezeit

- 2021 “Density of Free-Roaming Cats Related to Feeding Stations on Hayden Island, Oregon.” Portland State University, University Honors College. 16 pp.

Hildreth, A.M, S.M. Vantassel, and S.E. Hygnstrom

- 2010 *Feral Cats and Their Management*. University of Nebraska – Lincoln Extension.

Horn, J.A., N. Mateus-Pinilla, R.E. Warner, and E.J. Heske

- 2011 Home range, habitat use, and activity patterns of free-roaming domestic cats. *Journal of Wildlife Management* 75: 1177–1185.

Hosie, M.J., D. Addie, S. Belák, C. Boucraut-Baralon, H. Egberink, T. Frymus, T. Gruffydd-Jones, K. Hartmann, A. Lloret, H. Lutz, F. Marsilio, M. Grazia Pennisi, A.D. Radford, E. Thiry, U. Truyen, and M.C. Horzinek

- 2009 Feline Immunodeficiency: ABCD Guidelines on Prevention and Management. *Journal of Feline Medicine and Surgery* 11: 575–584.

Hwang J., N.L. Gottdenker, D.H. Oh, H.W. Nam, H. Lee, and M.S. Chun

- 2018 Disentangling the link between supplemental feeding, population density, and the prevalence of pathogens in urban stray cats. *PeerJ*. 6: e4988.

iNaturalist

- 2022 “iNaturalist, What is It?” Available online: <https://www.inaturalist.org/pages/what%252Bis%252Bit>. May 17, 2022.

Jagoda, N.

- 2019 “Tails in the Wind: An Exploratory Examination of Media Reports on Nonhuman Animals Throughout Hurricane Maria in Puerto Rico.” Electronic Theses and Dissertations. 6702.

Jessup, D.A

- 2004 The welfare of feral cats and wildlife. *Journal of the American Veterinary Medical Association* 225: 1377–1383.

Joglar, R.L., A.O., Álvarez, T.M., Aide, D., Barber, P.A., Burrowes, M.A., García, A. León-Cardona, A.V. Longo, N. Pérez-Buitrago, A. Puente, N. Rios-López, and P.J. Tolson

- 2007 Conserving the Puerto Rican herpetofauna. *Applied Herpetology* 4: 327–345.

Johnson, K.L. and J. Cicirelli

- 2014 Study of the effect on shelter cat intakes and euthanasia from a shelter neuter return project of 10,080 cats from March 2010 to June 2014. *PeerJ* 2: e646.

- Kanine, J. and M.T. Mengak
 2014 *Managing Wildlife Damage: Feral Cats (Felis catus)*. The University of Warnell School of Forestry and Natural Resources. Wildlife Damage Publication Series.
- Lepczyk, C.A., C.A. Lohr, and D.C. Duffy
 2015 A review of cat behavior in relation to disease risk and management options. *Applied Animal Behaviour Science* 173: 29–39.
- Levy, J.K. and P.C. Crawford
 2004 Humane strategies for controlling feral cat populations. *Journal of the American Veterinary Medical Association* 225(9): 1354–1360.
- Levy, J.K., N.M. Isaza, and K.C. Scott
 2014 Effect of high-impact targeted trap-neuter-return and adoption of community cats on cat intake to a shelter. *The Veterinary Journal* 201: 269–274.
- Longcore, T., C. Rich, and L.M. Sullivan
 2009 Critical assessment of claims regarding management of feral cats by trap–neuter–return. *Conservation Biology* 23: 887–894.
- López-Torres, A.L., H.J. Claudio-Hernández, C.A. Rodriguez-Gomez, A.V. Longo, and R.L. Joglar
 2012a Green Iguanas (*Iguana iguana*) in Puerto Rico: is it time for management? *Biological Invasions* 14(1): 35–45.
- Lopez-Ortiz R., D. Rivera-Martinez, M. Toro-Tirado, and L.R. Hernandez-Ortiz
 2012b *Comprehensive action plan to control the green iguana's population: A systematic approach to reduce the impacts of the ongoing invasion of the green iguana in Puerto Rico*. A report from the Puerto Rico Government interagency committee established for the population control of the green iguana. Puerto Rico Department of Natural and Environmental Resources Print, 45 p.
- Loss, S.R., T. Will, and P. Marra
 2013 The impact of free-ranging domestic cats on wildlife of the United States. *Nature Communications* 4: 1396.
- Ma, X., S. Bonaparte, M. Toro, L.A. Orciari, C.M. Gigante, J.D. Kirby, R.B. Chipman, C. Fehlner-Gardiner, V.G. Cedillo, N. Aréchiga-Ceballos, A.K. Rao, B.W. Petersen, and R.M. Wallace
 2022 Rabies surveillance in the United States during 2020. *Journal of the American Veterinary Medical Association* 260(10): 1157-1165.
- Mazzillo, F.F., K. Shapiro, K., and M.W. Silver
 2013 A new pathogen transmission mechanism in the ocean: the case of sea otter exposure to the land-parasite *Toxoplasma gondii*. *PloS one* 8(12): e82477.

Medina, F.M., E. Bonnaud, E. Vidal, B.R. Tershy, E.S. Zavaleta, C. Josh Donlan, B.S. Keitt, M. LeCorre, S.V. Horwath, and M. Nogales

2011 A global review of the impacts of invasive cats on island endangered vertebrates. *Global Change Biology* 17(11): 3503–3510.

Miller, M.A., M.E. Grigg, C. Kreuder Johnson, E.R. James, A.C. Melli, P.R. Crosbie, D.A. Jessup, J.C. Boothroyd, D. Brownstein, and P.A. Conrad

2004 An unusual genotype of *Toxoplasma gondii* is common in California sea otters (*Enhydra lutris nereis*) and is a cause of mortality. *International Journal for Parasitology* 34(3): 275-284.

Miller, M.A., C.A. Newberry, D.M. Sinnott, F.I. Batac, K. Greenwald, A. Reed, C. Young, M.D. Harris, A.E. Packham, and K. Shapiro

2023 Newly detected, virulent *Toxoplasma gondii* COUG strain causing fatal steatitis and toxoplasmosis in southern sea otters (*Enhydra lutris nereis*). *Frontiers in Marine Science* 10: 1116899.

My Cruise Stories

2022 “In Search of Cats in Old San Juan.” Available online: <https://mycruisestories.com/2018/04/20/in-search-of-cats-in-old-san-juan/>. Accessed May 13, 2022.

National Park Service (NPS)

2005 *Memorandum of Understanding between the US National Park Service, San Juan National Historic Site and Save a Gato, Inc.* July.

2006 *NPS Management Policies 2006.*

2008 *Memorandum of Understanding between the US National Park Service, San Juan National Historic Site and Save a Gato, Inc.* May.

2013 *Foundation Document, San Juan National Historic Site, Puerto Rico.* September.

2015 *National Park Service NEPA Handbook.* September.

2019 San Juan National Historic Site Visitor Complaints, 2010 to 2019. Unpublished data.

2021 *San Juan Historic City Wall San Juan National Historic Site, Puerto Rico Cultural Landscape Report.* September.

2022 *San Juan National Historic Site Cat Inventory Methods and Results, Final.* November.

2023 Monthly Public Use Report, San Juan National Historic Site. Available online: <https://irma.nps.gov/Stats/SSRSReports/Park%20Specific%20Reports/Monthly%20Public%20Use?Park=SAJU>. Accessed May 13, 2023.

Nutter, F.B., J.F. Levine, and M.K. Stoskopf

2004 Reproductive capacity of free-roaming domestic cats and kitten survival rate. *Journal of the American Veterinary Medical Association* 225(9): 1399–1402.

Ogan, C.V. and R.M. Jurek

- 1997 Biology and ecology of feral, free-roaming and stray cats. Pages 87-92 in J.E. Harris, and C.V. Ogan, (eds.), *Mesocarnivores of northern California: Biology, management and survey techniques, workshop manual*. August 12-15, 1997, Humboldt State University, Arcata, CA. The Wildlife Society, California North Coast Chapter, Arcata, CA. 127 p.

Page, D.A.

- 2020 “The Effects Of Feral Cat Removal On Rat Abundance In An Insular, Tropical Ecosystem.” A Thesis Presented to The Faculty of Humboldt State University In Partial Fulfillment of the Requirements for the Degree Master of Science in Natural Resources.

Parsons, H.P., P.B. Banks, M.A. Deutsch, and J. Munshi-South

- 2018 Temporal and Space-Use Changes by Rats in Response to Predation by Feral Cats in an Urban Ecosystem. *Frontiers in Ecology and Evolution*, v. 6, p. 146.

Pedersen M.G., P.B. Mortensen, B. Norgaard-Pedersen, and T.T. Postolache

- 2012 *Toxoplasma gondii* Infection and Self-directed Violence in Mothers. *Archives Of General Psychiatry* 69(11):1123–1130.

Roebeling, A.D., D. Johnson, J.D. Blanton, M. Levin, D. Slate, G. Fenwick, and C.E. Rupprecht

- 2014 Rabies prevention and management of cats in the context of Trap–Neuter–Vaccinate–Release programmes. *Zoonoses Public Health* 61: 290–296.

Ruscoe, W.A., D.S.L. Ramsey, R.P. Pech, P.J. Sweetapple, I. Yockney, M.C. Barron, M. Perry, G. Nugent, R. Carran, R. Warne, C. Brausch, and R.P. Duncan

- 2011 Unexpected consequences of control: competitive vs. predator release in a four-species assemblage of invasive mammals. *Ecology Letters* 14: 1035–1042.

Save a Gato, the Puerto Rican Feral Cats Association, the Society for the Prevention of Cruelty against Animals of Puerto Rico, and Animal Control Solutions (SAG et al.)

- 2004 *Proposal for the Control and Management of the Cat Colony in the Paseo de la Muralla and the San Juan Gate in Old San Juan, Puerto Rico*.

Shapiro K., E. VanWormer, A. Packham, E. Dodd, P.A. Conrad, and M. Miller

- 2019 Type X strains of *Toxoplasma gondii* are virulent for southern sea otters (*Enhydra lutris nereis*) and present in felids from nearby watersheds. *Proceedings of the Royal Society B: Biological Sciences* 286: 20191334.

Shi, J., Z. Wen, G. Zhong, and H. Yang

- 2020 Susceptibility of ferrets, cats, dogs, and other domesticated animals to SARS–coronavirus 2. *Science* 368: 1016–1020.

Tennent, J. and C.T. Downs

- 2008 Abundance and home ranges of feral cats in an urban conservancy where there is supplemental feeding: a case study from South Africa. *African Zoology* 43(2): 218–229.

Trouwborst, A., P.C. McCormack, and E. Martínez Camacho

- 2020 Domestic cats and their impacts on biodiversity: A blind spot in the application of nature conservation law. *People and Nature* 2: 235–250.

US Department of Agriculture (USDA)

- 2003 *Management of Feral and Free-Ranging Cat Populations to Reduce Threats to Human Health and Safety and Impacts to Native Wildlife Species in the Commonwealth of Puerto Rico Environmental Assessment*. December.
- 2014 “Biological Control.” Available online: <https://www.fs.fed.us/research/invasive-species/control/biological.php>. Accessed July 19, 2021.
- 2021 *Free-ranging and Feral Cats*. US Department of Agriculture Animal & Plant Health Inspection Service, Wildlife Service. Wildlife Damage Management Technical Series.

US Fish and Wildlife Service (USFWS)

- 2021 *Species status assessment report for the Puerto Rican boa (Chilabothrus inornatus)*. Version 1.2. April 2021. Boquerón, PR. 67pp. October.

Weil, E.

- 2005 Marine Biodiversity of Puerto Rico: Current Status. In *Caribbean Marine Biodiversity: The known and unknown*, edited by P. Miloslavich and E. Klein. DEStech Publications, Inc., pp 85–109.

Winter, L.

- 2004 Trap-neuter-release programs: the reality and the impacts. *Journal of the American Veterinary Medical Association* 225(9): 1369–1376.

Zito, S., G. Aguilar, S. Vigeant, and A. Dale

- 2018 Assessment of a targeted trap-neuter-return pilot study in Auckland, New Zealand. *Animals* 8: 73.

APPENDIX A: APPLICABLE LAWS, REGULATIONS, AND POLICIES

A multitude of laws, regulations, and policies influence the development and implementation of a free-ranging cat management plan for San Juan National Historic Site (the park). This appendix identifies and briefly summarizes the general authorities, as well as relevant laws, regulations, and policies that were considered during development of this plan. It is important to note that this list is not exhaustive but relates directly to the preparation of the free-ranging cat management plan and this environmental assessment.

General Authorities

Title 54 of the United States Code (USC), *National Park Service and Related Programs* – Title 54 is the statutory authority governing the national park system.

36 Code of Federal Regulations (CFR) Part 1 et. seq., *National Park Service, General Provisions* – 36 CFR contains NPS-specific regulations governing the national park system.

42 USC §§ 4321, *National Environmental Policy Act* – The purpose of the National Environmental Policy Act (NEPA) is to encourage productive and enjoyable harmony between human beings and the physical environment for present and future generations. The law provides the tools to implement these goals by requiring that federal agencies prepare an in-depth study of the impacts of “major federal actions having a significant effect on the environment” and alternatives to those actions. This information becomes an integral part of its decision-making process. NEPA also encourages and in some cases requires diligent efforts to involve the interested members of the public before they make decisions affecting the environment.

40 CFR Part 1500 et. seq., *National Environmental Policy Act Implementing Regulations* – NEPA is implemented through regulations of the Council on Environmental Quality (CEQ) (40 CFR 1500-1508) and the Department of the Interior implementing regulations (43 CFR 46.100). The National Park Service has adopted procedures to comply with CEQ regulations, as found in Director’s Order 12 and its accompanying 2015 NPS NEPA Handbook.

54 USC §§ 300101, *National Historic Preservation Act of 1966, as Amended* – The purpose of the National Historic Preservation Act (NHPA) is to ensure the consideration of historic properties in the planning and implementation of land use and development projects.

36 CFR Part 800 et. seq., *National Historic Preservation Act Implementing Regulations* – Section 106 of the NHPA requires federal agencies to consider the effects of their undertakings on historic properties and to provide state historic preservation officers, tribal historic preservation officers, and, as necessary, the Advisory Council on Historic Preservation a reasonable opportunity to review and comment on the effects of agency actions. The Section 106 consultation must also be complete before a Finding of No Significant Impact or Record of Decision can be signed.

Executive Order 13112, *Invasive Species*, amended by Executive Order 13751, *Safeguarding the Nation from the Impacts of Invasive Species* – This executive order requires federal land management agencies to manage invasive species where practical and allowed by law. Management includes prevention, early detection/rapid response, control, monitoring, restoration, and public education. Research and development of prevention and control methods are also included. The domestic cat is an

invasive species that has been introduced around the globe and contributes to anthropogenic impacts on native wildlife species.

NPS Management Policies 2006, Section 4.4.4, Management of Exotic Species states that invasive species will not be allowed to displace native species. It is the park’s responsibility to prevent the displacement of native species by invasive species. Free-ranging cats can be especially damaging to native wildlife on islands, such as Puerto Rico.

NPS Management Policies 2006, Section 4.4.4.1, Introduction or Maintenance of Exotic Species allows exceptions to Section 4.4.4, such as a species that is closely related to an extirpated species; an “improved” variety of a native that cannot survive (typically plants, such as the chestnut tree); the species is controlling another invasive species; or if allowed by law or legislative intent. There are no allowances for cats at San Juan National Historic Site.

NPS Management Policies 2006, Section 4.4.4.2, Removal of Exotic Species Already Present states that all invasive species not included in the exceptions of 4.4.4.1 must be managed as long as control is “prudent and feasible” and the species: interferes with natural processes and the perpetuation of natural features, native species, or natural habitats; disrupts the genetic integrity of native species; disrupts the accurate presentation of a cultural landscape; damages cultural resources; significantly hampers the management of park or adjacent lands; poses a public health hazard as advised by the US Public Health Service; or creates a hazard to public safety. Much of this applies to San Juan National Historic Site. Under 4.4.4.2, superintendents should evaluate the current or potential impacts of the invasive species; develop and implement a management plan; consult with appropriate agencies and interested groups; and invite public review and comment, where appropriate.

San Juan National Historic Site General Management Plan, 1984 – When the General Management Plan (GMP) was finalized in 1984, the Paseo, constructed in 1999, was not proposed as part of the plan or the recommended improvements. According to the GMP, no management plans (e.g., fire management, feral animal control) were needed due to the relatively small size of the national historic site and its urban setting. In 1984, the natural resources at the park included the vegetation along the city walls and cultural landscape. The GMP did not address feral animals, or devote much consideration to natural resources, except for vegetation management and erosion control measures at El Morro and El Cañuelo. The GMP does not discuss invasive species or free-ranging cats. However, the GMP states: “The site’s natural resources, therefore, will be managed to enhance the historic resources and visitor experience.” Cats were not part of the park experience when the park was created, and cats are not a resource the park is mandated to protect.

San Juan National Historic Site Foundation Document, 2013 – The Foundation Document includes a series of fundamental resources of value that could be affected by the presence of the free-ranging cats — city walls, topography, military landscape, and the San Juan gate. The Foundation Document only identifies the free-ranging cats as a possible threat to “Connections to the City of San Juan,” one of the fundamental resources of value. The Paseo is included under “Other Important Resources and Values,” but the Foundation Document does not mention the issue of free-ranging cats specific to the Paseo.

Related Commonwealth Laws and Regulations

Commonwealth of Puerto Rico Law Number 23, Organic Law of the Department of Natural Resources – This law, passed in June 1972, created the Puerto Rico Department of Natural and Environmental Resources, which was tasked with protecting, conserving, developing, and managing the natural and environmental resources in Puerto Rico.

Commonwealth of Puerto Rico Act Number 154, *Animal Protection and Welfare Act* – The Animal Protection and Welfare Act was passed in 2008 and banned cruelty to animals and animal abandonment and established penalties for such behavior. Among other penalties, this act identifies the abandonment of an animal as a fourth-degree felony that can result in imprisonment ranging from 6 months to 3 years.

Commonwealth of Puerto Rico Law Number 241, *New Wildlife Act of Puerto Rico, and Associated Regulations* – Act 241, passed in 1999 was established to protect, conserve, and foster native and migratory wildlife of Puerto Rico, regulate hunting, and establish regulations for the introduction of invasive species.

The Department of Natural and Environmental Resources (DNER) under Law Number 241 (as amended under Law Number 223) and Regulation Number 6765, has regulatory authority over wildlife species in Puerto Rico, including invasive species. Law Number 241 defines wildlife species as any resident animal species that are found in the wild and whose spread or survival does not depend on the zeal, care, or cultivation of humans. Pets that become feral and no longer rely on humans to survive are also considered wildlife. Under Law Number 241 an entity is required to obtain a permit from the DNER to capture and/or lethally remove those target species that are considered wildlife. However, those wildlife species that are considered harmful under Regulation Number 6765 (which promotes the protection, conservation, and management of wildlife species) can be trapped and lethally removed without a permit from the DNER. Target species listed as harmful under Regulation Number 6765 include Indian mongoose (*Herpestes auropunctatus*), rhesus macaque (*Macaca mulatta*), patas monkey (*Erythrocebus patas*), Norway rat (*Rattus norvegicus*), black rat (*Rattus rattus*), house mouse (*Mus musculus*), spectacled caiman (*Caiman crocodilus*), green iguana (*Iguana iguana*), and feral cat (*Felis catus*, when those feral cats occur in natural reserves, wildlife refuges, and regulatory forests).

Commonwealth of Puerto Rico Regulation Number 6765, *Regulation to Govern the Conservation and Management of Wildlife, Exotic Species, and Hunting in the Commonwealth of Puerto Rico* – This regulation promotes the protection, conservation, and management of wildlife species; establishes a mechanism to mitigate the modification of natural habitats; and provides more rigorous regulation of hunting and hunting weapons.

APPENDIX B: CAT INVENTORY METHODS AND RESULTS

Methods

An inventory was conducted to determine the scale of the free-ranging cat (*Felis catus*) issue at San Juan National Historic Site. Three camera traps were installed at feeding stations on the west side of the park to determine the number of cats visiting areas where they are being fed. An additional three cameras were installed on the east side of the park, where no feeding stations occur, to determine the number of cats visiting areas where supplemental feeding is not occurring (figure 1). Camera traps were set for approximately two weeks during the period of May 10 to June 16, 2021 (table 1). Cameras were run throughout each 24-hour period, but only photos between 7:00 pm and 7:00 am local time were analyzed. Batteries and memory cards were changed during the day to ensure complete coverage of photos during the survey period.

Initially, the goal was to calculate population density using a mark-recapture methodology appropriate for camera trap data; however, a number of issues arose during the inventory that made this impossible. For one, only six camera traps were set up on the west and east sides of the park (three on each side), but none were set up in the northern portion of the park, where a number of cats also reside. This was due to issues with setting up cameras in locations that would be undetectable by visitors, which could increase risk of theft or damage to the cameras. Additionally, conditions at the feeding stations on the west side of the park changed throughout the survey period, including changes in amount of food provided, number of feeding stations set up, and angles of cameras. For these reasons, it was decided that a count of individual cats would be identified to estimate the scale of the free-ranging cat issues instead.

Individual cats were identified in each photo, provided a unique identifier that included the type of cat identified (i.e., solid, solid bicolor, solid tricolor, tabby, tortoiseshell, and sealpoint) and a number. Because most black cats were unidentifiable by individual, they received a code of BLK. Individual cat information was recorded in a “cat registry” with example photos, and cat sighting data were recorded in a separate trail camera spreadsheet that included location, night, and photo information. Every cat that was identified in a photo was first compared to the previously recorded cats in the cat registry. It was recorded under its assigned ID if it matched with a previously recorded cat or was given a new ID if it was not found in the “cat registry.”

To calculate the total number of cats, the photos in the cat registry were compared to ensure that there were no duplicate identification assignments. The number of cats in the registry were then totaled. For the number of unidentifiable black cats, the trail camera spreadsheet was analyzed to calculate the maximum number of black cats found in a single photo. This number was added to the total number of cats in the registry. Additional information was also pulled from the cat registry, including the estimated number of pregnant cats, kittens, and males that had not been neutered. An attempt was made to identify the number of cats with clipped ears, but this was very difficult to obtain from the photos.

Results

Analysis of the camera trap data resulted in 196 individual cats being identified. All cats were observed at Camera Traps 1, 2, and 3, where the feeding stations are located (figure 1). Of the 196 individual cats identified, 26 appeared to either have been pregnant during the survey or had recently been pregnant. Also, 9 individual kittens were identified. This data suggests that even though Trap-Neuter-Return (TNR) is being conducted at the park, a breeding population still exists. Only three unneutered cats were

identified; however, photo evidence of this was difficult to observe without clear photos captured from specific angles.

Feeding stations located in the park may also be exacerbating invasive species issues. Cats were primarily observed at the camera traps located at the feeding stations, suggesting that they may be attracting more cats to the park than would normally occur there. Invasive rats (*Rattus* spp.) and green iguanas (*Iguana iguana*) were also observed eating from feeding stations, suggesting that these species are being supported by supplemental food, as well (figure 3).

Figure 1. Camera trap locations.



Figure 2. Pregnant cat observed at park.



Figure 3. Rats at feeding station.



Table 1. Dates that each trail camera was capturing photos.

Photos captured before 7:00 am on the first day and after 7:00 pm on the last day of a photo cycle were not analyzed. No photos were captured between May 18 and 23.

Trail Camera	May															June																
	10	11	12	13	14	15	16	17	24	25	26	27	28	29	30	31	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	
1	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2	X	X	X	X	X	X	X	X	-	-	-	-	-	-	-	-	-	X	X	X	X	X	X	X	-	-	-	-	-	-	-	-
3	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
6	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	X	X	X	X	X	X	X	X	X	X	X	X	X	X	
10	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
11	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Notes: X = Photos captured
 - = No photos captured

APPENDIX C: PAST, PRESENT, AND REASONABLY FORESEEABLE FUTURE ACTIONS

To establish the affected environment and assess the cumulative impacts of the alternatives, the National Park Service identified the following projects, plans, or actions that have, are currently, or may in the future potentially affect the resources analyzed in the environmental assessment (EA). The projects and actions may be limited to San Juan National Historic Site (the park), in the city of San Juan, or island-wide in Puerto Rico.

Replace Lighting along the Paseo – This is an ongoing project where the park is currently replacing the decorative and safety lighting along the Paseo, including 96 light fixtures, respective concrete boxes, and electrical cables. This lighting project will refurbish and clean the electrical substations and other lighting components (e.g., breaker subpanels, lighting contactors, transformers, primary switches, enclosures). The work includes removal and disposal of the existing lighting.

Stabilize Cliff at San Fernando Bastion – The west shore of Castillo San Felipe Del Morro is badly exposed to gravitational erosion caused by wind, constant rain, water salinity, and wave action. The cliff at San Fernando Bastion forms part of the foundation and support for the Castillo’s esplanade. This is an ongoing action to stabilize the cliff, correcting safety issues with falling rocks above a popular urban recreational trail. Sections of the cliff face were stabilized in the 1990s, but untreated sections continue to deteriorate requiring park personnel to temporarily close the trail. This project will address untreated sections building on the work that was completed in prior years.

Rehabilitate the Paseo and El Morro Nature Trail – Vegetation builds up along the Paseo and El Morro nature trail. In this ongoing action, youth groups will trim vegetation along both trails and around decorative lighting. Sand and debris will be removed from the surface of the Paseo, and the El Morro nature trail will be re-graded and erosion control measures will be installed to prevent further damage.

Preserve and Restore El Morro Fort Northwest Walls – This project was recently completed. The project preserved and restored approximately 20,000 square feet of the exterior northwest walls of Castillo San Felipe del Morro.

Park Operations: Vegetation Maintenance – In addition to the trail rehabilitation project above, park staff conducts vegetation management activities regularly, including maintaining turf, shrubs, and trees in landscaped areas of the park and replanting or removing vegetation from these areas, when necessary, and restoring areas following ground-disturbing activities.

Park Operations: Historic Structure Maintenance – Park maintenance staff regularly conduct generalized historic structure maintenance, in addition to the specific projects listed above. Structure maintenance includes periodic cleaning and repointing of the masonry mortar joints, removing debris, cleaning and painting structural steel elements, replacing damaged components, and removal of vegetation growing in cracks to maintain stability of the structures.

Invasive Species Management in Puerto Rico –The Puerto Rico Department of Natural and Environmental Resources and the Puerto Rico Department of Agriculture have regulatory authority over wildlife species in Puerto Rico, including invasive species. The Global Invasive Species Database lists 158 invasive species in Puerto Rico, including plants, animals, viruses, and fungi (ISSG 2023). Islands are particularly susceptible to colonization by invasive species because they are often able to occupy an available environmental niche without competition. Invasive species can be introduced to the island from storms and storm recovery activities, exacerbating the issue. The US Department of Agriculture, Animal

and Plant Health Inspection Service (APHIS) receives requests for assistance in relation to invasive wildlife, including free-ranging cats, relating to agriculture, natural resources, property, and human safety (USDA 2021). In response to these requests, APHIS developed the *Environmental Assessment for Managing Damage Caused by Mammal and Reptile Species in Puerto Rico*. However, this EA covers APHIS management of discrete populations or individuals of a limited number of species. The island-wide issue of invasive species remains a concern and a large issue in Puerto Rico.

Free-ranging Cats throughout Puerto Rico – Although most well known in Old San Juan, free-ranging cats are found throughout Puerto Rico, including natural areas such as El Yunque National Forest. As noted in chapter 3 of this report, the Humane Society of Puerto Rico estimates the number of free-ranging cats in Puerto Rico to be approximately one million (Jagoda 2017). Individual populations of free-ranging cats may be addressed, but Puerto Rico lacks a comprehensive approach to cat management.

Pet Abandonment – Pet abandonment is an ongoing issue in Puerto Rico that is rooted in a variety of causes, including lack of access to affordable veterinary care and natural disasters that force people to leave Puerto Rico for the mainland and leave their pets behind, and the misconception that organizations, such as Save a Gato (SAG) and the Sato Project will care for their abandoned cats and dogs. Companion animals that are abandoned are often not spayed or neutered, and those animals contribute to the cycle of reproduction and unwanted pets. When back-to-back disasters occur (e.g., hurricanes, earthquakes, and the COVID-19 pandemic), the government must prioritize its efforts, and restoring utilities and rebuilding infrastructure become more urgent than the pet abandonment problem. During the public scoping comment period, commenters noted that prior to the COVID-19 pandemic Puerto Rico held mass cat and dog sterilization events that provided spay and neuter services at a lower cost to pet owners. The lack of events like these increases the likelihood of reproductively intact animals becoming free-ranging and contributing unwanted litters to the population.

Shelter Conditions – The Autonomous Municipalities Act of the Commonwealth of Puerto Rico of 1991 (Act Number 81 of August 30, 1991, as amended) requires that all municipalities in Puerto Rico operate a municipal shelter; however, there are only five government-run shelters in Puerto Rico. In 2015, the Humane Society of the United States reported that municipal shelters had a euthanasia rate of 95% for the dogs and cats entering the shelters (HSUS 2015). Even with private animal shelters and rescues across the island and transferring dogs and cats to partner facilities on the mainland, the animal care facilities are overwhelmed and must euthanize animals for space. Hurricanes and other natural disasters cause damage to shelters, reducing the amount of care these facilities can provide. Structural damage, lack of funding, and lack of appropriate personnel could present any facility with the risk of closure, reducing the space available for homeless animals.

Iguana Management – The green iguana is invasive in Puerto Rico. This species is well adapted to the climate and the habitat, allowing the population to explode to an estimated 4 million across Puerto Rico in 2012 (Lopez-Ortiz et al. 2012). Iguanas cause destruction to native flora and fauna, public health, agriculture, infrastructure, and the economy, leading to the development of the Comprehensive Plan to Control the Green Iguana's Population. This plan is a systematic approach to reducing the Puerto Rico iguana population. The plan encourages the take, possession, sale, and consumption of wild iguana specimens captured in Puerto Rico to reduce the population and provide positive economic opportunities. In addition to the Commonwealth-wide program, the National Park Service is planning to develop a Green Iguana Management Plan, which would formulate strategies to minimize the impact of iguanas on park resources.

San Juan Cruise Port – The San Juan cruise port is one of the largest in the Caribbean. Between 2010 and 2019, the port hosted over one million passengers per year, with the highest in 2019 with nearly 1.8 million passengers. These numbers dropped significantly during the COVID-19 pandemic (Statistica

2023). Currently, there are four cruise ship piers; approximately 18 cruise lines use the port, and an estimated 500 cruise ships dock in San Juan (Cupeles 2023). A project to expand and modernize the port is underway. The project includes infrastructure repair at the existing piers, the addition of a new cruise pier and homeport terminal, upgrading the terminal buildings and walkways, and enhancing systems, equipment, and technology. These upgrades will double the port's capacity and accommodate the cruise industry's largest ships (Cruise Industry News 2022; Major 2022). In addition to this improvement project, the cruise ship schedule could change at any time due to incidents such as storm events, another pandemic, or changes in the industry.

Storm and High Tide Events – The park must close the Paseo during hurricanes and other strong storms to keep visitors safe. The storm events themselves, as well as the closures, affect visitation to the park. These closures also affect the free-ranging cats. Cats likely leave the Paseo prior to a storm, in search of safer areas, but the closures prevent volunteers from SAG from feeding the cats for the duration of the closures. On average, the park closes the Paseo two to three times per month during hurricane season and additionally throughout the year due to storm surges and flooding from storm events. The closures are limited to the shortest period necessary.

References

Cruise Industry News

- 2023 “Global Ports Holding Signs 30-Year Deal For San Juan Cruise Port.” Available online: <https://cruiseindustrynews.com/cruise-news/2022/08/global-ports-holding-signs-30-year-deal-for-san-juan-cruise-port/>. Accessed June 7, 2023.

Cupeles Communications, Inc. (Cupeles)

- 2023 “San Juan, Puerto Rico Cruise Guide.” Available online: <https://sanjuanpuertorico.com/cruises/>. Accessed June 7, 2023.

Humane Society of the United States

- 2015 “Humane Hurricane Hits Puerto Rico.” Available online: https://blog.humanesociety.org/2015/04/hsus-launches-puerto-rico-plan.html?credit=blog_post_022117_id8795. Accessed June 6, 2023.

Invasive Species Specialist Group (ISSG)

- 2023 “Global Invasive Species Database.” Available online: <http://www.iucngisd.org/gisd/search.php>. Accessed June 6, 2023.

Lopez-Ortiz R., D. Rivera-Martinez, M. Toro-Tirado, and L.R. Hernandez-Ortiz

- 2012 *Comprehensive action plan to control the green iguana's population: A systematic approach to reduce the impacts of the ongoing invasion of the green iguana in Puerto Rico.* A report from the Puerto Rico Government interagency committee established for the population control of the green iguana. Puerto Rico Department of Natural and Environmental Resources Print, 45 p.

Major, Brian

2022 “Puerto Rico To Launch \$425 Million San Juan Cruise Port Upgrade.” TravelPulse, Northstar Travel Media, LLC. Available online: <https://www.travelpulse.com/News/Cruise/Puerto-Rico-To-Launch-425-Million-San-Juan-Cruise-Port-Upgrade>. Accessed June 7, 2023.

Statistica

2023 “Number of cruise passengers at the port of Old San Juan, Puerto Rico from 2010 to 2021.” Available online: <https://www.statista.com/statistics/817537/puerto-rico-number-cruise-arrivals/>. Accessed June 7, 2023.

US Department of Agriculture (USDA)

2021 *Environmental Assessment (Final), Managing Damage Caused by Mammal and Reptile Species in Puerto Rico*. Prepared by the US Department of Agriculture Animal and Plant Health Inspection Service Wildlife Services in Consultation with Puerto Rico Department of Natural and Environmental Resources. April.

APPENDIX D: ZOOBOTIC DISEASES

Free-ranging cats can carry a number of diseases that can be transmitted to humans and wildlife (zoonotic diseases). These zoonotic diseases are summarized below.

Human Health

Toxoplasmosis. *Toxoplasma gondii* is a single-celled parasite that causes toxoplasmosis. *T. gondii* can survive in a variety of animals, but it only reproduces sexually in the gut of cats. *T. gondii* is spread via oocysts (a stage in the life cycle of a parasite) in the cats' feces. Large numbers of oocysts are shed, and they become infective within one to five days (CDC 2021a). Any cat — indoor or outdoor, owned or feral — could become infected by this protozoan, but this infection is more common in free-ranging cats (Majid et al. 2021; Inpankaew et al. 2021). The oocysts of *T. gondii* can remain viable in the soil for more than a year, especially in shady, moist, and temperate conditions, and in both seawater and freshwater for several years (Torrey and Yolken 2013). Studies of the number of oocysts in soil found between 3 and 434 oocysts per square foot. In areas where cats are concentrated, the number of oocysts is higher (Torrey and Yolken 2013). The conditions of the Paseo — the warm and humid climate, the shaded habitat provided by the vegetation, and the concentration of cats due to the feeding stations — create an environment where *T. gondii* oocysts may be concentrated and persistent. The park's maintenance staff often set up scaffolding to perform work on the city walls adjacent to the Paseo. Cats will climb and defecate on the scaffolding, creating an unsafe scenario for the maintenance staff. To avoid tracking cat waste, the staff must first clean the scaffolding, which puts them at greater risk of coming in contact with *T. gondii* oocysts. The Paseo borders San Juan Bay, where oocysts could also enter the surface water via storm runoff.

Humans can become infected with *T. gondii* by eating undercooked meat of an infected animal, consuming food or water contaminated with cat feces, coming into contact with contaminated objects (e.g., fecal-contaminated soil or litter box of a pet cat), having a blood transfusion or organ transplantation, and through congenital transmission (mother to baby) (CDC 2021a). Most people infected with *T. gondii* do not have symptoms because their immune systems keep the parasite from causing illness. Individuals with weaker immune systems and young children could develop damage to the brain, eyes, or other organs (CDC 2020a). Toxoplasmosis is a major cause of miscarriages (Kheirandish et al. 2019) and mental disorders, including autism, schizophrenia, attention deficit hyperactivity disorder, obsessive compulsive disorder, antisocial personality disorder, learning disabilities, and anxiety disorder (Flegr and Horáček 2020). It is estimated that 11% of the United States population over the age of 6 years old is infected with toxoplasmosis, and in other populations around the world, infection rates can be as high as 60% (CDC 2021b). Although there were no available studies on the extent of *T. gondii* in Puerto Rico, several studies were available that looked at the prevalence of toxoplasmosis in humans that live on islands. Toxoplasmosis infection rates of populations of people on islands in the Caribbean and Venezuela were approximately 42% and 50%, respectively (Chacín-Bonilla et al. 2003; Dubey et al. 2016). Toxoplasmosis is a life-long issue without a cure (Pederson et al. 2021).

Other Zoonotic Diseases. Several diseases can be transmitted through bites and scratches from a cat, including rabies, bartonellosis, and plague. Rabies is a zoonotic, viral disease that is nearly 100% fatal once symptoms appear; however, rabies is preventable through vaccination of domestic animals and post-exposure vaccination (WHO 2022). Symptoms of rabies include fever with pain and tingling, pricking, or burning sensation at the wound site. The virus spreads to the central nervous system, causing fatal inflammation of the brain and spinal cord (WHO 2022). Rabies is transmitted through deep bites or scratches from an infected animal. In 2020, Puerto Rico reported a total of 22 cases of rabies. Two of

these cases were cats; the remaining cases were dogs (4) and mongooses (16) (Ma et al. 2022), making mongooses the largest risk for transmission of rabies on the island. Between 2000 and 2021, there have been two cases of rabies in humans involving bites from a dog and a mongoose (Ma et al. 2022).

Although indoor cats can become infected with fleas, outdoor cats have greater exposure to the parasites (Tan et al. 2020), and therefore flea-associated diseases — bartonellosis, plague, and flea-borne typhus. Cats become infected with these diseases through flea bites, flea dirt getting into an open wound, or fighting with an infected cat. Humans and other animals can become infected when an infected cat bites or scratches a person hard enough to break the surface of the skin or licks a person’s open wound. Bartonellosis is caused by the bacterium *Bartonella henselae* and is referred to as cat scratch disease. Most cats will not show signs of infection, but others can develop an inflamed heart and labored breathing (CDC 2020b). In humans, bartonellosis can affect the brain, eyes, skin, heart, or other internal organs (CDC 2020b). The bacterium *Yersinia pestis* causes plague, and *Rickettsia typhi* causes typhus. These diseases can be passed to humans, and free-ranging cats are a common source of infection in humans (Gerhold and Jessup 2012). In humans, plague can cause swollen, tender lymph glands and, if left untreated, can lead to fatal respiratory disease or multi-organ failure in both humans and other animals (CDC 2018; Gerhold and Jessup 2012). Untreated flea-borne typhus can cause severe illness and damage to one or more organs, including the liver, kidneys, heart, lungs, and brain (CDC 2020c).

Parasites. Cats can become infected with parasites, such as roundworms and hookworms, through interactions with other cats, in their prey, or in the environment. These parasites can be passed to humans through accidental ingestion of soil or feces that is contaminated with eggs of the parasites (CDC 2021c). Infection by roundworms can cause damage to tissue, in some cases, resulting in permanent nerve or eye damage, even blindness; hookworm can cause red, itchy skin as well as serious damage to the intestines and other organs (CDC 2021c).

Wildlife Health

Toxoplasmosis. Other animals can become infected with *T. gondii* by ingesting contaminated soil, water, or plant material. Similar to humans, healthy animals rarely develop symptoms (Penn Vet 2020). Animals infected with *T. gondii* can have symptoms such as tissue necrosis and infection, pneumonia, diarrhea, myocarditis, myositis, and difficulty walking; spontaneous abortions may also occur (Cornell 2018). *T. gondii* infection can also cause behavioral changes. Infected animals are more curious, rendering them more prone to predation (Vyas et al. 2007; Berdoy et al. 2000; Ingram et al. 2013). *T. gondii* can affect both terrestrial and aquatic wildlife, as it is carried into aquatic habitats by runoff, and it is very persistent in the environment (Shapiro et al. 2019). Research on the presence of toxoplasmosis in Puerto Rican wildlife is lacking; however, between August 2010 and August 2011, four Antillean manatees (*Trichechus manatus manatus*) were stranded in single events on the coastal beaches of Puerto Rico and necropsies identified emaciated conditions, gastrointestinal tracts devoid of digesta, widespread inflammatory lesions of the gastrointestinal tract, and hearts with signs of *T. gondii* infestation. This is the first evidence of *T. gondii* in manatees in Puerto Rico (Bossart et al. 2012). One study found no contamination in seagrass beds in Puerto Rico. Although further study is needed, this suggests that manatees may become infected by *T. gondii* from another source (Wyrosdick et al. 2017).

Other Zoonotic Diseases and Parasites. Wildlife can become infected with rabies, bartonellosis, plague, and parasites through contact with infected cats, feces, or soil similar to humans, as discussed above.

References

Berdoy, M., J.P. Webster, and D.W. Macdonald

- 2000 Fatal attraction in rats infected with *Toxoplasma gondii*. *Proceedings of the Royal Society of London. Series B: Biological Sciences* 267(1452): 1591–1594.

Bossart, G.D., A.A. Mignucci-Giannoni, A.L. Rivera-Guzman, N.M. Jimenez-Marrero, A.C. Camus, R.K. Bonde, J.P. Dubey, and J.S. Reif

- 2012 Disseminated toxoplasmosis in Antillean manatees *Trichechus manatus* from Puerto Rico. *Diseases of Aquatic Organisms* 101: 139-144.

Centers for Disease Control and Prevention (CDC)

- 2018 “Frequently Asked Questions (FAQ) About Plague.” Available online: <https://emergency.cdc.gov/agent/plague/faq.asp>. Accessed on May 15, 2022.
- 2020a “Toxoplasmosis: General FAQs.” Available online: https://www.cdc.gov/parasites/toxoplasmosis/gen_info/faqs.html. Accessed on May 15, 2022.
- 2020b “Cat Scratch Disease (*Bartonella henselae* Infection).” Available online: <https://www.cdc.gov/healthypets/diseases/cat-scratch.html>. Accessed May 15, 2022.
- 2020c “Flea-borne (Murine) Typhus.” Available online: <https://www.cdc.gov/typhus/murine/index.html>. Accessed May 15, 2022.
- 2021a “Parasites - Toxoplasmosis (*Toxoplasma infection*).” Available online: <https://www.cdc.gov/parasites/toxoplasmosis/biology.html>. Accessed May 13, 2022.
- 2021b “Epidemiology & Risk Factors.” Available online: <https://www.cdc.gov/parasites/toxoplasmosis/epi.html>. Accessed May 13, 2022.
- 2021c “What Every Pet Owner Should Know About Roundworms & Hookworms.” Available online: https://www.cdc.gov/parasites/resources/web/roundworms_hookworms.html. Accessed May 15, 2022.

Chacín-Bonilla, L., Y. Sánchez, J. Estévez, Y. Larreal, and E. Molero.

- 2003 Prevalence of human toxoplasmosis in San Carlos Island, Venezuela. *Interiencia* 28: 457–462.

Cornell Wildlife Health Center (Cornell)

- 2018 *Toxoplasmosis Factsheet*. Available online: <http://efaidnbmnnnibpcajpcglclefindmkaj/https://cwhl.vet.cornell.edu/system/files/public/cwhl-fact-sheetstoxoplasmosis.pdf>. Accessed May 15, 2022.

Dubey, J. P., S.K. Verma, I. Villena, D. Aubert, R. Geers, C. Su, E. Lee, M.S. Forde, and R.C. Krecek

- 2016 Toxoplasmosis in the Caribbean islands: literature review, seroprevalence in pregnant women in ten countries, isolation of viable *Toxoplasma gondii* from dogs from St. Kitts, West Indies with report of new *T. gondii* genetic types. *Parasitology Research* 115(4): 1627–1634.

- Flegr, J. and J. Horáček
 2020 Negative Effects of Latent Toxoplasmosis on Mental Health. *Frontiers in Psychiatry* 10: 1012.
- Gerhold, R.W. and D.A. Jessup
 2012 Zoonotic diseases associated with free-roaming cats. *Zoonoses and Public Health* 60: 189–195.
- Ingram, W.M., L.M. Goodrich, E.A. Robey, and M.B. Eisen
 2013 Mice infected with low-sirulence strains of *Toxoplasma gondii* lose their innate aversion to cat urine, even after extensive parasite clearance. *PLoS ONE* 8(9): e75246.
- Inpankaew, T, P. Sattasathuchana, C. Kengradomkij, and N. Thengchaisri
 2021 Prevalence of toxoplasmosis in semi-domesticated and pet cats within and around Bangkok, Thailand. *BMC Veterinary Research* (17)1: 252.
- Kheirandish, F., B. Ezatpour, S. Fallahi, M.J. Tarahi, P. Hosseini, A.K. Rouzbahani, S.J.S. Tabaei, and S. Akbari
 2019 Toxoplasma serology status and risk of miscarriage, a case-control study among women with a history of spontaneous abortion. *International Journal of Fertility & Sterility*, 13(3): 184.
- Ma, X., S. Bonaparte, M. Toro, L.A. Orciari, C.M. Gigante, J.D. Kirby, R.B. Chipman, C. Fehlner-Gardiner, V.G. Cedillo, N. Aréchiga-Ceballos, A.K. Rao, B.W. Petersen, and R.M. Wallace
 2022 Rabies surveillance in the United States during 2020. *Journal of the American Veterinary Medical Association* 260(10): 1157-1165.
- Majid, A., N. Ahmad, S. Haleem, S. Zareen, M. Taib, S. Khan, and R. Hussain
 2021 Detection of toxoplasmosis in pets and stray cats through molecular and serological techniques in Khyber Pakhtunkhwa, Pakistan. *BMC Veterinary Research* 17(1): 357.
- Shapiro K., E. VanWormer, A. Packham, E. Dodd, P.A. Conrad, and M. Miller
 2019 Type X strains of *Toxoplasma gondii* are virulent for southern sea otters (*Enhydra lutris nereis*) and present in felids from nearby watersheds. *Proceedings of the Royal Society B: Biological Sciences* 286: 20191334.
- Tan, S.M., A.C. Stellato, and L. Niel
 2020 Uncontrolled outdoor access for cats: An assessment of risks and benefits. *Animals* 10(2): 258.
- Torrey, E.F. and R.H. Yolken
 2013 Toxoplasma oocysts as a public health problem. *Trends in parasitology* 29(8): 380–384.

University of Pennsylvania, School of Veterinary Medicine (Penn Vet)

2020 “Toxoplasmosis.” Available online: <https://www.vet.upenn.edu/research/centers-laboratories/research-initiatives/wildlife-futures-program/resources/fact-sheets/fact-sheet-detail/toxoplasmosis>. Accessed May 15, 2022.

Vyas, A., S-K. Kim, N. Giacomini, J.C. Boothroyd, and R.M. Sapolsky

2007 Behavioral changes induced by *Toxoplasma* infection of rodents are highly specific to aversion of cat odors. *Proceedings of the National Academy of Sciences* 104(15): 6442–6447.

World Health Organization (WHO)

2022 “Rabies.” Available online: <https://www.who.int/news-room/fact-sheets/detail/rabies>. Accessed May 15, 2022.

Wyrosdick, H.M., R. Gerhold, C. Su, A.A. Mignucci-Giannoni, R.K. Bonde, A. Chapman, C.I. Rivera-Pérez, J. Martinez, and D.L. Miller

2017 Investigating seagrass in *Toxoplasma gondii* transmission in Florida (*Trichechus manatus latirostris*) and Antillean (*T. m. manatus*) manatees. *Diseases of Aquatic Organisms* 127: 65–69.

APPENDIX E: FLORA AND FAUNA SPECIES LISTS

The following tables present species identified at San Juan National Historic Site by citizen scientists through iNaturalist and eBird. It should be noted that no natural resources assessments have been performed at the park, though this is a need identified in the park's Foundation Document (NPS 2013).

Amphibians

Common Name	Species Name	Native?
Cane Toad	<i>Rhinella marina</i>	No
Cuban Tree Frog	<i>Osteopilus septentrionalis</i>	No

Sources: iNaturalist 2023

Reptiles

Common Name	Species Name	Native?
Common Puerto Rican Ameiva	<i>Pholidoscelis exsul</i>	Yes
Crested Anole	<i>Anolis cristatellus</i>	Yes
Green Iguana	<i>Iguana iguana</i>	No

Sources: iNaturalist 2023

Birds

Common Name	Species Name	Native?
African Collared-Dove	<i>Streptopelia roseogrisea</i>	Yes
American Kestrel	<i>Falco sparverius</i>	Yes
American Oystercatcher	<i>Haematopus palliatus</i>	Yes
American Redstart	<i>Setophaga ruticilla</i>	Yes
Antillean Mango	<i>Cypseloides niger</i>	Yes
Antillean Nighthawk	<i>Chordeiles gundlachii</i>	Yes
Bananaquit	<i>Coereba flaveola</i>	Yes
Barn Swallow	<i>Hirundo rustica</i>	Yes
Belted Kingfisher	<i>Megaceryle alcyon</i>	Yes
Black Noddy	<i>Anous minutus</i>	Yes
Black Swift	<i>Cypseloides niger</i>	Yes
Black-and-white Warbler	<i>Mniotilta varia</i>	Yes
Black-bellied Plover	<i>Pluvialis squatarola</i>	Yes
Blackburnian Warbler	<i>Setophaga fusca</i>	Yes
Black-faced Grassquit	<i>Melanospiza bicolor</i>	Yes
Black-necked Stilt	<i>Himantopus mexicanus</i>	Yes
Blackpoll Warbler	<i>Setophaga striata</i>	Yes
Black-whiskered Vireo	<i>Vireo altiloquus</i>	Yes
Blue-and-yellow Macaw	<i>Ara ararauna</i>	No

Common Name	Species Name	Native?
Bobolink	<i>Dolichonyx oryzivorus</i>	Yes
Bronze Mannikin	<i>Lonchura cucullata</i>	No
Brown Booby	<i>Sula leucogaster</i>	Yes
Brown Noddy	<i>Anous stolidus</i>	Yes
Brown Pelican	<i>Pelecanus occidentalis</i>	Yes
Budgerigar	<i>Melopsittacus undulatus</i>	No
Cape May Warbler	<i>Setophaga tigrina</i>	Yes
Caribbean Elaenia	<i>Elaenia martinica</i>	Yes
Caribbean Martin	<i>Progne dominicensis</i>	Yes
Cattle Egret	<i>Bubulcus ibis</i>	Yes
Cave Swallow	<i>Petrochelidon fulva</i>	Yes
Chestnut-sided Warbler	<i>Setophaga pensylvanica</i>	Yes
Common Gallinule	<i>Gallinula galeata</i>	Yes
Common Ground Dove	<i>Columbina passerina</i>	Yes
Common Tern	<i>Sterna hirundo</i>	Yes
Common Yellowthroat	<i>Geothlypis trichas</i>	Yes
Domestic Chicken	<i>Gallus gallus domesticus</i>	No
Domestic Muscovy Duck	<i>Cairina moschata domestica</i>	No
Eastern Wood-Pewee	<i>Contopus virens</i>	Yes
Eurasian Collared-Dove	<i>Streptopelia decaocto</i>	Yes
Feral Pigeon	<i>Columba livia domestica</i>	Yes
Forster's Tern	<i>Sterna forsteri</i>	Yes
Grasshopper Sparrow	<i>Ammodramus savannarum</i>	No
Gray Kingbird	<i>Tyrannus dominicensis</i>	Yes
Great Blue Heron	<i>Ardea herodias</i>	Yes
Great Egret	<i>Ardea alba</i>	Yes
Greater Antillean Grackle	<i>Quiscalus niger</i>	Yes
Green Heron	<i>Butorides virescens</i>	Yes
Green Mango	<i>Anthracothorax viridis</i>	Yes
Green-throated Carib	<i>Eulampis holosericeus</i>	Yes
House Sparrow	<i>Passer domesticus</i>	No
Indian Silverbill	<i>Euodice malabarica</i>	No
Indigo Bunting	<i>Passerina cyanea</i>	Yes
Java Sparrow	<i>Lonchura oryzivora</i>	No
Killdeer	<i>Charadrius vociferus</i>	Yes
Laughing Gull	<i>Leucophaeus atricilla</i>	Yes
Least Tern	<i>Sternula antillarum</i>	Yes
Lesser Antillean Pewee	<i>Contopus latirostris</i>	Yes
Lesser Black-backed Gull	<i>Larus fuscus</i>	Yes
Little Blue Heron	<i>Egretta caerulea</i>	Yes

Common Name	Species Name	Native?
Loggerhead Kingbird	<i>Tyrannus caudifasciatus</i>	Yes
Magnificent Frigatebird	<i>Fregata magnificens</i>	Yes
Mangrove Cuckoo	<i>Coccyzus minor</i>	Yes
Masked Booby	<i>Sula dactylatra</i>	Yes
Merlin	<i>Falco columbarius</i>	Yes
Monk Parakeet	<i>Myiopsitta monachus</i>	No
Mourning Dove	<i>Zenaida macroura</i>	Yes
Northern Mockingbird	<i>Mimus polyglottos</i>	Yes
Northern Parula	<i>Setophaga americana</i>	Yes
Northern Red Bishop	<i>Euplectes franciscanus</i>	No
Northern Waterthrush	<i>Parkesia noveboracensis</i>	Yes
Orange-cheeked Waxbill	<i>Estrilda melpada</i>	No
Orange-winged Parrot	<i>Amazona amazonica</i>	No
Osprey	<i>Pandion haliaetus</i>	Yes
Ovenbird	<i>Seiurus aurocapilla</i>	Yes
Palm Warbler	<i>Setophaga palmarum</i>	Yes
Parasitic Jaeger	<i>Stercorarius parasiticus</i>	Yes
Pearly-eyed Thrasher	<i>Margarops fuscatus</i>	Yes
Peregrine Falcon	<i>Falco peregrinus</i>	Yes
Pin-tailed Whydah	<i>Vidua macroura</i>	No
Prairie Warbler	<i>Setophaga discolor</i>	Yes
Puerto Rican Bullfinch	<i>Melopyrrha portoricensis</i>	Yes
Puerto Rican Flycatcher	<i>Myiarchus antillarum</i>	Yes
Puerto Rican Lizard-Cuckoo	<i>Coccyzus vieilloti</i>	Yes
Puerto Rican Mango	<i>Anthracothorax aurulentus</i>	Yes
Puerto Rican Spindalis	<i>Spindalis portoricensis</i>	Yes
Puerto Rican Tody	<i>Todus mexicanus</i>	Yes
Puerto Rican Vireo	<i>Vireo latimeri</i>	Yes
Puerto Rican Woodpecker	<i>Melanerpes portoricensis</i>	Yes
Red Junglefowl	<i>Gallus gallus</i>	Yes
Red-eyed Vireo	<i>Vireo olivaceus</i>	Yes
Red-Legged Thrush	<i>Turdus plumbeus</i>	Yes
Red-tailed Hawk	<i>Buteo jamaicensis</i>	Yes
Ring-billed Gull	<i>Larus delawarensis</i>	Yes
Rock Pigeon	<i>Columba livia</i>	No
Roseate Tern	<i>Sterna dougallii</i>	Yes
Royal Tern	<i>Thalasseus maximus</i>	Yes
Ruddy Quail-Dove	<i>Geotrygon montana</i>	Yes
Ruddy Turnstone	<i>Arenaria interpres</i>	Yes
Saffron Finch	<i>Sicalis flaveola</i>	Yes

Common Name	Species Name	Native?
Sanderling	<i>Calidris alba</i>	Yes
Sandwich Tern	<i>Thalasseus sandvicensis</i>	Yes
Scaly-breasted Munia	<i>Lonchura punctulata</i>	No
Scaly-naped Pigeon	<i>Patagioenas squamosa</i>	Yes
Scarlet Tanager	<i>Piranga olivacea</i>	Yes
Semipalmated Plover	<i>Charadrius semipalmatus</i>	Yes
Shiny Cowbird	<i>Molothrus bonariensis</i>	Yes
Smooth-billed Ani	<i>Crotophaga ani</i>	Yes
Snowy Egret	<i>Egretta thula</i>	Yes
Spotted Sandpiper	<i>Actitis macularius</i>	Yes
Tricolored Heron	<i>Egretta tricolor</i>	Yes
Turkey Vulture	<i>Cathartes aura</i>	Yes
Turquoise-fronted Parrot	<i>Amazona aestiva</i>	Yes
Venezuelan Troupial	<i>Icterus icterus</i>	No
White Cockatoo	<i>Cacatua alba</i>	No
White-crowned Pigeon	<i>Patagioenas leucocephala</i>	Yes
White-Tailed Tropicbird	<i>Phaethon lepturus</i>	Yes
White-winged Dove	<i>Zenaida asiatica</i>	Yes
White-winged Parakeet	<i>Brotogeris versicolurus</i>	No
Wood Thrush	<i>Hylocichla mustelina</i>	Yes
Yellow Warbler	<i>Setophaga petechia</i>	Yes
Yellow-billed Cuckoo	<i>Coccyzus americanus</i>	Yes
Yellow-crowned Night-Heron	<i>Nyctanassa violacea</i>	Yes
Yellow-faced Grassquit	<i>Tiaris olivaceus</i>	Yes
Zenaida Dove	<i>Zenaida aurita</i>	Yes

Sources: eBird 2023; iNaturalist 2023; Castro-Prieto et al. 2023

Mammals

Common Name	Species Name	Native?
Domestic Cat	<i>Felis catus</i>	No
Domestic Dog	<i>Canis familiaris</i>	No
Rats	<i>Rattus spp.</i>	No

Sources: iNaturalist 2023

Plants

Common Name	Species Name	Native?
Adiantum Fern	<i>Adiantum deltoideum</i>	No
Alexandrian Laurel	<i>Calophyllum inophyllum</i>	No
Alkali Heliotrope	<i>Heliotropium curassavicum</i>	Yes
Arrowleaf Elephant's Ear	<i>Xanthosoma sagittifolium</i>	Yes

Common Name	Species Name	Native?
Ashen Hoarypea	<i>Tephrosia cinerea</i>	Yes
Asian Coromandel	<i>Asystasia gangetica</i>	No
Asthma Plant	<i>Euphorbia hirta</i>	Yes
Australian Umbrella Tree	<i>Heptapleurum actinophyllum</i>	No
Beach Bean	<i>Canavalia rosea</i>	Yes
Beach Morning Glory	<i>Ipomoea pes-caprae</i>	Yes
Beach Naupaka	<i>Scaevola taccada</i>	No
Beach Sheoak	<i>Casuarina equisetifolia</i>	No
Beggarticks	<i>Bidens alba</i>	Yes
Bermuda Grass	<i>Cynodon dactylon</i>	No
Big Caltrop	<i>Kallstroemia maxima</i>	Yes
Black Maidenhair Fern	<i>Adiantum capillus-veneris</i>	Yes
Black Torch	<i>Erithalis fruticosa</i>	Yes
Blue Porterweed	<i>Stachytarpheta jamaicensis</i>	Yes
Blue Wiss	<i>Teramnus labialis</i>	Yes
Catstongue	<i>Priva lappulacea</i>	Yes
Centipede Tongavine	<i>Epipremnum pinnatum</i>	No
Chinese Hibiscus	<i>Hibiscus rosa-sinensis</i>	No
Coconut Palm	<i>Cocos nucifera</i>	No
Common Passionfruit	<i>Passiflora edulis</i>	No
Common Purslane	<i>Portulaca oleracea</i>	No
Corkystem Passionflower	<i>Passiflora suberosa</i>	Yes
Creeping Beggarweed	<i>Desmodium incanum</i>	Yes
Creeping Indigo	<i>Indigofera spicata</i>	No
Creeping Woodsorrel	<i>Oxalis corniculata</i>	Yes
Cure-For-All	<i>Pluchea carolinensis</i>	Yes
Daisy Fleabane	<i>Erigeron bellioides</i>	Yes
Durban Crowfoot	<i>Dactyloctenium aegyptium</i>	No
Finger Grass	<i>Chloris barbata</i>	Yes
Flamboyant	<i>Delonix regia</i>	No
Flatleaf Flatsedge	<i>Cyperus planifolius</i>	Yes
Giant Leather Fern	<i>Acrostichum danaeifolium</i>	Yes
Giant Milkweed	<i>Calotropis procera</i>	No
Giant Sensitive Plant	<i>Mimosa pigra</i>	Yes
Goatweed	<i>Capraria biflora</i>	Yes
Golden Pothos	<i>Epipremnum aureum</i>	No
Gomphrena Weed	<i>Gomphrena serrata</i>	No
Goose Grass	<i>Eleusine indica</i>	No
Graceful Spurge	<i>Euphorbia hypericifolia</i>	Yes
Green Callaloo Amaranth	<i>Amaranthus viridis</i>	Yes

Common Name	Species Name	Native?
Herb-Of-Grace	<i>Bacopa monnieri</i>	Yes
Hurricanegrass	<i>Fimbristylis cymosa</i>	Yes
Island Goldback Fern	<i>Pityrogramma chrysophylla</i>	Yes
Jungle Flame	<i>Ixora coccinea</i>	No
Kleberg's Bluestem	<i>Dichanthium annulatum</i>	No
Ladder Fern	<i>Pteris vittata</i>	No
Little Ironweed	<i>Cyanthillium cinereum</i>	No
Matted Sandmat	<i>Euphorbia serpens</i>	Yes
Mexican Prickly Poppy	<i>Argemone mexicana</i>	Yes
Monarch Amazonvine	<i>Stigmaphyllon emarginatum</i>	Yes
Mother-In-Law's Tongue	<i>Sansevieria hyacinthoides</i>	No
Musk Fern	<i>Microsorium grossum</i>	No
Nosegaytree	<i>Plumeria alba</i>	Yes
Old World Diamond Flower	<i>Oldenlandia corymbosa</i>	No
Painted Spurge	<i>Euphorbia heterophylla</i>	Yes
Papaya	<i>Carica papaya</i>	No
Perfumed Spiderlily	<i>Hymenocallis latifolia</i>	Yes
Phasey Bean	<i>Macroptilium lathyroides</i>	Yes
Pink Trumpet-Tree	<i>Tabebuia heterophylla</i>	Yes
Pink Weed	<i>Spigelia anthelmia</i>	Yes
Popping Pod	<i>Ruellia tuberosa</i>	Yes
Portia Tree	<i>Thespesia populnea</i>	No
Quail Grass	<i>Celosia argentea</i>	No
Red Tasselflower	<i>Emilia fosbergii</i>	No
Rock Rosemary	<i>Merremia quinquefolius</i>	Yes
Rockweed	<i>Pilea microphylla</i>	Yes
Scarlet Spiderling	<i>Boerhavia coccinea</i>	Yes
Scorpion's-Tail	<i>Heliotropium angiospermum</i>	Yes
Sea Almond	<i>Terminalia catappa</i>	No
Seagrape	<i>Coccoloba uvifera</i>	Yes
Sea Purslane	<i>Sesuvium portulacastrum</i>	Yes
Sensitive Pea	<i>Chamaecrista nictitans</i>	Yes
Sensitive Plant	<i>Mimosa pudica</i>	Yes
Shell Mound Pricklypear	<i>Opuntia stricta</i>	Yes
Shortleaf Fig	<i>Ficus citrifolia</i>	Yes
Shrubby False Buttonweed	<i>Spermacoce verticillata</i>	Yes
Siam Weed	<i>Chromolaena odorata</i>	Yes
Silver Fern	<i>Pityrogramma calomelanos</i>	Yes
Snow Squarestem	<i>Melanthera nivea</i>	Yes
Soft Fern	<i>Christella dentata</i>	Yes

Common Name	Species Name	Native?
Southern Sandbur	<i>Cenchrus echinatus</i>	Yes
Spinyhead Sida	<i>Sida acuta</i>	Yes
Star of Bethlehem	<i>Hippobroma longiflora</i>	Yes
Swamp Flatsedge	<i>Cyperus ligularis</i>	Yes
Three-Lobe False Mallow	<i>Malvastrum coromandelianum</i>	Yes
Trailing Daisy	<i>Sphagneticola trilobata</i>	No
Tree Seaside Tansy	<i>Borrchia arborescens</i>	Yes
Tridax Daisy	<i>Tridax procumbens</i>	No
Upland Cotton	<i>Gossypium hirsutum</i>	Yes
White Leadtree	<i>Leucaena leucocephala</i>	No
White Moneywort	<i>Alysicarpus vaginalis</i>	No
Whitemouth Dayflower	<i>Commelina erecta</i>	Yes
Wild Calabash	<i>Elaeodendron xylocarpum</i>	Yes
Yellow Merremia	<i>Camonea umbellata</i>	No
Yerba de San Juan	<i>Pectis humifusa</i>	Yes

Sources: iNaturalist 2023; USDA 2023; Institute for Regional Conservation 2023

References

Castro-Prieto, J., J.M. Wunderle, J.A. Salguero-Faria, S. Soto-Bayo, J.D Crespo-Zapata, and W.A. Gould
 2021 *The Puerto Rico Breeding Bird Atlas. Gen. Tech. Rep. IITF-53.* Rio Piedras, PR: U.S. Department of Agriculture Forest Service, International Institute of Tropical Forestry. 311 p.

eBird

2023 “Hotspot: Viejo San Juan--El Morro.” Available online: <https://ebird.org/hotspot/L853622>. Accessed on June 13, 2023.

iNaturalist

2023 “San Juan National Historic Site Check List.” Available online: https://www.inaturalist.org/check_lists/290761-San-Juan-National-Historic-Site-Check-List?page=1&view=plain. Accessed on June 13, 2023.

Institute for Regional Conservation

2023 “Plants of the Island of Puerto Rico.” Available online: <https://www.regionalconservation.org/ircs/database/plants/ByElevationPR.asp?Elevation=1>. Accessed on June 13, 2023.

National Park Service

2013 *Foundation Document, San Juan National Historic Site, Puerto Rico.* September.

US Department of Agriculture (USDA)

2023 “PLANTS Database.” Available online: <https://plants.usda.gov/home>. Accessed on June 13, 2023.