

# Draft Environmental Assessment

Lower Rio Grande Valley and Laguna Atascosa  
National Wildlife Refuges Boca Chica Land Exchange

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Laguna Atascosa National Wildlife Refuges  
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U.S. Department of the Interior  
Fish and Wildlife Service  
Region 2 (Southwest Region)  
Lower Rio Grande Valley and Laguna Atascosa National Wildlife Refuges  
Boca Chica, Texas

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# 1 INTRODUCTION

The U.S. Fish and Wildlife Service’s (Service’s) Lower Rio Grande Valley National Wildlife Refuge (LRGVNWR) is preparing this environmental assessment (EA) to analyze and disclose the potential environmental impacts of exchanging 712 acres of the LRGVNWR (lands proposed for divestiture) for 692 acres that are privately owned by Space Exploration Technologies Corp. (SpaceX) (lands proposed for acquisition), located along State Highway (SH) 4 in the City of Starbase and adjacent to SH 100 in Laguna Vista in Cameron County, Texas (Figure 1-1).

Service approval of this land exchange would constitute a federal action subject to the requirements of the National Environmental Policy Act (NEPA).<sup>1</sup> Consequently, this EA has been written to analyze and disclose the potential environmental impacts of the land exchange (Proposed Action) and provide sufficient information for the Service to determine whether to prepare an environmental impact statement or a finding of no significant impact.

## 1.1 Background

The LRGVNWR, together with the Santa Ana National Wildlife Refuge, form the South Texas Refuge Complex in southernmost Texas. The Laguna Atascosa National Wildlife Refuge (LANWR), also located in southern Texas, is positioned along the shore of Laguna Madre and anchors the north end of the LRGVNWR corridor, providing critical habitat connectivity across the South Texas refuges (see Figure 1-1). The LRGVNWR began a long-term program of acquiring lands in 1979 to protect the remnants of existing native habitat, to form a riparian corridor for plants and wildlife, and to reestablish native habitats on acquired farmland. Land acquisition continues to be an emphasis for the LRGVNWR land protection program (Service 1997). LRGVNWR was established for the “development, advancement, management, conservation, and protection of fish and wildlife resources” (16 United States Code [USC] 742f(a)(4)), and for the “benefit of the United States Fish and Wildlife Service, in performing its activities and services” (16 USC f(b)(1)) (Fish and Wildlife Act of 1956, 16 USC 742(a)-754, as amended). Both the LRGVNWR and the LANWR are managed under their respective Comprehensive Conservation Plans (CCPs), documents that provide long range guidance for the management of national wildlife refuges.

The LANWR was formally established in 1946 as a unit of the National Wildlife Refuge System (NWRS) as a sanctuary for migratory birds and the protection of fish and wildlife resources (Service 2010). LANWR continues to acquire land within an approved acquisition boundary (Service 2010). LANWR was established for “use as an inviolate sanctuary, or for any other management purpose, for migratory birds...” (Migratory Bird Conservation Act of 1929 [16 USC 715d], as amended), for “wildlife conservation purposes if the real property has particular value in carrying out the national migratory bird management program” (Transfer of Certain Real Property for Wildlife Conservation Purposes Act of 1948 [16 USC 667b-667d], Public Law 80-537, as amended), for “the development, advancement, management, conservation and protection of fish and wildlife resources” (Fish and Wildlife Act of 1956 [16 USC 742(a)(4), as amended]), and for “the benefit of the United States Fish and Wildlife Service, in performing its activities and services” (Fish and Wildlife Act of 1956 [16 USC 742(b)(1), as amended]).

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<sup>1</sup> Executive Order 14154, Unleashing American Energy (Jan. 20, 2025), and a Presidential memorandum, Ending Illegal Discrimination and Restoring Merit-Based Opportunity (Jan. 21, 2025), require the Department of the Interior (Department) to strictly adhere to the National Environmental Policy Act (NEPA), 42 USC §§ 4321 et seq. Further, the Order and Memorandum repeal Executive Orders 12898 (Feb. 11, 1994) and 14096 (Apr. 21, 2023). Because Executive Orders 12898 and 14096 have been repealed, complying with such Orders is a legal impossibility. The U.S. Fish and Wildlife Service verifies that it has complied with the requirements of NEPA, including the Department’s revised NEPA implementing regulations and procedures at 43 Code of Federal Regulations (CFR) Part 46, as amended by the Department’s final rule, *National Environmental Policy Act Implementing Regulations*, 91 *Federal Register* (Feb. 24, 2026) and Part 516 of the Departmental Manual, consistent with the President’s January 2025 Order and Memorandum.

The LRGVNWR also overlaps portions of the Palmito Ranch Battlefield National Historic Landmark (NHL), a 9,391-acre site designated in 1997. The NHL marks the location of the final land engagement of the Civil War in 1865 and stands as a rare historic landscape that had remained largely unchanged since that time (National Park Service [NPS] 2020). However, recent development in the surrounding area, including the construction of large-scale industrial facilities, has begun to alter the historic viewshed.

SpaceX began acquiring land near Boca Chica in 2014 to develop Starbase, an industrial complex and rocket launch facility that now serves as the company's headquarters. In 2025, local voters approved the incorporation of Starbase as a new city. Starting in 2023, the Service initiated discussions with SpaceX regarding a potential land exchange in the area, with the goal of reducing fragmented ownership and consolidating lands managed by the Service. Most of the lands proposed for divestiture were originally acquired for public use by the Service through condemnation proceedings in the 1990s and managed consistent with the LRGVNWR CCP. At the time of acquisition, these parcels were identified for protection of the unique natural resources located thereon, including endangered species habitat, coastal wetlands, and barrier islands from irreparable damage in the Lower Rio Grande Valley. These parcels were also identified for their scenic and cultural values within the coastal addition in the Lower Rio Grande Valley. Since acquisition, the surrounding area has experienced significant industrialization and development, particularly associated with the expansion of SpaceX facilities and related infrastructure. This increased industrial activity combined with the fragmented pattern of private inholdings has led to increased disturbance from noise and lights, and elevated levels of habitat fragmentation, which have diminished the conservation value of these lands. The resulting changes in land use and landscape context have impacted the ability of these parcels to function as effective components of the regional conservation network.

The lands proposed for divestiture are mostly located between SH 4 and the Rio Grande, with approximately 6.8 acres along the north side of SH 4 and 1.3 acres along the north side of Starbase (see Figure 1-1). The bulk of the lands proposed for divestiture are approximately 3.5 miles southwest of the SpaceX Vertical Launch Area where testing, launches, and landings of the SpaceX Starship and Super Heavy vehicles occur, and approximately 1.5 miles southwest of Starbase and SpaceX manufacturing facilities. The lands proposed for divestiture are fragmented by private lands owned by SpaceX. These intervening private lands include the SpaceX Massey Test Site used to test space launch vehicles and vehicle components and lands under development by SpaceX for residential, commercial, and perhaps other uses. The 1.3 acres at Starbase are adjacent to developed lands used by SpaceX for manufacturing.

The lands proposed for acquisition are in two general locations, both within the approved acquisition boundary of LRGVNWR (Service 2010) and one area is within the approved acquisition boundary of LANWR. One set of parcels totals 216.1 acres located south of Starbase and the Vertical Launch Area in an area informally known as "Las Palomas" (Las Palomas Parcels). The Las Palomas Parcels are surrounded by lands of the LRGVNWR. There is currently no access to the Las Palomas Parcels. The other set of parcels totals 476.4 acres located between the communities of Laguna Vista and Laguna Heights, with parcels along both sides of SH 100 (Laguna Heights Parcels) and is contiguous with the Bahia Grande unit of LANWR. The Laguna Heights Parcels are adjacent to a portion of the LANWR and include frontage along the Laguna Madre and Laguna Larga. The lands proposed for divestiture and proposed for acquisition are subject to all valid existing rights. Nothing in this transaction will invalidate existing rights including but not limited to access, easements, rights of way, encumbrances, and mineral interests.

Together, the lands proposed for divestiture and the lands proposed for acquisition are referred to in this EA as the Project Area (see Figure 1-1). To best capture the current conditions and anticipated effects of the alternatives on each resource discussed in Chapter 3, unique analysis areas are used and defined in each section.

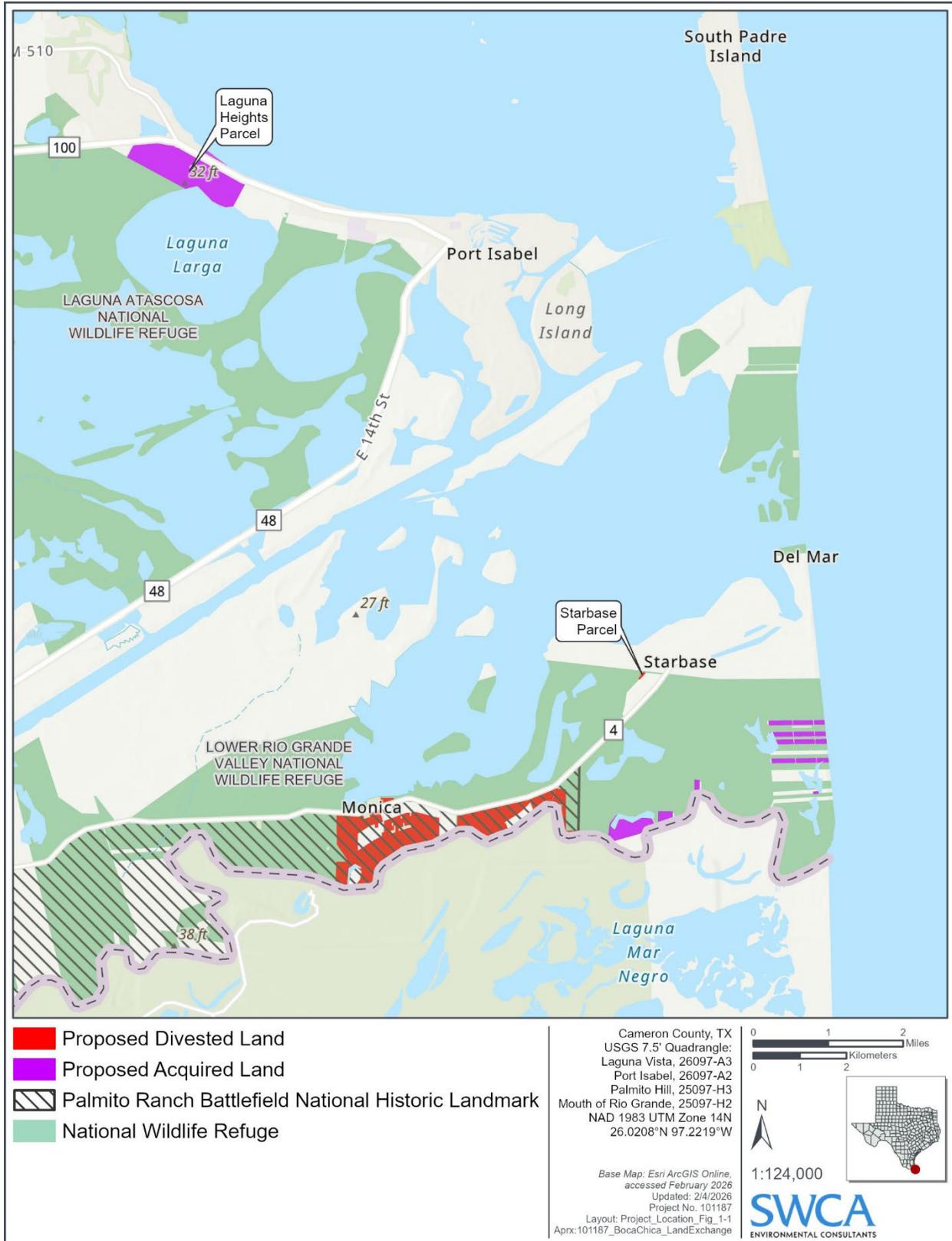


Figure 1-1. Project Area location.

## 1.2 Purpose and Need

The Service’s purpose for the Proposed Action is to consolidate lands of the NWRS in Cameron County, Texas, across a highly fragmented landscape of parcel ownership. The need for the Proposed Action is to reduce land use conflicts that impede the Service’s mission to conserve species’ habitats, improve habitat protection, consolidate ownership, and simplify management of refuge lands as established through the National Wildlife Refuge System Administration Act (as amended), consistent with the *Final Lower Rio Grande Valley and Santa Ana National Wildlife Refuges Comprehensive Conservation Plan* (Service 1997).

## 1.3 Decision to Be Made

The Service would determine whether or not to exchange the lands proposed for divestiture at LRGVNR for the lands proposed for acquisition. The lands proposed for acquisition would be administered by LRGVNR and LANWR.

## 1.4 Scoping and Issues

The Service’s internal scoping process began in November 2025 with interdisciplinary team review of the proposed land exchange. Through the internal scoping process, the issues listed in Table 1-1 were identified for detailed analysis and are analyzed Section 3.

**Table 1-1. Issues Analyzed in Detail**

Resource	Issue Statement
Land use	<ol style="list-style-type: none"><li>1. How would the land exchange affect refuge vulnerability to drought, severe flooding, and extreme weather events?</li><li>2. How would the land exchange affect the refuge's ability to administer its management goals?</li><li>3. How would the land exchange affect encroachment issues at the edge of refuge lands?</li></ol>
Cultural resources	<ol style="list-style-type: none"><li>1. How would the land exchange affect historic properties, including the National Register of Historic Places–listed Palmito Ranch Battlefield NHL?</li><li>2. How would the land exchange affect the traditional cultural uses of the Project Area, including the cultural uses of the Palmito Ranch Battlefield NHL?</li></ol>
Threatened and endangered species and critical habitats	<ol style="list-style-type: none"><li>1. How would the land exchange affect threatened and endangered species and critical habitats?</li></ol>
Mineral resources	<ol style="list-style-type: none"><li>2. How would the land exchange affect existing mineral rights or lands with mineral potential?</li></ol>

Several issues were identified during internal scoping that were not carried forward for analysis. These issues are analyzed in brief in Table 1-2.

**Table 1-2. Issues Analyzed in Brief**

Issue Statement	Analysis and Rationale for Not Carrying Forward for Detailed Analysis
<p><b>Geology and soils:</b> How would the land exchange affect the lomas within the Project Area?</p>	<p>Along the Gulf Coast, lomas (hills in Spanish) are higher elevation clay ridges formed from wind-blown silt or clay left by historical river meanders that serve as unique geologic features, in addition to valuable and habitat for plant and wildlife species (NPS 2025a).</p> <p>Within the Palmito Ranch Battlefield NHL, located within the LRGVNR, lomas are composed primarily of Point Isabel clay loam and occur on portions of the lands proposed for divestiture (see Figure 2-4 in Section 2.7). These lomas support unique vegetation communities and contribute to the historical significance of the area, as they were used in the battles that took place in the region (see Section 3.3.2). The geology, soils, and habitats of lomas within the LRGVNR are currently managed in accordance with the refuge’s conservation management plan (Service 1997).</p> <p>Transfer of ownership of the lands containing lomas from the Service to SpaceX could allow for future development that may affect these resources. However, avoidance and minimization measures identified in the Programmatic Agreement for cultural resources including lomas (see Section 2.7) would be implemented to reduce potential impacts to lomas and their associated resources.</p>
<p><b>Public access:</b> How would the land exchange affect public access to refuge areas?</p>	<p>Public access within the LRGVNR, the LANWR, and the Project Area are centered around recreation including wildlife observation, fishing, hiking, hunting, and beach access.</p> <p>Recreational resources within the LRGVNR and the LANWR are currently managed according to their respective conservation management plans (Service 1997, 2010). Private land owned by SpaceX is restricted to employees and does not include public recreation opportunities.</p> <p>Under the Proposed Action, recreational resources within the 712 acres of lands proposed for divestiture would be privately owned and would no longer be publicly accessible. However, the United States acquired the lands proposed for divestiture subject to the valid existing rights-of-way, easements or leases. The conditions of the exchange will remain subject to the property under the conditions of the exchange. Additionally, the acquisition of 692 acres that would be managed under the Service as part of the LRGVNR or the LANWR would have long-term positive effects if recreational resources within lands proposed for acquisition are added in the future. Additionally, the lands proposed for acquisition would allow for greater continuity of refuge parcels, which would provide a more contiguous and holistic recreation experience by users.</p> <p>The long-term positive effects of the Proposed Action on public access would outweigh the short-term adverse effects; therefore, public access was not carried forward for detailed analysis.</p>
<p><b>Wetlands and floodplains:</b> How would the land exchange affect wetlands and floodplains within the Project Area, including waters of the United States?</p>	<p>Wetlands and floodplains in the Project Area connect to the ecosystems of the Gulf of America and provide essential habitat and ecological benefits (U.S. Environmental Protection Agency 2025). In Cameron County and the Project Area, wetlands have been following global trends and have been generally decreasing from nearby developments, agricultural operations, and changing environmental conditions such as precipitation and air temperature (Tremblay 2012).</p> <p>Within the LRGVNR and the LANWR, wetlands and floodplains are managed by the Service according to their respective conservation management plans, in addition to the relevant federal and county regulations such as the Clean Water Act. Across both NWRs, wetlands and floodplains are managed primarily by conservation to restore and enhance their essential functions (Service 1997, 2010).</p> <p>Wetlands and floodplains on private land are managed by private landowners but are also subject to federal and county regulations (Cameron County 2014; Texas Parks and Wildlife Department 2025a).</p> <p>Executive Order (EO) 11988, Floodplain Management, and EO 11990, Protection of Wetlands (May 24, 1977), require Federal agencies to avoid to the extent possible the long and short-term adverse impacts associated with the occupancy and modification of floodplains and wetlands, respectively, and to avoid direct and indirect support of development in floodplains and wetlands wherever there is a practicable alternative. In developing the Proposed Action, the Service considered a range of alternative land exchange configurations and no practicable alternative to implementing the Proposed Action was found (Section 2.3). Restrictions consistent with the EOs will be applied as needed.</p> <p>Under the Proposed Action, the lands proposed for acquisition would be incorporated into the LRGVNR and the LANWR, which would protect these areas from potential future development and would likely include restoration of degraded areas.</p> <p>The Proposed Action would result in a change in management of wetlands and floodplains. Any future development or actions in these areas would need to comply with executive orders, federal, and/or county laws.</p>

Issue Statement	Analysis and Rationale for Not Carrying Forward for Detailed Analysis
<b>Contamination and toxic substances:</b> How would the land exchange affect the existence and spread of contamination and toxic substances?	<p>When land is acquired by the Service, contaminants that are remnants of former landowners are addressed through an environmental site assessment and, if necessary, remediation planning and oversight from the Service's contaminants experts. and engineers. Service policy requires that real property may be acquired only after completion of an environmental site assessment and only if one or more of the conditions outlined in 341 FW 3.9(A) are met, including that no evidence of hazardous substances or other environmental liabilities is found, or that any identified liabilities would not result in increased cost to the Department of the Interior or the United States and are determined to benefit the Service. The Service is also prohibited from divesting lands that have contaminated land or water until they have been mitigated or remediated (Service 2025a).</p> <p>A Phase I environmental site assessment was conducted across the Project Area and found that there are no contaminated areas in the Project Area; therefore, contamination and toxic substances were not carried forward for detailed analysis (SWCA 2025a, 2025b).</p>
<b>Air quality:</b> How would the land exchange affect air quality in Cameron County?	<p>According to the Texas Commission on Environmental Quality (TCEQ), Cameron County is currently in attainment for air quality standards set by the U.S. Environmental Protection Agency (TCEQ 2023).</p> <p>The land exchange itself would be an administrative action and would not result in any Service or SpaceX activities that would affect air quality.</p> <p>If the lands proposed for divestiture are developed by SpaceX in the future (see Section 2.5), short-term construction activities and long-term infrastructure would likely result in air emissions. However, short-term construction activities and long-term infrastructure would be required to comply with federal and TCEQ regulations for air quality. Future development would also not likely change Cameron County's attainment status; therefore, air quality was not carried forward for detailed analysis.</p>
<b>Fire:</b> How would the land exchange impact the ability of the LRGVNR and LANWR to effectively implement prescribed burns or control wildfires?	<p>Prescribed fires are one of several strategies both the LRGVNR and the LANWR use to control and lessen the fuel loads of areas that are susceptible to the growth of exotic grasses. Using prescribed fires in the LRGVNR and the LANWR has been proven to help maintain and restore native functioning prairie and marshland ecosystems. Additionally, using prescribed fires helps increase the refuges' wildfire resilience by lessening fuel loads that lessen the overall damage to the LRGVNR and the LANWR when wildfires occur (Service 1997, 2010).</p> <p>Each refuge experiences high amounts of ignitions (LRGVNR typically sees 50 to 75 per year) in wildfire seasons that can last up to 12 months (Service 1997, 2010). A portion of these ignitions are caused by proximity to Starbase, where SpaceX launches, landings, and tests take place (Lingle 2024). The LRGVNR and the LANWR typically allow wildfires to burn naturally, managing them only to prevent property damage and maintain public safety.</p> <p>Under the Proposed Action, refuge lands would be more contiguous, enabling the LRGVNR and the LANWR to implement prescribed burns and fire management activities more effectively. This increased continuity would reduce the need to consider fragmented land ownership, thereby improving the efficiency and ecological impact of fire management practices.</p> <p>Under the Proposed Action, the lands proposed for divestiture would be managed privately by SpaceX instead of the Service. The refuge would no longer carry out prescribed burns in these areas. SpaceX would continue allowing wildfires to burn naturally, and would manage them only to prevent property damage and maintain public safety, similar to the current management; therefore, fire risk was not carried forward for detailed analysis.</p> <p>Wildfire management goals and mitigation measures by both the Service and SpaceX would not change; therefore, fire was not carried forward for detailed analysis.</p>

## **2 ALTERNATIVES**

This chapter describes the alternatives that are analyzed in Chapter 3.

### **2.1 No Action**

Under the No Action alternative, the Service would retain the 712 acres of the LRGVNWR that are proposed for divestiture. The Service would continue to manage these lands according to applicable land use goals, objectives, and decisions as described in their respective conservation plans (Service 1997, 2010). The Service would evaluate and process ROW applications for access and utilities within this acreage in line with the LRGVNWR's CCP and under the authority of the National Wildlife Refuge System Administration Act of 1966 as amended. Known land use conflicts between conservation lands and industrial development would continue. The 692 acres proposed for acquisition would not become part of the NWRS.

### **2.2 Proposed Action**

Under the Proposed Action, 712 acres of Service-administered lands (lands proposed for divestiture) would be exchanged for 692 acres that are owned by SpaceX (lands proposed for acquisition). All restrictions required to comply with applicable laws and regulations would be included in the land exchange agreement.

### **2.3 Alternatives Dismissed from Detailed Consideration**

In developing the Proposed Action, the Service considered a range of alternative land exchange configurations. These included a more expansive exchange scenario as well as smaller or differently configured combinations of parcels. Following preliminary evaluation, these alternatives were eliminated from detailed consideration due to feasibility, environmental, operational, or policy constraints. The alternatives analysis reflects a robust and iterative planning process, and the Proposed Action represents the option that best meets the purpose and need while balancing environmental protection, management efficiency, and practical implementation considerations.

### **2.4 Affected Environment and Environmental Consequences**

This chapter describes the existing conditions relevant to the issues presented in Table 1-1 in Section 1.4 and discusses the potential impacts of the Proposed Action and the No Action alternative.

### **2.5 Reasonably Foreseeable Future Trends and Planned Actions**

Under the Proposed Action, the Service expects that the lands proposed for divestiture will be developed and used by SpaceX for residential, commercial, institutional, infrastructure, and/or manufacturing activities. Although SpaceX has not provided specific development plans for the lands proposed for divestiture, existing zoning indicates the types of uses that could occur which consist of open space, mixed use, and heavy industrial. Figure 2-1 identifies the existing zoning districts within Starbase.



Figure 2-1. Zoning districts in the Project Area.

The Service would manage the lands proposed for acquisition as part of the NWRS; specifically, the LRGVNWR and/or LANWR. These expected future uses of the lands proposed for divestiture and lands proposed for acquisition are activities related to the proposed exchange that would not occur on these specific sets of lands but for the proposed exchange and are reasonably certain to occur.

Management of the lands proposed for divestiture would be subject to spatial buffers, use restrictions, and other limitations designed to avoid or minimize effects to biological and cultural resources. These measures include, but are not limited to, buffers and limitations established to protect listed species and designated habitats, as well as areas subject to cultural resource protections. The full suite of applicable buffers and limitations is described in the Biological Assessment (Appendix C) and the Draft Programmatic Agreement (Service 2026), which together define the conditions under which land management and future activities would occur.

Based on the activities needed to achieve the goals and objectives of the *Final Lower Rio Grande Valley and Santa Ana National Wildlife Refuges Comprehensive Conservation Plan* (Service 1997) and the *Laguna Atascosa National Wildlife Refuge Comprehensive Conservation Plan* (Service 2010), it is reasonably foreseeable that the Service will conduct the following activities on the lands proposed for acquisition:

- **Revegetating former cropland:** Restore native Tamaulipan thornscrub and associated habitats by preparing soils, planting native species, installing infrastructure where necessary to facilitate vegetation establishment, controlling invasive species, and conducting follow-up maintenance to ensure long-term habitat success.
- **Habitat and Fire Management:** Implement prescribed fire, mechanical treatments (e.g., disking or mowing), and selective herbicide application to control invasive species, stimulate native plant growth, improve habitat conditions, and reduce hazardous fuel loads in areas of concern. These treatments would be conducted in accordance with approved fire management and integrated pest management plans.
- **Water Management and Infrastructure:** Install, maintain, or repair water control structures such as culverts, water control gates, low-water crossings, and levees to improve hydrologic connectivity, enhance wetland management, and support wildlife-dependent habitats. Activities may also include maintaining canals, pumps, and related infrastructure.
- **Land Acquisition:** Acquire lands from willing sellers through fee title purchase or conservation easements to meet the approved acquisition goal of 132,500 acres for the LRGVNWR. This may include boundary surveys, appraisals, environmental site assessments, and title work necessary to complete transactions.
- **Biological Inventories and Monitoring:** Conduct wildlife and plant inventories to document baseline conditions and biodiversity. Develop and implement long-term monitoring strategies to track habitat condition and detect significant population trends in migratory birds, resident wildlife, pollinators, and other species of concern.
- **Threatened and Endangered Species Management:** Monitor and manage populations of federally listed species and other sensitive species occurring on National Wildlife Refuge lands. Activities may include habitat enhancement, installation of supplemental habitat features (such as hacking or nest towers), nest or den monitoring, predator management where appropriate, and coordination with recovery partners.
- **Water Rights Protection and Delivery Efficiency:** Protect existing water rights associated with National Wildlife Refuge lands and improve water delivery systems by repairing infrastructure,

lining canals where feasible, upgrading pumps, and implementing water conservation practices to maximize efficiency and reliability.

- **Cultural Resource Protection:** Identify, document, and protect archaeological sites, historic structures, and other cultural resources. This may include site stabilization, avoidance during ground-disturbing activities, coordination with Tribal Nations and the State Historic Preservation Office (SHPO), and compliance with Section 106 of the National Historic Preservation Act (NHPA).
- **Compatible Public Use Opportunities:** Provide wildlife-dependent recreational opportunities such as hunting, fishing, wildlife observation, photography, environmental education, and interpretation, consistent with National Wildlife Refuge purposes. Activities may include maintaining trails, observation platforms, signage, visitor facilities, and implementing youth hunts or educational programming.

Past actions and present actions with no anticipated future impacts are accounted for in the description of the affected environment presented for each resource below.

## **2.6 Land Use**

### **2.6.1 Issue Statements and Analysis Area**

Project scoping identified the following issue statements for land use:

- How would the land exchange affect refuge vulnerability to drought, severe flooding, and other extreme weather events?
- How would the land exchange affect the refuges' ability to administer their management goals?
- How would the land exchange affect encroachment issues at the edge of refuge lands?

The land use analysis area is the Project Area plus a 0.5-mile buffer to capture impacts of land use outside the Project Area that may affect the land exchange parcels. The temporal scale of analysis is in perpetuity because it is assumed that the land exchange would be in perpetuity and that impacts to land use would be permanent.

### **2.6.2 Affected Environment**

The NWRS represents the only existing network of federally managed lands that are managed primarily for the conservation of wildlife. The mission of the NWRS is to “preserve a national network of lands and waters for the conservation and management of fish, wildlife, and plant resources of the United States for the benefit of present and future generations” (Executive Order 12996, *Management and General Public Use of the National Wildlife Refuge System*; National Wildlife Refuge System Improvement Act of 1997, 16 USC § 668dd-668ee). This mission is achieved through the goals of public use, the maintenance of high-quality habitats, strategic partnerships, and active public involvement. Land acquisition within the LRGVNR and the LANWR is guided by several priorities: conserving fish, wildlife, plants, and their habitats; protecting endangered species; establishing contiguous and connected wildlife corridors; conserving unique, rare, or declining ecosystems; protecting isolated tracts of desirable habitat; restoring wetlands and waters; and providing wildlife compatible recreation opportunities (Service 1997, 2010).

The LRGVNR and the LANWR have expanded their boundaries to provide additional riparian and thicket habitat for endangered species, and to protect and enhance migratory bird habitats. Wildlife corridors remain a key conservation tool in the region by addressing long-term protection of native biotic

communities and supporting the recovery of endangered species such as the ocelot (*Leopardus pardalis*) and Gulf Coast jaguarundi (*Puma yagouaroundsi cacomitli*).

SpaceX and USFWS collaborated to develop a system for evaluating habitat quality within the Project Area using Biological Importance Scores (BIS) (Figure 2-2). BIS values were assigned to each parcel based on three criteria: habitat quality, refuge connectivity, and critical habitat, each scored on a scale of 1 to 5. The specific factors and scoring methodology are described in Table 2-1. Using this approach, the lands proposed for divestiture were classified as poor (497 acres) and medium quality (215 acres), while the lands proposed for acquisition were classified as high quality (692 acres).

**Table 2-1. Habitat Evaluation Criteria for Biological Importance Scoring**

<b>Score</b>	<b>Habitat Quality</b>	<b>Refuge Connectivity</b>	<b>Critical Habitat Presence</b>
Poor	Degraded or fragmented habitat	Isolated habitat with no connectivity	No critical habitat features present
Medium	Some habitat features present but degraded	Limited connectivity	Limited critical habitat features present
Good	Intact habitat with some features	Moderate connectivity	Critical habitat features present but not abundant
High	High-quality habitat with most features intact	Good connectivity with adjacent habitats	Critical habitat features abundant and well-represented
Very High	Pristine habitat with all features intact	Excellent connectivity with multiple habitats	Critical habitat features extremely abundant and highly valued

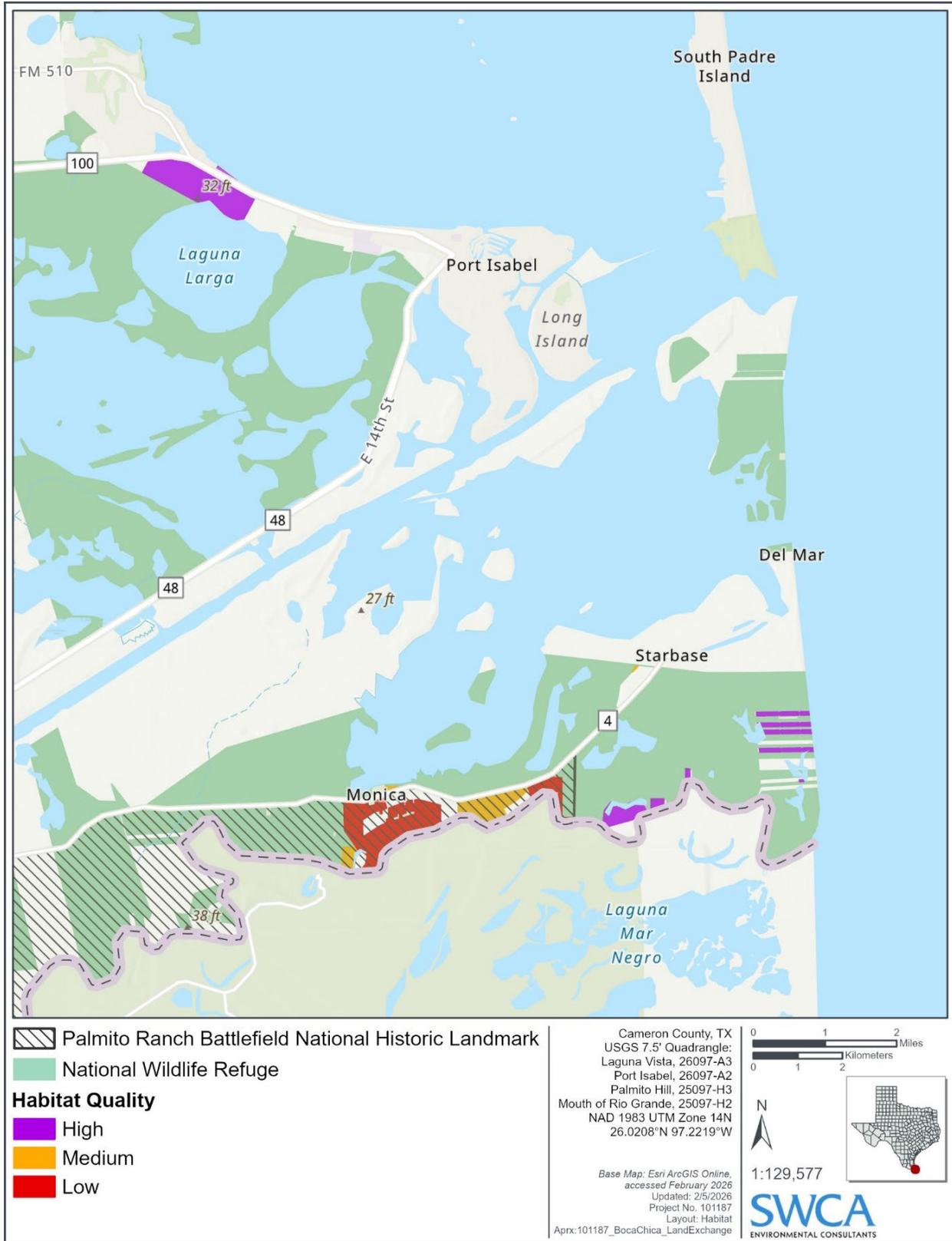


Figure 2-2. Habitat quality of the Project Area.

The LRGV region is characterized by periodic flooding of the Rio Grande, with climate projections indicating increasing temperatures, longer intervals between rainfall, and heightened storm severity leading to more runoff and flooding. These changes are expected to increase the frequency, severity, and extent of wildfires, and sea level rise may exacerbate flooding in coastal areas (U.S. Environmental Protection Agency 2016; U.S. Census Bureau 2022). The resilience of refuge lands to these extreme weather events depends on the integrity and connectivity of native habitats, as well as the management of conservation values.

Recent land use changes have introduced new challenges to conservation efforts. The passage of the North American Free Trade Act (1994), followed by its replacement with the United States-Mexico-Canada Agreement in 2020, contributed to increased infrastructure and industrial development in the region to facilitate trade. Additionally, SpaceX began acquiring land near Boca Chica in 2014 to develop Starbase, an industrial complex and rocket launch facility that now serves as the company’s headquarters. Additional industrial expansion occurred with the Rio Grande liquified natural gas export facility which broke ground in 2023. Over the past 20 years, increased development related to SpaceX activities and trade development have resulted in heightened noise and light pollution in both the LRGVNWR and the LANWR. Additionally, population growth in Cameron County, from approximately 260,120 in 1990 to 431,874 in 2024, with an annual growth rate of 0.8% projected, has further contributed to infrastructure expansion and development pressure in the region (US Census Bureau 2005; 2025). Over the past 40 years, development associated with trade, population growth, and industry have increased noise and light pollution within the LRGVNWR and the LANWR.

Data from LANDFIRE and the National Land Cover Database (NLCD) indicate a trend of increasing low, medium, and high density development in the analysis area, corroborating observed changes in land use and landscape character (Tables 2-2 and 2-3). These new land uses in the region have led to increased fragmentation, diminishing the conservation value of some refuge land tracts. Existing habitat quality is shown in Figure 2-2, while land use is shown in Figure 2-1. The large variations in open water, vegetated and barren land measurements across these remote sensing datasets is primarily due to dynamic wind-tidal flats system associated with the Laguna Madre. The submersion and emersion of these transitional areas are affected primarily by wind and storm tides rather than lunar tides with highly variable areas of open water or exposed tidal flats (Withers et al. 2023).

**Table 2-2. LANDFIRE Cover in the Analysis Area from 2001 Through 2024**

Cover Type	2001 (acres)	2016 (acres)	2020 (acres)	2024 (acres)
Open Water	1,503	3,508	3,650	3,657
Native Vegetation Types	6,762	3,973	5,713	5,760
Non-native Vegetation Types	290	897	873	804
Developed - Roads	262	262	282	282
Developed – Low Intensity	0	169	121	122
Developed – Medium Intensity	73	81	96	100
Developed – High Intensity	7	8	28	37
Open Water	1,503	3,508	3,650	3,657
<b>No data</b>	1,864	1,864	0	0
<b>Total</b>	<b>10,762</b>	<b>10,762</b>	<b>10,762</b>	<b>10,762</b>

Source: LANDFIRE (2025).

Note: Totals may not sum precisely due to rounding.

**Table 2-3. NLCD Cover in the Analysis Area from 2006 Through 2024**

Cover Type	2006 (acres)	2016 (acres)	2021 (acres)	2024 (acres)
Unclassified	1,864	1,863	1,862	1,862
Open Water	1,567	3,587	2,487	2,509
Developed – Open Space	96	74	23	23
Developed – Low Intensity	314	251	374	381
Developed – Medium Intensity	150	152	179	205
Developed – High Intensity	18	21	42	48
Barren	2,284	461	594	618
Vegetation Cover	4,469	4,353	5,202	5,116
<b>Total</b>	<b>10,762</b>	<b>10,762</b>	<b>10,762</b>	<b>10,762</b>

Source: U.S. Geological Survey (2024).

Note: Totals may not sum precisely due to rounding.

## **2.6.3 Environmental Consequences**

### **2.6.3.1 NO ACTION**

Under the No Action alternative, the 712 acres of Service lands would remain under refuge management as part of the LRGVNR. Habitat management would continue according to the CCPs (Service 1997, 2010). Parcels of land with high quality habitat would continue to exist within the approved acquisition boundaries for both the LRGVNR and LANWR that would provide conservation benefits in these areas and could be acquired by the NWRS in the future, either through a land exchange or through the National Wildlife Refuge land acquisition program.

The 692 acres currently owned and managed by SpaceX would remain under private ownership. These lands are expected to continue toward development, resulting in minimal conservation benefit. Existing native habitats on these parcels are already fragmented, and ongoing and anticipated development on SpaceX inholdings would further reduce habitat availability and connectivity. In addition, any development within floodplains and wetlands could alter natural hydrologic processes, reducing flood storage capacity, increasing runoff, and diminishing the ability of these areas to reduce flooding. Management conflicts between the NWRS and SpaceX would continue in these areas.

### **2.6.3.2 PROPOSED ACTION**

#### **2.6.3.2.1 Lands Proposed for Divestiture**

The land exchange itself would be an administrative action that would not result in immediate changes to land use. The lands proposed for divestiture would be managed by SpaceX, and the NWRS would no longer implement their management strategies, including habitat restoration and conservation, or extreme weather management response in these areas. Although no specific development plans have been shared, the lands proposed for divestiture are zoned for mixed use (see Figure 2-1), and it is reasonably foreseeable that the lands proposed for divestiture will be used for residential, commercial, industrial, and infrastructure purposes in the near term. The lands proposed for divestiture were assessed as more vulnerable than the lands proposed for acquisition to impacts from potential future development, which could result in light and noise encroachment over the short term from the construction of facilities, and reduced habitat quality over the long term from development in these areas. Wetlands and floodplains

within the lands proposed for divestiture would be subject to restrictions consistent with EO 11988 and EO 11990 will be applied as needed.

### **2.6.3.2.2 Lands Proposed for Acquisition**

The lands proposed for acquisition have been assessed as supporting high-quality habitat (see Section 2.6.2). Acquisition of these land parcels would reduce or eliminate private inholdings within the refuges, creating larger, more contiguous tracts of land and reducing habitat fragmentation. This consolidation would diminish edge effects within wildlife habitats and improve habitat connectivity, supporting wildlife movement, genetic diversity, and overall ecosystem resilience. When managed as part of the NWRS, habitat quality on the lands proposed for acquisition would add 429 acres of contiguous land in the LANWR, and would add 0.45 mile of contiguous shoreline to the LRGVNWR. By establishing larger, unbroken expanses of federally managed land, the impacts of surrounding noise and light pollution from adjacent land uses would be minimized, thereby enhancing conditions for sensitive species (see Section 2.8 for more details on impacts to sensitive species). Consolidated ownership would also increase management efficiency by reducing boundary conflicts, trespass issues, and the need for extensive coordination related to access, rights-of-way, and boundary maintenance, allowing the Service greater flexibility and effectiveness in implementing habitat management actions. Additionally, the acquisition of ecologically valuable lands, including wetlands, would enhance long-term resource protection and support refuge purposes such as flood control, protection of priority habitats, and increased resilience to extreme weather events.

## **2.7 Cultural Resources**

### **2.7.1 Issue Statements and Analysis Area**

Project scoping identified the following issue statements for cultural resources:

- How would the land exchange affect historic properties, including the National Register of Historic Places (NRHP)–listed Palmito Ranch Battlefield NHL?
- How would the land exchange affect the traditional cultural uses of the Project Area, including the cultural uses of the Palmito Ranch Battlefield NHL?

SEARCH, an archaeological consultant team, conducted a Phase I cultural resources survey for the land exchange and defined an area of potential effects (APE) and a direct effects area (DEA) within it. The DEA includes all federal and private parcels included in the proposed land exchange, and it excludes the portion of the Palmito Ranch NHL not included in the exchange (SEARCH 2026). In this section, the DEA is the area analyzed for potential effects under NEPA. The temporal scale of analysis is in perpetuity because it is assumed that the land exchange would be in perpetuity and impacts to cultural resources would be permanent unless measures are included in the exchange to protect historic properties.

### **2.7.2 Affected Environment**

#### **2.7.2.1 CULTURAL RESOURCES**

Cultural resources are sites, districts, buildings, structures, objects, or locales that provide evidence of past and present human activity or cultural belief and meaning. A historic property is defined in the NHPA (54 USC 300308) as any “prehistoric or historic district, site, building, structure, or object included in, or eligible for inclusion on, the National Register of Historic Places”. Section 106 of the NHPA requires federal agencies to consider the effects of undertakings on historic properties. The process

for complying with NHPA Section 106 is set forth in 36 Code of Federal Regulations (CFR) 800. Per Section 111 of the NHPA, a federal agency, after consultation with the Advisory Council on Historic Preservation, may exchange any property owned by the agency if the agency head determines that the exchange will adequately ensure the preservation of the historic property. In Texas, sites may also be recommended or designated as State Antiquities Landmarks, the state-level equivalent of historic properties in Texas.

Cultural resources surveys were conducted by SEARCH in the DEA to 1) confirm the presence or absence of sites within the DEA that may be eligible for the NRHP and 2) determine whether the portions of the Palmito Ranch Battlefield NHL that fall within the DEA are contributing elements of its eligibility (SEARCH 2026). SEARCH revisited five previously recorded sites and identified 24 new resources consisting of 11 archaeological sites and 13 isolated finds (IFs) (SEARCH 2026:89). Except for a surface concentration of oyster shell, these resources are historic-period artifacts; no precontact artifacts were identified (SEARCH 2026). SEARCH identified in the DEA eight cultural resources that are either independently eligible for the NRHP or that contribute to the eligibility of the Palmito Ranch NHL (SEARCH 2026:Table 6-3) (Table 2-4).

**Table 2-4. Summary of Eligible and Contributing Cultural Resources in the DEA**

Site Number	Name	Temporal Affiliation/ Site Type	NRHP Eligibility, Independent	NRHP Eligibility, Contributing
41CF184	Boca Chica No. 2 (THC Shipwreck No. 2404)	Historic, nineteenth-century shipwreck	Eligible	Does not contribute to the NHL
41CF6	White's Ranch	Historic, mid-nineteenth-century artifact scatter	Recommended eligible	Contributes to the NHL
Site JB-17	Historic scatter within Site 41CF6	Historic artifact scatter	Ineligible	Contributes to the NHL
IF JB-18	Historic isolate within 41CF6	Historic isolate	Ineligible	Contributes to the NHL
IF JB-11	Historic scatter, nineteenth-century military	Historic artifact scatter	Ineligible	Contributes to the NHL
Site JB-12	Historic scatter, nineteenth-century military and other artifacts	Historic artifact scatter	Ineligible	Contributes to the NHL
Site JB-15/16	Historic scatter, nineteenth century military and other artifacts	Historic artifact scatter	Ineligible	Contributes to the NHL
IF JMN-01	Historic isolate, nineteenth-century military	Historic isolate	Ineligible	Contributes to the NHL

Source: SEARCH (2026:Table 6-3).

Consultation with the SHPO as part of the Service’s NHPA Section 106 consultation is ongoing and will be finalized prior to the Service issuing a final decision.

Human occupation in this part of Texas may date back as far as the Paleoindian period (11,500–8000 BP) through the Archaic periods (8000–1200 BP), but evidence of such occupations along the south Texas coast is rare. By the Late Prehistoric period (1200–400 BP), people had specialized shell, pottery, and lithic tools and were semi-nomadic hunter-fisher-gatherers who followed a subsistence cycle based on seasons and tides. No sites from these time periods have yet been identified as intersecting the DEA.

The most prevalent site types in the DEA are from the Historic period and consist of shipwrecks and artifact scatters related to the Mexican American War, the American Civil War, and the Palmito Ranch Battlefield NHL (Figure 2-3) (SEARCH 2025).

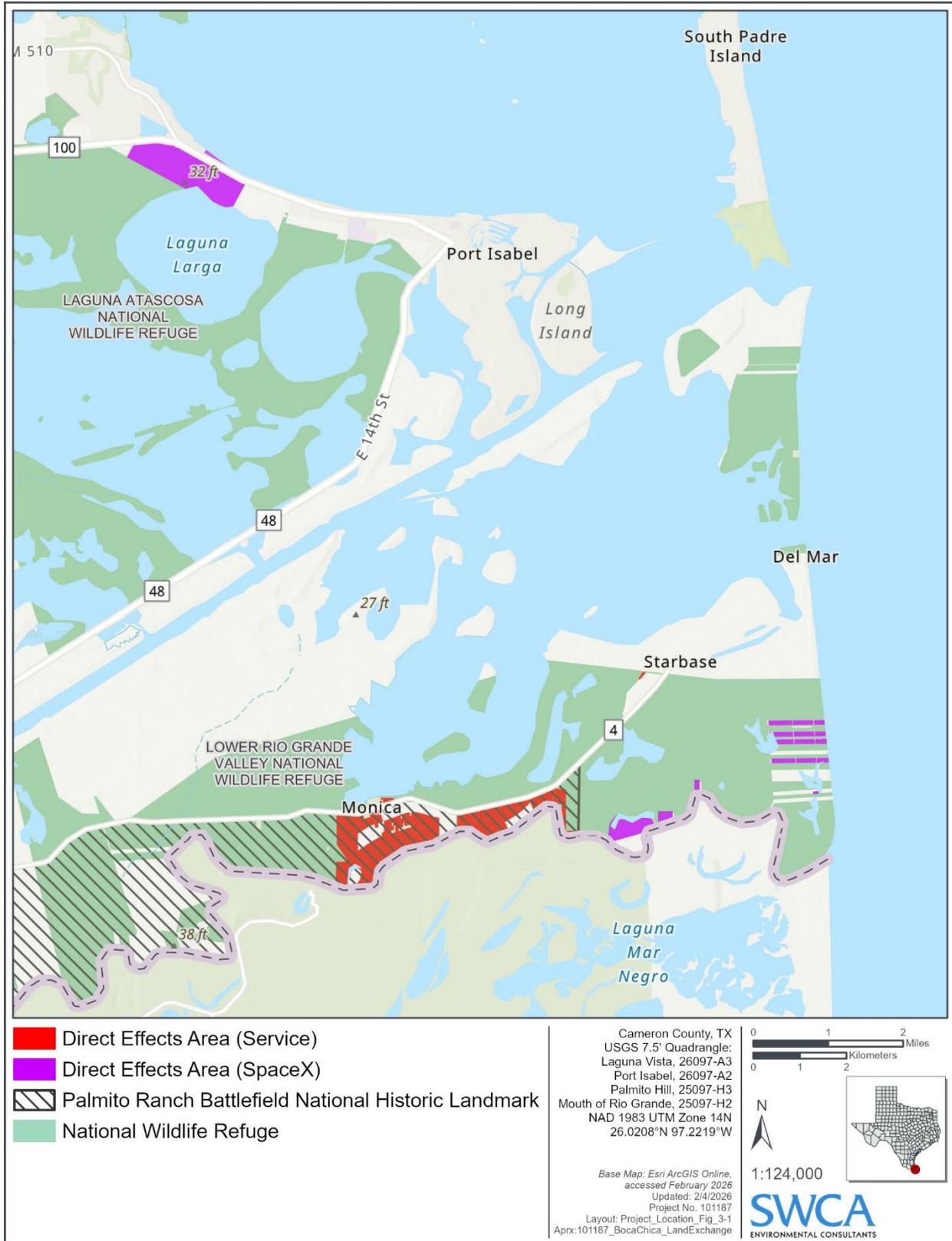


Figure 2-3. Locations of direct effects area and Palmito Ranch Battlefield NHL.

The Mexican American War, fought from 1846 to 1848, was a conflict between the United States and Mexico largely driven by the U.S. desire for westward expansion and the concept of Manifest Destiny. Tensions escalated after the United States annexed Texas, which Mexico still considered its territory, and disputes over the border further fueled hostilities. The war began with skirmishes near the Rio Grande and included major battles such as the capture of Mexico City by U.S. forces. The conflict ended with the Treaty of Guadalupe Hidalgo, through which Mexico ceded vast territories—including California and New Mexico—to the United States for \$15 million. This territorial gain significantly expanded the United States and had lasting effects on both nations, intensifying debates over enslavement and shaping future relations.

Shipping and the Texas Gulf Coast ports played a key role in the American Civil War. Federal forces attempted to control the ports to disrupt the flow of communications, money, and material to the Confederates but had limited success. The Federal Army had more success in blockading the Texas Coast except in one location: the coast's southernmost point at the mouth of the Rio Grande. The Rio Grande, as the international boundary between Texas and Mexico, was the main route for goods, especially cotton, to be smuggled downriver by Mexican merchants and out to foreign ships anchored in the Gulf, avoiding confiscation by the Federal Army. To stop this flow of Confederate commerce under the pretense of Mexican ownership, the Federals launched an invasion of South Texas. During this time, the Confederates maintained soldiers at Palmito Ranch to monitor Federal activity and boats coming upriver from the Gulf (ESE Partners 2024). On May 12 and 13, 1865, Union troops encountered Confederate resistance near White's Ranch and Palmito Ranch, which sparked the final battle of the Civil War more than one month after General Robert E. Lee's surrender.

The American Civil War-era Palmito Ranch Battlefield NHL is described in detail in the *Historic Context Report: 19<sup>th</sup> Century Military Action in the SpaceX Starbase Study Area, Cameron County, Texas* (ESE Partners 2024), which provides the historical context for military activities in a 58-square-mile study area that encompasses the DEA. The Palmito Ranch Battlefield was listed in the NRHP in 1993 under Criterion D (archaeology; information potential) and Criterion A (historic events) in Military History at the national level of significance. The battlefield's level of significance also resulted in its designation as an NHL in 1997.

The most concentrated fighting took place on plains west of Palmito Ranch. Small hills, or *lomas*, are found across the battlefield area, including in the DEA (Greco 2026), and were present at the time of the battle (Figure 2-4). Both armies used these small rises, most no higher than 30 feet above sea level, for gathering intelligence. The landscape of the battlefield had remained largely unchanged since the mid-nineteenth century due largely to its lack of development. For this reason, the landscape contributed to the battlefield's historic integrity because it conveys the visual sense of the area as it must have appeared to the soldiers in 1865. However, looting and the results of numerous archaeological surveys have left little material culture related to the battle (ESE Partners 2024).

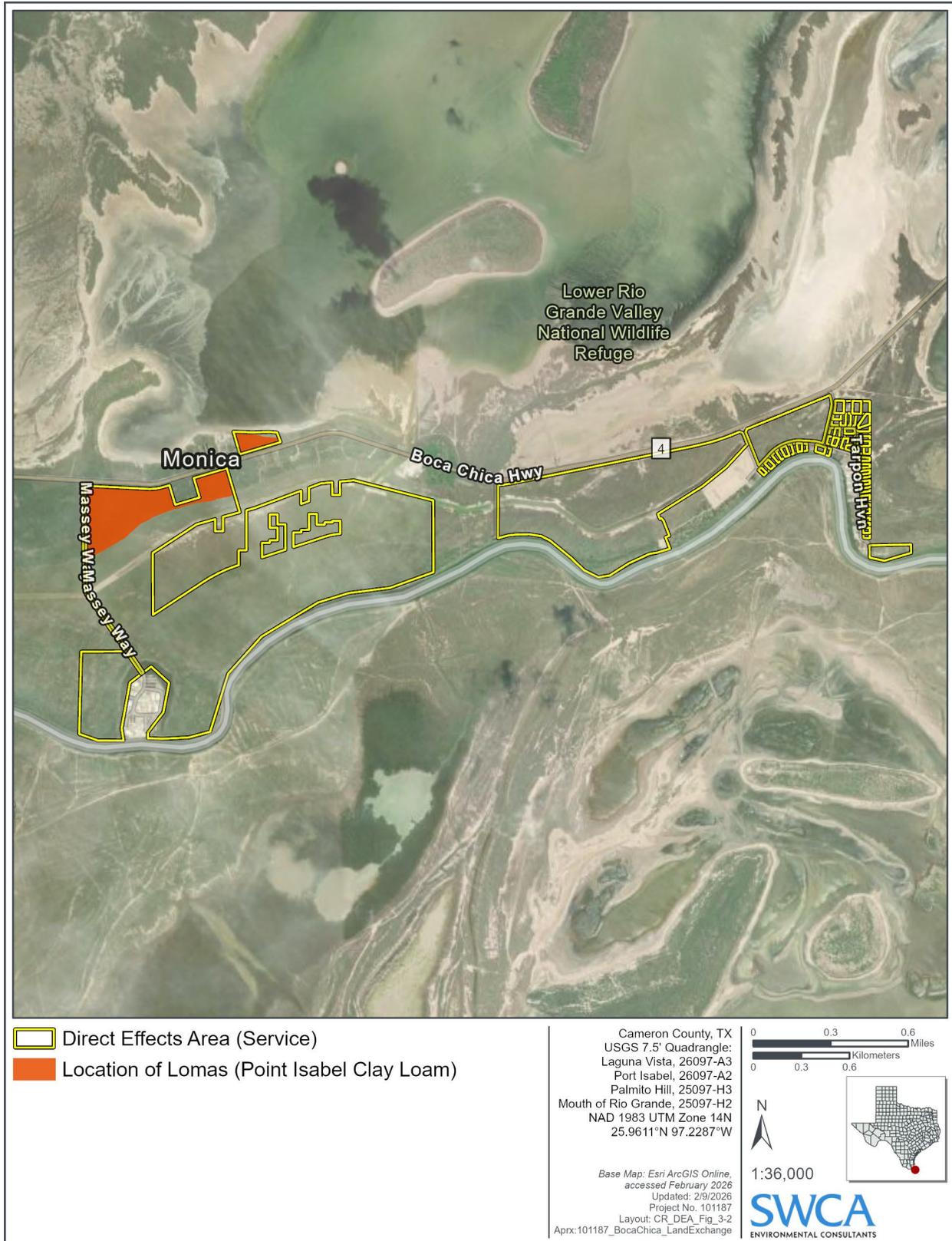


Figure 2-4. Location of lomas in the direct effects area.

Cultural resources within the LRGVNWR and the LANWR are currently managed by the following goals, according to the LRGVNWR conservation plan (Service 1997):

1. Coordinate with SHPO to identify cultural resources on the refuge. Evaluate the status of new sites and submit for additional protection (i.e., NRHP) if necessary.
2. Develop mechanisms and tools to assist in the education of local communities of the importance of Lower Rio Grande Valley cultural resources.
3. Develop opportunities for the public appreciation of identified cultural resource areas in coordination with the Camino del Rio project.
4. Establish interpretive kiosks at historic sites.
5. Research and record history of LRGVNWR tracts and consider developing a specific tract display in the refuge visitor center.

For cultural resources within the DEA that are currently managed privately by SpaceX, SpaceX is required to follow state regulations and federal regulations, such as the NHPA, when a federal nexus applies.

### **2.7.2.2 TRADITIONAL CULTURAL USES**

The term *traditional cultural uses* refers to practices, activities, and customs that are historically carried out by particular cultural groups—often Indigenous peoples or local communities—in accordance with their traditions, beliefs, and values. These uses are typically passed down through generations and are deeply connected to the group’s identity, heritage, and relationship with the land, water, plants, animals, and other natural resources. Examples of traditional cultural uses include gathering plants for food, medicine, or ceremonial purposes; hunting and fishing using customary methods; conducting religious or spiritual ceremonies; and practicing stewardship and land management according to ancestral knowledge

Section 106 initiation letters were sent to the Apache Tribe of Oklahoma, the Comanche Nation of Oklahoma, the Kiowa Tribe of Oklahoma, the Mescalero Apache Tribe of New Mexico, and the Tonkawa Tribe of Oklahoma on November 5, 2025. The Service received a response from the Comanche Nation on November 20, 2025, stating that they were unaware of historic properties of concern to the Tribe in the area of potential effect (Service 2026).

Tribal consultation letters on determinations of NRHP eligibility and determinations of affects to historic properties were sent to the Apache Tribe of Oklahoma, the Comanche Nation of Oklahoma, the Kiowa Tribe of Oklahoma, the Mescalero Apache Tribe of New Mexico, and the Tonkawa Tribe of Oklahoma on February 6, 2026 (Service 2026).

## **2.7.3 Environmental Consequences**

### **2.7.3.1 NO ACTION**

Under the No Action alternative, the Service would not divest lands to SpaceX nor acquire lands from SpaceX. Management of the lands proposed for divestiture, including cultural resources and historic properties, would remain under the Service. The lands proposed for divestiture would not be developed and used by SpaceX for residential, commercial, institutional, infrastructure, and/or manufacturing activities, and therefore there would be no ground disturbance and no direct effects to cultural resource sites. The Service would continue to consider any future requests for a Special Use Permit to a facilitate a cultural use under the National Wildlife Refuge System Administration Act of 1966, as amended, and the Service’s Appropriateness and Compatibility Policy 603 FW 2 (Service 2000)

SpaceX would retain ownership of the lands proposed for acquisition, and full development and use of those lands for residential, commercial, institutional, infrastructure, and/or manufacturing activities is assumed.

Access to the lands proposed for divestiture and the lands proposed for acquisition for traditional cultural uses would not be affected by the land exchange.

## 2.7.3.2 PROPOSED ACTION

### 2.7.3.2.1 Lands Proposed for Divestiture

Under the Proposed Action, ownership of the lands proposed for divestiture would be transferred from the Service to SpaceX. The potential for direct effects to the portion of the Palmito Ranch Battlefield NHL within the DEA and the sites that contribute to its eligibility is unknown. Measures described in the draft Programmatic Agreement (Appendix B) that would improve access to and interpretation of historic properties include establishment of a preservation area around White’s Ranch, construction of a viewing and interpretation platform, and development of a trail system within and outside of the Palmito Ranch Battlefield NHL. The transfer of federally owned property within the Palmito Ranch Battlefield NHL to SpaceX would constitute an adverse effect under Section 106 unless “adequate and legally enforceable restrictions or conditions to ensure long-term preservation” of the NHL’s significance are administered, pursuant to 36 CFR 800.5(a)(2)(vii). For this reason, SEARCH recommends a Section 106 finding of *adverse effect* to the Palmito Ranch Battlefield NHL and its contributing resources (SEARCH 2026:245). Table 2-5 summarizes the assessment of effects under Section 106 to historic properties on lands proposed for divestiture.

**Table 2-5. Section 106 Effects Assessment for Historic Properties on Lands Proposed for Divestiture**

Site Number	Name	Temporal Affiliation/ Site Type	NRHP Eligibility, Independent	NRHP Eligibility, Contributing	Effects Assessment
41CF6	White’s Ranch	Historic, mid-nineteenth-century artifact scatter	Recommended eligible	Contributes to the NHL	Adverse effect (transfer of federally owned property)
Site JB-17	Historic scatter within Site 41CF6	Historic artifact scatter	Ineligible	Contributes to the NHL	Adverse effect (transfer of federally owned property)
IF JB-18	Historic isolate within 41CF6	Historic isolate	Ineligible	Contributes to the NHL	Adverse effect (transfer of federally owned property)
IF JB-11	Historic scatter, nineteenth-century military	Historic artifact scatter	Ineligible	Contributes to the NHL	Adverse effect (transfer of federally owned property)
Site JB-12	Historic scatter, nineteenth-century military and other artifacts	Historic artifact scatter	Ineligible	Contributes to the NHL	Adverse effect (transfer of federally owned property)
Site JB-15/16	Historic scatter, nineteenth century military and other artifacts	Historic artifact scatter	Ineligible	Contributes to the NHL	Adverse effect (transfer of federally owned property)
IF JMN-01	Historic isolate, nineteenth-century military	Historic isolate	Ineligible	Contributes to the NHL	Adverse effect (transfer of federally owned property)

Site Number	Name	Temporal Affiliation/ Site Type	NRHP Eligibility, Independent	NRHP Eligibility, Contributing	Effects Assessment
41CF93 (NRHP No. 93000266)	Palmito Ranch Battlefield NHP	Civil War Battlefield	NRHP Listed 1993; Designated NHL 1997	N/A	Adverse effect (transfer of federally owned property)

Source: SEARCH 2026:Table 7-1.

Per the draft *Programmatic Agreement among the United States Fish and Wildlife Service, the Texas State Historic Preservation Office, National Park Service, the Advisory Council on Historic Preservation, and Space Exploration Technologies Corp., regarding a Land Exchange that includes Portions of the Palmito Ranch Battlefield National Historic Landmark, Cameron County, Texas* (Service 2026), the potential effects to historic properties resulting from the transfer of federally owned property within the Palmito Ranch Battlefield NHL to SpaceX would be avoided, minimized, and/or resolved through the following measures applicable to the lands proposed for divestiture:

- Archaeological monitoring in sensitive loma areas during ground-disturbing activities
- The establishment of a preservation area in the White’s Ranch vicinity with development limitations in parcel numbers including, but not limited to 173530, 173531, 173532, and 173533
- The construction of a viewing platform that includes interpretive signs/materials in the preservation area and the inclusion of information about the Battle of Palmito Ranch and the locations of historical markers, maps, and other interpretive materials on the Starbase City website
- The development of a trail or trail system providing connectivity to the viewing platform with surrounding parcels within and outside of the Palmito Ranch Battlefield NHL

### 2.7.3.2.2 Lands Proposed for Acquisition

Under the Proposed Action, ownership of the lands proposed for acquisition would be transferred from SpaceX to the Service. Historic properties on these lands would be managed by the Service and would not be part of lands developed and used by SpaceX for residential, commercial, institutional, infrastructure, and/or manufacturing activities.

The only historic property on these lands is 41CF184, the Boca Chica #2 Shipwreck. The proposed land exchange would transfer the parcel, including the mapped location of this historic property, from private to federal ownership, thereby conferring protections pursuant to Sections 106 and 110 of the NRHP. For this reason, SEARCH recommends a finding of no effect under Section 106 to 41CF184 (SEARCH 2026: 248). No direct effects to the site from the land exchange are anticipated.

## 2.8 Threatened and Endangered Species and Critical Habitats

### 2.8.1 Issue Statement and Analysis Area

Project scoping identified the following issue statement for threatened and endangered species and critical habitats:

- How would the land exchange affect threatened and endangered species and critical habitats?

The special-status species analysis area includes all lands proposed for exchange and a 0.5-mile buffer around each parcel to account for indirect effects such as noise, light, and altered hydrology. This spatial boundary is not a requirement of the Endangered Species Act (ESA) but captures the zone of potential environmental change for this EA, while the temporal scale extends in perpetuity, as the land exchange would result in permanent changes to landownership, management authority, and habitat conservation responsibilities.

## 2.8.2 Affected Environment

For this analysis, special-status species include those listed as threatened or endangered or proposed for listing under the federal ESA of 1973. Critical habitat refers to specific geographic areas that contain features essential for the conservation of a threatened or endangered species as designated by the Service.

Management of lands within the special-status species analysis area varies substantially depending on ownership and administrative status. The Service currently manages LRGV NWR under the *Final Lower Rio Grande Valley and Santa Ana National Wildlife Refuges Comprehensive Conservation Plan* (Service 1997) and the LANWR under the *Laguna Atascosa NWR Comprehensive Conservation Plan* (Service 2010). Refuge lands are managed for long-term habitat conservation through a combination of passive and active restoration. Passive restoration includes natural succession in retired agricultural fields and disturbed areas, while active restoration involves planting native woody and herbaceous species, prescribed burning, and hydrologic restoration to reestablish native vegetation structure and function. Wetland and coastal habitats within the NWRS are managed to maintain hydrologic connectivity and water quality through culvert maintenance, water control structures, and coordination with adjacent landowners.

Current conservation measures across the NWRS are implemented in coordination with the Texas Parks and Wildlife Department, the U.S. Department of Agriculture’s Natural Resources Conservation Service, and local conservation organizations through programs such as the South Texas Refuge Complex Land Protection Plan and the Lower Rio Grande Valley Joint Venture. These collaborative efforts aim to increase landscape-scale connectivity and resilience of habitats supporting special-status species.

LANDFIRE’s existing vegetation type layer represents the current distribution of terrestrial ecological systems (LANDFIRE 2025). LANDFIRE existing vegetation type mapping indicates the analysis area includes tidal marshes, saline prairies, thornscrub, lomas, grasslands, wetlands, and open water, as well as developed and agricultural land. Acres of LANDFIRE existing vegetation types in the analysis area are summarized in Table 2-6 and shown in Figures 2-5 through 2-7.

**Table 2-6. Existing Vegetation Types in the Analysis Area**

Existing Vegetation Type	Acres
Open Water	3,657.11
Texas Coast Salt and Brackish Tidal Marsh	2,341.88
Texas Coast Salt and Brackish Tidal Marsh Shrubland	1,141.04
South Texas Salt and Brackish Tidal Flat	635.01
Tamaulipan Lomas	546.94
Southeastern Ruderal Grassland	536.1
Texas Saline Coastal Prairie	394.03
Developed-Roads	281.88

<b>Existing Vegetation Type</b>	<b>Acres</b>
Tamaulipan Savanna Grassland	170.29
Developed-Low Intensity	122.2
Texas Coast Fresh and Oligohaline Tidal Marsh	122.04
Texas Coast Dune and Coastal Grassland	112.34
Developed-Medium Intensity	100.37
Texas Coast Fresh and Oligohaline Tidal Marsh Shrubland	90.64
Tamaulipan Floodplain Woodland	90.2
Southeastern Ruderal Shrubland	78.48
Agriculture-Cultivated Crops and Irrigated Agriculture	68.43
Central and South Texas Coastal Fringe Forest and Woodland	54.71
Western Warm Temperate Row Crop	38.58
Developed-High Intensity	36.86
Western Warm Temperate Developed Herbaceous	36.52
Texas Coast Beach	31.79
Western Warm Temperate Urban Herbaceous	18.37
Tamaulipan Riparian Woodland	17.51
Western Warm Temperate Developed Shrubland	15.12
Tamaulipan Mixed Deciduous Thornscrub	8.45
Western Warm Temperate Pasture and Hayland	7.34
Other*	7.34
<b>Total</b>	<b>10,762.46</b>

Note: Totals may not sum precisely due to rounding.

\*Other includes vegetation types that compose <3.0 acres of the analysis area.

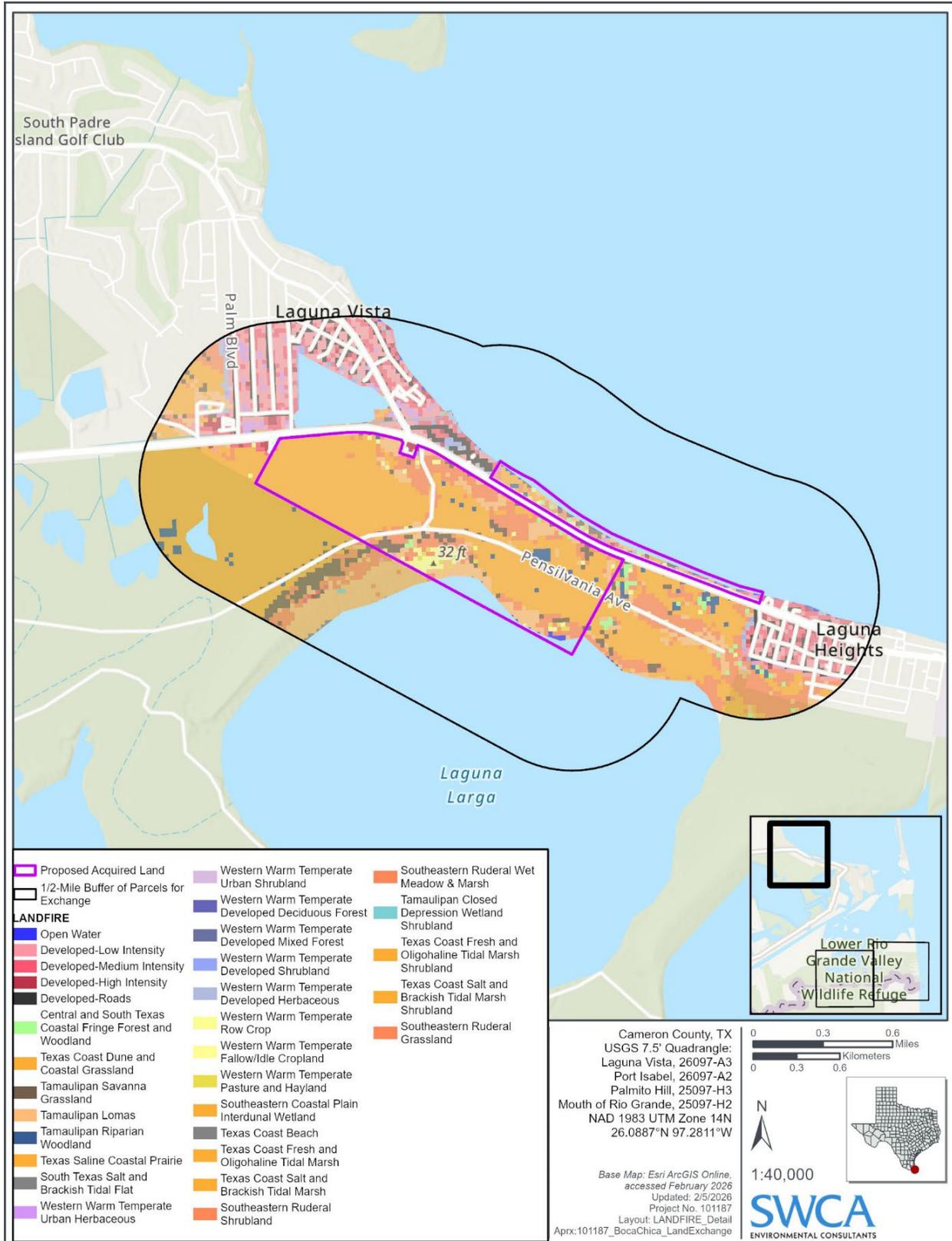


Figure 2-5. Vegetation types within the special status species analysis area (1 of 3).

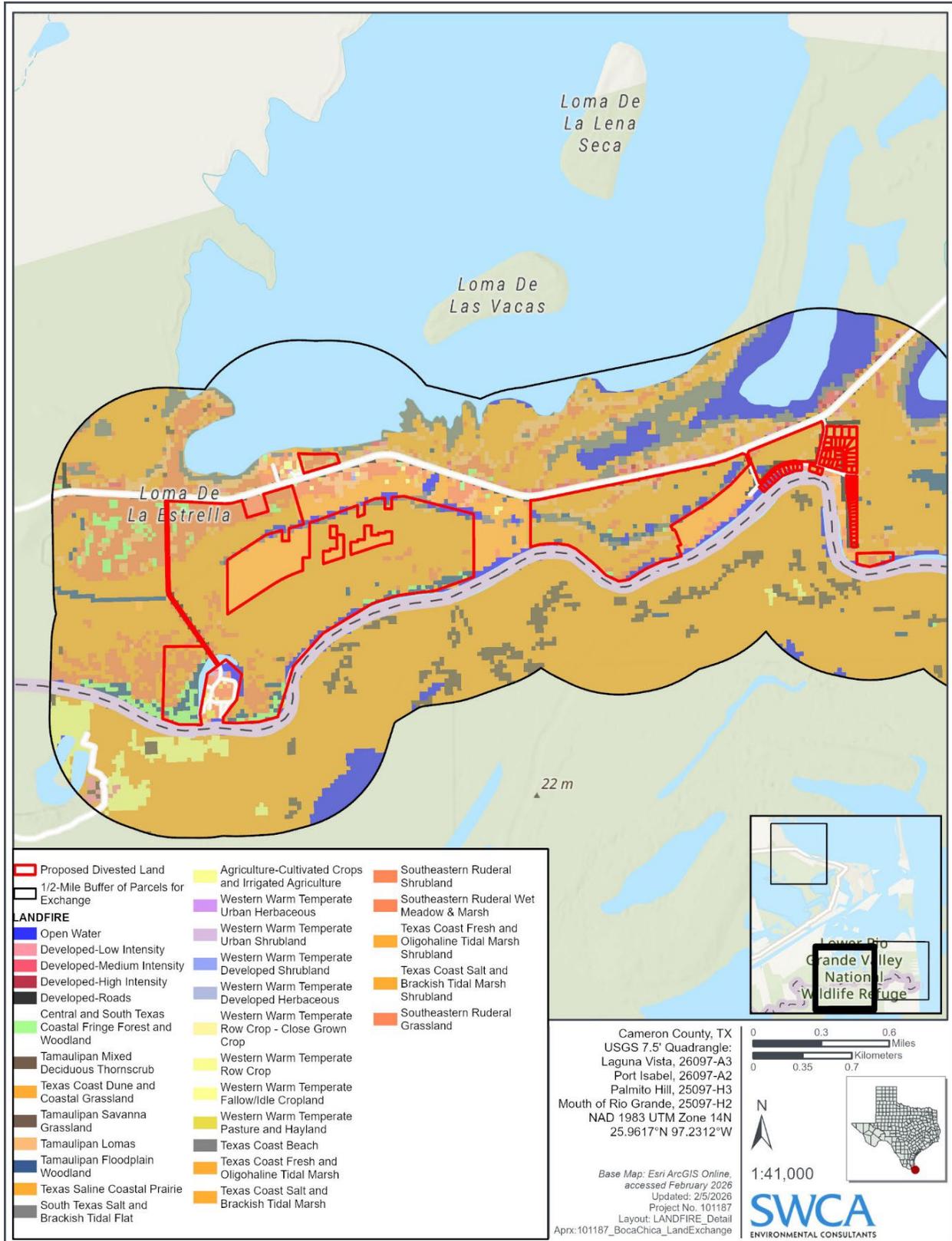


Figure 2-6. Vegetation types within the special status species analysis area (2 of 3).

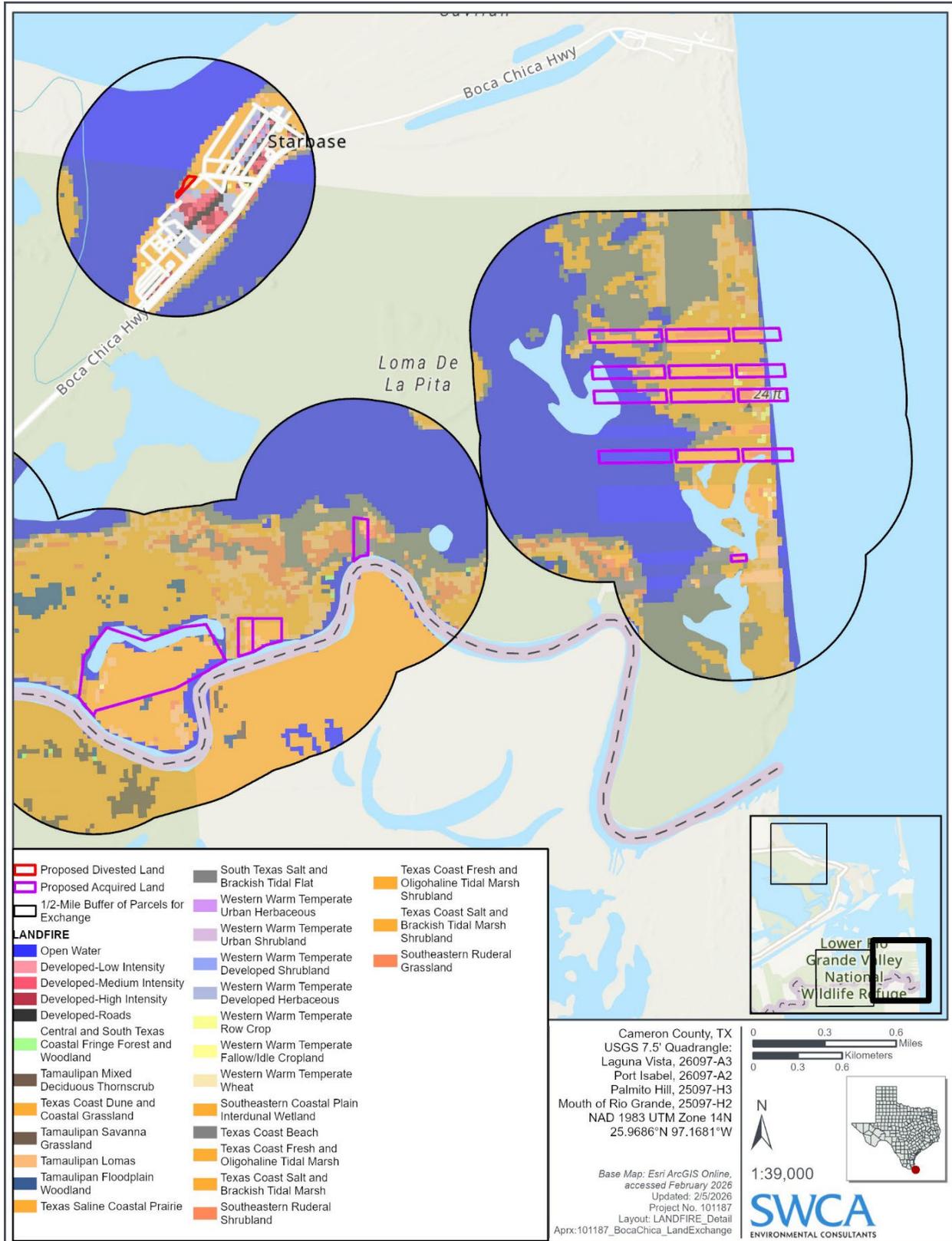


Figure 2-7. Vegetation types within the special status species analysis area (3 of 3).

The lands proposed for divestiture encompass approximately 712 acres of undeveloped tidal marsh, saline prairie, coastal thornscrub, mangrove-dominated edges, and wind-tidal flat habitats situated between expanding private development and refuge lands. These lands provide a diverse array of tidal and upland habitats that support ecological connectivity between LRGVNR lands and the Rio Grande corridor. The presence of guineagrass (*Megathyrsus maximus*) and buffelgrass (*Cenchrus ciliaris*) in these areas suggests historical cattle grazing, a known land use in the region now encompassed by the refuge, though no active grazing was observed during field surveys conducted in September 2025 (Service 2025b).

The lands proposed for acquisition encompass approximately 692 acres and are largely undeveloped, supporting a diverse mosaic of coastal, dune, tidal flat, wetland, and upland thornscrub habitats. Vegetation in the lands proposed for acquisition reflects both saline-influenced coastal habitats and upland thornscrub communities.

### 2.8.2.1 FEDERALLY LISTED SPECIES

SWCA queried the Service's Information for Planning and Consultation (IPaC) tool for official lists of species and habitats that should be considered when evaluating the effects of the proposed exchange (Service 2025e). SWCA submitted the query in two parts, one based on the boundary of the lands proposed for divestiture and the other based on the boundary of the lands proposed for acquisition. The response identified 18 species associated with the lands proposed for divestiture and lands proposed for acquisition that should be considered in the analysis of effects (Table 2-7).

Table 2-7 also identifies the potential for species to occur in the analysis area. The potential is defined as the following

- *None*: The species' current distribution does not overlap the analysis area.
- *Low*: Suitable habitat is absent or limited, and there are no known populations or individuals in the analysis area.
- *Moderate*: Suitable habitat is present, but there are no confirmed populations in the analysis area.
- *High*: Suitable habitat is abundant and there are known populations in the analysis area.

Not all species identified in Table 2-7 have a current distribution that includes the special-status species analysis area. The species lacking current distribution within the analysis area include Gulf Coast jaguarundi, cactus ferruginous pygmy-owl (*Glaucidium brasilianum cactorum*), Salina mucket (*Potamilus metnecktayi*), South Texas ambrosia (*Ambrosia cheiranthifolia*), and Texas ayenia (*Ayenia limitaris*). The proposed land exchange would have no effect on these species because it is not reasonably certain that individuals of these species would likely occur on these parcels. Therefore, these species are not evaluated further in this EA. For additional information, refer to *Biological Assessment for the Proposed Boca Chica Land Exchange* (Service 2025b). A final Intra-Service Section 7 Biological Evaluation was completed on February 23, 2026.

**Table 2-7. Federally Listed and Proposed Species with Potential to Occur in the Project Area**

Species	Endangered Species Act Status	Potential to Occur in the Lands Proposed for Divestiture	Potential to Occur in the Lands Proposed for Acquisition
<b>Mammals</b>			
Gulf Coast jaguarundi ( <i>Puma yagouaroundi cacomitli</i> )	Endangered	None	None
Ocelot ( <i>Leopardis [Felis] pardalis</i> )	Endangered	Low	Moderate
Tricolored bat ( <i>Perimyotis subflavus</i> )	Proposed endangered	Low	Low
West Indian manatee ( <i>Trichechus manatus</i> )	Threatened	None	Low
<b>Birds</b>			
Cactus ferruginous pygmy-owl ( <i>Glaucidium brasilianum cactorum</i> )	Threatened	None	None
Eastern black rail ( <i>Laterallus jamaicensis jamaicensis</i> )	Threatened	Low	Low
Northern aplomado falcon ( <i>Falco femoralis septentrionalis</i> )	Endangered	High	High
Piping plover ( <i>Charadrius melodus</i> )	Threatened	Low	High
Rufa red knot ( <i>Calidris canutus rufa</i> )	Threatened	High	High
<b>Reptiles</b>			
Green sea turtle, North Atlantic Distinct Population Segment ( <i>Chelonia mydas</i> )	Threatened	Low	High
Hawksbill sea turtle ( <i>Eretmochelys imbricata</i> )	Endangered	Low	Low
Kemp's ridley sea turtle ( <i>Lepidochelys kempii</i> )	Endangered	Low	High
Leatherback sea turtle ( <i>Dermochelys coriacea</i> )	Endangered	None	Low
Loggerhead sea turtle, Northwest Atlantic Distinct Population Segment ( <i>Caretta caretta</i> )	Threatened	Low	High
<b>Mollusks</b>			
Salina mucket ( <i>Potamilus metnecktayi</i> )	Proposed endangered	None	None
<b>Insects</b>			
Monarch butterfly ( <i>Danaus plexippus</i> )	Proposed threatened	Low	Low
<b>Flowering plants</b>			
South Texas ambrosia ( <i>Ambrosia cheiranthifolia</i> )	Endangered	None	None
Texas ayenia ( <i>Ayenia limitaris</i> )	Endangered	None	None

<b>Species</b>	<b>Endangered Species Act Status</b>	<b>Potential to Occur in the Lands Proposed for Divestiture</b>	<b>Potential to Occur in the Lands Proposed for Acquisition</b>
<b>Critical habitat</b>			
Piping plover critical habitat (Unit TX-1)	Designated	None	Present
Rufa red knot critical habitat (Unit TX-1)	Proposed	Present	Present

Source: USFWS (2025b).

### **2.8.2.1.1 Ocelot**

The ocelot has been listed as federally endangered since 1972 (Service 2025c). Ocelots are small, largely nocturnal wild cats typically found in dense thornscrub, mesquite-thornscrub, and live oak mottes, avoiding open areas (Service 2016). In Texas, suitable habitat consists of extremely dense mixed-brush cover from ground level up to approximately 4 feet, composed of thorny shrublands and dense chaparral vegetation (Service 2016). Ocelots require contiguous cover for hunting, shelter, and dispersal.

Ocelots in Texas occur primarily in two discrete populations; one population resides on private ranches in Kenedy, Kleberg, and Willacy Counties, and the other primarily occurs on the LANWR (Service 2025c). The estimated Texas population is approximately 100 individuals, which is slightly higher than previous estimates (Service 2025c).

No ocelots are known to regularly occupy the analysis area; however, some patches of thornscrub and riparian woodland in the lands proposed for acquisition and lands proposed for divestiture contain vegetation communities that could provide dispersal habitat. However, the acquired and lands proposed for divestiture have patchy habitat and anthropogenic barriers such as SH 4 and the Brazos Island Harbor Channel (Martinez et al. 2024; Veals et al. 2022). Dispersal from Mexico is unlikely because the longest documented ocelot dispersal is approximately 31 miles, and the landscape between Mexico and the Rio Grande contains barriers to movement (Booth-Binczik 2007).

Based on observations and habitat characteristics, it is unlikely that ocelots occur in lands proposed for divestiture, with a medium to high likelihood of occurrence in the lands proposed for acquisition in LANWR. Observations in the vicinity of SH 100 between Laguna Vista and Los Fresnos west of the Laguna Unit suggest potential use of adjacent areas, though no ocelots have been documented within the analysis area units themselves (Sheikh et al. 2023; Veals et al. 2022).

### **2.8.2.1.2 Tricolored Bat**

On September 13, 2022, the Service proposed listing the tricolored bat (*Perimyotis subflavus*) (TCB) as an endangered species under the ESA. As of the date of publication of this EA, a final listing decision has not been issued. The TCB faces extinction primarily due to the impacts of white-nose syndrome; additional factors affecting viability include habitat loss, climate variability, and the effectiveness of conservation measures (Service 2021a).

The TCB has a broad geographic range encompassing roughly half or more of the United States, parts of Canada, and Mexico (Service 2021a). The TCB hibernates during winter in caves and mines with constant temperatures and high humidity. Summer habitat generally consists of forested areas, including live and dead leaf clusters of live or recently dead deciduous hardwood trees. Successful roosting and foraging habitat require proximity to abundant food and water during spring, summer, and fall; microclimate conditions suitable for extended torpor and periodic arousal in winter; and adequate connectivity between summer and winter habitats. The TCB migrates from summer habitats to hibernacula in the fall (Service 2021a).

Important habitat features for vulnerable life stages, such as caves suitable for hibernation, are absent from the analysis area. While TCB occasionally uses road culverts as winter roosts (Service 2021a), the low-lying and frequently flooded topography of the analysis area makes culverts unlikely to function as regular hibernacula.

### **2.8.2.1.3 West Indian Manatee**

The West Indian manatee (*Trichechus manatus*) was downlisted from endangered to threatened in 2017 (82 *Federal Register* [FR] 16668). The West Indian manatee is a large aquatic mammal that uses marine, estuarine, and freshwater habitats (Schmidly and Bradley 2016; Service 2024b). West Indian manatees primarily inhabit larger rivers, brackish bays, and coastal waters and are extremely sensitive to cold water, which limits their northward distribution in North America. Individuals observed in Texas waters are temporary summer migrants from Florida, and the species does not reside year-round in Texas (Schmidly and Bradley 2016; Service 2024b).

West Indian manatees are considered “exceptionally uncommon” in Texas waters (Schmidly and Bradley 2016). Observations have been reported along the Texas coast, including near the mouth of the Rio Grande and in the Laguna Madre near Corpus Christi. In August 2025, a manatee was detected in Port Aransas heading into Corpus Christi Bay, approximately 123 miles north of the analysis area (Dailey 2025). A record from iNaturalist (2025a) reports an individual observed in June 2024 near Port Mansfield, Laguna Madre, approximately 33 miles north of the analysis area.

Although rare, West Indian manatees could occur in coastal waters at the mouth of the Rio Grande, along Boca Chica Beach, or in the interior waters of the Laguna Madre. Manatees have not been documented within the Rio Grande channel, although they are known to occur in slow-moving freshwater rivers in Florida. Therefore, manatees could occasionally be present in the waters in the Boca Chica Beach and Laguna Units of the analysis area.

### **2.8.2.1.4 Eastern Black Rail**

The eastern black rail (*Laterallus jamaicensis jamaicensis*) was listed as federally threatened in 2020. The eastern black rail is a small, secretive marsh bird that inhabits salt and brackish tidal marshes and freshwater wetlands. Eastern black rails occur almost entirely under dense, overhead-covering herbaceous vegetation on moist to saturated soils with very shallow water. They select areas that are not persistently inundated and include nearby refugia for use during high-water events (Service 2019). This species is also a rare migrant across the eastern third of Texas, with coastal populations augmented during the winter by migratory birds nesting out of state (Lockwood and Freeman 2014).

The eastern black rail has potential to occur in the analysis area, although suitable habitat is limited. Most of the analysis area does not contain dense herbaceous cover at the upland-wetland interface, which is necessary for this species. A large emergent wetland within the lands proposed for acquisition, south of SH 100, could provide potentially suitable habitat. However, given the current known distribution of breeding or year-round resident eastern black rails, it is unlikely that this wetland is regularly occupied by the species.

No eastern black rails have been observed within the analysis area. Citizen science records exist in Cameron County (iNaturalist 2025b), but exact locations are obscured, and they likely do not overlap the analysis area due to lack of public access and predominance of upland habitat. During the site survey, no eastern black rails were observed (Service 2025b).

### **2.8.2.1.5 Northern Aplomado Falcon**

The northern aplomado falcon (*Falco femoralis septentrionalis*) was listed as federally endangered in 1986. This medium-sized raptor hunts open grasslands, sparse shrublands, and estuarine marsh edges for small birds, large insects, and occasionally small mammals. In coastal Texas, the species occupies fragmented patches of deep-sand prairie, irregularly flooded saline prairies, and grasslands interspersed with sparse woody mottes (Service 2025d).

Northern aplomado falcons have potential to occur in the analysis area, particularly within the lands proposed for acquisition near the LANWR, which contain larger trees, shrubs, and yuccas for perching, and grasslands for foraging (SWCA 2025c). Observations in the area, including at the South Texas Ecotourism Center and along SH 100, indicate that this area is within the nonbreeding and possibly breeding home range of falcons from an artificial nest platform located 2.3 miles to the west (Service 2014). Other parcels in the analysis area provide limited or no suitable habitat, and few observations exist (Service 2025d). During the September 2025 site reconnaissance, no northern aplomado falcons or nests were observed within or immediately adjacent to any of the analysis area units (Service 2025d).

#### **2.8.2.1.6 Piping Plover**

The piping plover (*Charadrius melodus*) has been listed as federally threatened since 1986. The piping plover is a small, migratory shorebird that feeds on invertebrates in intertidal and supratidal zones, foraging along wrack lines and shallow flats. Breeding occurs in northern and interior habitats, including sandy or gravelly beaches, riverine sandbars, and alkali lake shores, while nonbreeding and migration periods are spent along coastal and estuarine shores, such as beaches, mudflats, tidal flats, shell-rich flats, and algal mats (Service 2024c). Piping plovers migrate through Texas and overwinter along the Texas Gulf Coast beginning in mid-July, primarily from the Northern Great Plains Distinct Population Segment (DPS). Most individuals begin migrating toward breeding grounds by late February and depart Texas by mid-May (Lockwood and Freeman 2014).

Suitable habitat for piping plovers (i.e., bare or sparsely vegetated wind-tidal flats or beach) is only available in the lands proposed for acquisition, and the species is known to use the beach and wind-tidal flats in these areas (Service 2025b). None of the lands proposed for divestiture south of SH 4 contain piping plover habitat, as they are either too densely vegetated or not sufficiently connected to the intertidal or supratidal hydrology of the region. The parcels of lands proposed for divestiture north of SH 4 abut, but do not substantially contain, piping plover habitat. Piping plover critical habitat overlaps the lands proposed for acquisition.

#### **2.8.2.1.7 Piping Plover Critical Habitat**

Piping plover critical habitat encompasses intertidal beach, wind-tidal flats, and beach dune system habitats between the Brazos Island Shipping Channel and the Rio Grande and the Gulf of America and a north-south line between Loma Ochoa and Loma de las Vacas. A portion of the lands proposed for acquisition (97.8 acres) and a portion of the lands proposed for divestiture (1.3 acres) overlap critical habitat for the piping plover associated with Critical Habitat Unit TX-1 (7,217 acres total). A field habitat assessment conducted in September 2025 found that the critical habitat within the lands proposed for divestiture is composed of dense, upland vegetation that would not be considered critical habitat (Service 2024c).

#### **2.8.2.1.8 Rufa Red Knot**

The rufa red knot (*Calidris canutus rufa*) was listed as federally threatened on January 12, 2015 (79 FR 73705 [December 11, 2014]). The rufa red knot is a medium-sized migratory shorebird that may travel up to 19,000 miles annually between arctic breeding grounds and southern nonbreeding habitats. The species typically occurs along sandy beaches, shorelines, and large intertidal flats, favoring sparsely vegetated coastal areas such as bays, estuaries, and natural tidal inlets. The Laguna Madre region of southern Texas and northern Mexico is recognized as an important stopover and core wintering area for the species (Service 2021b), and the species has critical habitat overlapping both the lands proposed for divestiture and the lands proposed for acquisition.

Rufa red knots are considered uncommon migrants and rare winter residents along the Texas coast (Lockwood and Freeman 2014). Routine avian monitoring within 3 miles of the Vertical Launch Area has documented the species sporadically, primarily during spring and fall migration periods, suggesting migratory use rather than overwintering (Service 2025b). Suitable habitat for rufa red knots (i.e., bare or sparsely vegetated wind-tidal flats or beach) occurs within the lands proposed for acquisition. None of the lands proposed for divestiture south of SH 4 contain rufa red knot habitat, as they are either too densely vegetated or not sufficiently connected to the intertidal or supratidal hydrology of the region. The parcels of lands proposed for divestiture north of SH 4 abut, but do not substantially contain, suitable habitat for this species.

### **2.8.2.1.9 Rufa Red Knot Critical Habitat**

A portion of the lands proposed for acquisition (22.8 acres) partially overlap proposed critical habitat for the rufa red knot associated with proposed Critical Habitat Unit TX-1 (15,400 acres total). The proposed physical or biological features of the proposed rufa red knot critical habitat include beaches and tidal flats used for foraging; upper beach areas used for roosting, preening, resting, or sheltering; ocean vegetation deposits used for foraging and roosting; intertidal peat banks used for foraging and roosting; features landward of the beach that support foraging or roosting; and artificial habitat mimicking natural conditions.

### **2.8.2.1.10 Green Sea Turtle (North Atlantic Distinct Population Segment)**

The green sea turtle (*Chelonia mydas*) North Atlantic DPS was listed as federally threatened under the ESA on April 6, 2016 (81 FR 20058). The green sea turtle is a large, primarily herbivorous marine turtle that inhabits tropical and subtropical coastal waters, including bays, lagoons, and seagrass meadows. This DPS occurs throughout the Gulf of America and the western Atlantic Ocean, where individuals forage in shallow nearshore habitats and nest on sandy beaches.

The lower Laguna Madre is recognized as an important foraging area for juvenile and subadult sea turtles, particularly green sea turtles. However, nesting is not anticipated on the interior beaches due to their narrow width and low elevation, which make them susceptible to tidal flooding and unsuitable for nesting (Sönmez 2024).

According to the National Marine Fisheries Service's 2025 biological opinion addressing increased SpaceX launch cadence at Starbase (Consultation Number 02ETCC00-2012-F-0186-R00), the first documented green sea turtle activity on Boca Chica Beach occurred in 2019 (NMFS 2025). Subsequent monitoring by Sea Turtle, Inc., documented one nest and several false crawls in 2022 and 2023, along with numerous live, dead, and cold-stunned individuals on or near Boca Chica Beach (lands proposed for acquisition).

While green sea turtles may be present on the beaches within the lands proposed for divestiture, they are unlikely to occur due to highly variable water levels and shallow flooding over the South Bay wind-tidal flats, which limit accessibility. The interior beaches of the Laguna Madre are unsuitable for nesting due to their narrow width and frequent tidal inundation. Green sea turtles are not expected to occur in the lands proposed for divestiture, which lack aquatic and beach habitat.

### **2.8.2.1.11 Hawksbill Sea Turtle**

The hawksbill sea turtle (*Eretmochelys imbricata*) was listed as federally endangered under the ESA on June 2, 1970 (35 FR 8491). This species inhabits tropical and subtropical marine environments, typically associated with coral reefs, rocky outcrops, and submerged structures such as jetties and ledges, where it feeds primarily on sponges and other invertebrates.

Along the Texas coast, hawksbill sea turtles are extremely rare. The species has been documented nesting in Texas only once, at Padre Island National Seashore in 1998, approximately 70 miles north of the analysis area (Shaver 1998). Juvenile hawksbills occasionally occur nearshore, using jetties for resting and foraging, and individuals sometimes wash ashore (Shaver 1998). The nearest jetties known to be used by the species are approximately 6 miles from the analysis area.

It is possible for hawksbill sea turtles to occur in the waters or along the beaches of the lands proposed for acquisition. However, the likelihood of occurrence is extremely low given the absence of suitable foraging structures (e.g., jetties or coral habitat) and the species' general rarity in the region. While the lower Laguna Madre abutting part of the lands proposed for acquisition provides important foraging habitat for young sea turtles, nesting is not anticipated on these interior beaches due to their narrow width and low elevation, which make them unsuitable for sea turtles.

Hawksbill sea turtles are not expected to occur in the lands proposed for divestiture; the Rio Grande is hydrologically connected to the Gulf of America; however, sea turtles are not known to travel upstream into the river.

#### **2.8.2.1.12 Kemp's Ridley Sea Turtle**

The Kemp's ridley sea turtle (*Lepidochelys kempii*) was listed as federally endangered on December 2, 1970 (35 FR 18319). The Kemp's ridley is the smallest of all sea turtles and is primarily found in nearshore and estuarine waters of the Gulf of America and the western Atlantic Ocean. The species feeds mainly on crabs and other benthic invertebrates and is well known for its synchronized, daytime nesting aggregations that occur primarily in Tamaulipas, Mexico, and along the Texas coast.

The Kemp's ridley sea turtle is the most common nesting sea turtle species in Texas and is known to nest annually on Boca Chica Beach. Nesting counts at this location range from 0 to 23 nests per year, with an average of 8.7 nests annually between 2014 and 2025 (Steinhaus 2025).

It is possible but unlikely that Kemp's ridley sea turtles occur in the aquatic portion of the lands proposed for acquisition near the LANWR. Nesting is not expected because the available beach is narrow and low in profile, making it prone to periodic tidal flooding and unsuitable for nesting. However, Kemp's ridley individuals occur in the nearshore aquatic habitat adjacent to the Boca Chica Beach (lands proposed for acquisition) and may nest in these areas.

Sea turtles may be present in waters of the lower Laguna Madre. However, the intermittent flooding and shallow depth of the South Bay wind-tidal flats near the lands proposed for divestiture preclude sea turtles, including Kemp's ridley, from occurring in these areas. Sea turtles are also not known to travel upstream into the Rio Grande despite its hydrologic connection to the Gulf of America.

#### **2.8.2.1.13 Leatherback Sea Turtle**

The leatherback sea turtle (*Dermochelys coriacea*) was listed as federally endangered under the ESA in 1970. The leatherback sea turtle is the largest of all sea turtles and is distinguished by its lack of a bony shell, instead having a leathery carapace with longitudinal ridges (NPS 2025b).

Leatherback sea turtles are highly migratory and occur primarily in deep pelagic waters where they forage on jellyfish and other soft-bodied prey. In the Gulf of America, leatherbacks are occasionally sighted offshore but rarely approach shallow nearshore environments (NPS 2025b). The species is known to have nested once in Texas in recent history, with a single nest documented at Padre Island National Seashore in 2008. Historical nesting activity also occurred at the same location in the 1920s and 1930s (NPS 2025b).

It is possible for leatherback sea turtles to occur in the water or on the beach within the lands proposed for acquisition. However, it is extremely unlikely that any individuals would be present, as these areas do not contain the deep pelagic waters that provide suitable foraging habitat for the species (NPS 2025b).

#### **2.8.2.1.14 Loggerhead Sea Turtle**

The loggerhead sea turtle (*Caretta caretta*) was listed as federally threatened as part of the Northwest Atlantic DPS under the ESA on October 4, 2011 (76 FR 58868). The loggerhead sea turtle is a large marine turtle distinguished by a hard, bony shell and a preference for warm temperate and tropical waters. Loggerheads are highly migratory and use shallow bays, lagoons, estuaries, and nearshore ocean waters for foraging, while females come ashore at night to dig nests and lay eggs on sandy beaches. The Northwest Atlantic DPS has maintained a generally stable nesting trend for more than two decades, with nests documented as recently as 2022 on Boca Chica Beach (Steinhaus 2025).

Loggerhead sea turtles may occur in the aquatic habitat and may nest on the beach within the lands proposed for acquisition. Loggerhead sea turtles are unlikely to be present in the lands proposed for divestiture because water levels in South Bay are highly variable at this location and due to the lack of both suitable aquatic and beach habitat for the species.

#### **2.8.2.1.15 Monarch Butterfly**

The monarch butterfly (*Danaus plexippus*) was proposed as a threatened species under the ESA on December 10, 2024 (Service 2024a). Monarch butterflies breed year-round in many regions. In temperate climates, monarchs undergo long-distance migration and can live for an extended period. Monarchs lay eggs exclusively on milkweed host plants (primarily *Asclepias* spp.). Monarchs east of the Rocky Mountains overwinter in forested areas of Mexico (Monarch Watch 2010).

Monarch butterflies are habitat generalists for at least part of their life cycle, using a variety of native and nonnative herbaceous plant communities for foraging, egg laying, and larval development (Service 2024a). Within the species' very large range, suitable grassland and herbaceous habitats are abundant and widely distributed. The NLCD identifies approximately 335 million acres of grassland or herbaceous land cover in the United States (Dewitz 2023), a reasonable landscape-scale indicator of potential foraging or larval habitat.

Critical habitat features for vulnerable life stages or large concentrations of monarchs (e.g., forested overwintering sites in Mexico or California) are not present in the analysis area.

### **2.8.3 Environmental Consequences**

#### **2.8.3.1 NO ACTION**

Under the No Action alternative, the 712 acres of Service lands would remain under refuge management as part of the LRGVNR. Habitat management would continue according to the CCP (Service 1997), including invasive species control, hydrologic maintenance, and restoration of native vegetation. These activities would maintain or incrementally improve habitat quality for species that currently occur within suitable areas. The lands currently under Service management may provide some habitat for federally listed species, but their contribution to long-term species viability would be limited due to the small size of suitable habitat and increased fragmentation and encroachment resulting from development of surrounding lands. In general, these lands provide limited suitable habitat for federally listed species, lack documented occurrences of such species, and therefore provide minimal contribution to species

conservation. Encroachment issues and impacts from SpaceX activities and other development in the region would continue to impact special-status species habitats and individuals present in the area.

The 692 acres currently owned and managed by SpaceX would remain under private ownership. These lands would be expected to continue toward development, resulting in minimal conservation benefit. Existing native habitats on these parcels are already fragmented, and development would further reduce habitat availability and connectivity. These lands contain habitat for foraging, breeding, or dispersal for federally listed species, and effects from development on adjacent lands (e.g., habitat edge effects or increased human disturbance) may influence local habitat quality in some locations.

Overall, the No Action alternative would maintain refuge management on Service lands, which support species recovery and ecosystem function within those areas. However, the combination of limited suitable habitat on lands proposed for acquisition and ongoing development on lands proposed for divestiture would restrict overall species viability in the analysis area. Habitat fragmentation and development pressures in the surrounding landscape would persist, further constraining species recovery. Lands proposed for divestiture would continue toward development, providing negligible conservation benefit and limited opportunities for species recovery.

### **2.8.3.2 PROPOSED ACTION**

Under the Proposed Action, 712 acres of lands proposed for divestiture would be exchanged for 692 acres of lands proposed for acquisition. The divested parcels would become privately owned and managed by SpaceX. Land ownership influences how endangered species protections are applied. Federally managed lands are subject to specific requirements under the ESA and other conservation laws that ensure listed species and their habitats are considered in management decisions. Privately owned lands are not subject to these same federal planning and conservation requirements. However, ESA protections for federally listed species still apply regardless of ownership, meaning that activities on private lands that directly harm listed species or their habitats would still be regulated under federal law.

#### **2.8.3.2.1 Lands Proposed for Divestiture**

Although no specific development plans have been shared, it is reasonably foreseeable that the lands proposed for divestiture will be used for residential, commercial, industrial, and infrastructure purposes in the near term. The impact of land development activities generally include replacement of existing land cover with a built environment; introduction of noise and light from the presence and activity of humans, structures, vehicles, and equipment; and alteration of stormwater runoff. This could impact ESA-listed species through reduction in foraging, dispersal, or breeding habitat quantity and/or quality; mortality due to vehicle collisions; displacement or alteration of behavior due to disturbances from light and/or noise; and exposure to hazardous chemicals from heavy machinery used during construction. These actions could impact the species and/or critical habitats with potential to occur in the lands proposed for divestiture (see Table 2-7). As discussed in Section 2.6.2, SpaceX and USFWS developed a system for evaluating habitat quality on the proposed exchange lands. Using this evaluation system, the lands proposed for divestiture were classified as low (497 acres) and medium (215 acres) quality habitat, indicating that while ESA-listed species may be present or have the potential to use these lands, the overall habitat suitability is limited and the likelihood of adverse impacts from future development is low.

#### **2.8.3.2.2 Lands Proposed for Acquisition**

The lands proposed for acquisition would be incorporated into the LRGVNR and LANWR and managed by the Service. As discussed in Section 2.6.2, the habitat evaluation conducted for the proposed exchange lands identified the lands proposed for acquisition as high-quality habitat. Management by the

Service would protect these lands from potential future development, reduce or eliminate private inholdings, and consolidate refuge lands into larger, more continuous blocks. This consolidation would improve habitat connectivity, supporting wildlife movement, genetic diversity, and ecosystem resilience, and would enhance long-term resource protection by bringing ecologically valuable and strategically located lands under federal stewardship.

Based on the activities needed to achieve the goals and objectives of the *Final Lower Rio Grande Valley and Santa Ana National Wildlife Refuges Comprehensive Conservation Plan* (Service 1997) and the *Laguna Atascosa National Wildlife Refuge Comprehensive Conservation Plan* (Service 2010), likely actions that would take place on these lands include revegetation of former cropland, brush restoration, enhancement of edge habitat, restoration of wetlands, fire management, installation or repair of water control structures, construction of channels, construction of artificial nest structures, planting of tree yuccas, and posting signs and markers in bird nesting areas. The impacts of potential future habitat management actions could include short-term adverse impacts, such as temporary displacement or disturbance from construction activities, vehicle collisions involving construction equipment, and potential exposure to hazardous chemicals from heavy machinery. These short-term impacts would be temporary in nature and limited to the duration of active management activities. In contrast, the long term effects of these actions would be beneficial, resulting in improvements to the quality and/or quantity of foraging, dispersal, and breeding habitats, as well as enhanced habitat connectivity for the special-status species and critical habitats with potential to occur on the lands proposed for acquisition (see Table 2-7).

### **2.8.3.2.3 Effects Determination**

A biological assessment was prepared under Section 7 of the ESA to address potential impacts of the Proposed Action to federally listed, candidate, and proposed threatened or endangered species (Appendix A). Based on the negligible suitable habitat or likely absence, the Service determined that there would be no effect for the Gulf Coast jaguarundi, cactus ferruginous pygmy-owl, salina mucket, South Texas ambrosia, and Texas ayenia. The tricolored bat, monarch butterfly, and critical habitat for the rufa red knot are proposed for listing or designation by the Service; therefore, none of these species will require conference under ESA Section 7. Based on low likelihood of occurrence, mitigation or minimization measures, minimal contribution to existing disturbance, and/or lack of suitable breeding or foraging habitat, the Service has determined that the Proposed Action may affect, but is not likely to adversely affect, ocelot, west Indian manatee, eastern black rail, northern aplomado falcon, piping plover, rufa red knot, green sea turtle, hawksbill sea turtle, Kemp's ridley sea turtle, leatherback sea turtle, loggerhead sea turtle, and piping plover critical habitat.

## **2.9 Mineral Resources**

### **2.9.1 Issue Statement and Analysis Area**

Project scoping identified the following issue statement for mineral resources:

- How would the land exchange affect existing mineral rights or lands with mineral potential?

The analysis area includes all lands proposed for exchange. The temporal scale of analysis is in perpetuity because it is assumed that the land exchange would be in perpetuity.

## 2.9.2 Affected Environment

The Lower Rio Grande Valley is a broad deltaic plain of the Rio Grande characterized by deltaic and estuarine deposits. The topography is generally flat with occasional hills consisting of sandstone outcrops and fossilized oyster reefs in the western part of the LRGVNWR.

Potentially valuable minerals are typically classified according to a “disposition class” as locatable, leasable, or salable. Each of these categories is described in Table 2-8, including a ranking (i.e., none, low, moderate, or high) of the mineral resource potential in the Project Area. No surface or underground mining operations are apparent on historical aerial photographs dating back to 1949 and historical topographic maps dating back to 1929 in the Project Area (Texas Parks and Wildlife Department 2025b).

Oil and gas activities can occur on NWRS lands where private entities, states, or native corporations, rather than the Service, own the mineral rights. The owners of these mineral rights can develop, produce, and transport the oil and gas resources within a refuge, but must ensure, to the greatest extent practicable, that these activities be conducted in such a manner as to “prevent damage, erosion, pollution, or contamination to the lands, waters, facilities, and vegetation of the area” (50 CFR 29.32). The refuge reviews proposals for oil and gas activities and can include special conditions in the letter of agreement, which typically include seasonal restrictions for activities, mitigation for habitat destruction, drilling fluids removal from the drilling site, and returning the site to as natural a condition as possible upon cessation of drilling activities.

Mineral resources within the LRGVNWR and the LANWR are currently managed by the following goals, according to the LGRVNWR conservation plan:

1. Attempt to acquire mineral rights and associated leasehold rights or develop a cooperative agreement or letter of understanding with the salt/brine extraction lease holders to minimize damages caused by extraction activities.
2. Investigate the feasibility of acquiring salt extraction subsurface rights in the Sal del Rey Tract (#85) (Bentson family).
3. Develop a process for efficiently researching pipeline, power, and oil and gas development rights-of-ways affecting refuge lands and develop a comprehensive land status map showing easements and county roads.

Table 2-8 summarizes the potential for the occurrence of mineral resources within the Project Area, which range in potential from low to none. There is currently no potential for locatable or salable minerals in the Project Area, and low potential for leasable minerals within the Project Area. Due to the low or nonexistent potential for locatable, leasable, and salable minerals, there are currently no active mineral claims, leases, or mineral sites in the Project Area.

**Table 2-8. Summary of Potential for the Occurrence of Mineral Resources in the Project Area**

Mineral Type	Mineral Classification	Potential	Notes
Locatable	Gold; minerals used as gemstones; bentonite clay; uranium, thorium, and other fissionable minerals; titanium minerals; gypsum; uncommon varieties of sand, stone gravel, pumice, pumicite, cinders, and clay.	None	None of these commodities have been historically mined in the Project Area, and no veins or lodes are known to intersect the Project Area. The underlying sediments and geologic structure do not favor the occurrence of commercial deposits of locatable minerals.

Mineral Type	Mineral Classification	Potential	Notes
Leasable	Oil and gas, coal bed natural gas, coal, potassium, sodium, phosphate, oil shale, native asphalt, solid and semi-solid bitumen and bituminous rock, chloride minerals, trona, sulfates, carbonates, borates, silicates or nitrates of potassium, and sodium.	Low	The Project Area is near the southern tip of the Gulf Coast Oil and Natural Gas Basin. Several inactive oil/gas fields are within 10 miles of the Project Area. The Project Area is not underlain by the recently active shale-gas plays in Texas and are not within coal or lignite-producing regions of Texas. The Project Area is not in a geothermal resource area.
Saleable	Common varieties of sand, gravel, dirt, pumice, cinder, and other rocks that have ordinary uses, quality, and value.	None	None of these commodities have been historically mined in the Project Area. The nearest major producing areas of crushed stone and sand are 50 miles or farther from the Project Area. The U.S. Geological Survey has records of three unnamed aggregate pits in Cameron County, which are all 20 miles or farther from the Project Area.

Source: SWCA 2025b

## 2.9.3 Environmental Consequences

### 2.9.3.1 NO ACTION

Under the No Action alternative, the Service would not divest lands to SpaceX and would not acquire lands from SpaceX. The Service would maintain surface ownership and management of the lands proposed for divestiture and SpaceX would maintain surface ownership and management of the lands proposed for acquisition. The potential of locatable, leasable, and salable minerals in the Project Area would not change, nor would the existence of mineral claims, leases, or mineral sites.

### 2.9.3.2 PROPOSED ACTION

#### 2.9.3.2.1 Lands Proposed for Divestiture

Under the Proposed Action, surface ownership of the lands proposed for divestiture would be transferred from the Service to SpaceX. The Proposed Action would have neither adverse nor positive effects on mineral resources because the subsurface of the lands proposed for divestiture would remain unchanged. Any leaseholder would maintain the mineral rights and would have the right to access and transport the mineral on lands proposed for divestiture. The lands proposed for divestiture would continue to have no or low potential for locatable, leasable, and salable minerals.

Any mineral claims, leases, and mineral sites on the lands proposed for divestiture would be coordinated with SpaceX.

#### 2.9.3.2.2 Lands Proposed for Acquisition

Under the Proposed Action, surface ownership of the lands proposed for acquisition would be transferred from SpaceX to the Service, and the subsurface ownership would remain unchanged. Any leaseholder would maintain the mineral rights and would have the right to access and transport the mineral on lands proposed for acquisition. While mineral potential of these lands is low to nonexistent, any subsurface owner seeking to develop mineral resources would be required to coordinate such activities with the Service and comply with regulations in 50 CFR 29.31 and 29.32 as well as any special conditions specified in the letter of agreement. While development of the mineral estate would still be permitted, additional restrictions or stipulations may apply to ensure compatibility with Service management objectives for surface lands.

### **3 PUBLIC INVOLVEMENT, CONSULTATION, AND COORDINATION**

#### **3.1 Federal Agencies**

Pursuant to Section 106 of the NHPA, the Service initiated consultations with the following federal agencies by letter on November 5, 2025 and electronically on November 6, 2025, regarding the Project:

- Advisory Council on Historic Preservation (ACHP)
- Federal Aviation Administration
- NPS Landmarks Program
- NPS Palo Alto Battlefield National Historical Park
- NPS Padre Island National Seashore
- International Boundary and Water Commission (IBWC)
- U.S. Customs and Border Protection.

The Service received a response from the ACHP on November 21, 2025, stating that their involvement in the NHPA process would be premature at that time. The NPS stated on November 24, 2025, that their comments would be consolidated among all local NPS units and the National Landmarks Program. They provided information on site identification processes, the project APE, and potential mitigations. The IBWC responded on November 14, 2025, and provided information on site identification processes and the APE. No responses were received from other federal agencies. The NPS and IBWC participated in an on-site meeting regarding NHPA compliance on December 16, 2025, and were involved in discussions regarding historic property identification, APE designation, and potential mitigations. Consultation letters on determinations of NRHP eligibility and determinations of affects to historic properties were sent to the ACHP, NPS, and IBWC on February 6, 2026. Consultation with these agencies is ongoing.

#### **3.2 State and Local Agencies**

Pursuant to Section 106 of the NHPA, the Service initiated consultations with the following state and local agencies by letter on October 10, 2025, regarding the Project:

- Texas Historical Commission (THC)
- Texas Parks and Wildlife Division
- Texas Department of Transportation
- Brownsville Historical Association
- Cameron County
- Cameron County Historical Commission

The Service received a response from the THC on November 14, 2025, outlining the NHPA process for the undertaking and providing recommendations on site identification. No responses were received from other state and local agencies. The THC actively participated in an on-site meeting regarding NHPA compliance on December 16, 2025, and was involved in discussion of historic property identification, APE designation, and potential mitigations. Consultation letters on determinations of NRHP eligibility

and determinations of affects to historic properties were sent to the THC on February 6, 2026. Consultation with the THC is ongoing

### **3.3 Government-to-Government Consultation**

Pursuant to Section 106 of the NHPA, the Service initiated Tribal consultations with the following five Tribes by letter on November 5, 2025, regarding the Project:

- Apache Tribe of Oklahoma
- Mescalero Apache Tribe of New Mexico
- Comanche Nation of Oklahoma
- Kiowa Tribe of Oklahoma

The Service received a response from the Comanche Nation on November 20, 2025, stating that they were unaware of historic properties of concern to the tribe in the APE. Consultation letters on determinations of NRHP eligibility and determinations of affects to historic properties were sent to the same Tribes on February 6, 2026.

### **3.4 Nongovernmental Organizations**

The following nongovernmental organizations were contacted for the purpose of Section 106 consultation:

- American Battlefield Trust
- United Daughters of the Confederacy
- National Trust for Historic Preservation
- Texas Historical Foundation
- Friends of the Texas Historical Commission
- University of Texas – Rio Grande Valley (UTRGV)

The Service received replies from the American Battlefield Trust (November 20, 2025) and the University of Texas – Rio Grande Valley (November 21, 2025) both stating their desire to be included in the consultation process for the project. No responses were received from the other non-governmental organizations. Both the American Battlefield Trust and UTRGV participated in the on-site meeting regarding NHPA compliance on December 16, 2025, and were involved in discussion of historic property identification, APE designation, and potential mitigations. Consultation letters on determinations of NRHP eligibility and determinations of affects to historic properties were sent to the American Battlefield Trust and UTRGV on February 6, 2026. Consultation with these agencies is ongoing.

## 4 LITERATURE CITED

- Booth-Binczik, S.D. 2007. Monitoring ocelot dispersal with satellite telemetry. *Endangered Species Update* 24:110–112.
- Cameron County. 2014. *Floodplain Management Regulations of Cameron County, Texas*. Available at: <https://www.cameroncountytexas.gov/wp-content/uploads/2020/05/Cameron-County-Floodplain-Regulations.pdf>. Accessed February 2026.
- Dailey, R. 2025. Manatee sighting halts work at TxDOT ferry construction project. Texas Department of Transportation, Corpus Christi News. Available at: <https://www.txdot.gov/about/newsroom/local/corpus-christi/manatee-sighting-halts-work-at-txdot-ferry-construction-project.html>. Accessed February 2026.
- Dewitz, J. 2023. National Land Cover Database (NLCD) 2021 Products: U.S. Geological Survey data release. Available at: <https://doi.org/10.5066/P9JZ7AO3>. Accessed February 2026.
- ESE Partners. 2024. *Historic Context Report: 19th Century Military Action in the SpaceX Starbase Study Area, Cameron County, Texas*. Austin, Texas: ESE Partners.
- Greco, Anthony. 2026. Personal communication, email from Anthony Greco, SpaceX, to Julia Aaronson, SWCA Environmental Consultants, February 3, 2026.
- iNaturalist. 2025a. West Indian Manatee Observations. Available at: [https://www.inaturalist.org/observations?subview=map&taxon\\_id=46316](https://www.inaturalist.org/observations?subview=map&taxon_id=46316). Accessed February 2026.
- . 2025b. Eastern Black Rail Observations. Available at: [https://www.inaturalist.org/observations?subview=map&taxon\\_id=725212](https://www.inaturalist.org/observations?subview=map&taxon_id=725212). Accessed February 2026.
- LANDFIRE. 2025. Existing Vegetation Type Layer, LANDFIRE 2.0.0. U.S. Department of the Interior, Geological Survey, and U.S. Department of Agriculture. Available at: <https://www.landfire.gov/viewer/>. Accessed February 2026.
- Lingle, B. 2024. *Boca Chica booms: A chronology of SpaceX explosions in — and over — South Texas*. San Antonio Express News. Available at: <https://www.expressnews.com/business/article/boca-chica-spacex-explosions-timeline-starship-19615935.php>. Accessed February 2026.
- Lockwood, M.W., and B. Freeman. 2014. *The Texas Ornithological Society Handbook of Texas Birds*. 2nd edition. College Station: Texas A&M University Press.
- Martinez, L.A., J.V. Lombardi, G. Powers, A.D. Anderson, T. Campbell, and R.R. Lopez. 2024. Assessing ecological and socio-political factors in site selection for ocelot reintroduction in Texas. *Conservation Science and Practice* E13113:1–15.
- Monarch Watch. 2010. Monarch Butterfly Fall and Spring Migrations. Available at: <https://www.monarchwatch.org/blog/uploads/2010/05/monarchwatch-map-1200x903.jpg>. Accessed February 2026.

- National Marine Fisheries Service (NMFS). 2025. Conference and Biological Opinion on SpaceX Starship-Super Heavy Increased Launch Cadence and Operations in the North Atlantic Ocean, Gulf of Mexico, North Pacific Ocean, South Pacific Ocean, and Indian Ocean Authorized by the Federal Aviation Administration. Available at: <https://repository.library.noaa.gov/view/noaa/66874>. Accessed February 2026.
- National Park Service (NPS). 2020. *Palmito Ranch Battlefield Preservation Plan*. U.S. Department of the Interior.
- . 2025a. *Gulf Coast Network Ecosystems*. U.S. Department of the Interior. Available at: <https://www.nps.gov/im/guln/ecosystems.htm>. Accessed February 2026.
- . 2025b. *Leatherback sea turtle*. U.S. Department of the Interior. Available at: <https://www.nps.gov/pais/learn/nature/leatherback.htm>. Accessed February 2026.
- Schmidly, D.J., and R.D. Bradley. 2016. *The Mammals of Texas*. 7th Edition. Austin: University of Texas Press. Available at: <https://www.depts.ttu.edu/nsrl/mammals-of-texas-online-edition/>. Accessed February 2026.
- SEARCH. 2026. *Phase I Cultural Resources Survey for the SpaceX and United States Fish and Wildlife Service Land Exchange in Cameron County, Texas*. Orlando, Florida: SEARCH.
- . 2025. Technical Memorandum: Work Plan for the SpaceX-USFWS Land Swap, Cameron County, Texas. Orlando, Florida: SEARCH.
- Shaver, D.J. 1998. *Padre Island National Seashore Kemp's Ridley Sea Turtle Project and Texas Sea Turtle Strandings 1998 Report*. U.S. Department of the Interior, National Park Service.
- Sheikh, Z.N., J.E. Langbein, K. Ryer, M.S. Rahman, C.A. Gabler, J.H. Young, Jr., and R.J. Kline. 2023. Use and effectiveness of wildlife exits designed for ocelots and other mesocarnivores on a south Texas highway. *Frontiers in Ecology and Evolution* 11:1235223. Available at: <https://doi.org/10.3389/fevo.2023.1235223>. Accessed February 2026.
- Sönmez, B. 2024. Repeatability of nest site selection of green turtles on Samandağ Beach. *COMU Journal of Marine Sciences and Fisheries* 7:138–145. Available at: <https://doi.org/10.46384/jmsf.1521720>. Accessed February 2026.
- Steinhaus, J. 2025. Daily sea turtle nest counts on the Texas coast. Available at: <https://seaturtles.org/turtle-count-texas-coast/>. Accessed February 2026.
- SWCA Environmental Consultants. 2025a. *Phase I Environmental Site Assessment for the Boca Chica Land Exchange Project, Cameron County, Texas*. On file at SWCA Environmental Consultants, Salt Lake City, Utah Office. Accessed October 2025.
- . 2025b. Rockhands Mitigation Bank 0 Mineral Remoteness Opinion Technical Memorandum. On file at SWCA Environmental Consultants, Salt Lake City, Utah Office. Accessed October 2025.
- . 2025c. *Biological Monitoring Annual Report for the SpaceX Boca Chica Launch Site Construction and Seasonal Avian Monitoring—July 2024 to June 2025*. Prepared for Space Exploration Technologies Corporation, Hawthorne, California.

- Texas Commission of Environmental Quality (TCEQ). 2023. *Nonattainment and Affected Counties*. Available at: <https://www.tceq.texas.gov/downloads/air-quality/terp/map-non-attainment-affected-counties.pdf/@@download/file/map-non-attainment-affected-counties.pdf>. Accessed November 2025.
- Texas Parks and Wildlife Department. 2025a. Water Resources on Private Lands. Available at: <https://tpwd.texas.gov/landwater/land/private/resource/>. Accessed February 2026.
- . 2025b. Texas Historical Imagery Viewer. Available at: [https://experience.arcgis.com/experience/e9c37dde9c8347f6bdb9c998a2f84ea1#widget\\_12=active\\_datasource\\_id:2903e3a191444efd825916c40ad8cd29,center:-10887701.535606466%2C3072172.4443990714%2C102100,scale:288895.27714399993,level:11,rotation:0,viewpoint:%7B%22rotation%22%3A0%2C%22scale%22%3A288895.27714399993%2C%22targetGeometry%22%3A%7B%22spatialReference%22%3A%7B%22latestWkid%22%3A3857%2C%22wkid%22%3A102100%7D%2C%22x%22%3A-10887701.535606466%2C%22y%22%3A3072172.4443990714%7D%7D](https://experience.arcgis.com/experience/e9c37dde9c8347f6bdb9c998a2f84ea1#widget_12=active_datasource_id:2903e3a191444efd825916c40ad8cd29,center:-10887701.535606466%2C3072172.4443990714%2C102100,scale:288895.27714399993,level:11,rotation:0,viewpoint:%7B%22rotation%22%3A0%2C%22scale%22%3A288895.27714399993%2C%22targetGeometry%22%3A%7B%22spatialReference%22%3A%7B%22latestWkid%22%3A3857%2C%22wkid%22%3A102100%7D%2C%22x%22%3A-10887701.535606466%2C%22y%22%3A3072172.4443990714%7D%7D). Accessed February 2026.
- Tremblay, T. 2012. *Status and trends of Inland Wetland and Aquatic Habitats, Brownsville-Harlingen Area*. Texas General Land Office and the National Oceanic and Atmospheric Administration. Available at: [https://www.glo.texas.gov/sites/default/files/coastal-grants/\\_documents/grant-project/11-026-final-rpt.pdf](https://www.glo.texas.gov/sites/default/files/coastal-grants/_documents/grant-project/11-026-final-rpt.pdf). Accessed February 2026.
- U.S. Census Bureau. 2005. *County population estimates and demographic components of population change: Annual time series, April 1, 1990 census to July 1, 200 estimate*. Population Estimates Program, Population Division. Available at: [https://www2.census.gov/programs-surveys/popest/tables/1990-2000/estimates-and-change-1990-2000/2000c8\\_48.txt](https://www2.census.gov/programs-surveys/popest/tables/1990-2000/estimates-and-change-1990-2000/2000c8_48.txt). Accessed February 2026.
- . 2022. Climate Mapping for Resilience and Adaptation v1.3.2. Available at: <https://livingatlas.arcgis.com/assessment-tool/search>. Accessed February 2026.
- . 2025. *Annual estimates of the resident population for counties: April 1, 2020 to July 1, 2024*. Available at: <https://www.census.gov/data/tables/time-series/demo/popest/2020s-counties-total.html>. Accessed February 2026.
- U.S. Environmental Protection Agency. 2016. *What Climate Change Means for Texas*. Available at: <https://www.epa.gov/sites/default/files/2016-09/documents/climate-change-tx.pdf>. Accessed February 2026.
- . 2025. *What is a wetland?* Available at: <https://www.epa.gov/wetlands/what-wetland>. Accessed February 2026.
- U.S. Fish and Wildlife Service (Service). 1997. *Lower Rio Grande Valley and Santa Ana National Wildlife Refuges Comprehensive Conservation Plan*. U.S. Department of the Interior. On file at SWCA Environmental Consultants, Salt Lake City, Utah Office.
- . 2000. Service Manual 603 FW2 – Compatibility. U.S. Department of Interior. [www.fws.gov/policy-library/603fw2](http://www.fws.gov/policy-library/603fw2). Accessed February 2026.

- . 2010. *Laguna Atascosa National Wildlife Refuge Comprehensive Conservation Plan*. U.S. Department of the Interior. On file at SWCA Environmental Consultants, Salt Lake City, Utah Office.
- . 2014. *Northern Aplomado Falcon (Falco femoralis septentrionalis) 5-Year Review: Summary and Evaluation*. Albuquerque, New Mexico: New Mexico Ecological Services Field Office.
- . 2016. *Recovery Plan for the Ocelot (Leopardus pardalis), First Revision*. Available at: [https://ecos.fws.gov/docs/recovery\\_plan/Ocelot%20Final%20Recovery%20Plan\\_Signed\\_July%202016\\_new%20\(1\).pdf](https://ecos.fws.gov/docs/recovery_plan/Ocelot%20Final%20Recovery%20Plan_Signed_July%202016_new%20(1).pdf). Accessed February 2026.
- . 2019. *Species Status Assessment Report for the Eastern Black Rail (Laterallus jamaicensis jamaicensis)*. Version 1.3. Atlanta, Georgia: U.S. Fish and Wildlife Service, Southeast Region.
- . 2021a. *Species Status Assessment Report for the Tricolored Bat (Perimyotis subflavus)*. Version 1.1. Hadley, Massachusetts: U.S. Fish and Wildlife Service, Northeast Region Office.
- . 2021b. *Rufa Red Knot (Calidris canutus rufa) 5-year Review: Summary and Evaluation*. Galloway, New Jersey: U.S. Fish and Wildlife Service, New Jersey Field Office.
- . 2024a. *Monarch Butterfly (Danaus plexippus) Species Status Assessment Report*. Version 2.3. Bloomington, Minnesota: U.S. Fish and Wildlife Service, Midwest Regional Office.
- . 2024b. *Species Status Assessment Report for the Florida Manatee (Trichechus manatus latirostris)*. Version 1.1. Atlanta, Georgia: U.S. Fish and Wildlife Service, South Atlantic-Gulf and Mississippi Basin Regions.
- . 2024c. *Piping Plover (Charadrius melodus) 5-year Review: Summary and Evaluation*. U.S. Fish and Wildlife Service, Northeast Region, Michigan Field Office, Missouri River Coordinator's Office, and South Carolina Field Office.
- . 2025a. Contaminants Mitigation. Available at: <https://www.fws.gov/program/contaminants-mitigation#:~:text=Some%20contaminants%20that%20affect%20national%20wildlife%20refuges,site%20to%20a%20safe%20and%20inhabitable%20condition>. Accessed February 2026.
- . 2025b. *DRAFT Biological Assessment for the Proposed Boca Chica Land Exchange*. Prepared for Space Exploration Technologies Corporation, Hawthorne, California.
- . 2025c. *Ocelot (Leopardus pardalis) 5-year Status Review: Summary and Evaluation*. Albuquerque, New Mexico: U.S. Fish and Wildlife Service, Southwest Regional Office.
- . 2025d. *Species Status Assessment Report for Northern Aplomado Falcon (Falco femoralis septentrionalis)*. Version 1.0. Corpus Christi, Texas: U.S. Fish and Wildlife Service. Available at: <https://iris.fws.gov/APPS/ServCat/DownloadFile/275433>. Accessed February 2026.
- . 2025e. Information for Planning and Consultation (IPaC). Available at: <https://ipac.ecosphere.fws.gov/>. Accessed February 2026.
- . 2026. *Draft Programmatic Agreement among the United States Fish and Wildlife Service, the Texas State Historic Preservation Office, National Park Service, the Advisory Council on Historic Preservation, and Space Exploration Technologies Corp., regarding a Land Exchange that includes Portions of the Palmito Ranch Battlefield National Historic Landmark, Cameron County, Texas*. U.S. Fish and Wildlife Service.

- U.S. Geological Survey. 2024. National Land Cover Database. Available at:  
<https://www.usgs.gov/centers/eros/science/annual-nlcd-data-access>. Accessed February 2026.
- Veals, A.M., J.D. Holbrook, M.J. Cherry, T.A. Campbell, J.H. Young, Jr., and M.E. Tewes. 2022. Landscape connectivity for an endangered carnivore: habitat conservation and road mitigation for ocelots in the US. *Landscape Ecology* 38:363–381.
- Withers, K., B.R. Chapman, J.W. Tunnell Jr., and F.W. Judd. 2023. The Laguna Madre of Texas and Tamaulipas.

## **APPENDIX A**

### **Biological Assessment**

**BIOLOGICAL ASSESSMENT FOR THE  
PROPOSED BOCA CHICA LAND EXCHANGE  
(CONSULTATION NUMBER 2025-0146895)**

Prepared for

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On behalf of

**U.S. Fish and Wildlife Service**  
National Wildlife Refuge System—Lower Rio Grande Valley National Wildlife Refuge  
U.S. Highway 281  
Alamo, Texas 78516-9509

and

**Space Exploration Technologies Corporation (SpaceX)**  
1 Rocket Road  
Hawthorne, California 90250

February 2026

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## 1 INTRODUCTION

This Biological Assessment (BA) evaluates the effects of a proposed action by the U.S. Fish and Wildlife Service (Service) to exchange certain lands with Space Exploration Technologies Corporation (SpaceX), in Cameron County, Texas, on resources protected by the Endangered Species Act (ESA). These ESA-protected resources are species listed as threatened or endangered and areas designated as critical habitat for ESA-listed species. This BA also considers the effects of the proposed action on species proposed for listing and on areas proposed for critical habitat designation.

This BA includes the information and supports the process of consultation specified by Section 7(a)(2) of the ESA (16 United States Code [USC] 1536) and its implementing regulations (50 Code of Federal Regulations [CFR] 402). In this instance, the Service is both the action agency and the consulting agency. The National Wildlife Refuge System (NWRS) division of the Service represents the action agency, and the Ecological Services (ES) division of the Service represents the consulting agency.

## 2 CONSULTATION HISTORY

The date and a summary of substantive meetings, teleconferences, and written communications pertaining to the consultation process between or among the Service's NWRS division, ES division, and SpaceX are listed below. Substantive informal communications, if any, are cited herein as personal communications.

- **September 9, 2025** – The Service's ES division (Texas Coastal and Central Plains Ecological Services Field Office) generated two official species lists for the proposed action through the Information Planning and Conservation (IPaC) online tool (IPaC Project Codes 2025-0146878—Boca Chica Land Swap-SpaceX Parcels and 2025-016895—Boca Chica Land Swap-USFWS Parcels; Appendix A). These lists identify the species and critical habitat areas to be considered when assessing the effects of the action on the lands to be divested and the lands to be acquired.
- **November 6, 2025** – SpaceX provided the Service's NWRS division with a draft BA.
- **November 18, 2025** – The Service's NWRS division shared a draft BA with the ES division to initiate informal consultation and request a completeness review of the draft BA.
- **November-December 2025** – The Service's NWRS and ES divisions, with SpaceX and SWCA Environmental Consultants, coordinated on revisions to the BA.
- **DATE** – The Service's NWRS division delivered a final BA to the ES division.

## 3 DESCRIPTION OF THE PROPOSED ACTION

The Service proposes to exchange 712 acres of the Lower Rio Grande Valley National Wildlife Refuge (Divested Lands) for 692 acres that are privately owned by SpaceX (Acquired Lands). The proposed exchange would involve lands in the vicinity of the Starbase and Laguna Heights communities in Cameron County, Texas (Figure 1).

Under the proposed action, the Service expects that the Divested Lands will be developed and used by SpaceX for residential, commercial, institutional, infrastructure, and manufacturing activities. SpaceX has not provided the Service with specific development plans for the Divested Lands. The Service will manage the Acquired Lands as part of the National Wildlife Refuge system; specifically, the Lower Rio Grande Valley National Wildlife Refuge and Laguna Atascosa National Wildlife Refuge. Management of the Lower Rio Grande Valley National Wildlife Refuge is guided by the *Final Lower Rio Grande Valley*

and *Santa Ana National Wildlife Refuges Comprehensive Conservation Plan* (Service 1997). Management of the Laguna Atascosa National Wildlife Refuge is guided by the *Final Laguna Atascosa National Wildlife Refuge Comprehensive Conservation Plan* (Service 2010). These expected future uses of the Divested Lands and Acquired Lands are activities related to the proposed exchange that would not occur on these specific sets of lands but for the proposed exchange and, in a general sense, are reasonably certain to occur.

The proposed exchange would be under the authority of the National Wildlife Refuge System Administration Act, as amended by the 1997 National Wildlife Refuge System Improvement Act (16 USC 668dd). The purpose of the proposed exchange would be to consolidate lands of the National Wildlife Refuge system in a highly fragmented landscape of parcel ownership. The proposed exchange is needed to reduce land use conflicts with the Service's mission to conserve species' habitats and improve habitat protection within the Lower Rio Grande National Wildlife Refuge and Laguna Atascosa National Wildlife Refuge. Through the proposed exchange, Service would divest lands likely to be impacted by SpaceX activities and acquire lands from SpaceX that include desirable habitat for conservation.

### **3.1 Location of the Proposed Action**

The Divested Lands are in two primary locations: 1) a 1.3-acre parcel adjacent to Starbase (the Starbase Parcel; see inset in Figure 1), and 2) multiple parcels totaling 710 acres (the Rio Parcels) approximately 3.5 miles southwest of the SpaceX Vertical Launch Area where testing, launches, and landings of the SpaceX Starship and Super Heavy vehicles occur and approximately 1.5 miles southwest of Starbase and SpaceX manufacturing facilities. The Divested Lands, including the Rio Parcels, are fragmented by private lands already owned by SpaceX. These intervening private lands include the SpaceX Massey Test Site used to test space launch vehicles and vehicle components and lands that are under development by SpaceX for residential, commercial, and other uses. See Section 4 for more detail about the Divested Lands.

The Acquired Lands are in three general locations (see Figure 1). One set of parcels totals 112.7 acres that are adjacent to the Rio Grande in an area informally known as "Las Palomas" (the Las Palomas Parcels). The Las Palomas Parcels are surrounded by lands of the Lower Rio Grande Valley National Wildlife Refuge. Accessing the Las Palomas Parcels requires travel through the refuge on unimproved vehicle trails or by off-road transit; access is limited to NWRS staff or by Special Use Permit; and public entry is prohibited. The second set of parcels are along Boca Chica Beach south of the SpaceX Vertical Launch Area (the Boca Chica Beach Parcels). The Boca Chica Beach Parcels total 101.4 acres. The third set of parcels includes 476.7 acres between the communities of Laguna Vista and Laguna Heights (the Laguna Heights Parcels). The Laguna Heights Parcels are distributed along both sides of State Highway 100. The Laguna Heights Parcels are adjacent to the Laguna Atascosa National Wildlife Refuge's Bahia Grande tracts and include frontage along the Laguna Madre. See Section 4 for more detail about the Acquired Lands.

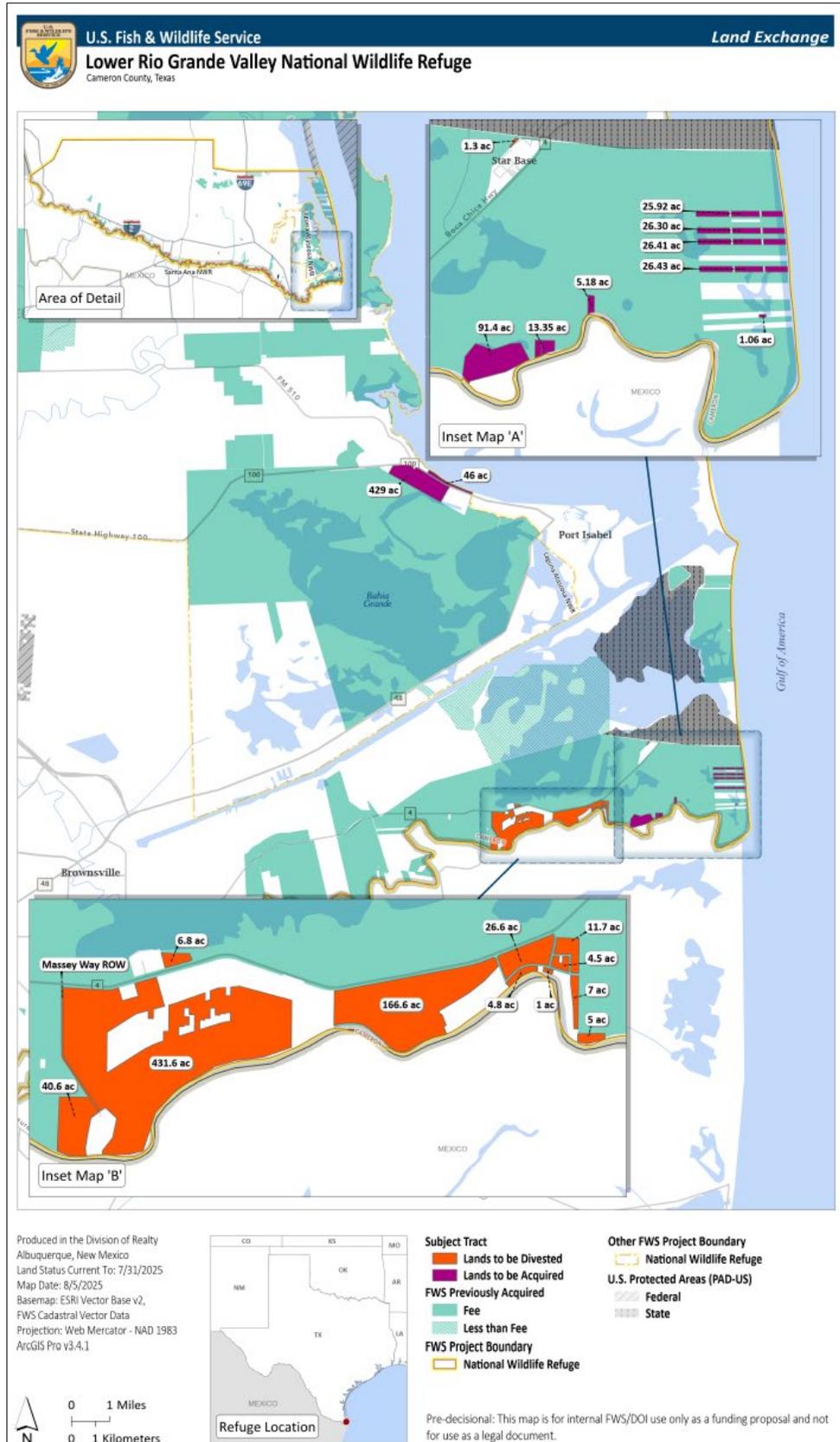


Figure 1. Location of the Divested Lands and Acquired Lands.

## 3.2 Likely Physical Consequences of the Proposed Action

The proposed action is an exchange of lands between the Service and SpaceX in the general vicinities of the Starbase and Laguna Heights communities. The physical consequences of the proposed exchange would be related to the expected future uses of the Divested Lands and Acquired Lands. These future uses would be either development for a variety of uses related to SpaceX activities or management for wildlife conservation by the Service. The proposed exchange would flip the expected future uses of the two sets of lands (i.e., from development to wildlife conservation management or from wildlife conservation management to development).

The physical consequences of land development activities generally include the following:

- Replacement of existing land cover with a built environment (e.g., structures, hardened or impervious surfaces, landscaping)
- Introduction of noise and light from the presence and activity of humans, structures, vehicles, and equipment
- Alteration of stormwater runoff

The physical consequences of development would encompass the area of the developed lands (i.e., for the replacement of existing land cover) and extend beyond the developed lands for some distance. For the purpose of analysis, the Service expects that these off-site consequences would create clear and substantial change in the environment for a distance of 0.5 mile beyond the boundary of the developed land. This distance is based on the attenuation of the following physical consequences:

- Attenuation of Noise – Operation of construction equipment (e.g., bulldozers, graders, tractors or large trucks, and excavators) produce sound that is generally between 80 and 100 decibels (A-weighted; dBA) at a distance of 50 feet from the source (Federal Highway Administration 2006). Sound attenuates with distance (Federal Highway Administration 2006). A noise level of 90 dBA (the midpoint of the range for typical construction equipment) would attenuate to approximately 56 dBA by 0.5 mile. This level of attenuated noise is roughly consistent with background noise typical of a “quiet urban residential” or “quiet commercial, industrial, and normal urban residential” area with equivalent daytime sound levels of between 56 and 60 dBA (see Table 3-4 in Federal Aviation Administration 2022). These background noise conditions are consistent with the existing land uses in the vicinity of the proposed exchange.
- Attenuation of Light – Lighting installed on buildings and other structures (e.g., streetlights) in the built environment illuminates areas adjacent to the lighting source, with the amount and extent of such illumination conditioned on a wide variety of factors (e.g., directionality, shielding, intensity). Radiance data from the Visible Infrared Imaging Radiometer Suite satellite instrument suggests that existing developed areas around Starbase, the Vertical Launch Area, the SpaceX Massey Test Site, and Laguna Heights generate a clear signal of increased radiance above background levels to a distance of approximately 0.5 mile (Figure 2).
- Attenuation of Stormwater Runoff – Land development often adds impervious cover to the landscape that can change patterns of stormwater runoff across the ground surface. Most of the pollutants in stormwater runoff are mobilized by the first 0.5 to 0.75 inch of rainfall over an impervious surface (the “first flush”). The extent to which this volume of water leaves a developed site depends on many characteristics of the landscape and the development (e.g., soils, topography, amount of impervious cover, stormwater controls). Vegetated buffers are a form of stormwater control with demonstrated effectiveness at promoting infiltration of runoff into the soil. Best practices for using vegetated buffers or filter strips commonly include

recommendations for at least 50 feet of dense, well-vegetated cover to provide a high level of attenuation (Environmental Protection Agency 2021). While the land conditions immediately adjacent to developed lands may not be densely vegetated, given the effectiveness of vegetated buffers it is reasonable to expect that any clear and substantial off-site impacts from stormwater runoff would be contained within the 0.5-mile distance for attenuation of noise and light.

The management of lands by the Service for wildlife conservation, based on the activities needed to achieve the goals and objectives of the *Final Lower Rio Grande Valley and Santa Ana National Wildlife Refuges Comprehensive Conservation Plan* (Service 1997) and *Laguna Atascosa National Wildlife Refuge Comprehensive Conservation Plan* (Service 2010) include the following:

- Revegetation of former cropland
- Brush restoration and testing brush restoration techniques in areas with potential for ocelot establishment
- Enhancement of “edge” habitat
- Restoration of wetlands
- Fire management techniques such as prescribed fire, disking, and herbicides where needed to remove exotic species and stimulate desirable plant or water conditions
- Installation or repair of water control structures, such as culverts, where applicable
- Construction of channels and associated structures interconnecting Laguna Larga, Little Laguna Madre, and Bahia Grande basins
- Construction of artificial nest structures for Northern Aplomado Falcons
- Planting of tree yuccas in grasslands where they are otherwise absent to provide nesting habitat for Northern Aplomado Falcons
- Posting signs and markers in bird nesting areas

The physical consequences of management for wildlife conservation would also encompass the area of the managed lands and, for some types of management activities, would extend beyond the boundary of these lands for some distance. It is likely that management activities would have similar but less intense off-site physical consequences as compared to land development activities. However, for simplicity of analysis, the Service conservatively adopts 0.5 mile as the distance beyond a refuge-managed parcel where management activities would create clear and substantial change in the environment. This is a reasonable approach because land management activities occasionally require the presence and activity of people, vehicles, and equipment to maintain access roads and manage vegetation. These activities and the tools needed to implement them are similar to and have physical consequences similar to those created during development activities.

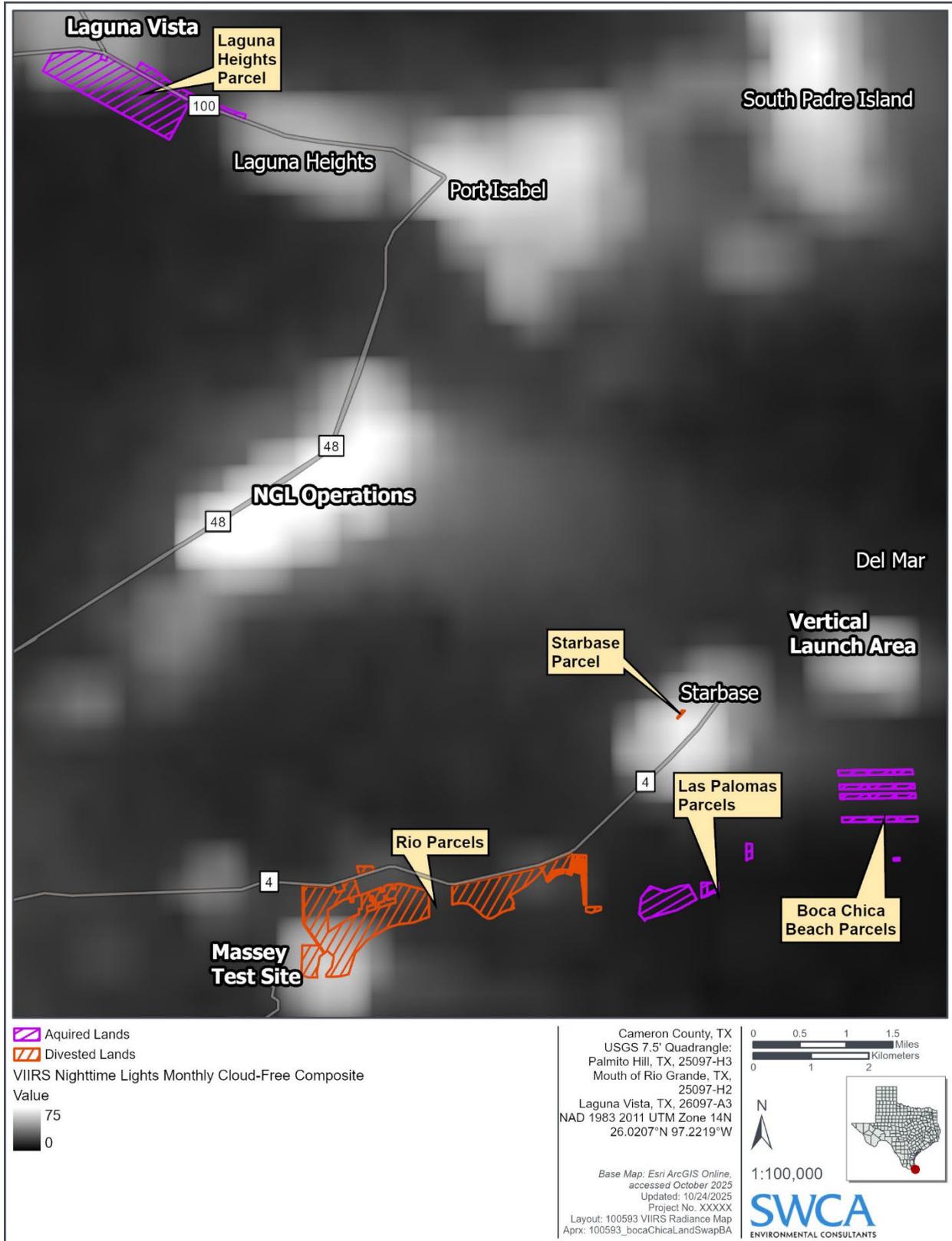


Figure 2. Visible Infrared Imaging Radiometer Suite radiance data near Acquired and Divested Lands.

## **4 DESCRIPTION OF THE ACTION AREA**

The action area encompasses the Divested Lands, Acquired Lands, and the area up to 0.5 mile around these lands. In total, the action area contains 10,762 acres that are distributed across five units: Rio Unit, Starbase Unit, Las Palomas Unit, Boca Chica Beach Unit, and Laguna Unit (Figure 3). Because of their proximity, the Las Palomas Unit and the Rio Unit overlap, constituting approximately 300 acres of the action area. Divested Lands are the exchange parcels in the Rio Unit and Starbase Unit. Acquired Lands are the exchange parcels in the Boca Chica Beach Unit, Laguna Unit, and Las Palomas Unit. The action area contains approximately 1,820 acres in Mexico. The portion of the action area in Mexico is outside the jurisdiction of the Service.

Readily available aerial and/or satellite imagery used in the figures of the Divested Lands and Acquired Lands shown below is dated from June 12, 2024 (Esri 2024). Land cover modeling by LANDFIRE (2025) classifies vegetation communities (categorized as Existing Vegetation Type) across this landscape. These desktop data sources indicate that the Divested Lands and Acquired Lands are undeveloped. Satellite imagery indicates that vegetation communities generally match the modeled land cover; although on-the-ground habitat features do not precisely overlap modeled habitat boundaries given the broad scale (i.e., 30 x 30-meter [m] resolution) used by LANDFIRE (2025).

On behalf of SpaceX and with Service authorization (Service special use permit number LRGV-09-10-25-IMD), environmental specialists with SWCA Environmental Consultants (SWCA) visited the Divested Lands and the Acquired Lands in September 2025 to document the current condition of these parcels. SWCA noted land uses and land covers that contribute to or influence habitat conditions and likelihood of use by ESA-listed or proposed species.

The SWCA field investigations confirmed that available desktop data sources accurately represent current habitats. SWCA noted that habitat types generally followed that observed in the satellite imagery, but that habitat boundaries differed from the LANDFIRE (2025) habitat polygons. Thus, while the modeled landcover is accurate, acreage calculations and delineations based on LANDFIRE (2025) may differ slightly from on-the-ground site habitat features (see tables and figures in respective unit descriptions below).

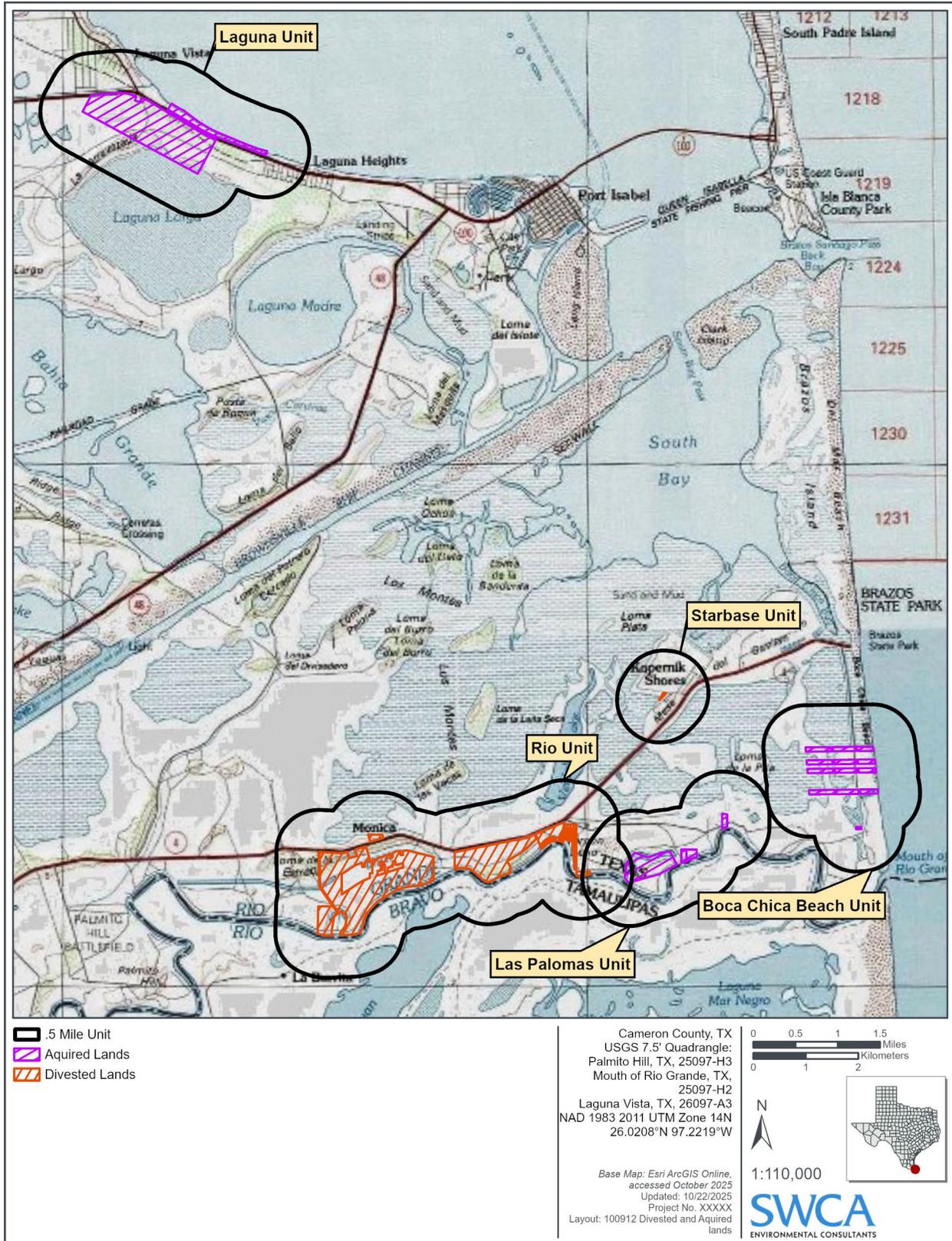


Figure 3. Location of Acquired and Divested Lands and respective action area units.

## 4.1 Divested Lands Action Area Units

### 4.1.1 Rio Unit

The Rio Unit contains 710 acres (99.9%) of the Divested Lands (i.e., the Rio Parcels) (Figure 4). Beyond the Rio Parcels, notable features within the Rio Unit include the SpaceX Massey Test Site, existing residential properties, the Ad Astra School, private lands currently undergoing development for residential and commercial purposes (e.g., the Rio East and Rio West projects), a segment of State Highway 4 and associated aboveground high-voltage transmission lines, and undeveloped uplands and wind-tidal flats of the Lower Rio Grande Valley National Wildlife Refuge. Secondary roads bisecting this unit include Massey Way, Quicksilver Avenue, Richardson Drive, Tarpon Bend Drive, and Rio Grande Drive that are components of the SpaceX Massey Test Site and residential developments in the Rio Unit. Many areas in this unit contain fences from prior ownership.

Several areas within this action area unit (but outside of the Divested Lands), particularly near Tarpon Bend Drive and Rio Grande Drive, have been altered for on-road and off-road vehicle passage and parking. Near the intersection of Rio Grande Drive and Richardson Drive, there is some utility equipment and an abandoned Border Patrol guard post. Development activities, including house construction and fiber optic installation, are ongoing near Tarpon Drive, Richardson Drive, and Rio Grande Drive. However, the Rio Unit largely consists of undeveloped lands that are part of the Lower Rio Grande Valley National Wildlife Refuge, a segment of the Rio Grande, and lands in Mexico.

SWCA noted the following common plants within the Rio Parcels during the September 2025 field investigations: guineagrass (*Megathyrsus maximus*), bushy seaside tansy (*Borrchia frutescens*), prickly pear (*Opuntia* spp.), honey mesquite (*Neltuma glandulosa*), Spanish dagger (*Yucca gloriosa*), Berlandier's fiddlewood (*Citharexylum berlandieri*), screwbean mesquite (*Strombocarpa pubescens*), Texas swampprivet (*Forestiera angustifolia*), lime pricklyash (*Zanthoxylum fagara*), spartina (*Spartina* spp.), yucca (*Yucca* spp.), Cuman ragweed (*Ambrosia psilostachya*), camphor daisy (*Rayjacksonia phyllocephala*), lotebush (*Ziziphus obtusifolia*), saltwort (*Batis maritima*), shoregrass (*Monanthochloe littoralis*), and buffelgrass (*Cenchrus ciliaris*). These species are largely upland shrub-scrub species consistent with thornscrub habitat. Other noted plants, such as spartina, saltwort, and shoregrass, are common in areas that receive some inundation by saltwater. Species such as guineagrass and buffelgrass suggest that portions of this unit may have been used for cattle grazing, which is a known historical use of the area currently encompassed by the Lower Rio Grande Valley National Wildlife Refuge; however, no cattle or other domestic grazing operations occur on the Rio Parcels at this time.

Of the 710.0 acres comprising the Rio Parcels, approximately 17.3 acres (2.4%) are classified as developed, which primarily consists of Massey Way connecting State Highway 4 to the SpaceX Massey Test Site (LANDFIRE 2025). The dominant undeveloped land cover types within the Rio Parcel include Texas Coast Salt and Brackish Tidal Marsh (181.9 acres; 25.6%), Texas Coast Salt and Brackish Tidal Marsh Shrubland (122.8 acres; 17.3%), Texas Saline Coastal Prairie (112.8 acres; 15.7%), Southeastern Ruderal Grassland (82.5 acres; 11.6%), and Texas Coast Fresh and Oligohaline Tidal Marsh (61.0 acres; 8.5%). These five land cover types account for approximately 559.4 acres (78.8%) of the Rio Parcels' undeveloped areas. A representative photograph of typical habitat observed within the Rio Parcels during the field habitat assessment in September 2025 is in Figure 5.

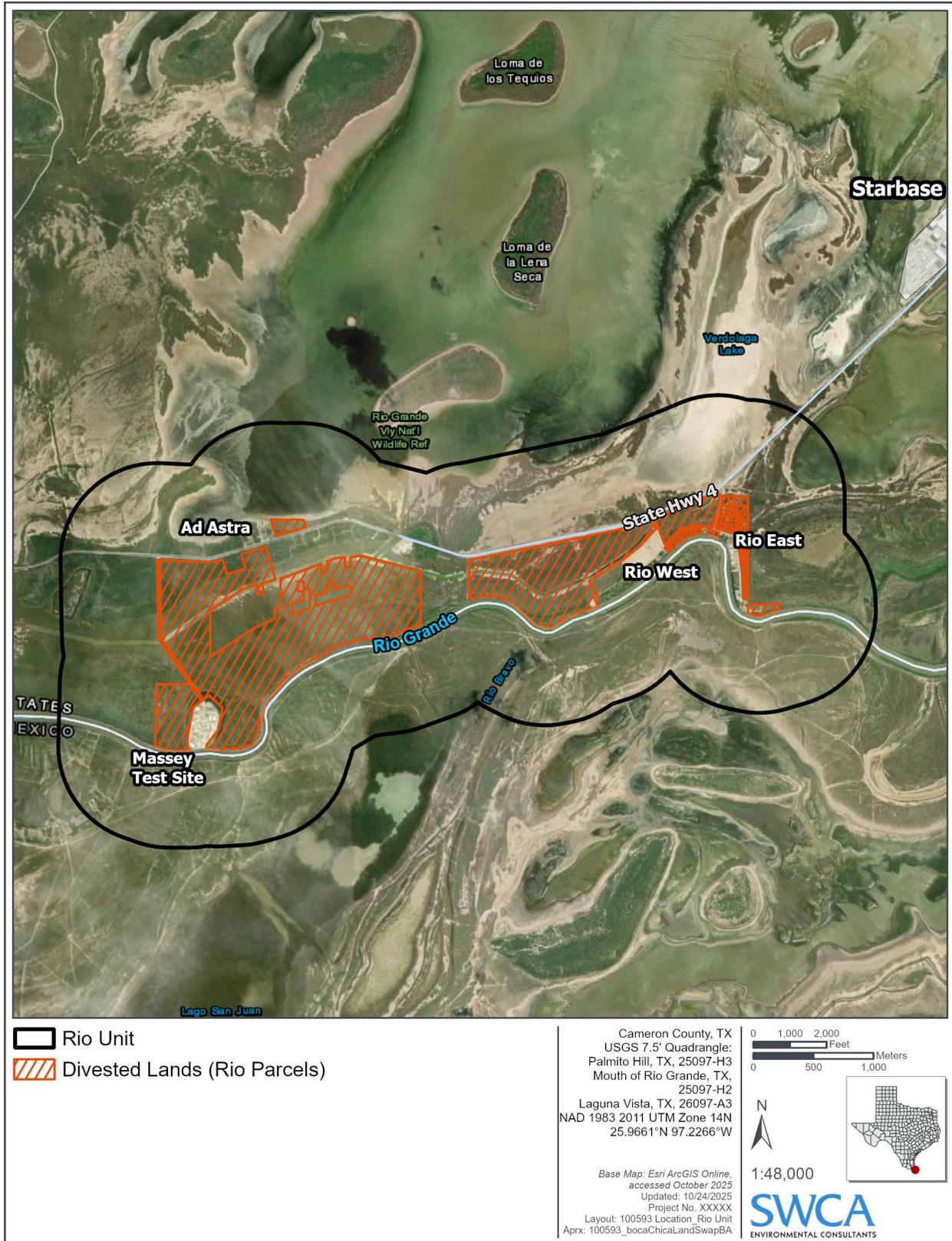


Figure 4. Divested Lands (Rio Parcels) and Rio Unit of the action area.



**Figure 5. Representative photograph of typical habitat observed within the Rio Parcels, September 2025.**

#### **4.1.2 Starbase Unit**

The Starbase Unit of the action area is associated with a single, undeveloped 1.3-acre parcel of Divested Lands located adjacent to the existing SpaceX manufacturing facility (Figure 6). The Starbase Unit contains undeveloped land immediately adjacent to Starbase and San Martin Boulevard on the east side, and the wind-tidal flats of South Bay on the west side.

Dominant vegetation identified during the September 2025 habitat assessment included black mangrove (*Avicennia germinans*), bushy seaside tansy, honey mesquite, prickly pear, and yucca. These species reflect a row of black mangroves separating the parcel from the adjacent tidal mudflats, transitioning into an upland thornscrub area as the unit gets closer to existing Starbase infrastructure.

Of the 1.3-acre Starbase Parcel, approximately 0.49 acre (37.7%) is categorized as developed by LANDFIRE (2025); however, this is an artefact of LANDFIRE's classification system (i.e., 30 x 30-m polygons) rather than true conditions. The September 2025 habitat assessment found no developed areas within the 1.3-acre parcel. The dominant undeveloped landcover types within the Starbase Parcel include Texas Coast Salt and Brackish Tidal Marsh Shrubland (0.39 acre; 30.0%), Texas Coast Salt and Brackish Tidal Marsh (0.32 acre; 24.6%), and South Texas Salt and Brackish Tidal Flat (0.08 acre; 6.15%). These three land cover types account for approximately 0.79 acre (60.8%) of the Starbase Parcel and all the undeveloped area. A representative photograph of typical habitat observed within the Starbase Parcel during the field habitat assessment in September 2025 is in Figure 7.

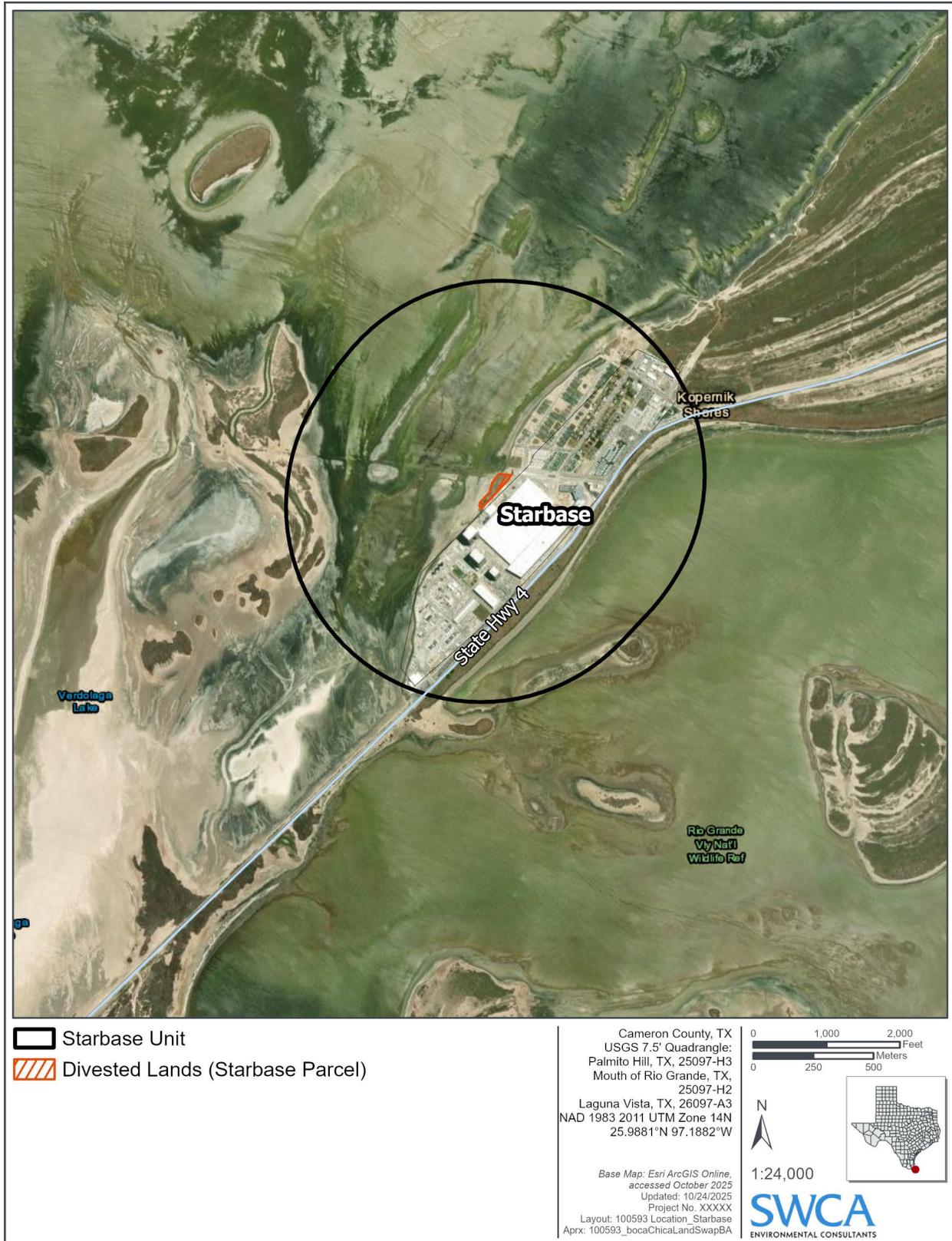


Figure 6. Divested Lands (Starbase Parcel) and Starbase Unit of the action area.



**Figure 7. Representative photograph of typical habitat within the Starbase Parcel, September 2025.**

## **4.2 Acquired Lands Action Area Units**

### **4.2.1 Boca Chica Beach Unit**

The Boca Chica Beach Unit of the action area contains no developed lands. The undeveloped lands include a segment of Boca Chica Beach and an area over the Gulf of America (Figure 8). Although undeveloped, Boca Chica Beach is a public beach that incurs daily vehicle traffic, except during closures for safety concerns (e.g., hurricanes) and for SpaceX launch and testing operations.

This unit consists of unvegetated sandy beach, unvegetated wind-tidal flats, and vegetated dunes separating the beach and wind-tidal flats. Dominant vegetation identified during the September 2025 habitat assessment includes spartina, sea oats (*Uniola paniculata*), and seaside bluestem (*Schizachyrium littorale*). These species indicate that between the unvegetated beach and tidal wind-tidal flats of this unit lies a grassland over the dunes of Boca Chica Beach.

Of the 101.4 acres comprising the Boca Chica Beach Parcels, none are developed, and 34.0 acres (33.7%) are categorized as open water (the Las Palomas wind-tidal flats are categorized as open water in the LANDFIRE database) (LANDFIRE 2025). The dominant land cover types within the Boca Chica Beach Parcels include Texas Coast Salt and Brackish Tidal Marsh Shrubland (16.6 acres; 16.4%), Southeastern Ruderal Grassland (13.6 acres; 13.5%), Texas Coast Salt and Brackish Tidal Marsh (13.1 acres; 13.0%), Texas Coast Dune and Coastal Grassland (11.1 acres; 11.0%), and South Texas Salt and Brackish Tidal Flat (6.2 acres; 6.1%). These five land cover types account for approximately 61 acres (60.4%) of the Boca Chica Beach Parcels. A representative photograph of typical habitat observed within the Boca Chica Beach Parcels during the field habitat assessment in September 2025 is in Figure 9.

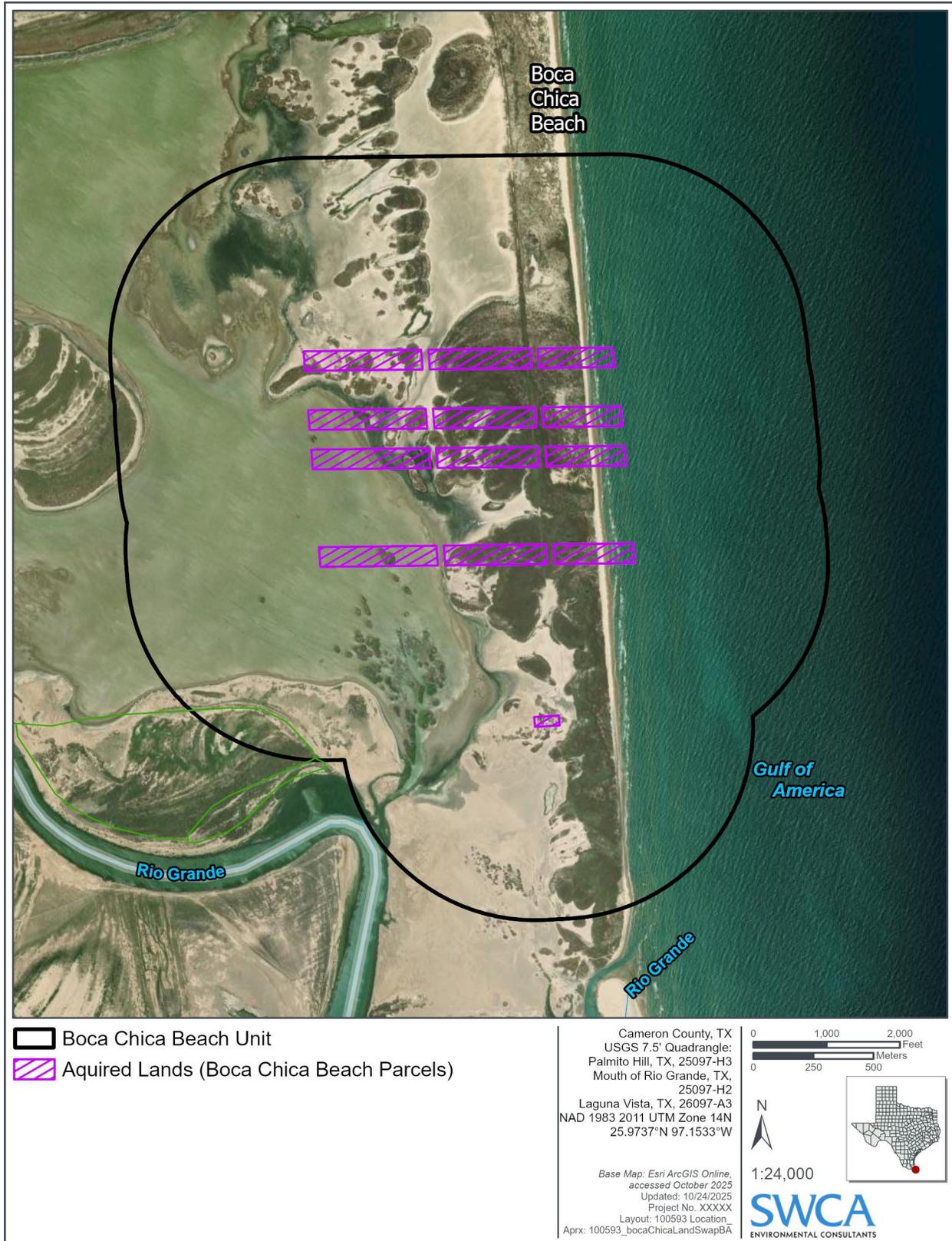


Figure 8. Acquired Lands (Boca Chica Beach Parcels) and Boca Chica Beach Unit of the action area.



**Figure 9. Representative photograph of typical habitat within Boca Chica Beach Parcels, September 2025.**

## **4.2.2 Laguna Unit**

The Laguna Unit of the action area contains very little developed land, with several ATV trails, fences bordering the property, and an abandoned trailer near the adjacent Stripes Gas Station on the west side of State Highway 100 near its intersection with Santa Isabel Boulevard. The Laguna Unit overlaps with the Laguna Atascosa National Wildlife Refuge, Laguna Larga, and Laguna Madre. A small strip of the Laguna Heights Parcels borders Laguna Madre on the north side of State Highway 100 (Figure 10).

Dominant vegetation identified during the September 2025 habitat assessment includes honey mesquite, brasil (*Condalia hookeri*), Spanish dagger, prickly pear, buffelgrass, screwbean mesquite, whiplash pappusgrass (*Pappophorum vaginatum*), camphor daisy, shoregrass, spartina, scarlet spiderling (*Boerhavia coccinea*), and lime pricklyash. These species indicate that this unit consists of shrub-scrub uplands but also contains herbaceous areas that are at least occasionally inundated with water. Wetlands within the more inland portion of this unit are likely to be inundated by spillover from Laguna Larga or rainwater. Species such as buffelgrass suggest that this unit may have been used for cattle grazing at some point in the past. This wetland is approximately 17 acres and consists of upright burhead (*Echinodorus berteroi*), scarlet spiderling, bushy seaside tansy, and spartina (Figure 11).

Of the 477 acres comprising the Laguna Parcels, approximately 8.5 acres (1.9%) are categorized as developed (LANDFIRE 2025). The dominant undeveloped land cover types within the Laguna Parcels include Texas Coast Salt and Brackish Tidal Marsh (96.1 acres; 20.1%), Texas Coast Salt and Brackish Tidal Marsh Shrubland (78.7 acres; 16.5%), Southeastern Ruderal Grassland (71.8 acres; 15.1%), Texas Saline Coastal Prairie (63.9 acres; 13.4%), and Tamaulipan Lomas (52.0 acres; 10.9%). These five land cover types account for approximately 362 acres (77.6%) of the Laguna Parcels. A representative photograph of upland shrub-scrub habitat observed within the Laguna Parcels during the field habitat assessment in September 2025 is in Figure 12.

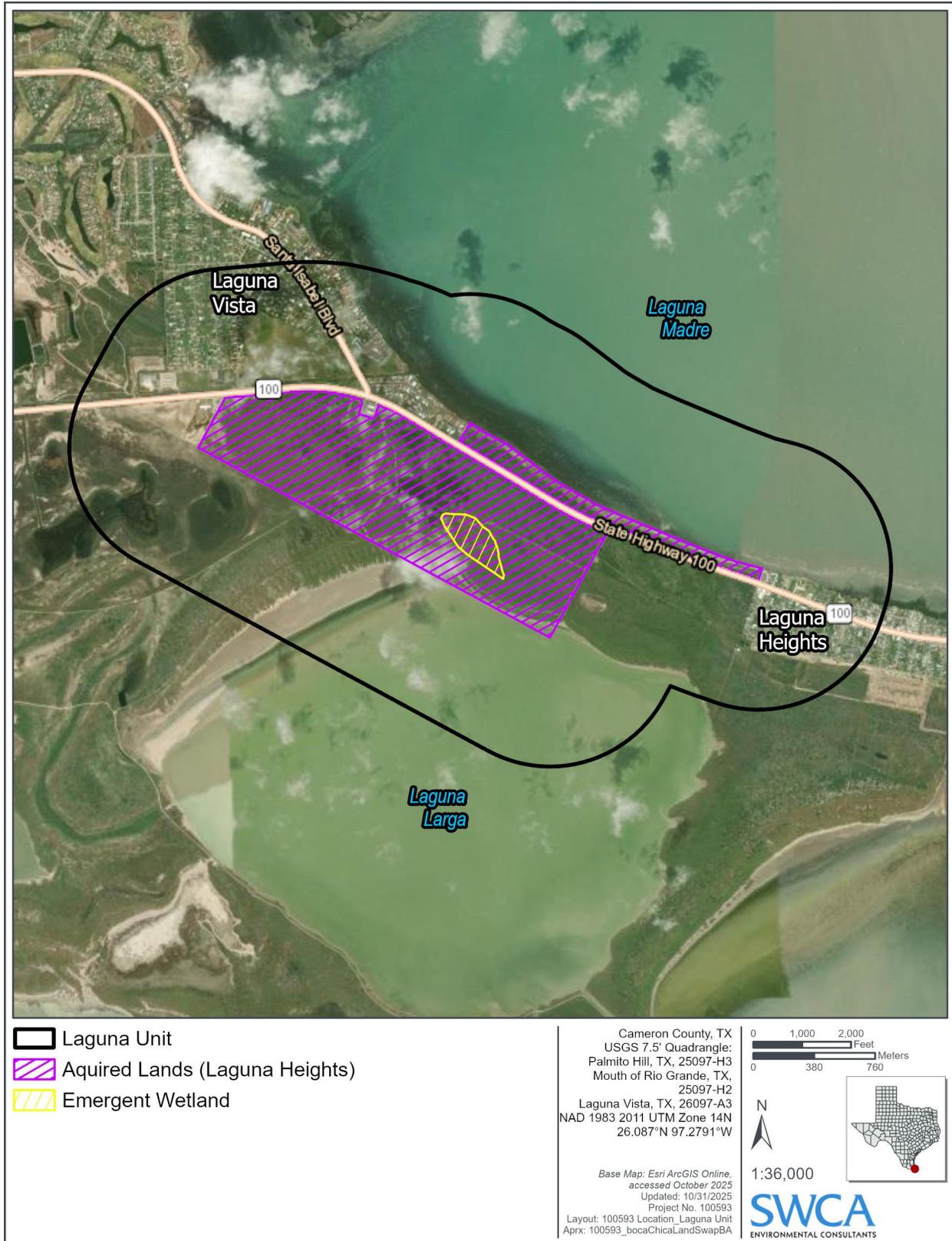


Figure 10. Acquired Lands (Laguna Heights Parcels) and Laguna Unit of the action area.



**Figure 11. Representative photograph of emergent wetland habitat within the Laguna Heights Parcels, September 2025.**



**Figure 12. Representative photograph of upland shrub-scrub habitat within Laguna Heights Parcels, September 2025.**

### **4.2.3 Las Palomas Unit**

The Las Palomas Unit of the action area contains no developed lands and includes a segment of the Rio Grande and lands in Mexico (Figure 13). Dominant vegetation identified during the September 2025 habitat assessment includes sea purslane (*Sesuvium portulacastrum*), pickleweed (*Salicornia* spp.), bushy seaside tansy, saltwort, prickly pear, screwbean mesquite, Spanish dagger, and yucca. These species reflect areas where saltwater at least occasionally inundates where sea purslane, pickleweed, and saltwort are found, and upland, thornscrub habitats where species like Spanish dagger, prickly pear, and screwbean mesquite are found. Areas of unvegetated mudflat are also present within this unit.

Of the 112.7 acres comprising the Las Palomas Parcels, none are classified as developed, and 25.0 acres (22.1%) are classified as open water (primarily associated with an oxbow resulting from a historical Rio Grande course; see Figure 13) (LANDFIRE 2025). The dominant land cover types within the Las Palomas Unit include Texas Coast Salt and Brackish Tidal Marsh Shrubland (41.0 acres; 36.3%), Texas Coast Salt and Brackish Tidal Marsh (28.1 acres; 24.9%), Tamaulipan Lomas (7.1 acres; 6.3%), South Texas Salt and Brackish Tidal Flat (4.2 acres; 3.7%) and Texas Coast Fresh and Oligohaline Tidal Marsh (2.7 acres; 2.4%). These five land cover types account for approximately 83 acres (73.5%) of the Las Palomas Parcels' area. A representative photo of typical habitat observed within the Las Palomas Parcels during the field habitat assessment in September 2025 is shown in Figure 14.

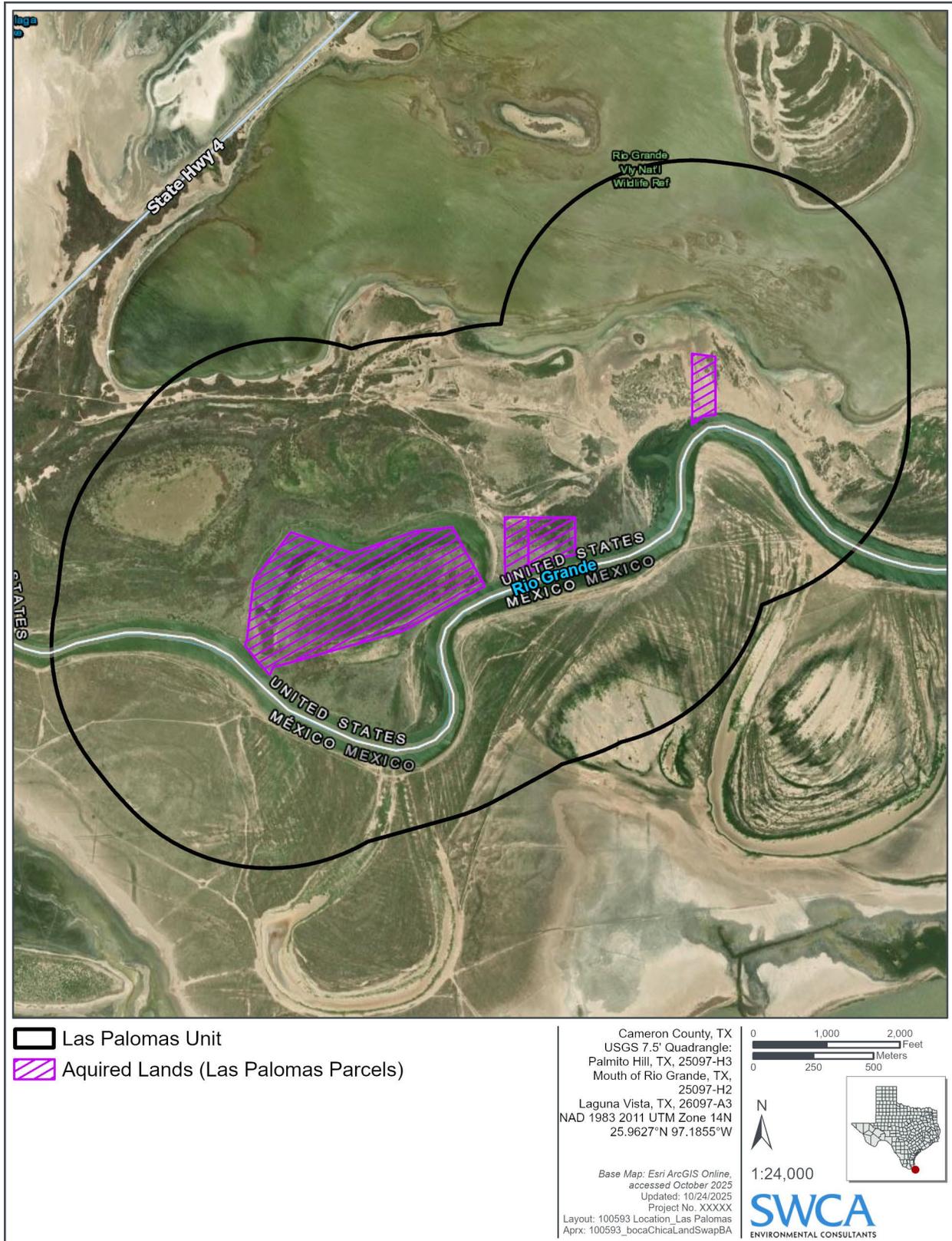


Figure 13. Acquired Lands (Las Palomas Parcels) and Las Palomas Unit of the action area.



**Figure 14. Representative photograph of typical habitat within Las Palomas Parcels, September 2025.**

## 5 SPECIES AND CRITICAL HABITATS CONSIDERED

SWCA queried the Service’s IPaC tool for official lists of species and habitats that should be considered when evaluating the effects of the proposed exchange. SWCA submitted the query in two parts, one based on the boundary of the Divested Lands and the other based on the boundary of the Acquired Lands. The Service’s Texas Coastal and Central Plains Ecological Services Field Office (through the IPaC tool) returned two automated response letters on September 9, 2025 (see Appendix A). The response letters identified 18 species and two critical habitat areas associated with the Divested Lands and Acquired Lands that should be considered in the analysis of effects (Table 1).

**Table 1. Species and Critical Habitat Considered for the Analysis of Effects**

Species or Habitat Area	Endangered Species Act Status
<b>Mammals</b>	
Gulf Coast jaguarundi ( <i>Puma yagouaroundi cacomitli</i> )	Endangered
Ocelot (Leopardis [= <i>Felis</i> ] <i>pardalis</i> )	Endangered
Tricolored bat ( <i>Perimyotis subflavus</i> )	Proposed Endangered*
West Indian manatee ( <b><i>Trichechus manatus</i></b> )	Threatened
<b>Birds</b>	
Cactus ferruginous pygmy-owl ( <i>Glaucidium brasilianum cactorum</i> )	Threatened
Eastern black rail ( <i>Laterallus jamaicensis jamaicensis</i> )	Threatened
Northern aplomado falcon ( <i>Falco femoralis septentrionalis</i> )	Endangered

Species or Habitat Area	Endangered Species Act Status
Piping plover ( <i>Charadrius melodus</i> )	Threatened
Rufa red knot ( <i>Calidris canutus rufa</i> )	Threatened
<b>Reptiles</b>	
Green sea turtle, North Atlantic Distinct Population Segment ( <i>Chelonia mydas</i> )	Threatened
Hawksbill sea turtle ( <i>Eretmochelys imbricata</i> )	Endangered
Kemp's ridley sea turtle ( <i>Lepidochelys kempii</i> )	Endangered
Leatherback sea turtle ( <i>Dermochelys coriacea</i> )	Endangered
Loggerhead sea turtle, Northwest Atlantic Distinct Population Segment ( <i>Caretta caretta</i> )	Threatened
<b>Mollusks</b>	
Salina mucket ( <i>Potamilus metnecktayi</i> )	Proposed Endangered*
<b>Insects</b>	
Monarch butterfly ( <i>Danaus plexippus</i> )	Proposed Threatened*
<b>Flowering Plants</b>	
South Texas ambrosia ( <i>Ambrosia cheiranthifolia</i> )	Endangered
Texas ayenia ( <i>Ayenia limitaris</i> )	Endangered
<b>Critical Habitat</b>	
Piping plover critical habitat (Unit TX-1)	Designated
Rufa red knot critical habitat (Unit TX-11)	Proposed**

\* Additional action on the proposed rule is contemplated as a Long-Term Action on the Spring 2025 Unified Agenda of Federal Regulatory and Deregulatory Actions (Office of Information and Regulatory Affairs [OIRA] 2025a). Items on the agenda of Long-Term Actions are those for which the agency responsible does not expect to act within 12 months of the publication of the agenda. The Spring 2025 agenda was published in the Federal Register (FR) on September 22, 2025 (90 FR 45468).

\*\* This proposed rule is identified as "inactive" by OIRA (2025b). The agency responsible has not planned to take additional action on this proposal.

## 5.1 No Effect Determinations

Not all species identified in Table 1 have a current distribution that includes the action area. The species lacking current distribution within the action area include Gulf Coast jaguarundi (*Puma yagouaroundi cacomitli*), cactus ferruginous pygmy-owl (*Glaucidium brasilianum cactorum*), Salina mucket (*Potamilus metnecktayi*), South Texas ambrosia (*Ambrosia cheiranthifolia*), and Texas ayenia (*Ayenia limitaris*). The proposed land exchange would have no effect on these species because it is not reasonably certain that individuals of these species would be exposed to the effects of the action. Therefore, these species are not evaluated further in this BA. Supporting rationale for the no effect determinations is provided below.

### 5.1.1 Gulf Coast Jaguarundi

The 2024 5-year Status Review of the Gulf Coast jaguarundi acknowledges that, despite numerous unconfirmed sightings, the last confirmed sighting of the subspecies in the United States occurred in 1986 as a road-killed individual approximately 2 miles east of Brownsville, Texas (Service 2024a). Service (2024a) notes that monitoring projects using deployment of remote cameras for extended periods have occurred in areas where unconfirmed reports of Gulf Coast jaguarundis have been made. None of these monitoring projects have produced a "class 1" sighting of the species (i.e., photographic evidence, or one with physical evidence such as tracks, a carcass, or a pelt).

Lombardi et al. (2022) report findings of a camera trapping effort conducted at 16 properties and along two highways in southern Texas and northern Tamaulipas, Mexico. The effort involved 350,366 trap

nights at 685 camera sites between 2003 and 2021. After approximately 18 years of study, no Gulf Coast jaguarundis were recorded in Texas; however, the subspecies was detected in Mexico. The authors conclude that the Gulf Coast jaguarundi is extirpated from Texas and that the current northern end of the subspecies' range terminates approximately 95 miles south of the Texas-Mexico border.

The Texas Parks and Wildlife Department (TPWD) also considers the Gulf Coast jaguarundi to be extinct in or extirpated from Texas (TPWD 2025a), and the species does not appear on the state's list of Species of Greatest Conservation Concern (TPWD 2023). The NatureServe state rank for the jaguarundi in Texas is "SX" (Hammerson and Cannings 2025) meaning "presumed extirpated" and described as "believed to be extirpated from the jurisdiction (i.e., nation, or state/province) ... Not located despite intensive searches of historical sites and other appropriate habitat, and virtually no likelihood that it will be rediscovered."

Given the likely extirpation of the Gulf Coast jaguarundi from Texas and distance from the action area to the estimated northern extent of the current range in Mexico, the proposed activities will have no effect on the subspecies.

### **5.1.2 Cactus Ferruginous Pygmy-owl**

In Texas, the current known distribution of the cactus ferruginous pygmy-owl is described as "almost extirpated along Rio Grande, but more common now in areas of Kenedy and Brooks counties" (Service 2022a). Kenedy County is approximately 36 miles from the action area and Brooks County is approximately 64 miles from the action area. However, the Service reported that cactus ferruginous pygmy-owls have been detected at the headquarters of the Laguna Atascosa National Wildlife Refuge, citing a personal communication from Brandon Jones, Refuge Manager. Although parts of the refuge are adjacent to the Laguna Heights Parcels, which are Acquired Lands proposed for acquisition by the Service, the refuge headquarters is approximately 10 miles to the northwest. No records of the cactus ferruginous pygmy-owl in Cameron County are documented on eBird (2025) or iNaturalist (2025). This species is also not recorded on eBird in Mexico within 50 miles of the action area (eBird 2025).

Cactus ferruginous pygmy-owls in Texas are known to use riparian woodlands, brush, palm, and mesquite thickets (TPWD 2025b). No cactus ferruginous pygmy-owls or suitable habitat for this species were observed on the Divested Lands or Acquired Lands by SWCA during field visits in September 2025. No oak trees were observed on these properties, and the observed mesquite trees were too small to provide nesting cavities for the owl.

No suitable habitat for cactus ferruginous pygmy-owls is known to occur in the action area, and the current known distribution of the species does not include the action area. Therefore, no cactus ferruginous pygmy-owls would be affected by the proposed exchange.

### **5.1.3 Salina Mucket**

The Salina mucket, a species of freshwater mussel proposed for listing, was historically known to inhabit the Rio Grande drainage in Texas and northern Mexico. No live individuals have ever been documented downstream of Lake Amistad in Val Verde County, Texas. The current range of the Salina mucket is comprised of the Rio Grande in Brewster, Terrell, and Val Verde Counties in Texas. The species is considered extirpated in Mexico (Service 2023).

This species is not known to occur within action area, and the closest known distribution is approximately 335 miles upstream of the action area. Therefore, no Salina muckets would be affected by the proposed exchange.

### 5.1.4 South Texas Ambrosia

South Texas ambrosia is a flowering plant with a historic distribution that included Cameron County, Texas, based on a detection reported from the county in 1932 (Service 2018a, 2022b). The species is not currently known to occur in Cameron County. Extant populations are only reported from Nueces and Kleberg counties (Service 2018a). The iNaturalist database (2025) does not contain any records of South Texas ambrosia from Cameron County.

South Texas ambrosia is found in grasslands and mesquite-dominated shrublands on various soils ranging from heavy clays to lighter textured sandy loams (Service 2018a). It occurs in mowed but unplowed sites such as railroad and highway right-of-way, cemeteries, mowed fields, and erosional areas along small creeks (Service 2018a).

The action area contains soil types and vegetation communities that might support South Texas ambrosia. However, there is no evidence that the species is presently distributed in Cameron County or occurs within the action area. Therefore, no South Texas ambrosia would be affected by the proposed exchange.

### 5.1.5 Texas Ayenia

Two extant populations of Texas ayenia, a species of flowering plant, occur in Cameron County, Texas: one at C.B. Wood Municipal Park in Harlingen and one on private lands north of Rio Hondo (Service 2016a, 2022c). Neither site is within the action area. Historic occurrences of this plant were reported from other sites in Cameron County, but all are presumed to be extirpated (Service 2016a). The iNaturalist database (2025) does not contain any records of Texas ayenia within 10 miles of the action area, and the closest record to the action area is approximately 12 miles west of the Laguna Unit.

Texas ayenia is found in open, partially shaded ground, within or along the edge of thickets (e.g., subtropical thorn woodlands or tall shrublands). Wild populations of Texas ayenia have been documented in a wide range of alluvial soil types, from sandy loam to heavy clay (Service 2016a).

The action area contains soil types and vegetation communities that might support Texas ayenia. However, there is no evidence that the species presently occurs within the action area. Therefore, no Texas ayenia would be affected by the proposed exchange.

## 5.2 No Conference Determinations

The tricolored bat (*Perimyotis subflavus*), monarch butterfly (*Danaus plexippus*), and critical habitat for the rufa red knot (*Calidris canutus rufa*) are proposed for listing or designation by the Service. Species that are proposed for listing and areas proposed for critical habitat designations are subject to the conference provisions of interagency coordination under certain circumstances. Conference is only required when the effects of the action are likely to jeopardize the continued existence of the species proposed for listing or are likely to cause the destruction or adverse modification of the area proposed for critical habitat designation. As discussed below, none of these resources (i.e., tricolored bat, monarch butterfly, and critical habitat for the rufa red knot) require conference under ESA Section 7 or its implementing regulations. Furthermore, the Service does not anticipate acting on these proposals to list or designate until September 2026 at the earliest (OIRA 2025a, 2025b). Therefore, these proposed species and habitat areas are not considered further this BA.

### **5.2.1 Tricolored Bat and Monarch Butterfly**

The tricolored bat and monarch butterfly each have a very large range and distribution that includes approximately half or more of the United States, parts of Canada and Mexico, and beyond (Service 2021a, 2024b). Both species are habitat generalists for at least part of their life cycle. Tricolored bats use many different types of forest cover and some non-forest cover for summer and winter roosting (Service 2021a). Monarch butterflies use many different types of native and nonnative herbaceous plant communities for foraging, egg laying, and larval development (Service 2024b). These general habitats (forest cover for tricolored bats and herbaceous cover for monarch butterflies) are abundant and widely distributed within the very large ranges of these species. The Service estimates 929 million acres within the current “extent of occurrence” for tricolored bats (Service 2021a). The National Land Cover Dataset identifies approximately 335 million acres of grassland or herbaceous land cover in the United States (Dewitz 2023), which is a reasonable landscape-scale indicator of potential foraging or larval habitat for monarch butterflies.

Habitat features that support vulnerable life stages or large concentrations of tricolored bats or monarch butterflies (e.g., caves where bats hibernate or trees where butterflies overwinter) are not present in the action area and would not be affected by the proposed exchange. The geology underlying the action area (alluvium, barrier island deposits, and windblown deposits) does not form caves (Texas Water Science Center 2014). While road culverts are sometimes used by tricolored bats as hibernacula or winter roosts (Service 2021a), the action area is low-lying ground that is frequently flooded making culverts unlikely to be regular wintering habitat for tricolored bats. Monarch butterflies rely on specific forest areas in Mexico and California for wintering (Service 2024b). Neither of these monarch butterfly wintering areas occur in the action area.

Therefore, while some tricolored bats and monarch butterflies may be affected by the proposed exchange through loss or modification of habitat and exposure to potentially other types of effects, the proposed exchange is not likely to jeopardize the continued existence of either species because of the following reasons:

- The size of the action area and even smaller size of the Divested Lands where development is assumed to occur in the future are very small compared to the ranges of the tricolored bat and monarch butterfly. The amount of habitat for these species that might be affected by the proposed action is an insignificant fraction of the total available habitat that may be used by these species.
- The action area contains no habitat resources for the tricolored bat or monarch butterfly that are relatively rare, support vulnerable life stages, or that support disproportionately large concentrations of individuals of these species. The proportion of the population that may be affected by the proposed exchange is an insignificant fraction of the total populations of these species.

### **5.2.2 Rufa Red Knot Critical Habitat**

The Service proposed to designate 683,405 acres of critical habitat for the rufa red knot across 127 individual units in 13 states. In Texas, the proposed area of critical habitat includes 186,612 acres across 11 units. The action area partially overlaps proposed critical habitat for the rufa red knot associated with proposed Critical Habitat Unit TX-11. Unit TX-11 includes approximately 15,400 acres (88 Federal Register [FR] 22530).

Only the Boca Chica Beach Parcels, which are Acquired Lands proposed for acquisition by the Service, overlap with proposed rufa red knot critical habitat. The Boca Chica Beach Parcels contain 22.8 acres of proposed critical habitat. No other Acquired Lands or Divested Lands parcels intersect with the proposed

critical habitat (Figure 15). However, the broader action area overlaps with proposed rufa red knot critical habitat in four of the five action area units: Boca Chica Beach Unit (568.7 acres), Las Palomas Unit (296.2 acres), Rio Unit (855.4 acres), and Starbase Unit (408.0 acres).

The proposed physical or biological features of the proposed rufa red knot critical habitat include the following:

(1) Beaches and tidal flats used for foraging; (2) Upper beach areas used for roosting, preening, resting, or sheltering; (3) Ephemeral and/or dynamic coastal features used for foraging or roosting; (4) Ocean vegetation deposits or surf-cast wrack used for foraging and roosting; (5) Intertidal peat banks used for foraging and roosting; (6) Features landward of the beach that support foraging or roosting; and, (7) Artificial habitat mimicking natural conditions or maintaining the physical or biological features 1 to 6 (above). (88 FR 22530)

Therefore, while some proposed critical habitat for the rufa red knot may be affected by the proposed exchange through loss or modification of one or more of the physical or biological features necessary for the conservation of the species, the proposed exchange is not likely to appreciably diminish the value of critical habitat as a whole for the conservation of the rufa red knot (i.e., the definitional threshold for “destruction or adverse modification of”) because of the following reasons:

- Essentially no critical habitat would be replaced by future development of the Divested Lands; no critical habitat is within these lands. The Service acknowledges that rufa red knots use habitats near developed lands if the habitat remains and human disturbance is not excessive.
- Only a small fraction of the total area of the proposed critical habitat designation would be potentially influenced by the off-site impacts of land development or land management activities such as noise, light, or altered stormwater runoff. The amount of proposed critical habitat within the Divested Lands Rio Unit is 5.5% of the total proposed designation and this area is already impacted by development of private lands adjacent to the Rio Parcels.
- The portion of proposed Critical Habitat Unit TX-11 that occurs in the action area does not contain unique, uncommon, or particularly vulnerable physical or biological features compared to the rest of the proposed critical habitat designation. Therefore, the small amount of proposed critical habitat in the action area would not have a disproportionately large effect on the ability of the designation as a whole to support the conservation of the rufa red knot if the proposal is finalized.

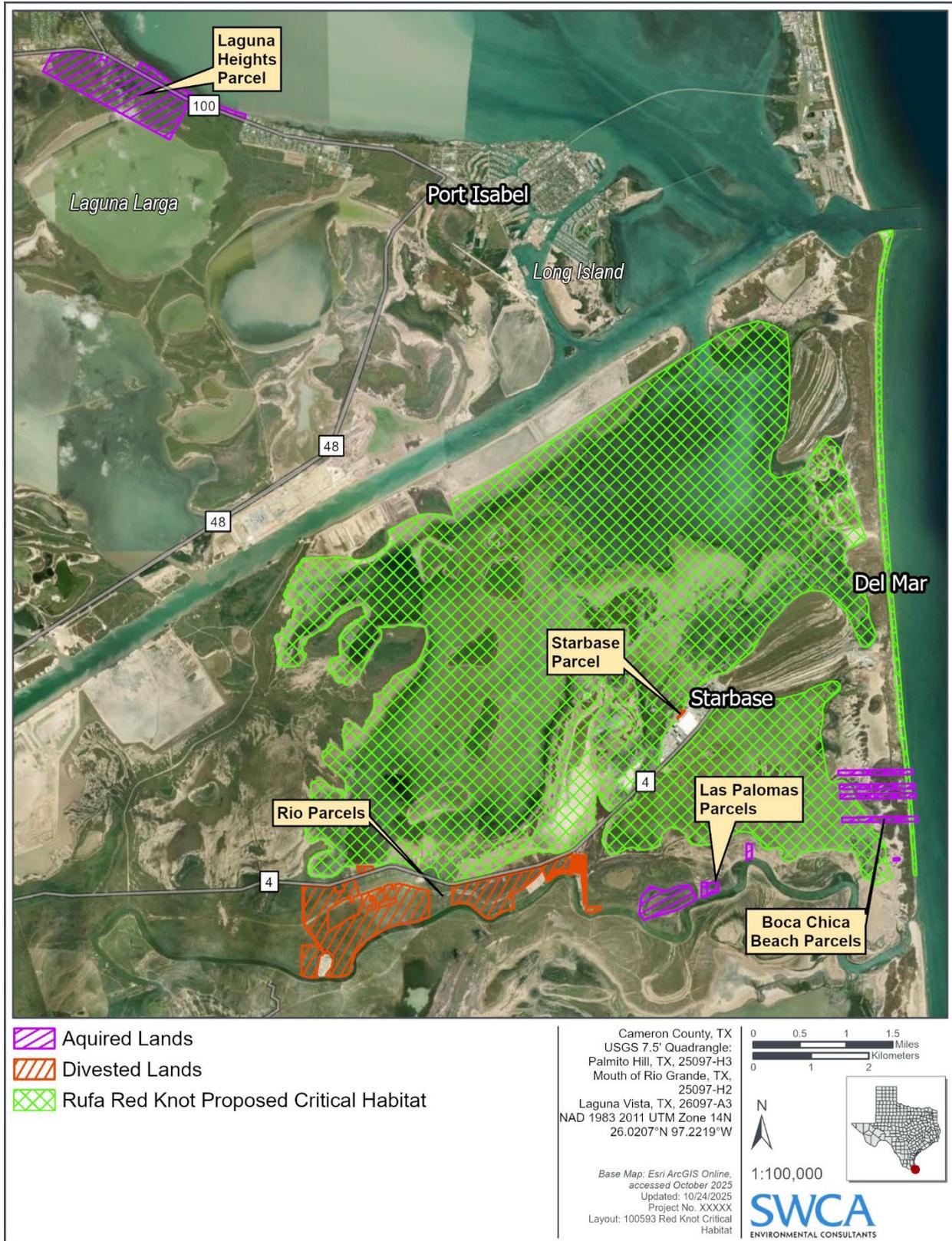


Figure 15. Rufa red knot proposed Critical Habitat Unit TX-11.

## 6 RESOURCE-SPECIFIC ANALYSIS

This section provides information on the status and environmental baseline of each species and critical habitat area that may be affected by the proposed exchange: ocelot (*Leopardis [=Felis] pardalis*), West Indian manatee (*Trichechus manatus*), eastern black rail (*Laterallus jamaicensis jamaicensis*), northern aplomado falcon (*Falco femoralis septentrionalis*), piping plover (*Charadrius melodus*), rufa red knot, green sea turtle (*Chelonia mydas*), hawksbill sea turtle (*Eretmochelys imbricata*), Kemp's ridley sea turtle (*Lepidochelys kempii*), leatherback sea turtle (*Dermochelys coriacea*), loggerhead sea turtle (*Caretta caretta*), and piping plover designated critical habitat. This section also provides an analysis of effects of the proposed exchange on each of these resources, concluding with determinations about whether the effects of the action are likely or not likely to cause an adverse effect.

ESA implementing regulations define "environmental baseline" and "effects of the action" as:

*Environmental baseline* refers to the condition of the listed species or its designated critical habitat in the action area, without the consequences to the listed species or designated critical habitat caused by the proposed action. The environmental baseline includes the past and present impacts of all Federal, State, or private actions and other human activities in the action area, the anticipated impacts of all proposed Federal projects in the action area that have already undergone formal or early section 7 consultation, and the impact of State or private actions which are contemporaneous with the consultation in process. The impacts to listed species or designated critical habitat from Federal agency activities or existing Federal agency facilities that are not within the agency's discretion to modify are part of the environmental baseline.

*Effects of the action* are all consequences to listed species or critical habitat that are caused by the proposed action, including the consequences of other activities that are caused by the proposed action but that are not part of the action. A consequence is caused by the proposed action if it would not occur but for the proposed action and it is reasonably certain to occur. Effects of the action may occur later in time and may include consequences occurring outside the immediate area involved in the action. (50 CFR 402.02)

The Service's *Endangered Species Consultation Handbook: Procedures for Conducting Consultation and Conference Activities under Section 7 of the Endangered Species Act* (Service and National Marine Fisheries Service 1998) offers the following guidance for concluding whether effects of the action are likely or not likely to adversely affect a listed species or critical habitat area:

**Is Not Likely to Adversely Affect** – the appropriate conclusion when effects on listed species are expected to be discountable, insignificant, or completely beneficial. Beneficial effects are contemporaneous positive effects without any adverse effects to the species. Insignificant effects relate to the size of the impact and should never reach the scale where take occurs. Discountable effects are those extremely unlikely to occur. Based on best judgment, a person would not: (1) be able to meaningfully measure, detect, or evaluate insignificant effects; or (2) expect discountable effects to occur.

**Is Likely to Adversely Affect** – the appropriate finding in a biological assessment (or conclusion during informal consultation) if any adverse effect to listed species may occur as a direct or indirect result of the proposed action or its interrelated or interdependent actions, and the effect is not: discountable, insignificant, or beneficial (see definition of "is not likely to adversely affect"). In the event the overall effect of the proposed action is beneficial to the listed species, but is also likely to cause some adverse effects, then the proposed action "is likely to adversely affect" the listed species. If incidental take is anticipated to occur as a result of the proposed action, an "is likely to adversely affect" determination should be made. An "is likely to adversely affect" determination should be made. An "is likely to adversely affect"

determination requires the initiation of formal section 7 consultation. (Service and National Marine Fisheries Service 1998:xv-xvi)

As described in Section 3, the proposed action is an exchange of lands between the Service and SpaceX in the vicinity of the Starbase and Laguna Heights communities. The physical consequences of the proposed exchange would be related to the expected future uses of the Divested Lands and Acquired Lands. These future uses would be either development for a variety of uses related to SpaceX activities or management for wildlife conservation by the Service. For simplicity, the Service assumes that the physical consequences of activities associated with the proposed exchange (i.e., the physical consequences of land development and wildlife conservation activities) are similar in type and spatial extent (see Section 3.3). However, the physical consequences of land development and wildlife conservation activities are likely to differ in terms of magnitude, frequency, and duration. For example, land development activities may use equipment that generates more sound than the equipment used for wildlife conservation activities, or land development may generate noise and light that is consistently elevated whereas wildlife conservation activities may generate elevated noise or light only on an occasional basis.

Generally, the physical consequences of land development and wildlife conservation activities associated with the proposed exchange proposed action may cause the following types of biological impacts to species or their habitats:

- **Habitat Loss or Habitat Protection** – Vegetation clearing and other construction site preparation activities that remove habitat features (e.g., cover, forage, dens, and roosts) temporarily or permanently reduce the amount habitat available to be used by a species. Habitat loss changes the local distribution of a species (e.g., species are not expected to occur in places where habitat is not present). Habitat loss may also reduce the abundance of a species if individuals are killed or injured by the loss of habitat when essential life history behaviors (e.g., breeding, feeding, sheltering, movement) are significantly impaired. Conversely, incorporating Acquired Lands into the federal refuge system would confer upon them the status of protected lands that would likely preclude most opportunity for future development.
- **Habitat Degradation or Habitat Management** – Land development activities (and some wildlife conservation activities) may temporarily or permanently reduce the functional quality of habitat without completely removing the habitat. When severe, habitat degradation can cause functional habitat loss. Like habitat loss, habitat degradation may change the local distribution of a species or reduce the abundance of a species through significant impairment of an essential life behavior through habitat fragmentation and edge effects (e.g., decreased mobility across the landscape, increased predation by avian and mammalian predators that exploit open corridors), as well as through noise and visual disturbance created by human activity (e.g., individuals using habitat near an active construction site may spend more time being wary of human activity and less time foraging) Alternatively, management of Acquired Lands for wildlife conservation would benefit species with potential to occur on those lands through passive management of native habitat or through species-specific habitat restoration and management.
- **Chemical or Hazardous Material Exposure** – Chemicals (e.g., herbicides), fuels, or other hazardous materials used during activities related to land development or wildlife conservation may degrade habitat, particularly for species with relatively small home ranges. Toxicity from chemical or hazardous materials may also directly impact individuals of a species that are susceptible to such exposure. Where chemical or hazardous material exposure substantially degrades habitat or directly impacts individuals, the use of these materials may change the local distribution or reduce the local abundance of the species.
- **Collision** – Activities associated with increased human presence, vehicles, equipment, and machinery can create opportunities to physically encounter individuals of a species. Collisions

can occur under two types of circumstances: 1) when an individual of a species collides with structures (e.g., construction crane, building window); or 2) when vehicles, equipment, or machinery collide with an individual of a species (e.g., crushing viable eggs in an active nest). Collisions may kill or wound individuals of a species and reduce the abundance of local populations.

Whether a particular impact type is applicable to a particular species will depend on the specific circumstances of the species' biology, habitat, distribution, and abundance. These relationships are evaluated, by species, in the following sections.

## **6.1 Ocelot**

### **6.1.1 Biology and Habitat**

Ocelots are a small, largely nocturnal wild cat with a range that is primarily in South and Central America and parts of Mexico. The ocelot primarily inhabits mesquite-thornscrub and live oak mottes, avoiding open areas. The species' habitat in Texas consists of extremely dense mixed-brush cover below from ground level to 4 feet high, comprised of thorny shrublands and dense chaparral vegetation (Service 2016b).

### **6.1.2 Status and Environmental Baseline**

The ocelot has been listed as endangered since 1972. The Service made a negative 90-day finding on a 2021 petition to list the Texas population of ocelot as a distinct population segment (i.e., the petition did not present substantial scientific or commercial information indicating that the petitioned action may be warranted) (Service 2025a). The Service has not prepared a Species Status Assessment for the ocelot and published the latest 5-year Status Review in 2025 (Service 2025a).

The Service estimates that the Texas ocelot population numbers approximately 100 individuals in two separate populations (Service 2025a). One population resides primarily on private ranches in Kenedy, Kleberg, and Willacy counties; the other population primarily resides on the Laguna Atascosa National Wildlife Refuge in Cameron County, Texas (Service 2025a). The 2025 Texas ocelot population estimate is greater than the prior estimate of 80 individuals (Service 2018b). Picillo et al. (2024) report that the refuge population of Texas ocelots is essentially stable (neither substantially increasing nor decreasing). Service (2025a), citing a draft thesis, reported evidence of recent bi-directional dispersal and reproduction between these two Texas populations.

No ocelots are known to regularly occupy or reside in the action area (i.e., the action area units are outside of the known extent of the ranch and refuge ocelot populations). However, patches of thornscrub and riparian woodland habitat are within and adjacent to the Laguna, Las Palomas, and Rio Units of the action area that could be suitable for use by ocelots, at least for the purposes of dispersal. The Boca Chica Beach and Starbase Units of the action area do not have vegetation characteristics necessary to support use by ocelots.

The Laguna Unit of the action area is near dense thornscrub within the Laguna Atascosa National Wildlife Refuge (Picillo et al. 2024). Modeling by Veals et al. (2022) suggests that dense thornscrub within the Laguna Unit of the action area has a moderate or high probability of use by ocelots. The Laguna Unit is within an area identified as a "pinch-point" to ocelot movement between areas of suitable habitat (Lehnen et al. 2021). The lands within the Laguna Unit have been identified as being of "medium" value to connectivity if they are transitioned to optimal habitat conditions for ocelot (Lehnen et al. 2021).

Ocelots have been documented in the vicinity of State Highway 100 between Laguna Vista and Los Fresnos west of the Laguna Unit (Sheikh et al. 2023).

The Las Palomas and Rio Units of the action area have a low probability of use by adult male or female ocelots (Veals et al. 2022). There have been no reports of ocelots south of the Brazos Island Harbor Channel since 1998, approximately 25 years ago. While it is possible for an ocelot to travel across lands in the Las Palomas and Rio Units, it is unlikely that an ocelot would do so. Potentially suitable habitats for ocelots are patchy and fragmented south of the Brazos Island Harbor Channel (Veals et al. 2022). For individuals from known populations in south Texas to reach the Las Palomas and Rio Units, they would need to travel through developed areas of Brownsville, cross or travel along State Highway 4, and/or cross or travel along the Brazos Island Harbor Channel. Ocelots are not expected to easily cross these non-habitat barriers making dispersal to the Las Palomas and Rio Units unlikely. Alternately, an ocelot from the nearest population in Mexico, approximately 100 miles south, would need to traverse a varied landscape to reach the Las Palomas and Rio Units. Because the longest observed dispersal by an ocelot is approximately 31 miles (Booth-Binczik 2007) and the anthropogenic land uses between the ocelot population in northeastern Mexico and the Rio Grande are a barrier to ocelot movement, dispersal from the Mexico population to the Las Palomas and Rio Units is not expected (Martinez et al. 2024).

### **6.1.3 Effects of the Proposed Action**

The proposed action may affect the ocelot in the following ways:

1. **Habitat Loss/Protection** – Divested Lands within the Rio Unit of the action area contain suitable ocelot habitat that would be lost because of future development of these lands by SpaceX. However, this habitat is not currently known to be used by ocelots, has a low probability of current use, and is not identified as an important travel corridor for ocelots. Therefore, the expected loss of this suitable habitat would have an insignificant adverse effect on ocelots. The Divested Lands in the Starbase Unit of the action area do not contain habitat for the ocelot.

Acquisition of the Las Palomas Parcels and Boca Chica Beach Parcels would protect and manage some suitable habitat for ocelots. However, there are no reports of ocelots using these parcels or the Las Palomas and Boca Chica Beach Units of the action area, and the habitat on these parcels has a low probability of current use. Therefore, the protection of the Las Palomas Parcels and Boca Chica Beach Parcels would have an insignificant beneficial effect on ocelots.

Acquisition of the Laguna Heights Parcels by the Service would protect approximately 476.8 acres of suitable habitat for ocelots that abuts the Laguna Atascosa National Wildlife Refuge. The Service believes larger areas protected and managed for ocelots are important for the conservation of the species; the consolidation of the Laguna Heights Parcels with abutting lands in the Bahia Grande area of the Laguna Atascosa National Wildlife Refuge supports this conservation objective. While there are no reports of ocelots using these parcels, the habitat has a medium to high probability of current use. Therefore, acquisition of the Laguna Heights Parcels as part of the refuge system is likely to have a beneficial effect on ocelots.

2. **Habitat Degradation/Management** – Because the ocelot has not been observed south of the Brazos Island Harbor Channel in approximately 25 years and ocelot habitat in the Rio and Las Palomas Units of the action area has a low probability of occupancy and is not identified as an important travel corridor for ocelots, any off-site degradation of ocelot habitat from development of the Divested Lands (e.g., noise, light, human activity) would have an insignificant adverse effect on ocelots. For similar reasons, management of the Las Palomas Parcels and Boca Chica Beach Parcels for wildlife conservation would have insignificant effects on ocelots. The Starbase Unit of the action area does not contain ocelot habitat, and development of the Starbase Parcel would have no effect on ocelots in this unit.

Management of the Laguna Heights Parcels for wildlife conservation would have a likely beneficial effect on the ocelot. Lehnen et al. (2021) predicts that ocelot habitat within the Laguna Unit (both within and adjacent to the Laguna Heights Parcels) would have “medium” value to supporting ocelot dispersal if managed to achieve optimal habitat conditions. The Service could implement management activities on the Laguna Heights Parcels to improve the value of this habitat. Any potentially adverse effects from implementing land management activities would be insignificant, in part because ocelots are not currently known to reside in the Laguna Unit and management activities that might disturb ocelots would be short-term and infrequent.

3. **Chemical or Hazardous Material Exposure** – Ocelots are not expected to be exposed to chemical or hazardous materials associated with development of the Divested Lands or management of lands in the Las Palomas Parcels or Boca Chica Beach Parcels because the species is not expected to occur in the action area units with these lands (i.e., the potential adverse effect is discountable). In the Laguna Unit, ocelots have a medium to high likelihood of occurrence. Management of the Laguna Heights Parcels could involve heavy equipment that could leak or spill, resulting in a potential adverse effect. However, an adverse effect is discountable because the use of heavy equipment for refuge management is not frequent, and the Service would carefully oversee the use of such equipment to prevent spills or leaks.
4. **Collision** – Vehicle mortality on roadways is a threat to ocelots (Service 2025a). It is possible that development of the Divested Lands could increase local traffic on State Highway 4. However, any increased traffic on State Highway 4 associated with such development would have a discountable adverse effect on ocelots because no ocelots have been observed south of the Brazos Island Harbor Channel for approximately 25 years and the likelihood of ocelot occurrence in these areas is low.

Protection and management of the Laguna Heights Parcels, rather than development by SpaceX, could moderate future changes to traffic on the portion of State Highway 100 within the Laguna Unit (a potentially beneficial effect). At the same time, management of the Laguna Heights Parcels to improve ocelot habitat could increase the likelihood that ocelots are exposed to traffic on State Highway 100, thereby potentially increasing the potential for road mortality. The Service expects that management of the Laguna Heights Parcels could include actions that help provide for safe crossing of State Highway 100, such as signage, roadside exclusion fencing, or wildlife crossing culverts. Therefore, increased vehicle collision risk in the Laguna Unit is a discountable adverse effect.

#### **6.1.4 Effect Determination**

Activities associated with the future uses of Divested Lands and Acquired Lands in the Rio, Starbase, Las Palomas, and Boca Chica Beach Units of the action area would have discountable or insignificant effects on ocelots because ocelots have a low likelihood of occurring south of the Brazos Island Harbor Channel. Ocelots may occur in the Laguna Unit of the action area. Acquisition of the Laguna Heights Parcels would have beneficial effects on the ocelot by expanding the area of contiguous protected land and managing ocelot habitat to improve its function as a dispersal corridor. The potentially adverse effects of increased ocelot occurrence near State Highway 100 (and increased risk of vehicle collision) is discountable because the Service expects to take action to minimize such risks. Therefore, the proposed action *may affect, is not likely to adversely affect* the ocelot.

## 6.2 West Indian Manatee

### 6.2.1 Biology and Habitat

The West Indian manatee is an aquatic mammals that uses marine, estuarine, and freshwater habitats. The species is distributed across tropical and subtropical regions of the New World from the southeastern U.S. coastline, through Central America and the West Indies, to the northern shores of South America. West Indian manatees primarily inhabit larger rivers, brackish bays, and coastal waters and are extremely sensitive to cold water, which limits their northward distribution in North America. Manatees observed in Texas waters are temporary summer migrants from Florida; the species does not reside year-round in Texas waters (Schmidly and Bradley 2016; Service 2024c).

### 6.2.2 Status and Environmental Baseline

The West Indian manatee a threatened species, having been downlisted from endangered in 2017 (82 FR 16668). In January 2025, the Service proposed to list separately the Florida and Antillean subspecies of the West Indian manatee, with the Florida subspecies (*T. m. latirostris*) as threatened and the Antillean subspecies (*T. m. manatus*) as endangered (90 FR 3131). This proposed rule, if finalized as proposed, would not change the listing status of the manatees that range into Texas (the Florida subspecies). The Service has not published a Species Status Assessment for the West Indian manatee but has published a Species Status Assessment for the Florida manatee subspecies (Service 2024c). The Service asserts that the January 2025 proposed rule to list separately the manatee subspecies functions as a 5-year Status Review.

West Indian manatees are described as “exceptionally uncommon” in Texas waters (Schmidly and Bradley 2016). Schmidly and Bradley (2016) report that manatees have been observed in several locations along the Texas coast, including near the mouth of the Rio Grande and in the Laguna Madre near Corpus Christi, Texas. In August 2025, a manatee was detected in Port Aransas heading into Corpus Christi Bay, approximately 123 miles north of the action area (Texas Department of Transportation 2025). The closest record of this species on iNaturalist (2025) concerns an individual observed in June 2024 near Port Mansfield, in the waters of the Laguna Madre, approximately 33 miles to the north of the Laguna Unit.

Although rare, West Indian manatees could occur in the coastal waters at the mouth of the Rio Grande and along Boca Chica Beach or in the interior waters of the Laguna Madre. West Indian manatees have not been documented within the Rio Grande channel, although the species is known to occur in slow-moving freshwater rivers in Florida (Edwards 2000). Therefore, it is possible that manatees could occasionally be present in the waters within the Boca Chica Beach and Laguna Units of the action area. Although unprecedented in the Rio Grande, we also consider potential impacts to West Indian manatees within that waterbody overlapping the Las Palomas and Rio Units.

### 6.2.3 Effects of the Proposed Action

The proposed action may affect the West Indian manatee in the following ways:

1. **Habitat Loss/Protection** – The Divested Lands and Acquired Lands do not contain aquatic habitat. Therefore, the proposed exchange will neither cause the loss nor protection of manatee habitat.
2. **Habitat Degradation/Management** – In the unlikely event that a manatee was present in the Rio Grande adjacent to the Rio Parcels, artificial light and noise pollution from development of the

Rio Parcels are not expected to have an adverse effect due to existing artificial light and noise pollution from the Massey Test Site and existing construction activities and residential buildings that currently occur on private lands adjoining the Rio Parcels. Any new artificial lighting or noise pollution would be insignificant with respect to their potential to adversely affect West Indian manatees in the Rio Grande. The Boca Chica Beach, Las Palomas, and Laguna Units will not be developed, and no new artificial light or noise pollution will occur.

3. **Chemical or Hazardous Material Exposure** – Construction activities at the Rio Unit are expected to have contamination control best management practices implemented in accordance with any relevant local, state, or federal regulatory requirements. No adverse effects to the West Indian manatee as a result of chemical or hazardous material exposure is expected to occur.
4. **Collision** – No consequences related to the proposed action would result in water vehicle usage of the Laguna Madre, Rio Grande, or Gulf of America. Therefore, the proposed action would not result in any adverse effects to the West Indian manatee from collision.

### **6.2.4 Effect Determination**

While unlikely, West Indian manatees may occur in the waters within the Boca Chica Beach, Laguna, Las Palomas, and Rio Units of the action area. The Boca Chica Beach and Las Palomas Units are associated with Acquired Lands that would be protected and managed for wildlife conservation. This expected land use would be beneficial, albeit insignificant, for any West Indian manatees using these waters. It is possible that wildlife conservation activities within these Acquired Lands could generate noise or light that manatees might experience. However, manatees are not known to be disturbed by lights or by noise made by the kinds of land-based vehicles or machinery that the Service might use in land management activities; any such adverse effects would be insignificant. Development of the Rio Parcels may contribute marginally to existing artificial light and noise from existing operations at the Massey Test Site and development occurring at Rio East and Rio West. This marginal contribution would be insignificant with respect to its potential to adversely affect West Indian manatees in the Rio Grande. Therefore, the proposed action *may affect, is not likely to adversely affect* the West Indian manatee.

## **6.3 Eastern Black Rail**

### **6.3.1 Biology and Habitat**

The eastern black rail is a bird that inhabits salt and brackish tidal marshes and freshwater wetlands, feeding on aquatic and terrestrial invertebrates and seeds (Eddleman et al. 2020). Eastern black rails live almost entirely under dense, overhead-covering, herbaceous vegetation on moist to saturated soils interspersed with very shallow water. Eastern black rails select areas that not persistently inundated, with nearby refugia during high water (Service 2019). This species is also a rare migrant across the eastern third of the state where coastal populations are augmented during the winter by migratory birds that nest out of state (Lockwood and Freeman 2014).

### **6.3.2 Status and Environmental Baseline**

The eastern black rail was listed as threatened in 2020, and the Service published a Species Status Assessment in August 2019 (Service 2019). Records of eastern black rails in Cameron County are few (Watts 2016). The current expected distribution of the eastern black rail (described as rails contributing to spring/summer, year-round, or breeding distribution) does not extend to Cameron County (Service 2019), although citizen science records exist for the species in Cameron County (eBird 2025; iNaturalist 2025).

Exact locations are obscured on both of the citizen science sites. However, given the lack of public access and preponderance of upland habitat, it is unlikely any of those records overlap with the Laguna Parcel.

There are no records of eastern black rails from within the action area. Most of the action area does not contain suitable habitat for eastern black rails, lacking dense herbaceous vegetation cover at the upland-wetland interface. However, there is a large emergent wetland in the Laguna Heights Parcel south of State Highway 100 (see Figure 11) that could provide suitable habitat for eastern black rails. However, given the current known distribution of breeding or year-round resident eastern black rails, it is unlikely that this wetland is regularly (if at all) occupied by the species.

### **6.3.3 Effects of the Proposed Action**

The proposed action may affect the eastern black rail in the following ways:

1. **Habitat Loss/Protection** – Only the Laguna Unit contains suitable wetland habitat for the eastern black rail. Given that the species is of rare occurrence in Cameron County and the action area is not within the current expected distribution of the species, the eastern black rail is not expected to occur in the Laguna Unit. Therefore, protection of the Acquired Lands in the Laguna Parcels would have an insignificant beneficial effect on the eastern black rail. The eastern black rail is not expected to occur within the Boca Chica Beach, Las Palomas, Starbase, or Rio Units due to a lack of suitable habitat and current expected distribution and would not be exposed to the consequences of the proposed action in those units.
2. **Habitat Degradation/Management** – Similar to rationale for habitat loss/protection, wildlife conservation activities implemented by the Service within the Laguna Unit would have an insignificant effect on the eastern black rail. Land development and wildlife conservation activities in other parts of the action area would have no effect on the eastern black rail.
3. **Chemical or Hazardous Material Exposure** – Eastern black rails are not expected to be exposed to chemical or hazardous materials associated with development of the Divested Lands or management of lands in the Boca Chica Beach and Las Palomas Parcels of the Acquired Lands because the species is not expected to occur in the action area units associated with these lands (i.e., the potential adverse effect is discountable). Management of the Laguna Heights Parcels could involve heavy equipment that could leak or spill, resulting in a potential adverse effect. However, an adverse effect is discountable because the use of heavy equipment for refuge management is not frequent, and the Service would carefully oversee the use of such equipment to prevent spills or leaks.
4. **Collision** – The species is not at risk of collision because the species is not expected to occur in the Boca Chica Beach, Las Palomas, Starbase, or Rio Parcels, and because the Service would consider the eastern black rail for any management activities in the Laguna Heights Parcel and would avoid adverse effects.

### **6.3.4 Effect Determination**

Eastern black rails are not expected to occur within the Boca Chica Beach, Las Palomas, Rio, or Starbase Units and, therefore, no individuals would be impacted by the proposed action involving those units. The Laguna Parcel contains a wetland that may be suitable habitat; however, the species is not known to occur. Wildlife conservation activities by the Service on the Acquired Lands would consider eastern black rail in advance of management activities that could alter suitable habitat in Laguna Parcel and avoid adverse effects. Transfer of the Laguna Parcels to federal management would have a beneficial, but discountable, effect through conservation management of the parcel under the National Wildlife Refuge system. Therefore, the proposed action *may affect, is not likely to adversely affect* the eastern black rail.

## **6.4 Northern Aplomado Falcon**

### **6.4.1 Biology and Habitat**

The northern aplomado falcon is primarily a non-migratory raptor and breeding pairs exhibit strong nest-site fidelity. Northern aplomado falcons hunt over open grasslands, savannas, and sparse shrublands for prey such as small birds, large insects, and occasionally small mammals. In coastal Texas, the northern aplomado falcon occupies fragmented patches of deep-sand prairie, irregularly flooded saline prairies, estuarine marsh edge, and grassland interspersed with sparse woody mottes. These falcons do not build their own nests, but instead use nests constructed by other species on elevated substrates such as large yucca and mesquite trees. Northern aplomado falcons will accept artificial nest platforms (Service 2025b). Reported home ranges size varies from 815 to 69,437 acres (Service 2025b).

Northern aplomado falcons are known to occur along the Texas coast from Boca Chica to Matagorda Island, in the Chihuahuan Desert of the United States and Mexico, as well as in the tropical lowlands of Mexico. Individuals from these populations are not known to interact (Service 2024d).

### **6.4.2 Status and Environmental Baseline**

The Service listed the northern aplomado falcon as endangered in 1986. The Service prepared a Species Status Assessment in July 2025. The Texas population of northern aplomado falcons is 23 pairs (Service 2025b). An established breeding population is known to occur within the Laguna Atascosa National Wildlife Refuge (Service 2014).

A nesting platform maintained by the Service and used heavily by the species over the past several years is located approximately 2.3 miles to the west of the Laguna Unit. Service (2014) reports that an adult pair of northern aplomado falcons regularly used a site approximately 3 miles north of the SpaceX Massey Test Site, presumably where lomas provide trees or shrubs for perching, with two other areas of regular or occasional use reported approximately 5 miles to the west. Monthly avian monitoring by SpaceX since 2014 within 3 miles of the Vertical Launch Area has recorded only one detection of a northern aplomado falcon, which occurred in April 2023 (SWCA 2023). This detection was approximately 3.2 miles northwest of the Starbase Unit. Numerous recent (<5 years) reports on eBird (2025) exist for the portion of State Highway 100 that bisects the Laguna Unit, and only three eBird (2025) reports since 2020 along State Highway 4 near the Rio Unit. Northern aplomado falcons are not known to nest within any of the action area units.

The Boca Chica Beach and Las Palomas Parcels contain scattered yuccas, which could potentially be used as hunting perches, and grassland habitat for foraging; however, there are no records of this species within these parcels (eBird 2025; SWCA 2025).

The Rio Unit contains utility poles, taller shrubs, and yuccas, which northern aplomado falcons might use as hunting perches, and grassland habitat that could potentially be used for foraging. However, only three eBird (2025) reports of the species have been made since 2020, all concerning birds along State Highway 4 during the non-breeding season. There are no nesting records of northern aplomado falcons within this unit. Numerous recent eBird records exist from the area of the Palmito Ranch Battlefield State Historic Site, approximately 2 miles west of the Rio Parcels; however, no breeding records exist at that location either, and all eBird records are during the non-breeding season, indicating that the Palmito Ranch Battlefield State Historic Site is within the non-breeding home range of a pair of falcons but not the breeding home range. It is possible that this non-breeding home range could stretch into the western portion of the Rio Unit, but sparse records indicate that the habitat is more preferable west of the unit.

The Laguna Unit contains utility poles, larger trees and shrubs, and large yuccas that northern aplomado falcons might use as hunting perches. It also contains grassland habitat that could potentially be used for foraging. As mentioned previously, an artificial nest platform is occupied by a northern aplomado falcon pair approximately 2.3 miles to the west of the Laguna Heights Parcels. Northern aplomado falcons, presumably one or both of this pair and their offspring, are also frequently observed at the South Texas Ecotourism Center, which is adjacent to the Laguna Heights Parcels and within the Laguna Unit. One individual was reported from the South Texas Ecotourism Center as recently as October 14, 2025 (eBird 2025). Additionally, several records exist from State Highway 100, which bisects the Laguna Heights Parcels. Numerous records exist from these locations within both the non-breeding and breeding seasons, indicating that property immediately adjacent to the Laguna Heights Parcels is within both the breeding and non-breeding home range of the species. As the non-breeding home range for northern aplomado falcons is much more expansive than the breeding home range, the Laguna Heights Parcels are at least within the non-breeding home range, and possibly within the breeding home range of the northern aplomado falcons occupying the artificial nest platform west of the Laguna Heights Parcels.

The Starbase Unit contains several short yuccas and tall, shrubby vegetation that are unsuitable perch sites for the species. As the Starbase Parcel is so small and lacks grassland, there is also no foraging habitat for the northern aplomado falcon in the Starbase Unit.

No northern aplomado falcons or nests were observed by SWCA within or immediately adjacent to any of the Acquired or Divested Parcels during the September 2025 field visit.

### **6.4.3 Effects of the Proposed Action**

The proposed action may affect the northern aplomado falcon in the following ways:

1. **Habitat Loss/Protection** – Divested Lands within the Rio Unit of the action area contain suitable northern aplomado falcon hunting habitat that would be permanently lost because of future development of these lands by SpaceX. However, this habitat is not currently known to be used on a regular basis by northern aplomado falcons. Therefore, the expected loss of this suitable habitat would have an insignificant adverse effect on the species. The other Divested Lands in the Starbase Unit of the action area do not contain suitable habitat and development of those lands would not affect northern aplomado falcons.

Acquisition of the Boca Chica Beach and Las Palomas Parcels would protect and manage some suitable habitat for northern aplomado falcons. However, there are no reports of the species using these parcels, and the habitat on these parcels does not provide suitable nesting substrates. Therefore, the protection of the Boca Chica Beach and Las Palomas Parcels would have an insignificant beneficial effect on northern aplomado falcons.

Acquisition of the Laguna Heights Parcels by the Service would protect approximately 475 acres of suitable habitat for northern aplomado falcon that abuts the Laguna Atascosa National Wildlife Refuge. The Service believes larger areas protected and managed for northern aplomado falcons are important for the conservation of the species; the consolidation of the Laguna Heights Parcels with abutting lands of the Laguna Atascosa National Wildlife Refuge supports this conservation objective. Northern aplomado falcons have been reported along the portion of State Highway 100 that bisects the Laguna Unit indicating that the species does use the Laguna Unit in some capacity, although no large yuccas suitable for nesting were discovered during the September 2025 field visit. Therefore, acquisition of Laguna Heights Parcels as part of the refuge system is likely to have a beneficial effect on northern aplomado falcon.

2. **Habitat Degradation/Management** – Because the habitat in the Rio Unit does not contain nesting substrates, any off-site degradation of northern aplomado falcon habitat from development of the Divested Lands (e.g., noise, light, human activity) would have an insignificant adverse effect on the species. For similar reasons, management of the Las Palomas and Boca Chica Beach Parcels for wildlife conservation would have insignificant positive effects on northern aplomado falcons. The Starbase Unit of the action area does not contain northern aplomado falcon habitat, and development of the Starbase Parcel would have no effect on northern aplomado falcons in this unit.

Management of the Laguna Heights Parcels for wildlife conservation would have a likely beneficial effect on the northern aplomado falcon. Individuals have been documented using the uplands associated with the Laguna Unit. The Service could implement management activities on the Laguna Heights Parcel, including establishing an artificial nest structure. Any potentially adverse effects from implementing land management activities would be temporary and insignificant, in part because the Service will consider the species before doing management activities and would avoid potential adverse effects.

3. **Chemical or Hazardous Material Exposure** – Northern aplomado falcons are not expected to be exposed to chemical or hazardous materials associated with development of the Divested Lands because northern aplomado falcons are not expected to occur in the Starbase Parcels. No development is planned for the Acquired Lands of the Boca Chica Beach and Las Palomas Parcels; therefore, northern aplomado falcons would not be exposed to potential chemical or hazardous material exposure.

Northern aplomado falcons are likely to occur in the Laguna Unit. Management of the Laguna Heights Parcels could involve heavy equipment that could leak or spill, resulting in a potential adverse effect. However, an adverse effect is discountable because the use of heavy equipment for refuge management is not frequent, and the Service would carefully oversee the use of such equipment to prevent spills or leaks.

4. **Collision** – Vehicle mortality has been identified as a conceptual threat to northern aplomado falcons (Hager 2009); however, no vehicular collisions have been documented for the species (Service 2025b). It is possible that development of the Divested Lands could increase local traffic on State Highway 4. However, any increased traffic on State Highway 4 associated with such development would have a discountable adverse effect on northern aplomado falcons because the likelihood of northern aplomado falcon occurrence within the Rio Unit is low and the species has never been documented as a vehicular mortality.

Protection and management of the Laguna Heights Parcels, rather than development by SpaceX, could moderate future changes to traffic on the portion of State Highway 100 within the Laguna Unit (a potentially beneficial effect). The Service expects that management of the Laguna Heights Parcels for northern aplomado falcon will not alter current or future use patterns by northern aplomado falcons and, thus, risk of collision would not change from existing conditions. Therefore, increased vehicle collision risk in the Laguna Unit is not expected.

#### **6.4.4 Effect Determination**

Northern aplomado falcon suitable hunting habitat is present within the Boca Chica Beach, Laguna, Las Palomas, and Rio Parcels. Northern aplomado falcons are not expected to occur on the Starbase Parcel due to a lack of suitable habitat and development of that parcel would not affect northern aplomado falcons. Because no nest territories are within the Rio Unit, the habitat loss and degradation resulting from SpaceX development of the Rio Parcels would have a discountable adverse effect. Suitable hunting habitat is present in the Boca Chica Beach and Las Palomas Units; however, the species is not known to

occur in those units. Therefore, protection and conservation management of those units would have an insignificant beneficial effect on the northern aplomado falcon. Transfer of the Laguna Unit to federal management would have a beneficial effect by consolidating patches of adjoining northern aplomado falcon habitat under the National Wildlife Refuge system where the species is known to occur. Therefore, the proposed action *may affect, is not likely to adversely affect* the northern aplomado falcon.

## **6.5 Piping Plover**

### **6.5.1 Biology and Habitat**

The piping plover is a small, migratory shorebird that feeds on invertebrates in the intertidal and supratidal zones, frequently foraging along the wrack line and shallow flats. Their life cycle includes a breeding season in northern and interior habitats (e.g., on sandy or gravelly beaches, riverine sandbars, and alkali lake shores) and a long non-breeding period spent along coastal and estuarine shores (e.g., beaches, mudflats, tidal flats, shell-rich flats, and algal mats). During migration and over winter, piping plovers use a mosaic of ephemeral habitats that shift with local weather, tides, and water levels (Service 2024e).

Piping plovers migrate through Texas and overwinter along the Texas Gulf Coast generally beginning in mid-July (Campbell 2003; Lockwood and Freeman 2014). Piping plovers overwintering in Texas are mostly from the Northern Great Plains Distinct Population Segment (DPS) (Service 2024e). Most piping plovers begin migrating toward breeding grounds by late February, and most are gone from Texas by mid-May (Campbell 2003).

### **6.5.2 Status and Environmental Baseline**

The piping plovers on their wintering range have been listed as threatened since 1986. The Service has not published a Species Status Assessment for the piping plover; the most recent 5-year Status Review is dated December 2024 (Service 2024e). Available information suggests that the abundance of piping plovers from the Northern Great Plains DPS has remained stable, at least between 1991 and 2016, although the Service notes that these data are not sufficiently consistent in methodology, time frames, and metrics to support inference towards recovery progress (Service 2024e). Using estimates of vital metrics and connectivity among subpopulations, Service (2024e) reports that the Northern Great Plains DPS has a 50-year extinction risk of 22%, which is below the target threshold of 5% deemed necessary for demonstrating future viability.

On the wintering grounds, Service (2024e) reports that piping plover abundance has also remained apparently stable, excepting at Boca Chica, Texas. However, analysis of routine avian monitoring data collected within 3 miles of the Vertical Launch Area between the 2014 and 2024 wintering seasons found no significant trend in the number of piping plovers detected at this site (SWCA 2025).

Suitable habitat for piping plovers (i.e., bare or sparsely vegetated wind-tidal flats or beach) is within all units of the action area. However, only the Acquired Lands contain such habitat. Piping plovers are known to use the beach and wind-tidal flats associated with the Boca Chica Beach Parcels (SWCA 2025). There is no data regarding the occurrence of piping plovers on the Laguna Heights Parcels. None of the Divested Lands contain piping plover habitat, as they are either too densely vegetated or not sufficiently connected to the intertidal or supratidal hydrology of the region. The parcels of Divested Lands north of State Highway 4 abut, but do not substantially contain, piping plover habitat.

### 6.5.3 Effects of the Proposed Action

The proposed action may affect the piping plover in the following ways:

1. **Habitat Loss/Protection** – Acquired Lands within the Boca Chica Beach and Laguna Units of the action area contain suitable piping plover habitat that would be protected from future development by the Service. The other Acquired Lands of the Las Palomas Parcels and the Divested Lands of the Rio and Starbase Units do not contain habitat for the piping plover; however, South Bay wind-tidal flats within the Las Palomas, Rio, and Starbase Units may be used by the species. No direct habitat loss is expected to occur because of the proposed Rio or Starbase Parcels divestiture.

Acquisition of the Boca Chica Parcels would consolidate protected lands within the Lower Rio Grande Valley National Wildlife Refuge among the beachfront properties along Boca Chica Beach extending inland to the Las Palomas wind-tidal flats of the Las Palomas Wildlife Management Area – Boca Chica Unit. Piping plovers are known to use the stretch of Boca Chica Beach contained within the Boca Chica Parcels and the Las Palomas wind-tidal flats in the vicinity of the Boca Chica Parcels (SWCA 2023, 2024, 2025). However, Boca Chica Beach remains a public beach, and access is not restricted except for temporary closures related to SpaceX testing and launch activities and safety concerns (e.g., hurricanes). Therefore, the protection of the Boca Chica Parcels would have an insignificant beneficial effect on piping plovers.

Acquisition of the Laguna Heights Parcels by the Service would protect approximately 46.0 acres of upland and mudflat habitats between State Highway 100 and Laguna Madre. Piping plovers have been documented using the mudflats of Laguna Madre between Port Isabel and Laguna Vista (eBird 2025) and are expected to use the mudflats associated with Laguna Larga. Public access restrictions on the Laguna Heights Parcels would benefit piping plovers by reducing disturbance caused by humans along the Laguna Madre between Laguna Heights and Laguna Vista. Therefore, acquisition of the Laguna Heights Parcels as part of the refuge system is likely to have a beneficial effect on piping plovers.

2. **Habitat Degradation/Management** – Because the Starbase Parcel is adjacent to SpaceX activities at Starbase, including continuous infrastructure construction of production facilities and residential housing, no impacts exceeding current conditions are expected as a consequence of the proposed action. The Rio Unit of the action area north of State Highway 4 contains piping plover habitat within the South Bay wind-tidal flats. Development of the Rio Parcels south of State Highway 4 would have no effect on piping plovers in this unit; however, development of the parcel north of the highway may have a temporary adverse impact during construction from noise and human disturbance by temporarily displacing piping plovers. The surrounding wind-tidal flats contain abundant piping plover habitat; therefore, adverse impacts would be insignificant because piping plovers are expected to resume normal feeding, sheltering, and movement patterns immediately after any potential displacement from the Rio Unit.

Management of the Laguna Heights Parcels for wildlife conservation would have a likely beneficial effect on the piping plover. The Service would implement public access restrictions to reduce human disturbance and thereby improve the quality and value of this habitat. Any potentially adverse effects from implementing land management activities, such as installing boundary signage, would be temporary and insignificant.

3. **Chemical or Hazardous Material Exposure** – Piping plovers are not expected to be exposed to chemical or hazardous materials associated with development of the Divested Lands of the Rio or Starbase Units or management of the Las Palomas Parcels because the species is not expected to occur on the land parcels, although the species may occur within the Las Palomas, Rio, and

Starbase Unit action areas (i.e., the potential adverse effect is discountable). The species is known, or expected to occur, within the Boca Chica Beach and Laguna Units. Management of the Laguna Heights Parcels could involve heavy equipment that could leak or spill, resulting in a potential adverse effect. However, an adverse effect is discountable because the use of heavy equipment for refuge management is not frequent, and the Service would carefully oversee the use of such equipment to prevent spills or leaks. Refuge management of the Boca Chica Parcels is not expected to involve heavy equipment.

4. **Collision** – Vehicle mortality has not been identified as a threat to wintering piping plovers on beaches (Service 2024e). No piping plover fatalities from vehicle collisions have been reported for Boca Chica Beach, likely because piping plovers do not nest on the beach, vehicle speeds are limited by driving conditions, and piping plovers can easily avoid approaching vehicles. Acquisition of the Boca Chica Parcels would consolidate protected lands within the Lower Rio Grande Valley National Wildlife Refuge among the beachfront properties along Boca Chica Beach. Piping plovers regularly use the stretch of Boca Chica Beach contained within the Boca Chica Unit (SWCA 2025). Boca Chica Beach would remain a public beach, and access would not be restricted except for temporary closures related to SpaceX testing and launch activities and safety concerns (e.g., hurricanes). Therefore, the risk of vehicle collision would not change from existing conditions. The Laguna Madre portion of the Laguna Heights Parcels does not currently have vehicle access. If vehicle access were developed by the Service for public use it would be done in accordance with policies and procedures of the NWRS to analyze and mitigate impacts with protection of the species in mind.

#### **6.5.4 Effect Determination**

Piping plovers are not expected to occur on the Las Palomas, Rio, or Starbase Parcels, but may occur within the action area of those units. Adverse impacts to piping plovers by the proposed action involving the Rio and Starbase Parcels are discountable or insignificant due to existing construction and development in the Rio and Starbase Units. No impacts are expected from wildlife conservation activities within the Las Palomas Parcels. Piping plovers occur on the Boca Chica Beach and Laguna Parcels. Potential consequences of wildlife conservation activities on these parcels would not include habitat loss, habitat degradation, chemical and hazardous material exposure, or changes to collision risk above baseline conditions. Transfer of the Boca Chica Beach and Laguna Heights Parcels to federal management would have a beneficial effect afforded by protection and management of those land parcels under the National Wildlife Refuge system. Therefore, the proposed action *may affect, is not likely to adversely affect* the piping plover.

## **6.6 Rufa Red Knot**

### **6.6.1 Biology and Habitat**

The rufa red knot is a migratory shorebird (individual birds may travel up to 19,000 miles each year) that migrates through or overwinters in Texas. Rufa red knots migrate in flocks that can number from a few individuals to several thousand birds.

Like piping plovers, rufa red knots use unvegetated or sparsely vegetated areas of beach and mud flat/intertidal, flat/salt, and flat habitats for resting and foraging in the winter and during migration. They favor muddy or sandy coastal regions, specifically bays, estuaries, tidal flats, herbaceous wetlands, and natural tidal inlets with limited human alteration (Service 2023b).

## 6.6.2 Status and Environmental Baseline

The rufa red knot has been listed as threatened since 2014. The Service published a Species Status Assessment for the rufa red knot in 2020, a 5-year Status Review in 2021 (Service 2021b), and a recovery plan in 2023. The Service estimates the range-wide abundance of rufa red knots as approximately 63,600 individuals and believes that the wintering population of the Western Gulf of America/Central America (which includes the Laguna Madre core area) is declining (albeit with a low degree of certainty and based on information provided by personal communications) (Service 2021b).

The Laguna Madre region of south Texas/north Mexico is identified as an important stopover and core wintering area for the species (Service 2021b). However, rufa red knots migrate in flocks that can number from a few individuals to several thousand birds and are considered an uncommon migrant and rare winter resident along the Texas coast (Lockwood and Freeman 2014). Routine avian monitoring within 3 miles of the Vertical Launch Area has documented rufa red knots sporadically, with most observations occurring during migration in the spring and late summer or fall months (SWCA 2025), suggesting that the species uses these areas during migration and not for extended periods of overwintering.

Suitable habitat for rufa red knots (i.e., bare or sparsely vegetated wind-tidal flats or beach) is within all units of the action area. However, only the Acquired Lands contain such habitat. Rufa red knots are known to occasionally use habitats within the Boca Chica Beach Unit of the action area (SWCA 2025). There is no data regarding the occurrence of rufa red knots on the Laguna Heights Parcels. None of the Divested Lands contain rufa red knot habitat, being either too densely vegetated or not sufficiently connected to the hydrology of the region. The parcels of Divested Lands north of State Highway 4 abut, but do not substantially contain, rufa red knot habitat.

## 6.6.3 Effects of the Proposed Action

The proposed action may affect the rufa red knot in the following ways:

1. **Habitat Loss/Protection** – Acquired Lands within the Boca Chica Beach, Laguna, and Las Palomas Units of the action area contain suitable rufa red knot habitat that would be protected by the Service from future development. The Divested Lands of the Rio and Starbase Parcels Units do not contain habitat for the rufa red knot; however, wind-tidal flats within the Rio and Starbase Units may be used by the species. No direct habitat loss is expected to occur because of the divestiture of the Rio or Starbase Parcels.

Acquisition of the Boca Chica Parcels would consolidate protected lands within the Lower Rio Grande Valley National Wildlife Refuge among the beachfront properties along Boca Chica Beach. Rufa red knots have been documented on Boca Chica Beach during migration and, rarely, in winter, as well as during migration on the east side of the Las Palomas wind-tidal flats (eBird 2025; SWCA 2023, 2024, 2025). However, Boca Chica Beach remains a public beach, and access is not restricted except for temporary closures related to SpaceX testing and launch activities and safety concerns (e.g., hurricanes). Therefore, the protection of the Boca Chica Beach Parcels would have an insignificant beneficial effect on rufa red knots.

Acquisition of the Laguna Heights Parcels by the Service would protect approximately 26 acres of upland and mudflat habitats between State Highway 100 and Laguna Madre. Rufa red knots have not been documented using the mudflats of Laguna Madre between Port Isabel and Laguna Vista (eBird 2025) but may be expected to use those mudflats as well as the mudflats associated with Laguna Larga within the Laguna Atascosa NWR abutting the Laguna Heights Parcel west of Highway 100. Public access restrictions on the Laguna Heights Parcels would benefit rufa red knots by reducing disturbance caused by humans along the Laguna Madre between Laguna

Heights and Laguna Vista. Because rufa red knots have not been documented on the Laguna Heights Parcels but suitable habitat exists, acquisition of the Laguna Heights Parcels as part of the refuge system is likely to have an insignificant beneficial effect on rufa red knots.

2. **Habitat Degradation/Management** – Because Divested Lands of the Starbase Unit are already impacted by SpaceX activities at Starbase, including continuous infrastructure construction of production facilities and residential housing, no impacts exceeding current conditions are expected as a consequence of the proposed action. The Rio Unit of the action area north of State Highway 4 contains rufa red knot habitat within the South Bay wind-tidal flats. Development of the Rio Parcel south of State Highway 4 would have no effect on rufa red knots in this unit; however, development of the parcel north of the highway may have a temporary adverse impact during construction from noise and human disturbance by temporarily displacing rufa red knots. The surrounding wind-tidal flats contain abundant rufa red knot habitat; therefore, adverse impacts would be discountable because rufa red knots are expected to resume normal feeding, sheltering, and movement patterns immediately after displacement for the Rio Unit.

Management of the Laguna Heights Parcels for wildlife conservation would have a likely beneficial effect on the rufa red knot. The Service would implement public access restrictions to reduce human disturbance and thereby improve the quality and value of this habitat. Any potentially adverse effects from implementing land management activities, such as installing boundary signage, would be temporary and insignificant.

3. **Chemical or Hazardous Material Exposure** – Rufa red knots are not expected to be exposed to chemical or hazardous materials associated with development of the Divested Lands of the Rio or Starbase Units, although the species may occur within the Rio and Starbase Units (i.e., the potential adverse effect is discountable). The species is known to occur on Boca Chica Beach and the east side of the Las Palomas wind-tidal flats. Rufa red knots have occurred within the Starbase Unit action area (SWCA 2025), although the upland habitat associated with the Starbase Parcel is not suitable for the species. Management of the Laguna Heights Parcels could involve heavy equipment that could leak or spill, resulting in a potential adverse effect. However, an adverse effect is discountable because the use of heavy equipment for refuge management is not frequent, and the Service would carefully oversee the use of such equipment to prevent spills or leaks. Refuge management of the Boca Chica or Las Palomas Parcels is not expected to involve heavy equipment.
4. **Collision** – Vehicle mortality has not been identified as a threat to rufa red knots (Service 2020). Rufa red knots have been documented on Boca Chica Beach (SWCA 2024; eBird 2025). Acquisition of the Boca Chica Parcels would consolidate protected lands within the Lower Rio Grande Valley NWR among the beachfront properties along Boca Chica Beach. However, Boca Chica Beach would remain a public beach, and access would not be restricted except for temporary closures related to SpaceX testing and launch activities and safety concerns (e.g., hurricanes). Therefore, the risk of vehicle collision would not change from existing conditions. Rufa red knots may use the wind-tidal within the Laguna Unit; however, the Laguna Heights Parcels do not currently have vehicle access. If vehicle access were developed by the Service for public use it would be done in accordance with policies and procedures of the NWRS to analyze and mitigate impacts with protection of the species in mind.

#### **6.6.4 Effect Determination**

Rufa red knots are not expected to occur on the Las Palomas, Rio, or Starbase Parcels, but may occur within the action area of those units. Adverse impacts to rufa red knots by the proposed action involving the Rio and Starbase Parcels are discountable due to existing construction and development in the Rio and Starbase Units. No impacts are expected from management activities of the Las Palomas Parcel. Rufa red

knots are expected to occur on the Boca Chica Beach and Laguna Parcels. Proposed action consequences would not include habitat loss, habitat degradation, chemical and hazardous material exposure, or changes to collision risk above baseline conditions. Transfer of the Boca Chica Beach and Laguna Units to federal management would have a beneficial effect afforded by protection and management of those land parcels under the National Wildlife Refuge system. Therefore, the proposed action *may affect, is not likely to adversely affect* the rufa red knot.

## **6.7 Sea Turtles**

### **6.7.1 Biology and Habitat**

The sea turtles discussed in this report include the five species known to occur along the Texas coast: green sea turtle, hawksbill sea turtle, Kemp's ridley sea turtle, leatherback sea turtle, and loggerhead sea turtle. All five sea turtle species live primarily in the ocean. Females venture onto beaches for brief periods, usually at night, to dig nests and lay eggs. Hatchlings emerge from these beach nests and immediately crawl to the ocean.

Sea turtles may be present in waters of the lower Laguna Madre abutting the Laguna Unit. The lower Laguna Madre is an important foraging habitat for young sea turtles, particularly green sea turtles (Metz and Landry 2013; Shaver et al. 2013), although nesting is not anticipated on this interior beach due to its narrow width (less than 15 feet wide) and low profile making it likely subject to periodic flooding from tidal influences and unsuitable for sea turtle nests (Whitmore and Dutton 1985; Wood and Bjorndal 2000; Shaver et al. 2020; Cuevas et al. 2021; Sönmez 2024). While waters of the Rio Grande have a hydrologic connection to the Gulf of America, sea turtles are not known to travel upstream into the river. The South Bay wind-tidal flats can flood to the Starbase Unit of the action area and sea turtles, particularly subadult green sea turtles, occur in South Bay (Coyne 1994). However, the intermittent nature of flooding and shallow water depth over the South Bay wind-tidal flats during flooding precludes sea turtles from occurring near the Starbase Unit of the action area.

### **6.7.2 Status and Environmental Baseline**

#### **6.7.2.1 GREEN SEA TURTLE (NORTH ATLANTIC DPS)**

A 2016 final listing rule for green sea turtles established 11 DPSs and extended endangered status to three DPSs and threatened status to eight DPSs (81 FR 20058). The threatened North Atlantic DPS has a range that includes the Gulf of America, and this DPS is the listed entity in the action area. The 2016 listing rule is the most recent status assessment of the species by the Service; the Service has not published a Species Status Assessment or 5-year Status Review for the green sea turtle.

The 2016 listing rule describes the North Atlantic DPS has having a high nesting abundance with approximately 167,424 females using 73 nesting sites and with long-term increasing trends in abundance at all major nesting sites under a diversity of mainland and insular nesting locations.

From an April 18, 2025, Biological Opinion by the Service to the Federal Aviation Administration addressing increased cadence of SpaceX launch activity from Starbase (Consultation Number 02ETCC00-2012-F-0186-R00), the Service wrote:

The first recorded green sea turtle activity occurred on Boca Chica Beach in 2019 (which was 1 false crawl). There was no green sea turtle activity documented on Boca Chica Beach prior to 2019, and no activity detected during 2020 and 2021 (Bonka et al. 2024). SpaceX supports sea turtle monitoring on Boca Chica Beach by Sea Turtle, Inc., following protocols approved by the

Service. Data collected by Sea Turtle, Inc. in 2022 and through October 2023 (Sea Turtle, Inc. unpublished data) documented dozens of live, dead, and cold-stunned green sea turtles on or near Boca Chica Beach, one false crawl by a green sea turtle on Boca Chica Beach near the Rio Grande in 2022, four false crawls on Boca Chica Beach in 2023, and one green sea turtle nest on Boca Chica Beach in July of 2023 (this nest was collected by Sea Turtle, Inc.). None of the deaths were noted as likely vehicle strikes.

Therefore, green sea turtles may be present in the Boca Chica Beach Unit of the action area, including on the beach within the associated Acquired Lands. Green sea turtles are unlikely to be within the Starbase Unit of the action area because the water level in South Bay is highly variable at this location. Green sea turtles may be present within the Laguna Unit of the action area but are not expected to use the beach for nesting because the use of interior beaches is very rare and the width of available beach is narrow (approximately 15 feet) and low profile, making it likely subject to periodic flooding from tidal influences and unsuitable for green sea turtle nests (Sönmez 2024). Green sea turtles are not expected to occur in the Rio or Las Palomas Units of the action area that lack both aquatic and beach habitat for the species.

### **6.7.2.2 HAWKSBILL SEA TURTLE**

The hawksbill sea turtle is listed as endangered. The Service has not published a Species Status Assessment for the hawksbill sea turtle and the most recent 5-year Status Review was published in 2013. Hawksbill sea turtle is known to have nested in Texas only once at a nest found at the Padre Island National Seashore in 1998 (Shaver 1998). Juvenile hawksbill sea turtles are known to forage and rest in jetties and occasionally wash ashore.

It is possible for hawksbill sea turtles to occur in the water or on the beach within the Boca Chica Beach and Laguna Units of the action area. However, it is extremely unlikely that any individuals will actually be present because these action area units are not near any jetties known to be used by the species. The closest jetties are at least 6 miles from these units.

### **6.7.2.3 KEMP'S RIDLEY SEA TURTLE**

The Kemp's ridley sea turtle is listed as endangered. The Service has not published a Species Status Assessment for the Kemp's ridley sea turtle and the most recent 5-year Status Review was published in 2015. The species nests annually on Boca Chica Beach with yearly counts ranging from zero to 23 nests (average of 8.7 nests per year from 2014-2025) (Steinhaus 2025).

Kemp's ridley sea turtles occur in the aquatic habitat of the Boca Chica Beach Unit of the action area and may nest on the beach within the associated Acquired Lands. It is possible but unlikely that individuals of this species also occur in the aquatic portion of the Laguna Unit of the action area. It is unlikely and not expected that Kemp's ridley sea turtles nest on the beach portion of the Laguna Heights Parcels because the width of available beach is narrow (approximately 15 feet) and low profile, making it likely subject to periodic flooding from tidal influences and unsuitable for Kemp's ridley sea turtle nests (Shaver et al. 2020).

### **6.7.2.4 LEATHERBACK SEA TURTLE**

The leatherback is listed as endangered. The National Marine Fisheries Service and the Service published a joint Status Review for the leatherback sea turtle in 2020 (National Marine Fisheries Service and Service 2020), which the Service acknowledges as fulfilling the role of a 5-year Status Review. Leatherback sea turtle is known to have nested once in Texas in recent history at a nest found at the Padre

Island National Seashore in 2008. Historical leatherback sea turtle nesting occurred at the Padre Island National Seashore in the 1920s and 1930s (National Park Service 2025).

It is possible for leatherback sea turtles to occur in the water or on the beach within the Boca Chica Beach and Laguna Units of the action area. However, it is extremely unlikely that any individuals will actually be present because these action area units do not contain the deep pelagic waters where leatherback sea turtles forage (National Park Service 2025).

### **6.7.2.5      LOGGERHEAD SEA TURTLE**

A 2011 final rule for loggerhead sea turtles established nine DPSs and extended endangered status to five DPSs and threatened status to four DPSs (76 FR 58868). The threatened Northwest Atlantic DPS has a range that includes the Gulf of America, and this DPS is the listed entity in the action area. The Service and the National Marine Fisheries Service jointly published a 5-year Status Review for the Northwest Atlantic DPS in 2023 (National Marine Fisheries Service and Service 2023). The overall nesting trend of the Northwest Atlantic DPS appears to be stable for over two decades. Loggerhead sea turtle is known to have nested on Boca Chica Beach as recently as 2022. However, no other nests were documented from 2014 to 2025 (Steinhaus 2025).

Loggerhead sea turtles may occur in the aquatic habitat of the Boca Chica Beach Unit of the action area and may nest on the beach within the associated Acquired Lands. It is possible that individuals of this species also occur in the aquatic portion of the Laguna Unit of the action area because the species is known to use shallow bays, lagoons, and ship channels. It is unlikely that loggerhead sea turtles would nest on the beach portion of the Laguna Heights Parcels because the width of available beach is narrow (approximately 15 feet). Loggerhead sea turtles are unlikely to be within the Starbase Unit of the action area because the water level in South Bay is highly variable at this location. Green sea turtles are not expected to occur in the Rio or Las Palomas Units of the action area that lack both suitable aquatic and beach habitat for the species.

### **6.7.3    *Effects of the Proposed Action***

The proposed action may affect sea turtles in the following ways:

1. **Habitat Loss/Protection** – The Acquired Lands of the Boca Chica Beach Unit are the only land parcels of the Acquired and Divested Lands that contain nesting habitat for sea turtles. Kemp’s ridley sea turtle is the only species expected to nest annually on Boca Chica Beach at an average of slightly more than one nest per beach mile (average 8.7 nests per year along the approximate 7.4-mile beach between the Rio Grande and Brazos Island Harbor Channel). Protection of the Boca Chica Beach Parcels would have an insignificant beneficial effect on sea turtles.
2. **Habitat Degradation/Management** – Sea turtles are not expected to occur in the Rio Grande or South Bay wind-tidal flats and, therefore, would not be exposed to habitat degradation from development of the Divested Lands in the Rio or Starbase Units. Management of the Acquired Lands in the Boca Chica Beach and Laguna Units for conservation purposes would have an insignificant beneficial effect on sea turtles.
3. **Chemical or Hazardous Material Exposure** – Sea turtles are not expected to be exposed to chemical or hazardous materials because the species are not expected to occur near the Divested Lands of the Rio and Starbase Units, and because no conservation actions involving heavy equipment are planned for the Acquired Lands of the Boca Chica Beach, Laguna, or Las Palomas Units.

4. **Collision** – The risk of collision with vehicles would not increase above existing levels at the Boca Chica Beach Unit because vehicle speeds, daily patterns of use, and number of vehicles using Boca Chica Beach are not expected to change as a consequence of the proposed action. Therefore, the risk of collision with vehicles is also not expected to change with the addition of the Boca Chica Beach Parcels to federal management.

### **6.7.4 Effect Determination**

Sea turtles are not expected to occur within the Rio Grande or South Bay wind-tidal flats and, therefore, no individuals would be impacted by the proposed action involving the Las Palomas, Rio, or Starbase Units. Sea turtles may occur in the Laguna Madre waters of the Laguna Unit but are not expected to occur on land and, therefore, protection and management of the Laguna Unit would have a beneficial but insignificant effect on sea turtles. Sea turtles, particularly Kemp's ridley sea turtle, could occur on Boca Chica Beach during nesting season. Proposed action consequences would not include habitat loss, habitat degradation, chemical and hazardous material exposure, or changes to collision risk above baseline conditions. Therefore, the proposed action *may affect, is not likely to adversely affect* the green sea turtle, hawksbills sea turtle, Kemp's ridley sea turtle, leatherback sea turtle, or loggerhead sea turtle.

## **6.8 Piping Plover Critical Habitat**

### **6.8.1 Primary Constituent Elements**

Critical habitat for wintering piping plovers is designated based on the primary constituent elements that include habitat components that support foraging, roosting, and sheltering of wintering piping plovers and the physical features necessary for maintaining the natural processes that support these habitat components (66 FR 36086). Habitat components of critical habitat include the presence of intertidal beaches, sand and/or mudflats with no or very little emergent vegetation, and associated dune systems, and adjacent non- or sparsely vegetated sand, mud, or algal flats above annual high tide. These areas may have debris, detritus, or micro-topographic relief less than 50 centimeters above substrate surface that offer refuge to piping plovers from high winds and cold weather. Piping plover Critical Habitat Unit TX-1 is highly used by the species during migration and winter months (June through April, inclusive) and contains all the habitats and characteristics mentioned above.

### **6.8.2 Status and Environmental Baseline**

Piping plover Critical Habitat Unit TX-1 was designated in 2001 and encompasses 7,217 acres of intertidal beach, wind-tidal flats, and beach dune system habitat between the Brazos Island Shipping Channel and the Rio Grande and the Gulf of America and a north-south line between Loma Ochoa and Loma de las Vacas (Figure 16). Designated critical habitat does not include existing developed and densely vegetated habitats within the critical habitat unit boundary (66 FR 36038).

The Boca Chica Beach Parcels contain 97.8 acres of intertidal beach, dunes, and wind-tidal flats within this critical habitat unit. The 1.3-acre Starbase Parcel is within the critical habitat unit; however, the September 2025 habitat assessment found that the Starbase Parcel is comprised of dense, upland vegetation that would not be considered critical habitat (see Figure 7). A portion of the Las Palomas Unit within the Lower Rio Grande Valley National Wildlife Refuge's Las Palomas Wildlife Management Area – Boca Chica Unit and a small portion of the Rio Unit north of Rio East and State Highway 4 partially overlap with the critical habitat unit boundary.

### **6.8.3 Effects of the Action**

Piping plovers are known to variably occupy Boca Chica Beach and the wind-tidal flats of South Bay and the Las Palomas Wildlife Management Area – Boca Chica Unit during migration and winter (June through April, inclusive). According to the September 2025 habitat assessment, the divested Starbase Parcel is a densely vegetated upland that is excluded as designated critical habitat by definition. The Starbase Parcel, however, abuts the South Bay wind-tidal flats to the west which is considered designated critical habitat. SpaceX has maintained a vegetated barrier between Starbase and the South Bay wind-tidal flats and a similar barrier is expected should SpaceX develop the Starbase Parcel. Moreover, SpaceX construction and manufacturing activities are part of the existing baseline conditions of the critical habitat unit adjacent to the Starbase Parcel. Therefore, development of the Starbase Parcel is not expected to have a measurable contribution to existing baseline conditions or cause any adverse effects on the quality of the critical habitat unit.

The Boca Chica Beach Parcels are entirely within the Critical Habitat Unit TX-1. These are Acquired Lands by the Service and, thus, contribute an additional 97.8 acres of piping plover habitat that would benefit from the consolidation of land parcels under Service management. Under Service control, the Boca Chica Beach Unit would be protected against any future developments.

The portion of the Rio Unit that overlaps with critical habitat is already impacted by State Highway 4 and existing construction and activities at Rio East. Divestiture of the Rio Parcels is not expected to contribute to existing baseline conditions of Critical Habitat Unit TX-1. No development is expected to occur within the Acquired Lands of the Las Palomas Parcels; the portion of critical habitat overlapping with the Las Palomas Unit would not be affected by the proposed action.

### **6.8.4 Effect Determination**

Divested Lands of the Rio and Starbase Parcels do not contain piping plover critical habitat. Development of these parcels is not expected to have a measurable effect on baseline conditions because of ongoing Starbase operations and construction of Rio East. No effect is expected from acquisition of the Las Palomas Parcels. Acquired Lands of the Boca Chica Beach Parcels would benefit the piping plover by placing those lands under Service management and protect those lands from future development. Therefore, the proposed action *may affect, is not likely to adversely affect* piping plover Critical Habitat Unit TX-1.

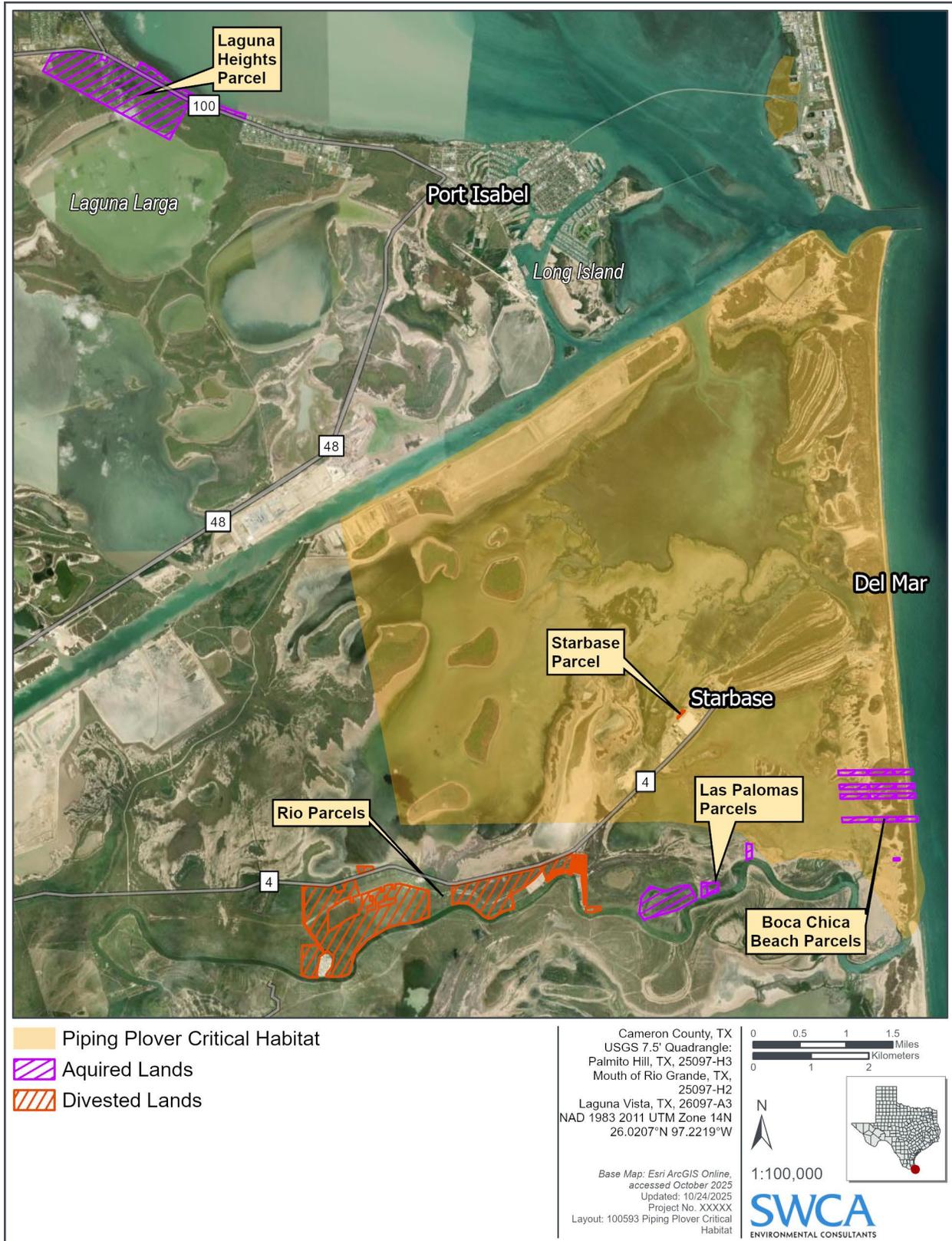


Figure 16. Piping plover Critical Habitat Unit TX-1.

## 7 SUMMARY AND CONCLUSIONS

The Service proposes to exchange certain Lower Rio Grande Valley National Wildlife Refuge parcels with parcels held by SpaceX. The effects of the proposed action include the related activities involving development of Divested Lands and management for wildlife conservation purposes of Acquired Lands. The action area includes those parcels and a 0.5-mile buffer based on noise and light changes arising from the kinds of activities, tools, and equipment used to develop and manage land.

The proposed action will have no effect on four species considered (i.e., Gulf Coast jaguarundi, cactus ferruginous pygmy-owl, South Texas ambrosia, and Texas ayenia) because those species' known distributions do not currently overlap with the action area. Two species proposed for listing (i.e., tricolored bat and monarch butterfly) and one critical habitat area proposed for designation (rufa red knot critical habitat) were also considered and dismissed from further analysis because conference is not required when the effects of the action are not likely to jeopardize the continued existence of a proposed species or destroy or adversely modify proposed critical habitat.

The action area overlaps with the ranges and potential distribution of 11 listed species and one designated critical habitat area. The proposed action may affect but is not likely to adversely affect those 11 species and one designated critical habitat area. Table 2 summarizes the effect determinations for the species and critical habitat areas considered in this BA.

**Table 2. Effects Summary for the Proposed Boca Chica Land Exchange.**

Species or Habitat Area	Effect Determination
<b>Mammals</b>	
Gulf Coast jaguarundi ( <i>Puma yagouaroundi cacomitli</i> )	No effect
Ocelot ( <i>Leopardis [=Felis] pardalis</i> )	May affect, not likely to adversely affect
Tricolored bat ( <i>Perimyotis subflavus</i> )	Conference not required
West Indian manatee ( <i>Trichechus manatus</i> )	May affect, not likely to adversely affect
<b>Birds</b>	
Cactus ferruginous pygmy-owl ( <i>Glaucidium brasilianum cactorum</i> )	No effect
Eastern black rail ( <i>Laterallus jamaicensis jamaicensis</i> )	May affect, not likely to adversely affect
Northern aplomado falcon ( <i>Falco femoralis septentrionalis</i> )	May affect, not likely to adversely affect
Piping plover ( <i>Charadrius melodus</i> )	May affect, not likely to adversely affect
Rufa red knot ( <i>Calidris canutus rufa</i> )	May affect, not likely to adversely affect
<b>Reptiles</b>	
Green sea turtle, North Atlantic Distinct Population Segment ( <i>Chelonia mydas</i> )	May affect, not likely to adversely affect
Hawksbill sea turtle ( <i>Eretmochelys imbricata</i> )	May affect, not likely to adversely affect
Kemp's ridley sea turtle ( <i>Lepidochelys kempii</i> )	May affect, not likely to adversely affect
Leatherback sea turtle ( <i>Dermochelys coriacea</i> )	May affect, not likely to adversely affect
Loggerhead sea turtle, Northwest Atlantic Distinct Population Segment ( <i>Caretta caretta</i> )	May affect, not likely to adversely affect
<b>Mollusks</b>	
Salina mucket ( <i>Potamilus metnecktayi</i> )	Conference not required

<b>Species or Habitat Area</b>	<b>Effect Determination</b>
<b>Insects</b>	
Monarch butterfly ( <i>Danaus plexippus</i> )	Conference not required
<b>Flowering Plants</b>	
South Texas ambrosia ( <i>Ambrosia cheiranthifolia</i> )	No effect
Texas ayenia ( <i>Ayenia limitaris</i> )	No effect
<b>Critical Habitat</b>	
Piping plover critical habitat (Unit TX-1)	May affect, not likely to adversely affect
Rufa red knot critical habitat (Unit TX-11)	Conference not required

## 8 LITERATURE CITED

- Bonka, A.N., T.E. Deserisy, H.R. Frandsen, and D.J. Shaver. 2023. Southernmost nesting record in Texas. *Herpetological Review* 54:641-642.
- Booth-Binczik, S.D. 2007. Monitoring ocelot dispersal with satellite telemetry. *Endangered Species Update* 24:110-112.
- Campbell, L. 2003. *Endangered and Threatened Animals of Texas: Their Life History and Management*. Austin: Texas Parks and Wildlife, Wildlife Division.
- Coyne, M.S. 1994. *Feeding ecology of subadult green sea turtles in south Texas waters*. Master's Thesis, Texas A&M University, College Station, Texas.
- Cuevas, E., M. de los Ángeles Liceaga-Correa, E. Nuñez-Lara, and I. Mariño-Tapia. 2021. How changes in beach morphology affect hawksbill turtle (*Eretmochelys imbricata*) nesting distribution at Celestun, Yucatan, Mexico. *Regional Studies in Marine Science* 44:101714. Available at: <https://doi.org/10.1016/j.rsma.2021.101714>. Accessed October 2025.
- Dewitz, J. 2023. National Land Cover Database (NLCD) 2021 Products: U.S. Geological Survey data release. Available at: <https://doi.org/10.5066/P9JZ7AO3>. Accessed October 2025.
- eBird. 2025. Explore. Available at: <https://ebird.org/explore>. Accessed October 2025.
- Eddleman, W.R., R.E. Flores, and M. Legare. 2020. Black Rail *Laterallus jamaicensis*, version 1.0. In *Birds of the World* (A.F. Poole and F.B. Gill, editors). Cornell Lab of Ornithology, Ithaca, New York. Available at: <https://doi.org/10.2173/bow.blkrai.01>. Accessed October 2025.
- Edwards, H. 2000. *Trichechus manatus*. Available at: [https://animaldiversity.org/accounts/Trichechus\\_manatus/](https://animaldiversity.org/accounts/Trichechus_manatus/). Accessed October 2025.
- Environmental Protection Agency. 2021. Stormwater Best Management Practices - Vegetated Buffers. EPA-832-F-21-028HH. Available at: <https://www.epa.gov/system/files/documents/2021-11/bmp-vegetated-buffers.pdf>. Accessed October 2025.
- Esri. 2024. World Imagery, dated June 12, 2024. Available at: <https://www.arcgis.com/home/item.html?id=10df2279f9684e4a9f6a7f08febac2a9>. Accessed October 2025.
- Federal Aviation Administration. 2022. Final Programmatic Environmental Assessment for the Starship/Super Heavy Launch Vehicle at the SpaceX Boca Chica Launch Site in Cameron County, Texas. Available at: [https://www.faa.gov/sites/faa.gov/files/2022-06/PEA\\_for\\_SpaceX\\_Starship\\_Super\\_Heavy\\_at\\_Boca\\_Chica\\_FINAL.pdf](https://www.faa.gov/sites/faa.gov/files/2022-06/PEA_for_SpaceX_Starship_Super_Heavy_at_Boca_Chica_FINAL.pdf). Accessed October 2025.
- Federal Highway Administration. 2006. Construction Noise Handbook. FHWA-HEP-06-15; DOT-VNTSC-FHWA-06-02; NTIS No. PB2006-109102. Available at: [https://www.fhwa.dot.gov/environment/noise/construction\\_noise/handbook/](https://www.fhwa.dot.gov/environment/noise/construction_noise/handbook/). Accessed October 2025.
- Hager, S.B. 2009. Human-related threats to urban raptors. *Journal of Raptor Research* 43:210-226.

- Hammerson, G., and S. Cannings. 2025. *Herpailurus yagouaroundi cacomitli*: Gulf Coast Jaguarundi. NatureServe Explorer database. Available at: [https://explorer.natureserve.org/Taxon/ELEMENT\\_GLOBAL.2.104968/Herpailurus\\_yagouaroundi\\_cacomitli](https://explorer.natureserve.org/Taxon/ELEMENT_GLOBAL.2.104968/Herpailurus_yagouaroundi_cacomitli). Accessed October 2025.
- iNaturalist. 2025. Available at: <https://www.inaturalist.org/>. Accessed October 2025.
- LANDFIRE. 2025. LF 2024 us\_250 Existing Vegetation Type. Available at: <https://www.landfire.gov/viewer/>. Accessed October 2025.
- Lehnen, S.E., M.A. Sternberg, H.M. Swarts, and S.E. Sesnie. 2021. Evaluating population connectivity and targeting conservation action for an endangered cat. *Ecosphere* 12:e03367.
- Lockwood, M.W., and B. Freeman. 2014. The Texas Ornithological Society Handbook of Texas Birds. 2nd edition. College Station: Texas A&M University Press.
- Lombardi, J.V., A.M. Haines, G.W. Watts, L.I. Grassman, J.E. Janečka, A. Caso, S. Carvajal, Z.M. Wardle, T.J. Yamashita, W.C. Stasey, A.B. Branney, D.G. Scognamillo, T.A. Campbell, J.H. Young, and M.E. Tewes. 2022. Status and distribution of jaguarundi in Texas and Northeastern México: Making the case for extirpation and initiation of recovery in the United States. *Ecology and Evolution*. 12:e8642.
- Martinez, L.A., J.V. Lombardi, G. Powers, A.D. Anderson, T. Campbell, and R.R. Lopez. 2024. Assessing ecological and socio-political factors in site selection for ocelot reintroduction in Texas. *Conservation Science and Practice*. E13113:1–15.
- Metz, T.L., and A.M. Landry. 2013. An assessment of green turtle (*Chelonia mydas*) stocks along the Texas coast, with emphasis on the Lower Laguna Madre. *Chelonian Conservation and Biology* 12:293–302.
- National Park Service. 2025. Leatherback sea turtle. Available at: <https://www.nps.gov/pais/learn/nature/leatherback.htm>. Accessed October 2025.
- Newstead, D. and B. Hill. 2022. Insights into habitat use, abundance, and distribution of piping plovers and red knots on the Texas coast. Coastal Bend and Bays Estuaries Program. Final report to the Canadian Wildlife Service.
- Office of Information and Regulatory Affairs (OIRA). 2025a. Spring 2025 Unified Agenda of Regulatory and Deregulatory Actions – Long-Term Actions. Available at: [https://www.reginfo.gov/public/do/eAgendaHistory?operation=OPERATION\\_GET\\_PUBLICATION&showStage=longterm&currentPubId=202504](https://www.reginfo.gov/public/do/eAgendaHistory?operation=OPERATION_GET_PUBLICATION&showStage=longterm&currentPubId=202504). Accessed October 2025.
- Office of Information and Regulatory Affairs (OIRA). 2025b. Unified Agenda of Regulatory and Deregulatory Actions – Inactive List. Available at: <https://www.reginfo.gov/public/do/eAgendaInactive>. Accessed October 2025.
- Picillo, M., H. Swarts, and M. Sternberg. 2024. Note: Monitoring the ocelot population in the Laguna Atascosa National Wildlife Refuge. *Endangered Species Research*. 55:261–266.
- Schmidly, D.J., and R.D. Bradley. 2016. The Mammals of Texas. 7<sup>th</sup> Edition. Austin: University of Texas Press. Available at: <https://www.depts.ttu.edu/nsrl/mammals-of-texas-online-edition/>. Accessed October 2025.

- Shaver, D.J. 1998. Padre Island National Seashore Kemp's Ridley Sea Turtle Project and Texas Sea Turtle Strandings 1998 Report. U.S. Department of the Interior, National Park Service.
- Shaver, D.J., K.M. Hart, I. Fujisaki, C. Rubio, and A.R. Sartain. 2013. Movement mysteries unveiled: spatial ecology of juvenile green sea turtles. *In* Reptiles in Research, W.I. Lutterschmidt, editor. Available at: [https://www.novapublishers.com/wp-content/uploads/2019/07/978-1-62808-599-0\\_ch23.pdf](https://www.novapublishers.com/wp-content/uploads/2019/07/978-1-62808-599-0_ch23.pdf). Accessed October 2025.
- Shaver, D.J., H.R. Frandsen, J.S. Walker, J.A. George, and C. Gredzens. 2020. Threats to Kemp's ridley sea turtle (*Lepidochelys kempii* Garman, 1880) nests incubating in situ on the Texas coast. *Herpetology Notes* 13:907–923.
- Sheikh, Z.N., J.E. Langbein, K. Ryer, M.S. Rahman, C.A. Gabler, J.H. Young, Jr., R.J. Kline. 2023. Use and effectiveness of wildlife exits designed for ocelots and other mesocarnivores on a south Texas highway. *Frontiers in Ecology and Evolution* 11:1235223. Available at: <https://doi.org/10.3389/fevo.2023.1235223>. Accessed October 2025.
- Sönmez, B. 2024. Repeatability of nest site selection of green turtles on Samandağ Beach. *COMU Journal of Marine Sciences and Fisheries* 7:138-145. Available at: <https://doi.org/10.46384/jmsf.1521720>. Accessed October 2025.
- Steinhaus, J. 2025. Daily sea turtle nest counts on the Texas coast. Available at: <https://seaturtles.org/turtle-count-texas-coast/>. Accessed October 2025.
- SWCA Environmental Consultants (SWCA). 2023. Final Biological Monitoring Annual Report for the SpaceX Boca Chica Launch Site Construction and Seasonal Avian Monitoring—July 2022 to June 2023. Prepared for Space Exploration Technologies Corporation, Hawthorne, California.
- SWCA Environmental Consultants (SWCA). 2024. Biological Monitoring Annual Report for the SpaceX Boca Chica Launch Site Construction and Seasonal Avian Monitoring – July 2023 to June 2024. Prepared for Space Exploration Technologies Corporation, Hawthorne, California.
- SWCA Environmental Consultants (SWCA). 2025. Biological Monitoring Annual Report for the SpaceX Boca Chica Launch Site Construction and Seasonal Avian Monitoring—July 2024 to June 2025. Prepared for Space Exploration Technologies Corporation, Hawthorne, California.
- Texas Department of Transportation. 2025. Manatee sighting halts work at TxDOT ferry construction project. TxDOT Newsroom: Corpus Christi News. Available at: <https://www.txdot.gov/about/newsroom/local/corpus-christi/manatee-sighting-halts-work-at-txdot-ferry-construction-project.html>. Accessed October 2025.
- Texas Parks and Wildlife Department (TPWD). 2023. State Wildlife Action Plan: Texas 2023 Comprehensive Revision. Kelly Conrad Simon, State Wildlife Action Plan Coordinator (editor). Austin, Texas. Available at: <https://tpwd.texas.gov/wildlife/wildlife-diversity/swap/>. Accessed October 2025.
- Texas Parks and Wildlife Department (TPWD). 2025a. Wildlife Fact Sheets: Jaguarundi (*Herpailurus yagouaroundi*). Available at: <https://tpwd.texas.gov/huntwild/wild/species/jag/>. Accessed October 2025.

- Texas Parks and Wildlife Department (TPWD). 2025b. Annotated County Lists of Rare Species by County. Last revised January 15, 2025. Non-game and Rare Species Program Natural Diversity Database. Austin, Texas. Available at: <http://tpwd.texas.gov/gis/rtest/>. Accessed September 2025.
- Texas Water Science Center. 2014. Geologic Database of Texas, 2014-02-01. Available at: <https://webapps.usgs.gov/txgeology/>. Accessed October 2025.
- U.S. Fish and Wildlife Service (Service). 1997. Final Lower Rio Grande Valley and Santa Ana National Wildlife Refuges Comprehensive Conservation Plan.
- U.S. Fish and Wildlife Service (Service). 2010. Final Laguna Atascosa National Wildlife Refuge Comprehensive Conservation Plan. Available at: <https://www.fws.gov/doiddata/dwh-ar-documents/1266/DWH-ARZ000415.pdf>. Accessed October 2025.
- U.S. Fish and Wildlife Service (Service). 2014. Northern Aplomado Falcon (*Falco femoralis septentrionalis*) 5-Year Review: Summary and Evaluation. New Mexico Ecological Services Field Office. Albuquerque, New Mexico.
- U.S. Fish and Wildlife Service (Service). 2016a. Recovery Plan for the Tamaulipan Kidney-petal (Texas ayenia) (*Ayenia limitaris*). Southwest Regional Office. Albuquerque, New Mexico.
- U.S. Fish and Wildlife Service (Service). 2016b. Recovery Plan for the Ocelot (*Leopardus pardalis*) First Revision. Available at: [https://ecos.fws.gov/docs/recovery\\_plan/Ocelot%20Final%20Recovery%20Plan\\_Signed\\_July%202016\\_new%20\(1\).pdf](https://ecos.fws.gov/docs/recovery_plan/Ocelot%20Final%20Recovery%20Plan_Signed_July%202016_new%20(1).pdf). Accessed October 2025.
- U.S. Fish and Wildlife Service (Service). 2018a. Texas Coastal Bend Shortgrass Prairie Multi-species Recovery Plan: including slender rush-pea (*Hoffmannseggia tenella*) and South Texas ambrosia (*Ambrosia cheiranthifolia*). Texas Coastal Ecological Services Field Office. Houston, Texas.
- U.S. Fish and Wildlife Service (Service). 2018b. 5-year Review: Summary and Evaluation; Ocelot (*Leopardus pardalis*) endangered. USFWS Laguna Atascosa National Wildlife Refuge. Los Fresnos, Texas. Available at [https://ecosphere-documents-production-public.s3.amazonaws.com/sams/public\\_docs/species\\_nonpublish/3341.pdf](https://ecosphere-documents-production-public.s3.amazonaws.com/sams/public_docs/species_nonpublish/3341.pdf). Accessed May 2, 2024.
- U.S. Fish and Wildlife Service (Service). 2019. Species Status Assessment Report for the Eastern Black Rail (*Laterallus jamaicensis jamaicensis*). Version 1.3. Southeast Region. Atlanta, Georgia.
- U.S. Fish and Wildlife Service (Service). 2020. Species Status Assessment Report for the Rufa Red Knot (*Calidris canutus rufa*), Version 1.1. North Atlantic-Appalachian Region. Galloway, New Jersey.
- U.S. Fish and Wildlife Service (Service). 2021a. Species Status Assessment Report for the Tricolored Bat (*Perimyotis subflavus*), Version 1.1. Northeast Region Office. Hadley, Massachusetts.
- U.S. Fish and Wildlife Service (Service). 2021b. Rufa Red Knot (*Calidris canutus rufa*) 5-year Review: Summary and Evaluation. New Jersey Field Office. Galloway, New Jersey.

- U.S. Fish and Wildlife Service (Service). 2022a. Species status assessment report for *Glaucidium brasilianum cactorum* (cactus ferruginous pygmy-owl), Version 1.2. Tucson, Arizona: U.S. Fish and Wildlife Service.
- U.S. Fish and Wildlife Service (Service). 2022b. South Texas ambrosia (*Ambrosia cheiranthifolia*) 5-year review: summary and evaluation. Texas Coastal Ecological Services Field Office. Corpus Christi, Texas.
- U.S. Fish and Wildlife Service (Service). 2022c. Texas ayenia (*Ayenia limitaris*) 5-year Review: Summary and evaluation. Texas Coastal Ecological Service Office. Corpus Christi, Texas.
- U.S. Fish and Wildlife Service (Service). 2023. Species status assessment report for two Rio Grande mussels: the Salina mucket (*Potamilus metnecktayi*) and Mexican fawnsfoot (*Truncilla cognata*), Version 1.2. U.S. Fish and Wildlife Service Region 2, Albuquerque, New Mexico.
- U.S. Fish and Wildlife Service (Service). 2024a. Gulf Coast Jaguarundi (*Puma yagouaroundi cacomitli*) 5-year Status Review: Summary and Evaluation. Texas Coastal & Central Plains Ecological Services Field Office. Corpus Christi, Texas. 7 pp. Available at: [https://ecosphere-documents-production-public.s3.amazonaws.com/sams/public\\_docs/species\\_nonpublish/18591.pdf](https://ecosphere-documents-production-public.s3.amazonaws.com/sams/public_docs/species_nonpublish/18591.pdf). Accessed October 2025.
- U.S. Fish and Wildlife Service (Service). 2024b. Monarch Butterfly (*Danaus plexippus*) Species Status Assessment Report. Version 2.3. Midwest Regional Office. Bloomington, Minnesota.
- U.S. Fish and Wildlife Service (Service). 2024c. Species Status Assessment Report for the Florida manatee (*Trichechus manatus latirostris*). Version 1.1. South Atlantic-Gulf and Mississippi Basin Regions. Atlanta, Georgia.
- U.S. Fish and Wildlife Service (Service). 2024d. Northern Aplomado Falcon (*Falco femoralis septentrionalis*) 5-year Status Review: Summary and Evaluation. Texas Coastal and Central Plains Ecological Services Field Office. Corpus Christi, Texas.
- U.S. Fish and Wildlife Service (Service). 2024e. Piping Plover (*Charadrius melodus*) 5-year Review: Summary and Evaluation. Northeast Region, Michigan Field Office, Missouri River Coordinator's Office, and South Carolina Field Office.
- U.S. Fish and Wildlife Service (Service). 2025a. Ocelot (*Leopardus pardalis*) 5-year Status Review: Summary and Evaluation. Southwest Regional Office. Albuquerque, New Mexico.
- U.S. Fish and Wildlife Service (Service). 2025b. Species Status Assessment Report for Northern Aplomado Falcon (*Falco femoralis septentrionalis*). Version 1.0. Corpus Christi, Texas.
- U.S. Fish and Wildlife Service (Service) and National Marine Fisheries Service. 1998. Endangered Species Act Consultation Handbook: Procedures for Conducting Section 7 Consultations and Conferences. Washington, District of Columbia.
- Veals, A.M., J.D. Holbrook, M.J. Cherry, T.A. Campbell, J.H. Young, Jr., M.E. Tewes. 2022. Landscape connectivity for an endangered carnivore: habitat conservation and road mitigation for ocelots in the US. *Landscape Ecology* 38:363–381.

- Watts, B.D. 2016. Status and distribution of the eastern black rail along the Atlantic and Gulf Coasts of North America. The Center for Conservation Biology Technical Report Series, CCBTR-16-09. College of William and Mary/Virginia Commonwealth University, Williamsburg, Virginia.
- Whitmore, C.P., and P.H. Dutton. 1985. Infertility, embryonic mortality, and nest-site selection in leatherback and green sea turtles in Suriname. *Biological Conservation* 34:251–272.
- Wood, D.W., and K.A. Bjorndal. 2000. Relation of temperature, moisture, salinity, and slope to nest site selection in loggerhead sea turtles. *Copeia* 1:119–128.

## **APPENDIX A**

### **Official Species Lists**

Response Letters Generated from the U.S. Fish and Wildlife Service  
Information for Planning and Conservation Online Tool



## United States Department of the Interior



FISH AND WILDLIFE SERVICE  
Texas Coastal & Central Plains Esfo  
17629 El Camino Real, Suite 211  
Houston, TX 77058-3051  
Phone: (281) 286-8282 Fax: (281) 488-5882

In Reply Refer To:

09/09/2025 17:52:55 UTC

Project Code: 2025-0146878

Project Name: Boca Chica Land Swap - SpaceX Parcels

Subject: List of threatened and endangered species that may occur in your proposed project location or may be affected by your proposed project

To Whom It May Concern:

The U.S. Fish and Wildlife Service (Service) field offices in Clear Lake, Corpus Christi, Fort Worth, and Alamo, Texas, have combined administratively to form the Texas Coastal Ecological Services Field Office. All project related correspondence should be sent to the field office address listed below responsible for the county in which your project occurs:

Project Leader; U.S. Fish and Wildlife Service; 17629 El Camino Real Ste. 211; Houston, Texas 77058

*Angelina, Austin, Brazoria, Brazos, Chambers, Colorado, Fayette, Fort Bend, Freestone, Galveston, Grimes, Hardin, Harris, Houston, Jasper, Jefferson, Leon, Liberty, Limestone, Madison, Matagorda, Montgomery, Newton, Orange, Polk, Robertson, Sabine, San Augustine, San Jacinto, Trinity, Tyler, Walker, Waller, and Wharton.*

Assistant Field Supervisor, U.S. Fish and Wildlife Service; 4444 Corona Drive, Ste 215; Corpus Christi, Texas 78411

*Aransas, Atascosa, Bee, Brooks, Calhoun, De Witt, Dimmit, Duval, Frio, Goliad, Gonzales, Jackson, Jim Hogg, Jim Wells, Karnes, Kenedy, Kleberg, La Salle, Lavaca, Live Oak, Maverick, McMullen, Nueces, Refugio, San Patricio, Victoria, and Wilson.*

U.S. Fish and Wildlife Service; Santa Ana National Wildlife Refuge; Attn: Texas Ecological Services Sub-Office; 3325 Green Jay Road, Alamo, Texas 78516

*Cameron, Hidalgo, Starr, Webb, Willacy, and Zapata.*

For questions or coordination for projects occurring in counties not listed above, please contact [arles@fws.gov](mailto:arles@fws.gov).

The enclosed species list identifies threatened, endangered, proposed and candidate species, as well as proposed and final designated critical habitat, that may occur within the boundary of your

proposed project and/or may be affected by your proposed project. The species list fulfills the requirements of the Service under section 7(c) of the Endangered Species Act (Act) of 1973, as amended (16 U.S.C. 1531 *et seq.*).

New information based on updated surveys, changes in the abundance and distribution of species, changed habitat conditions, or other factors could change this list. Please feel free to contact us if you need more current information or assistance regarding the potential impacts to federally proposed, listed, and candidate species and federally designated and proposed critical habitat. Please note that under 50 CFR 402.12(e) of the regulations implementing section 7 of the Act, the accuracy of this species list should be verified after 90 days. This verification can be completed formally or informally as desired. The Service recommends that verification be completed by visiting the IPaC website at regular intervals during project planning and implementation for updates to species lists and information. An updated list may be requested through the IPaC system by completing the same process used to receive the enclosed list.

The purpose of the Act is to provide a means whereby threatened and endangered species and the ecosystems upon which they depend may be conserved. Under sections 7(a)(1) and 7(a)(2) of the Act and its implementing regulations (50 CFR 402 *et seq.*), Federal agencies are required to utilize their authorities to carry out programs for the conservation of threatened and endangered species and to determine whether projects may affect threatened and endangered species and/or designated critical habitat.

A Biological Assessment is required for construction projects (or other undertakings having similar physical impacts) that are major Federal actions significantly affecting the quality of the human environment as defined in the National Environmental Policy Act (42 U.S.C. 4332(2) (c)). For projects other than major construction activities, the Service suggests that a biological evaluation similar to a Biological Assessment be prepared to determine whether the project may affect listed or proposed species and/or designated or proposed critical habitat. Recommended contents of a Biological Assessment are described at 50 CFR 402.12.

If a Federal agency determines, based on the Biological Assessment or biological evaluation, that listed species and/or designated critical habitat may be affected by the proposed project, the agency is required to consult with the Service pursuant to 50 CFR 402. In addition, the Service recommends that candidate species, proposed species and proposed critical habitat be addressed within the consultation. More information on the regulations and procedures for section 7 consultation, including the role of permit or license applicants, can be found in the "Endangered Species Consultation Handbook" at: <http://www.fws.gov/media/endangered-species-consultation-handbook>.

Non-Federal entities may consult under Sections 9 and 10 of the Act. Section 9 and Federal regulations prohibit the take of endangered and threatened species, respectively, without special exemption. "Take" is defined as to harass, harm, pursue, hunt, shoot, wound, kill, trap, capture or collect, or to attempt to engage in any such conduct. "Harm" is further defined (50 CFR § 17.3) to include significant habitat modification or degradation that results in death or injury to listed species by significantly impairing essential behavioral patterns, including breeding, feeding, or sheltering. "Harass" is defined (50 CFR § 17.3) as intentional or negligent actions that create the likelihood of

injury to listed species to such an extent as to significantly disrupt normal behavior patterns which include, but are not limited to, breeding, feeding or sheltering. Should the proposed project have the potential to take listed species, the Service recommends that the applicant develop a Habitat Conservation Plan and obtain a section 10(a)(1)(B) permit. The Habitat Conservation Planning Handbook is available at: <https://www.fws.gov/library/collections/habitat-conservation-planning-handbook>.

#### Migratory Birds:

In addition to responsibilities to protect threatened and endangered species under the Act, there are additional responsibilities under the Migratory Bird Treaty Act (MBTA) and the Bald and Golden Eagle Protection Act (BGEPA) to protect native birds from project-related impacts. Any activity resulting in take of migratory birds, including eagles, is prohibited unless otherwise permitted by the Service (50 C.F.R. Sec. 10.12 and 16 U.S.C. Sec. 668(a)). For more information regarding these Acts visit: <https://www.fws.gov/program/migratory-birds>.

It is the responsibility of the project proponent to comply with these Acts by identifying potential impacts to migratory birds and eagles within applicable National Environmental Policy Act (NEPA) documents (when there is a federal nexus) or a Bird/Eagle Conservation Plan (when there is no federal nexus). Proponents should implement conservation measures to avoid or minimize the production of project-related stressors or minimize the exposure of birds and their resources to the project-related stressors. For more information on avian stressors and recommended conservation measures see <https://www.fws.gov/library/collections/threats-birds>.

In addition to MBTA and BGEPA, Executive Order 13186: *Responsibilities of Federal Agencies to Protect Migratory Birds*, obligates all Federal agencies that engage in or authorize activities that might affect migratory birds, to minimize those effects and encourage conservation measures that will improve bird populations. Executive Order 13186 provides for the protection of both migratory birds and migratory bird habitat.

We appreciate your concern for threatened and endangered species. The Service encourages Federal agencies to include conservation of threatened and endangered species into their project planning to further the purposes of the Act. Please include the Consultation Code in the header of this letter with any request for consultation or correspondence about your project that you submit to our office.

#### Attachment(s):

- Official Species List
- Marine Mammals
- Coastal Barriers

## OFFICIAL SPECIES LIST

This list is provided pursuant to Section 7 of the Endangered Species Act, and fulfills the requirement for Federal agencies to "request of the Secretary of the Interior information whether any species which is listed or proposed to be listed may be present in the area of a proposed action".

This species list is provided by:

**Texas Coastal & Central Plains Esfo**

17629 El Camino Real, Suite 211

Houston, TX 77058-3051

(281) 286-8282

## PROJECT SUMMARY

Project Code: 2025-0146878  
Project Name: Boca Chica Land Swap - SpaceX Parcels  
Project Type: Land Exchange  
Project Description: Proposed land swap  
Project Location:

The approximate location of the project can be viewed in Google Maps: <https://www.google.com/maps/@26.08706195,-97.2813610490179,14z>



Counties: Cameron County, Texas

## ENDANGERED SPECIES ACT SPECIES

There is a total of 18 threatened, endangered, or candidate species on this species list.

Species on this list should be considered in an effects analysis for your project and could include species that exist in another geographic area. For example, certain fish may appear on the species list because a project could affect downstream species.

IPaC does not display listed species or critical habitats under the sole jurisdiction of NOAA Fisheries<sup>1</sup>, as USFWS does not have the authority to speak on behalf of NOAA and the Department of Commerce.

See the "Critical habitats" section below for those critical habitats that lie wholly or partially within your project area under this office's jurisdiction. Please contact the designated FWS office if you have questions.

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1. [NOAA Fisheries](#), also known as the National Marine Fisheries Service (NMFS), is an office of the National Oceanic and Atmospheric Administration within the Department of Commerce.

**MAMMALS**

NAME	STATUS
Gulf Coast Jaguarundi <i>Puma yagouaroundi cacomitli</i> No critical habitat has been designated for this species. Species profile: <a href="https://ecos.fws.gov/ecp/species/3945">https://ecos.fws.gov/ecp/species/3945</a>	Endangered
Ocelot <i>Leopardus (=Felis) pardalis</i> No critical habitat has been designated for this species. Species profile: <a href="https://ecos.fws.gov/ecp/species/4474">https://ecos.fws.gov/ecp/species/4474</a>	Endangered
Tricolored Bat <i>Perimyotis subflavus</i> No critical habitat has been designated for this species. Species profile: <a href="https://ecos.fws.gov/ecp/species/10515">https://ecos.fws.gov/ecp/species/10515</a>	Proposed Endangered
West Indian Manatee <i>Trichechus manatus</i> There is <b>final</b> critical habitat for this species. Your location does not overlap the critical habitat. <b>This species is also protected by the Marine Mammal Protection Act, and may have additional consultation requirements.</b> Species profile: <a href="https://ecos.fws.gov/ecp/species/4469">https://ecos.fws.gov/ecp/species/4469</a>	Threatened

**BIRDS**

NAME	STATUS
Cactus Ferruginous Pygmy-owl <i>Glaucidium brasilianum cactorum</i> There is <b>final</b> critical habitat for this species. Species profile: <a href="https://ecos.fws.gov/ecp/species/1225">https://ecos.fws.gov/ecp/species/1225</a>	Threatened
Eastern Black Rail <i>Laterallus jamaicensis ssp. jamaicensis</i> No critical habitat has been designated for this species. Species profile: <a href="https://ecos.fws.gov/ecp/species/10477">https://ecos.fws.gov/ecp/species/10477</a>	Threatened
Northern Aplomado Falcon <i>Falco femoralis septentrionalis</i> Population: Wherever found, except where listed as an experimental population No critical habitat has been designated for this species. Species profile: <a href="https://ecos.fws.gov/ecp/species/1923">https://ecos.fws.gov/ecp/species/1923</a>	Endangered
Piping Plover <i>Charadrius melodus</i> Population: [Atlantic Coast and Northern Great Plains populations] - Wherever found, except those areas where listed as endangered. There is <b>final</b> critical habitat for this species. Your location overlaps the critical habitat. Species profile: <a href="https://ecos.fws.gov/ecp/species/6039">https://ecos.fws.gov/ecp/species/6039</a>	Threatened
Rufa Red Knot <i>Calidris canutus rufa</i> There is <b>proposed</b> critical habitat for this species. Your location overlaps the critical habitat. Species profile: <a href="https://ecos.fws.gov/ecp/species/1864">https://ecos.fws.gov/ecp/species/1864</a>	Threatened

**REPTILES**

NAME	STATUS
Green Sea Turtle <i>Chelonia mydas</i>	Threatened

NAME	STATUS
Population: North Atlantic DPS There is <b>proposed</b> critical habitat for this species. Your location does not overlap the critical habitat. Species profile: <a href="https://ecos.fws.gov/ecp/species/6199">https://ecos.fws.gov/ecp/species/6199</a>	
Hawksbill Sea Turtle <i>Eretmochelys imbricata</i> There is <b>final</b> critical habitat for this species. Your location does not overlap the critical habitat. Species profile: <a href="https://ecos.fws.gov/ecp/species/3656">https://ecos.fws.gov/ecp/species/3656</a>	Endangered
Kemp's Ridley Sea Turtle <i>Lepidochelys kempii</i> There is <b>proposed</b> critical habitat for this species. Species profile: <a href="https://ecos.fws.gov/ecp/species/5523">https://ecos.fws.gov/ecp/species/5523</a>	Endangered
Leatherback Sea Turtle <i>Dermochelys coriacea</i> There is <b>final</b> critical habitat for this species. Your location does not overlap the critical habitat. Species profile: <a href="https://ecos.fws.gov/ecp/species/1493">https://ecos.fws.gov/ecp/species/1493</a>	Endangered
Loggerhead Sea Turtle <i>Caretta caretta</i> Population: Northwest Atlantic Ocean DPS There is <b>final</b> critical habitat for this species. Your location does not overlap the critical habitat. Species profile: <a href="https://ecos.fws.gov/ecp/species/1110">https://ecos.fws.gov/ecp/species/1110</a>	Threatened

## CLAMS

NAME	STATUS
Salina Mucket <i>Potamilus metnecktayi</i> There is <b>proposed</b> critical habitat for this species. Your location does not overlap the critical habitat. Species profile: <a href="https://ecos.fws.gov/ecp/species/8753">https://ecos.fws.gov/ecp/species/8753</a>	Proposed Endangered

## INSECTS

NAME	STATUS
Monarch Butterfly <i>Danaus plexippus</i> There is <b>proposed</b> critical habitat for this species. Your location does not overlap the critical habitat. Species profile: <a href="https://ecos.fws.gov/ecp/species/9743">https://ecos.fws.gov/ecp/species/9743</a>	Proposed Threatened

## FLOWERING PLANTS

NAME	STATUS
South Texas Ambrosia <i>Ambrosia cheiranthifolia</i> No critical habitat has been designated for this species. Species profile: <a href="https://ecos.fws.gov/ecp/species/3331">https://ecos.fws.gov/ecp/species/3331</a>	Endangered
Texas Ayenia <i>Ayenia limitaris</i> No critical habitat has been designated for this species. Species profile: <a href="https://ecos.fws.gov/ecp/species/4942">https://ecos.fws.gov/ecp/species/4942</a>	Endangered

## CRITICAL HABITATS

There are 2 critical habitats wholly or partially within your project area under this office's jurisdiction.

NAME	STATUS
Piping Plover <i>Charadrius melodus</i> <a href="https://ecos.fws.gov/ecp/species/6039#crithab">https://ecos.fws.gov/ecp/species/6039#crithab</a>	Final
Rufa Red Knot <i>Calidris canutus rufa</i> <a href="https://ecos.fws.gov/ecp/species/1864#crithab">https://ecos.fws.gov/ecp/species/1864#crithab</a>	Proposed

## COASTAL BARRIERS

Projects within the [John H. Chafee Coastal Barrier Resources System](#) (CBRS) may be subject to the restrictions on Federal expenditures and financial assistance and the consultation requirements of the Coastal Barrier Resources Act (CBRA) (16 U.S.C. 3501 et seq.). For more information, please contact the local [Ecological Services Field Office](#) or visit the [CBRA Consultations website](#). The CBRA website provides tools such as a flow chart to help determine whether consultation is required and a template to facilitate the consultation process.

## SYSTEM UNIT (SU)

*Most new Federal expenditures and financial assistance, including Federal flood insurance, are prohibited within System Units. **Federally-funded projects within System Units require consultation with the Service.** Consultation is not required for projects using private, state, or local funds.*

UNIT	NAME	TYPE	SYSTEM UNIT ESTABLISHMENT DATE	FLOOD INSURANCE PROHIBITION DATE
T12	Boca Chica	SU	10/18/1982	10/1/1983
T12	Boca Chica	SU	11/16/1990	11/16/1990
T12	Boca Chica	SU	11/16/1990	11/16/1990
T12	Boca Chica	SU	11/16/1990	11/16/1990
T12	Boca Chica	SU	11/16/1990	11/16/1990

## MARINE MAMMALS

Marine mammals are protected under the [Marine Mammal Protection Act](#). Some are also protected under the Endangered Species Act<sup>1</sup> and the Convention on International Trade in Endangered Species of Wild Fauna and Flora<sup>2</sup>.

The responsibilities for the protection, conservation, and management of marine mammals are shared by the U.S. Fish and Wildlife Service [responsible for otters, walruses, polar bears, manatees, and dugongs] and NOAA Fisheries<sup>3</sup> [responsible for seals, sea lions, whales, dolphins, and porpoises]. Marine mammals under the responsibility of NOAA Fisheries are **not** shown on this list; for additional information on those species please visit the [Marine Mammals](#) page of the NOAA Fisheries website.

The Marine Mammal Protection Act prohibits the take of marine mammals and further coordination may be necessary for project evaluation. Please contact the U.S. Fish and Wildlife Service Field Office shown.

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1. The [Endangered Species Act](#) (ESA) of 1973.
  2. The [Convention on International Trade in Endangered Species of Wild Fauna and Flora](#) (CITES) is a treaty to ensure that international trade in plants and animals does not threaten their survival in the wild.
  3. [NOAA Fisheries](#), also known as the National Marine Fisheries Service (NMFS), is an office of the National Oceanic and Atmospheric Administration within the Department of Commerce.

NAME

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West Indian Manatee *Trichechus manatus*

Species profile: <https://ecos.fws.gov/ecp/species/4469>

## **IPAC USER CONTACT INFORMATION**

Agency: Private Entity  
Name: Camryn Kiel  
Address: 4407 Monterey Oaks Blvd  
Address Line 2: Bldg 1, Ste 110  
City: Austin  
State: TX  
Zip: 78749  
Email: camryn.kiel@swca.com  
Phone: 5124760891

## **LEAD AGENCY CONTACT INFORMATION**

Lead Agency: U.S. Fish and Wildlife Service



## United States Department of the Interior



FISH AND WILDLIFE SERVICE  
Texas Coastal & Central Plains Esfo  
17629 El Camino Real, Suite 211  
Houston, TX 77058-3051  
Phone: (281) 286-8282 Fax: (281) 488-5882

In Reply Refer To:

09/09/2025 17:34:04 UTC

Project Code: 2025-0146895

Project Name: Boca Chica Land Swap - USFWS Parcels

Subject: List of threatened and endangered species that may occur in your proposed project location or may be affected by your proposed project

To Whom It May Concern:

The U.S. Fish and Wildlife Service (Service) field offices in Clear Lake, Corpus Christi, Fort Worth, and Alamo, Texas, have combined administratively to form the Texas Coastal Ecological Services Field Office. All project related correspondence should be sent to the field office address listed below responsible for the county in which your project occurs:

Project Leader; U.S. Fish and Wildlife Service; 17629 El Camino Real Ste. 211; Houston, Texas 77058

*Angelina, Austin, Brazoria, Brazos, Chambers, Colorado, Fayette, Fort Bend, Freestone, Galveston, Grimes, Hardin, Harris, Houston, Jasper, Jefferson, Leon, Liberty, Limestone, Madison, Matagorda, Montgomery, Newton, Orange, Polk, Robertson, Sabine, San Augustine, San Jacinto, Trinity, Tyler, Walker, Waller, and Wharton.*

Assistant Field Supervisor, U.S. Fish and Wildlife Service; 4444 Corona Drive, Ste 215; Corpus Christi, Texas 78411

*Aransas, Atascosa, Bee, Brooks, Calhoun, De Witt, Dimmit, Duval, Frio, Goliad, Gonzales, Jackson, Jim Hogg, Jim Wells, Karnes, Kenedy, Kleberg, La Salle, Lavaca, Live Oak, Maverick, McMullen, Nueces, Refugio, San Patricio, Victoria, and Wilson.*

U.S. Fish and Wildlife Service; Santa Ana National Wildlife Refuge; Attn: Texas Ecological Services Sub-Office; 3325 Green Jay Road, Alamo, Texas 78516

*Cameron, Hidalgo, Starr, Webb, Willacy, and Zapata.*

For questions or coordination for projects occurring in counties not listed above, please contact [arles@fws.gov](mailto:arles@fws.gov).

The enclosed species list identifies threatened, endangered, proposed and candidate species, as well as proposed and final designated critical habitat, that may occur within the boundary of your

proposed project and/or may be affected by your proposed project. The species list fulfills the requirements of the Service under section 7(c) of the Endangered Species Act (Act) of 1973, as amended (16 U.S.C. 1531 *et seq.*).

New information based on updated surveys, changes in the abundance and distribution of species, changed habitat conditions, or other factors could change this list. Please feel free to contact us if you need more current information or assistance regarding the potential impacts to federally proposed, listed, and candidate species and federally designated and proposed critical habitat. Please note that under 50 CFR 402.12(e) of the regulations implementing section 7 of the Act, the accuracy of this species list should be verified after 90 days. This verification can be completed formally or informally as desired. The Service recommends that verification be completed by visiting the IPaC website at regular intervals during project planning and implementation for updates to species lists and information. An updated list may be requested through the IPaC system by completing the same process used to receive the enclosed list.

The purpose of the Act is to provide a means whereby threatened and endangered species and the ecosystems upon which they depend may be conserved. Under sections 7(a)(1) and 7(a)(2) of the Act and its implementing regulations (50 CFR 402 *et seq.*), Federal agencies are required to utilize their authorities to carry out programs for the conservation of threatened and endangered species and to determine whether projects may affect threatened and endangered species and/or designated critical habitat.

A Biological Assessment is required for construction projects (or other undertakings having similar physical impacts) that are major Federal actions significantly affecting the quality of the human environment as defined in the National Environmental Policy Act (42 U.S.C. 4332(2) (c)). For projects other than major construction activities, the Service suggests that a biological evaluation similar to a Biological Assessment be prepared to determine whether the project may affect listed or proposed species and/or designated or proposed critical habitat. Recommended contents of a Biological Assessment are described at 50 CFR 402.12.

If a Federal agency determines, based on the Biological Assessment or biological evaluation, that listed species and/or designated critical habitat may be affected by the proposed project, the agency is required to consult with the Service pursuant to 50 CFR 402. In addition, the Service recommends that candidate species, proposed species and proposed critical habitat be addressed within the consultation. More information on the regulations and procedures for section 7 consultation, including the role of permit or license applicants, can be found in the "Endangered Species Consultation Handbook" at: <http://www.fws.gov/media/endangered-species-consultation-handbook>.

Non-Federal entities may consult under Sections 9 and 10 of the Act. Section 9 and Federal regulations prohibit the take of endangered and threatened species, respectively, without special exemption. "Take" is defined as to harass, harm, pursue, hunt, shoot, wound, kill, trap, capture or collect, or to attempt to engage in any such conduct. "Harm" is further defined (50 CFR § 17.3) to include significant habitat modification or degradation that results in death or injury to listed species by significantly impairing essential behavioral patterns, including breeding, feeding, or sheltering. "Harass" is defined (50 CFR § 17.3) as intentional or negligent actions that create the likelihood of

injury to listed species to such an extent as to significantly disrupt normal behavior patterns which include, but are not limited to, breeding, feeding or sheltering. Should the proposed project have the potential to take listed species, the Service recommends that the applicant develop a Habitat Conservation Plan and obtain a section 10(a)(1)(B) permit. The Habitat Conservation Planning Handbook is available at: <https://www.fws.gov/library/collections/habitat-conservation-planning-handbook>.

#### Migratory Birds:

In addition to responsibilities to protect threatened and endangered species under the Act, there are additional responsibilities under the Migratory Bird Treaty Act (MBTA) and the Bald and Golden Eagle Protection Act (BGEPA) to protect native birds from project-related impacts. Any activity resulting in take of migratory birds, including eagles, is prohibited unless otherwise permitted by the Service (50 C.F.R. Sec. 10.12 and 16 U.S.C. Sec. 668(a)). For more information regarding these Acts visit: <https://www.fws.gov/program/migratory-birds>.

It is the responsibility of the project proponent to comply with these Acts by identifying potential impacts to migratory birds and eagles within applicable National Environmental Policy Act (NEPA) documents (when there is a federal nexus) or a Bird/Eagle Conservation Plan (when there is no federal nexus). Proponents should implement conservation measures to avoid or minimize the production of project-related stressors or minimize the exposure of birds and their resources to the project-related stressors. For more information on avian stressors and recommended conservation measures see <https://www.fws.gov/library/collections/threats-birds>.

In addition to MBTA and BGEPA, Executive Order 13186: *Responsibilities of Federal Agencies to Protect Migratory Birds*, obligates all Federal agencies that engage in or authorize activities that might affect migratory birds, to minimize those effects and encourage conservation measures that will improve bird populations. Executive Order 13186 provides for the protection of both migratory birds and migratory bird habitat.

We appreciate your concern for threatened and endangered species. The Service encourages Federal agencies to include conservation of threatened and endangered species into their project planning to further the purposes of the Act. Please include the Consultation Code in the header of this letter with any request for consultation or correspondence about your project that you submit to our office.

#### Attachment(s):

- Official Species List
- Marine Mammals
- Coastal Barriers

## OFFICIAL SPECIES LIST

This list is provided pursuant to Section 7 of the Endangered Species Act, and fulfills the requirement for Federal agencies to "request of the Secretary of the Interior information whether any species which is listed or proposed to be listed may be present in the area of a proposed action".

This species list is provided by:

**Texas Coastal & Central Plains Esfo**

17629 El Camino Real, Suite 211

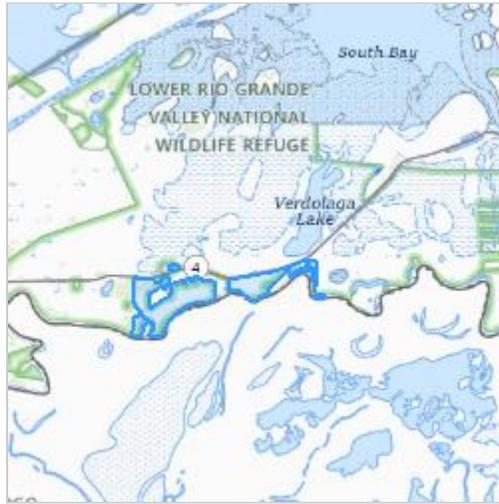
Houston, TX 77058-3051

(281) 286-8282

## PROJECT SUMMARY

Project Code: 2025-0146895  
Project Name: Boca Chica Land Swap - USFWS Parcels  
Project Type: Land Exchange  
Project Description: Proposed land swap  
Project Location:

The approximate location of the project can be viewed in Google Maps: <https://www.google.com/maps/@25.9614906,-97.22217009518374,14z>



Counties: Cameron County, Texas

## ENDANGERED SPECIES ACT SPECIES

There is a total of 16 threatened, endangered, or candidate species on this species list.

Species on this list should be considered in an effects analysis for your project and could include species that exist in another geographic area. For example, certain fish may appear on the species list because a project could affect downstream species.

IPaC does not display listed species or critical habitats under the sole jurisdiction of NOAA Fisheries<sup>1</sup>, as USFWS does not have the authority to speak on behalf of NOAA and the Department of Commerce.

See the "Critical habitats" section below for those critical habitats that lie wholly or partially within your project area under this office's jurisdiction. Please contact the designated FWS office if you have questions.

- 
1. [NOAA Fisheries](#), also known as the National Marine Fisheries Service (NMFS), is an office of the National Oceanic and Atmospheric Administration within the Department of Commerce.

**MAMMALS**

NAME	STATUS
Gulf Coast Jaguarundi <i>Puma yagouaroundi cacomitli</i> No critical habitat has been designated for this species. Species profile: <a href="https://ecos.fws.gov/ecp/species/3945">https://ecos.fws.gov/ecp/species/3945</a>	Endangered
Ocelot <i>Leopardus (=Felis) pardalis</i> No critical habitat has been designated for this species. Species profile: <a href="https://ecos.fws.gov/ecp/species/4474">https://ecos.fws.gov/ecp/species/4474</a>	Endangered
Tricolored Bat <i>Perimyotis subflavus</i> No critical habitat has been designated for this species. Species profile: <a href="https://ecos.fws.gov/ecp/species/10515">https://ecos.fws.gov/ecp/species/10515</a>	Proposed Endangered
West Indian Manatee <i>Trichechus manatus</i> There is <b>final</b> critical habitat for this species. Your location does not overlap the critical habitat. <b>This species is also protected by the Marine Mammal Protection Act, and may have additional consultation requirements.</b> Species profile: <a href="https://ecos.fws.gov/ecp/species/4469">https://ecos.fws.gov/ecp/species/4469</a>	Threatened

**BIRDS**

NAME	STATUS
Cactus Ferruginous Pygmy-owl <i>Glaucidium brasilianum cactorum</i> There is <b>final</b> critical habitat for this species. Species profile: <a href="https://ecos.fws.gov/ecp/species/1225">https://ecos.fws.gov/ecp/species/1225</a>	Threatened
Eastern Black Rail <i>Laterallus jamaicensis ssp. jamaicensis</i> No critical habitat has been designated for this species. Species profile: <a href="https://ecos.fws.gov/ecp/species/10477">https://ecos.fws.gov/ecp/species/10477</a>	Threatened
Northern Aplomado Falcon <i>Falco femoralis septentrionalis</i> Population: Wherever found, except where listed as an experimental population No critical habitat has been designated for this species. Species profile: <a href="https://ecos.fws.gov/ecp/species/1923">https://ecos.fws.gov/ecp/species/1923</a>	Endangered
Piping Plover <i>Charadrius melodus</i> Population: [Atlantic Coast and Northern Great Plains populations] - Wherever found, except those areas where listed as endangered. There is <b>final</b> critical habitat for this species. Your location overlaps the critical habitat. Species profile: <a href="https://ecos.fws.gov/ecp/species/6039">https://ecos.fws.gov/ecp/species/6039</a>	Threatened
Rufa Red Knot <i>Calidris canutus rufa</i> There is <b>proposed</b> critical habitat for this species. Your location overlaps the critical habitat. Species profile: <a href="https://ecos.fws.gov/ecp/species/1864">https://ecos.fws.gov/ecp/species/1864</a>	Threatened

**REPTILES**

NAME	STATUS
Green Sea Turtle <i>Chelonia mydas</i>	Threatened

NAME	STATUS
Population: North Atlantic DPS There is <b>proposed</b> critical habitat for this species. Your location does not overlap the critical habitat. Species profile: <a href="https://ecos.fws.gov/ecp/species/6199">https://ecos.fws.gov/ecp/species/6199</a>	
Hawksbill Sea Turtle <i>Eretmochelys imbricata</i> There is <b>final</b> critical habitat for this species. Your location does not overlap the critical habitat. Species profile: <a href="https://ecos.fws.gov/ecp/species/3656">https://ecos.fws.gov/ecp/species/3656</a>	Endangered
Kemp's Ridley Sea Turtle <i>Lepidochelys kempii</i> There is <b>proposed</b> critical habitat for this species. Species profile: <a href="https://ecos.fws.gov/ecp/species/5523">https://ecos.fws.gov/ecp/species/5523</a>	Endangered

## CLAMS

NAME	STATUS
Salina Mucket <i>Potamilus metnecktayi</i> There is <b>proposed</b> critical habitat for this species. Your location does not overlap the critical habitat. Species profile: <a href="https://ecos.fws.gov/ecp/species/8753">https://ecos.fws.gov/ecp/species/8753</a>	Proposed Endangered

## INSECTS

NAME	STATUS
Monarch Butterfly <i>Danaus plexippus</i> There is <b>proposed</b> critical habitat for this species. Your location does not overlap the critical habitat. Species profile: <a href="https://ecos.fws.gov/ecp/species/9743">https://ecos.fws.gov/ecp/species/9743</a>	Proposed Threatened

## FLOWERING PLANTS

NAME	STATUS
South Texas Ambrosia <i>Ambrosia cheiranthifolia</i> No critical habitat has been designated for this species. Species profile: <a href="https://ecos.fws.gov/ecp/species/3331">https://ecos.fws.gov/ecp/species/3331</a>	Endangered
Texas Ayenia <i>Ayenia limitaris</i> No critical habitat has been designated for this species. Species profile: <a href="https://ecos.fws.gov/ecp/species/4942">https://ecos.fws.gov/ecp/species/4942</a>	Endangered

## CRITICAL HABITATS

There are 2 critical habitats wholly or partially within your project area under this office's jurisdiction.

NAME	STATUS
Piping Plover <i>Charadrius melodus</i> <a href="https://ecos.fws.gov/ecp/species/6039#crithab">https://ecos.fws.gov/ecp/species/6039#crithab</a>	Final

NAME	STATUS
Rufa Red Knot <i>Calidris canutus rufa</i> <a href="https://ecos.fws.gov/ecp/species/1864#crithab">https://ecos.fws.gov/ecp/species/1864#crithab</a>	Proposed

## COASTAL BARRIERS

Projects within the [John H. Chafee Coastal Barrier Resources System](#) (CBRS) may be subject to the restrictions on Federal expenditures and financial assistance and the consultation requirements of the Coastal Barrier Resources Act (CBRA) (16 U.S.C. 3501 et seq.). For more information, please contact the local [Ecological Services Field Office](#) or visit the [CBRA Consultations website](#). The CBRA website provides tools such as a flow chart to help determine whether consultation is required and a template to facilitate the consultation process.

## SYSTEM UNIT (SU)

*Most new Federal expenditures and financial assistance, including Federal flood insurance, are prohibited within System Units. **Federally-funded projects within System Units require consultation with the Service.** Consultation is not required for projects using private, state, or local funds.*

UNIT	NAME	TYPE	SYSTEM UNIT ESTABLISHMENT DATE	FLOOD INSURANCE PROHIBITION DATE
T12	Boca Chica	SU	11/16/1990	11/16/1990

## MARINE MAMMALS

Marine mammals are protected under the [Marine Mammal Protection Act](#). Some are also protected under the Endangered Species Act<sup>1</sup> and the Convention on International Trade in Endangered Species of Wild Fauna and Flora<sup>2</sup>.

The responsibilities for the protection, conservation, and management of marine mammals are shared by the U.S. Fish and Wildlife Service [responsible for otters, walruses, polar bears, manatees, and dugongs] and NOAA Fisheries<sup>3</sup> [responsible for seals, sea lions, whales, dolphins, and porpoises]. Marine mammals under the responsibility of NOAA Fisheries are **not** shown on this list; for additional information on those species please visit the [Marine Mammals](#) page of the NOAA Fisheries website.

The Marine Mammal Protection Act prohibits the take of marine mammals and further coordination may be necessary for project evaluation. Please contact the U.S. Fish and Wildlife Service Field Office shown.

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1. The [Endangered Species Act](#) (ESA) of 1973.

2. The [Convention on International Trade in Endangered Species of Wild Fauna and Flora \(CITES\)](#) is a treaty to ensure that international trade in plants and animals does not threaten their survival in the wild.
3. [NOAA Fisheries](#), also known as the National Marine Fisheries Service (NMFS), is an office of the National Oceanic and Atmospheric Administration within the Department of Commerce.

NAME

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West Indian Manatee *Trichechus manatus*

Species profile: <https://ecos.fws.gov/ecp/species/4469>

## **IPAC USER CONTACT INFORMATION**

Agency: Private Entity  
Name: Camryn Kiel  
Address: 4407 Monterey Oaks Blvd  
Address Line 2: Bldg 1, Ste 110  
City: Austin  
State: TX  
Zip: 78749  
Email: camryn.kiel@swca.com  
Phone: 5124760891

## **APPENDIX B**

### **Draft Programmatic Agreement**



41 **WHEREAS**, the FWS conducted archaeological investigations within the APE to identify  
42 properties that are listed on or eligible for the listing on the National Register of Historic Places  
43 (National Register) in consultation with the Texas SHPO and other consulting parties and  
44 identified historic properties within the parcels proposed for exchange; and  
45

46 **WHEREAS**, the FWS has prepared a report in its identification of historic properties and  
47 evaluation of the potential effects of the undertaking on historic properties, titled *Phase I*  
48 *Cultural Resources Survey for the SpaceX and United States Fish and Wildlife Service Land*  
49 *Exchange in Cameron County, Texas*, and this report provides supporting information to this PA;  
50 and  
51

52 **WHEREAS**, the FWS has determined that the undertaking will have an adverse effect on  
53 properties listed on or eligible for listing on the National Register as discussed below and has  
54 consulted with the Texas SHPO and other signatories pursuant to 36 CFR § 800; and  
55

56 **WHEREAS**, the FWS, in consultation with the Texas SHPO, National Park Service (NPS), and  
57 other signatories, and has determined that the Undertaking will cause adverse effects to the  
58 Palmito Ranch Battlefield National Historic Landmark, due to the transfer of historic properties  
59 out of federal control; and  
60

61 **WHEREAS**, Section 110 (f) of the NHPA specifies that for a Federal undertaking affecting an  
62 NHL, the Federal agency will “to the maximum extent possible, undertake such planning and  
63 actions as may be necessary to minimize harm” to the NHL; and  
64

65 **WHEREAS**, Section 111 of the NHPA specifies that a Federal agency has the authority to  
66 exchange historic property “if the agency head determines that the lease or exchange will  
67 adequately ensure the preservation of the historic property” and certain stipulations as discussed  
68 below are intended to preserve contributing aspects of the Palmito Ranch Battlefield National  
69 Historic Landmark; and  
70

71 **WHEREAS**, archaeological sites 41CF6 (including Site JB-17 and IF IB-18) will be adversely  
72 affected by the proposed land exchange. Newly recorded historic properties including sites JB-  
73 12, JB-15/16, and IF JB-11 and IF-JMN-01 are not individually eligible for the National Register  
74 of Historic Places but do contribute to the eligibility of the Palmito Ranch Battlefield National  
75 Historic Landmark and will be adversely affected by the land exchange. The transfer of 703  
76 acres of USFWS land from within the landmark though this exchange will adversely affect the  
77 integrity of the Palmito Ranch Battlefield National Historic Landmark; and  
78

79 **WHEREAS**, the FWS identified the Apache Tribe of Oklahoma, the Comanche Nation of  
80 Oklahoma, the Wichita and Affiliated Tribes of Oklahoma, the Mescalero Tribe of New Mexico,

81 and the Tonkawa Tribe of Oklahoma as having religious or cultural affiliation with the Project  
82 area, and invited tribes to participate in the Section 106 process and will continue to consult with  
83 them regarding assessments of effects and resolution of adverse effects resulting from actions  
84 taken as part of this Undertaking (see **Attachment E** for Tribal consultation summary); and  
85

86 **WHEREAS**, the interested members of the public have been provided opportunities to comment  
87 on the Project and participate in the Section 106 process through notification letters dated 13  
88 October 2025 and through a Cultural Resources meeting among interested parties on 16  
89 December 2025; and  
90

91 **WHEREAS**, the FWS invited the National Park Service (NPS), which administers the NHL  
92 Program, to participate in the consultation process as a consulting party pursuant to 36CFR  
93 800.2(c)(5); and  
94

95 **WHEREAS**, the FWS invited the Advisory Council on Historic Preservation (ACHP) to  
96 participate in consultation for this undertaking pursuant to 36 CFR 800(a)(1)(iii) by letter dated  
97 13 October 2025 and electronically on 6 November 2026 and ACHP responded that their  
98 participation would be premature at that time in a letter dated 21 November 2025; and  
99

100 **WHEREAS**, in accordance with 36 CFR 800.6(a)(1), the FWS has notified the ACHP of its  
101 adverse effect determination providing specified documentation on 6 February 2026 and the  
102 ACHP decided to participate in consultation by letter dated \*\*\*\*\* and is a Signatory to this  
103 Agreement; and  
104

105 **NOW, THEREFORE**, the FWS, Texas SHPO, NPS, ACHP, and SpaceX agree that the  
106 Undertaking will be implemented in accordance with the following Stipulations in order to take  
107 into account the effects of the Undertaking on historic properties:  
108

109 **STIPULATIONS**  
110

111 The FWS will ensure that the following measures are carried out:  
112

113 **I. PROFESSIONAL QUALIFICATIONS**

- 114 A. All work conducted under this Agreement will be conducted by or under the  
115 direct supervision of professionals meeting the Federal qualification standards in  
116 the discipline appropriate to the properties being treated (Archaeology for  
117 treatments of archaeological sites; History, Architectural History, and/or Historic  
118 Architecture for aboveground resources), as established by the Secretary of the  
119 Interior and published in 36 CFR Part 61, Appendix A.  
120

- 121 B. Standards, guidelines, and statutes. All cultural resource work conducted under  
122 this Agreement will be consistent with NHPA (16 U.S.C. § 470) and Texas  
123 Administrative Code Title 13, Part 2, Chapter 26 and conducted in accordance  
124 with the following standards, guidelines, and statutes as applicable:  
125
- 126 1. The Secretary of Interior: *Standards and Guidelines for Archaeology*  
127 *and Historic Preservation* (1983) (48 FR 44716-44742), including the  
128 Standards for the Treatment of historic Properties (1995); and  
129
  - 130 2. Advisory Council on Historic Preservation: *Treatment of Archaeological*  
131 *Properties: A Handbook* (1980), and the ACHP Policy Statement  
132 *Regarding Treatment of Burial Sites, Human Remains and Funerary*  
133 *Objects*, dated 23 February 2007; and  
134
  - 135 3. Texas Historical Commission: *Archaeological Survey Standards for*  
136 *Texas* and Council of Texas Archaeologists: *Guidelines for Cultural*  
137 *Resource Management Reports*.  
138

139 **II. TRIBAL CONSULTATION PROTOCOLS**  
140

- 141 A. The FWS will afford the Apache Tribe of Oklahoma, the Comanche Nation of  
142 Oklahoma, the Kiowa Tribe of Oklahoma, the Mescalero Apache Tribe of New  
143 Mexico, and the Tonkawa Tribe of Oklahoma the opportunity to review and  
144 comment on any draft plan or report associated with this Undertaking.  
145
- 146 B. The FWS will respond to any request made by a federally recognized Tribe for  
147 government-to-government consultation.  
148
- 149 C. The FWS will respond to any request made by a federally recognized Tribe for  
150 confidentiality regarding their concerns about the effects of the Undertaking on  
151 properties of religious and cultural significance to the Tribe.  
152

153 **III. DEVELOPMENT, REVIEW, AND APPROVAL OF DOCUMENTS**  
154

- 155 A. SpaceX has primary responsibility for developing and revising all deliverables  
156 identified in the stipulations of this PA.  
157
- 158 B. The FWS will review all deliverables developed by SpaceX prior to distribution  
159 to the Signatories and additional consulting parties. SpaceX will address the  
160 FWS's comments prior to distribution.  
161

- 162 C. The FWS will distribute materials electronically for review and comment. Hard  
163 copies will be provided upon request.  
164
- 165 D. Signatories and additional consulting parties will have 30 calendar days, or other  
166 timeframe specified in this PA, from the date of transmission to review and  
167 comment. The FWS will request SHPO concurrence with its determinations and  
168 findings.  
169
- 170 E. If SHPO concurs with FWS’s determinations and findings or does not respond  
171 within the specified timeframe, and no comments are received from additional  
172 consulting parties within the specified timeframe, no further action is required.  
173 FWS will ensure that any noted avoidance and minimization measures are  
174 implemented by SpaceX.  
175
- 176 F. If comments are received, the FWS, in coordination with SpaceX, will take all  
177 comments received within the specified timeframe into consideration. If  
178 necessary, the FWS will coordinate a meeting with the consulting party to resolve  
179 comments.  
180
- 181 G. If SHPO does not concur or an objection is received within the specified  
182 timeframe, the FWS will coordinate a meeting with the SHPO or the objecting  
183 party to resolve the objection. If the FWS cannot resolve the objection, the FWS  
184 will follow the procedures in **Stipulation VII**.  
185
- 186 H. If a deliverable is revised as a result of comments and/or an objection, the FWS  
187 will distribute the revised deliverables to the Signatories and additional consulting  
188 parties once finalized.  
189

190 **IV. AVOIDANCE, MINIMIZATION, AND MITIGATION MEASURES FOR THE**  
191 **RESOLUTION OF ADVERSE EFFECTS ASSOCIATED WITH HISTORIC**  
192 **PROPERTIES IN THE PALMITO RANCH BATTLEFIELD NHL**  
193

- 194 A. Avoidance of adverse effects to unrecorded historic properties on lomas. Loma  
195 areas within the DEA of the Palmito Ranch Battlefield NHL have the potential to  
196 contain deeply buried archaeological deposits that were not identified during the  
197 2025 cultural resource assessment survey.  
198
- 199 1. For any future disturbance or development in soils designated by the  
200 United States Department of Agricultural Natural Resources  
201 Conservation Service as Point Isabel clay loam, SpaceX shall retain a

202 qualified archaeologist pursuant to **Stipulation I** to monitor initial  
203 ground disturbing activities (See Attachment G).

204  
205 2. If archaeological resources are discovered during monitoring, SpaceX  
206 shall immediately notify the FWS of the discovery.

207  
208 B. Establishment of White’s Ranch Preservation Area. SpaceX shall prohibit  
209 industrial development and residential (housing) construction within 4.5 acres of  
210 parcels believed to be the location of the last shot fired during the Civil War, in  
211 order to preserve the historic viewshed of the site (see Attachment H). This area  
212 may be subject to deed restrictions that prohibit industrial development and  
213 residential construction.

214  
215 C. Construction of Viewing Platform and Interpretive Exhibit. SpaceX will build a  
216 public viewing platform. The viewing platform will include interpretive materials  
217 such as storyboards or panels discussing the history of the Palmito Ranch  
218 Battlefield NHL, the significance of the White’s Ranch area, and the story of the  
219 last shot of the Civil War. The viewing platform may also include Starbase related  
220 materials. Interpretive materials will be reviewed pursuant to **Stipulation III** of  
221 this Agreement.

222  
223 D. Starbase City Historical Website Information. SpaceX will interface with the City  
224 of Starbase to include additional tourist information on the city’s website about  
225 the Battle of Palmito Ranch and the locations of historical markers, maps, and  
226 other interpretive materials.

227  
228 E. Development of Trail System. SpaceX, in partnership with the Lower Rio Grande  
229 Valley National Wildlife Refuge, may develop a trail or trail system providing  
230 connectivity to the viewing platform with surrounding parcels within and outside  
231 of the Palmito Ranch Battlefield NHL.

232  
233 F. Collection of Artifacts that Contribute to the NHL Eligibility. SpaceX will have  
234 their archaeological contractor collect and curate historic artifacts that have been  
235 recorded during the archaeological inventory that are not individually NRHP  
236 eligible but that contribute to the Eligibility of the Palmito Ranch Battlefield  
237 National Historic Landmark. Artifacts at IF JB-11, Site JB-12, Site JB 15/16 and  
238 IF JMN-01 have been plotted in GIS and will be surface collected in their entirety  
239 (see ATTACHMENT I). Collected materials will be curated at the Texas  
240 Archaeological Research Laboratory for future research regarding the Battle of  
241 Palmito Ranch.

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**V. POST-REVIEW DISCOVERIES**

- A. SpaceX will notify the FWS within 24 hours of the discovery of an unrecorded archaeological site within the DEA of the Palmito Ranch Battlefield NHL.
1. Consulting Party Notification: The FWS will notify the Signatories and additional consulting parties within thirty (30) calendar days of initial notification. If known, the notification will include details regarding the property’s NRHP eligibility and a description of effects to the historic property.
  2. Evaluation of Historic Properties:
    - a) For previously unrecorded properties, the FWS may assume a property is eligible for the NRHP pursuant to 36 CFR § 800.13(c).
    - b) If a property is not assumed eligible for the NRHP, SpaceX will utilize qualified professionals pursuant to **Stipulation I** to make a NRHP eligibility recommendation to the FWS with sixty (60) calendar days of the initial notification. Within ninety (90) days of the initial notification, the FWS will submit a NRHP eligibility determination to the Signatories and additional consulting parties for review and comment pursuant to **Stipulation I**.
    - c) If the FWS determines that the property does not meet NRHP criteria, and SHPO concurs, then no further action is necessary.
    - d) If SHPO does not concur with the FWS’s determination of eligibility, then the FWS will assume the property is eligible for the NRHP.
  3. Finding of Effect: If a property is assumed eligible or determined eligible for listing in the NRHP, SpaceX will utilize a qualified professional pursuant to **Stipulation I** to make a finding of effect recommendation to the FWS. If the recommendation is a finding of Adverse Effects, SpaceX will also prepare and include a recommended treatment plan for avoidance, minimization, or mitigation of effects.
  4. The FWS will provide the documentation to the Signatories and additional consulting parties for review pursuant to **Stipulation III**.

- 282 a) For a No Adverse Effect finding, the FWS will seek SHPO  
283 concurrence.  
284 i. If SHPO concurs, then no further action is necessary.  
285 ii. If SHPO does not concur, the FWS will direct SpaceX to  
286 prepare a recommended treatment plan for the avoidance,  
287 minimization, or mitigation of the historic property within  
288 thirty (30) calendar days. The FWS will provide the  
289 documentation to the Signatories and additional consulting  
290 parties pursuant to **Stipulation III**. All parties will have  
291 thirty (30) calendar days to review and comment.  
292  
293 b) If there is an Adverse Effect, the FWS will take comments received  
294 into account and finalize a treatment plan prior to SpaceX's  
295 implementation of it.  
296

- 297 5. The FWS will provide a report of actions to the Signatories and  
298 additional consulting parties, when they are complete.  
299

300 B. If human remains are discovered:

- 301  
302 1. Historic and prehistoric human remains from non-federal, non-tribal  
303 lands are subject to protection under the state's burial/unmarked  
304 grave/cemetery laws. As such, if human remains are discovered during  
305 construction, work in that portion of the project shall stop immediately.  
306 The remains shall be covered and/or protected in place in such a way  
307 that minimizes further exposure of and damage to the remains, and  
308 SpaceX will immediately notify the FWS.  
309  
310 2. The FWS will immediately consult with SHPO and other relevant  
311 parties.  
312  
313 3. If the remains are found to be Native American, in accordance with  
314 applicable law, a treatment plan shall be developed by the FWS and  
315 SHPO in consultation with appropriate federally recognized Indian  
316 tribes. FWS shall ensure that any treatment and reburial plan is fully  
317 implemented.  
318  
319 4. If the remains are not Native American, the appropriate local authority  
320 shall be consulted to determine the final disposition of the remains.

321 Avoidance and preservation in place is the preferred option for treating  
322 human remains.

323

324 **VI. PROJECT CHANGES**

325

326 A. Neither the FWS nor SpaceX shall alter any plan, scope of services, or other  
327 document that has been reviewed and commented on pursuant to this Agreement  
328 (except to finalize documents commented on in draft form), without first  
329 affording the parties to this agreement the opportunity to review the proposed  
330 change and determine whether it shall require that this Agreement be amended. If  
331 one or more such party determines that an amendment is needed, the parties to the  
332 Agreement shall consult in accordance with **Stipulation VIII** to consider such an  
333 amendment.

334

335 **VII. DISPUTE RESOLUTION**

336

337 A. If any Signatory or additional consulting party objects to any plans or actions  
338 pursuant to this PA or the manner in which the terms of this PA are implemented,  
339 the objecting party will provide written notice to the FWS. The FWS will take the  
340 objection into account and consult, as needed, within 14 calendar days with the  
341 Signatories to resolve the objection. Copies of written objections will be  
342 submitted to all Signatories and additional consulting parties.

343

344 B. If the FWS determines that the objection cannot be resolved, the FWS will  
345 forward all documentation to the dispute to the ACHP and request that the ACHP  
346 provide its opinion on the resolution of the objection within 30 days of receiving  
347 adequate documentation.

348

349 C. The FWS will prepare a written response that considers comments from the  
350 ACHP. If the ACHP does not provide comment regarding the dispute within the  
351 30 day period, the FWS may make a final decision on the dispute. The FWS will  
352 provide the Signatories and additional consulting parties with a copy of its final  
353 decision and then proceed accordingly.

354

355 D. Any ACHP comment provided in response to such a request will be considered by  
356 the FWS with reference only to the subject of the dispute. All responsibilities to  
357 carry out actions under this PA that are not subject to the dispute will remain  
358 unchanged.

359 **VIII. DURATION, AMENDMENT, AND TERMINATION**  
360

- 361 A. This PA will become effective upon execution the FWS, SHPO, NPS, and SpaceX  
362 and will remain in effect for a term of five (5) years from the date of the execution  
363 of this PA.  
364
- 365 B. Any Signatory may request an amendment, in which case the parties will consult  
366 to consider the proposed amendment(s). The amendment will be effective on the  
367 date a copy is signed by all of the Signatories.  
368
- 369 C. If any Signatory to this PA determines that its terms will not or cannot be carried  
370 out, that party will immediately consult with the other parties to attempt to  
371 develop an amendment per **Stipulation VII.B**. If an amendment cannot be  
372 reached within 30 calendar days (or another time period agreed to by all  
373 Signatories), any Signatory may terminate the PA upon written notification to the  
374 other Signatories.  
375
- 376 D. If the PA is terminated, prior to work related to the Undertaking or stipulated by  
377 this PA continuing, the FWS must either execute a new PA pursuant to 36 CFR §  
378 800.6, or request, consider, and respond to the comments of the ACHP under 36  
379 CFR § 800.7. The FWS will notify Signatories and additional consulting parties  
380 as to the course of action it will approve.  
381
- 382 E. Once the terms of the PA are complete, the FWS will send a formal letter to the  
383 Signatories, additional consulting parties, and the ACHP notifying them that the  
384 terms of the PA are complete, and the requirements set forth under the PA are  
385 concluded.  
386

387 **IX. CONFIDENTIALITY**  
388

- 389 A. If disclosure of location information could result in the disturbance of a cultural  
390 resource, the FWS will ensure shared data, including data concerning the precise  
391 location and nature of historic properties, archaeological sites, and properties of  
392 religious and cultural significance to Native American tribes, are protected from  
393 public disclosure to the greatest extent permitted by federal law including Section  
394 204 of the NHPA; 36 CFR § 800.11(c)(1); 54 U.S.C. § 307103; Section 9 of the  
395 Archaeological Resources Protection Act; 16 U.S.C. § 470hh); and the Freedom  
396 of Information Act, 5 U.S.C. 552.  
397

398 B. Some consulting parties, as determined by the FWS, will not receive information  
399 protected from public disclosure or may receive redacted information.

400

401 X. ANTI-DEFICIENCY ACT

402

403 A. The FWS's future efforts to execute requirements arising from the stipulations of  
404 the PA are subject to the provisions of the Anti-Deficiency Act. If compliance  
405 with the Anti-Deficiency Act alters or impairs the FWS's ability to implement the  
406 stipulations of the PA, the FWS shall consult in accordance with **Stipulation**  
407 **VIII**. No provision of the PA shall be interpreted to require obligation or payment  
408 of funds in violation of the Anti-Deficiency Act, Title 31 U.S.C. § 1341.

409

410 Execution of this Agreement by the FWS, Texas SHPO, NPS, ACHP, and SpaceX and  
411 implementation of its terms by the Signatories and Invited Signatories, is evidence the FWS has  
412 taken into account the effects of the Undertaking on historic properties.

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**PROGRAMMATIC AGREEMENT  
AMONG  
THE UNITED STATES FISH AND WILDLIFE SERVICE,  
THE TEXAS STATE HISTORIC PRESERVATION OFFICE,  
NATIONAL PARK SERVICE,  
THE ADVISORY COUNCIL ON HISTORIC PRESERVATION,  
AND SPACE EXPLORATION TECHNOLOGIES CORP.,  
REGARDING A LAND EXCHANGE THAT INCLUDES PORTIONS OF THE PALMITO  
RANCH BATTLEFIELD NATIONAL HISTORIC LANDMARK,  
CAMERON COUNTY, TEXAS**

**SIGNATORY**

**UNITED STATES FISH AND WILDLIFE SERVICE**

By: \_\_\_\_\_

[NAME]

[TITLE]

Date: \_\_\_\_\_

439 **PROGRAMMATIC AGREEMENT**  
440 **AMONG**  
441 **THE UNITED STATES FISH AND WILDLIFE SERVICE,**  
442 **THE TEXAS STATE HISTORIC PRESERVATION OFFICE,**  
443 **NATIONAL PARK SERVICE,**  
444 **THE ADVISORY COUNCIL ON HISTORIC PRESERVATION,**  
445 **AND SPACE EXPLORATION TECHNOLOGIES CORP.,**  
446 **REGARDING A LAND EXCHANGE THAT INCLUDES PORTIONS OF THE PALMITO**  
447 **RANCH BATTLEFIELD NATIONAL HISTORIC LANDMARK,**  
448 **CAMERON COUNTY, TEXAS**  
449

450  
451 **SIGNATORY**  
452

453  
454 **TEXAS STATE HISTORIC PRESERVATION OFFICE**  
455

456  
457 By: \_\_\_\_\_  
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459 [NAME]

460 [TITLE]  
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463 Date: \_\_\_\_\_

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**PROGRAMMATIC AGREEMENT  
AMONG  
THE UNITED STATES FISH AND WILDLIFE SERVICE,  
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THE ADVISORY COUNCIL ON HISTORIC PRESERVATION,  
AND SPACE EXPLORATION TECHNOLOGIES CORP.,  
REGARDING A LAND EXCHANGE THAT INCLUDES PORTIONS OF THE PALMITO  
RANCH BATTLEFIELD NATIONAL HISTORIC LANDMARK,  
CAMERON COUNTY, TEXAS**

**SIGNATORY**

**NATIONAL PARK SERVICE**

By: \_\_\_\_\_

[NAME]

[TITLE]

Date: \_\_\_\_\_

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**PROGRAMMATIC AGREEMENT  
AMONG  
THE UNITED STATES FISH AND WILDLIFE SERVICE,  
THE TEXAS STATE HISTORIC PRESERVATION OFFICE,  
NATIONAL PARK SERVICE,  
THE ADVISORY COUNCIL ON HISTORIC PRESERVATION,  
AND SPACE EXPLORATION TECHNOLOGIES CORP.,  
REGARDING A LAND EXCHANGE THAT INCLUDES PORTIONS OF THE PALMITO  
RANCH BATTLEFIELD NATIONAL HISTORIC LANDMARK,  
CAMERON COUNTY, TEXAS**

**SIGNATORY**

**ADVISORY COUNCIL ON HISTORIC PRESERVATION**

By: \_\_\_\_\_

[NAME]

[TITLE]

Date: \_\_\_\_\_

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**PROGRAMMATIC AGREEMENT  
AMONG  
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THE TEXAS STATE HISTORIC PRESERVATION OFFICE,  
NATIONAL PARK SERVICE,  
THE ADVISORY COUNCIL ON HISTORIC PRESERVATION,  
AND SPACE EXPLORATION TECHNOLOGIES CORP.,  
REGARDING A LAND EXCHANGE THAT INCLUDES PORTIONS OF THE PALMITO  
RANCH BATTLEFIELD NATIONAL HISTORIC LANDMARK,  
CAMERON COUNTY, TEXAS**

**SIGNATORY**

**SPACE EXPLORATION TECHNOLOGIES CORP.**

By: \_\_\_\_\_

[NAME]

[TITLE]

Date: \_\_\_\_\_

539 **ATTACHMENT A. PROJECT DESCRIPTION**

540

541

**INTRODUCTION**

542

543 The U.S. Fish and Wildlife Service’s (USFWS) Lower Rio Grande Valley National Wildlife  
544 Refuge is considering a proposal for a land exchange with SpaceX that includes an analysis of  
545 approximately 712 acres of USFWS land that would leave federal control and 692 acres of private  
546 land owned by SpaceX to be traded into federal ownership. Approximately 703 acres of the  
547 USFWS land is located with the Palmito Battlefield National Historic Landmark (NHL). Parcels  
548 that would leave federal ownership are located on Lower Rio Grande Valley (LRGV) National  
549 Wildlife Refuge (NWR) and in and around existing SpaceX infrastructure at Boca Chica while the  
550 parcels to enter federal control are located adjacent to LRGV NWR at Boca Chica and adjacent to  
551 Laguna Atascosa NWR further north. The purpose of the exchange is to facilitate streamlined  
552 management and use of existing federal and private parcels and to accommodate potential future  
553 growth of SpaceX facilities. SpaceX has not developed plans for expansion inclusive of parcels.

554

555 The proposed land exchange constitutes an undertaking pursuant to Public Law 113-287 (Title 54  
556 U.S.C.), which incorporates the provisions of the National Historic Preservation Act of 1966, as  
557 amended (NHPA). The USFWS is the lead Federal Agency administering the regulations  
558 implementing Section 106 of the NHPA (Code of Federal Regulations [CFR] Title 36, Part 800).  
559 Additionally, since most of the land that would leave federal ownership is part of the Palmito  
560 Ranch Battlefield NHL, the USFWS is required by Section 110(f) of the NHPA, “to the maximum  
561 extent possible, undertake such planning and actions as may be necessary to minimize harm” to  
562 the NHL from any direct adverse effects.

563

564

**BACKGROUND**

565

566 The Lower Rio Grande Valley (LRGV) National Wildlife Refuge, together with the Santa Ana  
567 National Wildlife Refuge, form the South Texas National Wildlife Refuge Complex in southern  
568 Texas (Figure 1). The Laguna Atascosa National Wildlife Refuge, also located in southern Texas,  
569 is positioned along the western shore of Laguna Madre, and anchors the northern end of the Lower  
570 Rio Grande Valley National Wildlife Refuge corridor, providing critical habitat connectivity  
571 across the South Texas refuges. The LRGV began a long-term program of acquiring lands in 1979  
572 to protect the remnants of existing native habitat to form a riparian corridor for plants and wildlife  
573 and to reclaim acquired agricultural lands to reestablish native habitats. Land acquisition continues  
574 to be an emphasis for the LRGV land protection program (USFWS 1997).

575

576 The refuge also encompasses the Palmito Ranch Battlefield National Historic Landmark (NHL), a  
577 9,391-acre site designated in 1997. The battlefield marks the location of the final land engagement  
578 of the Civil War in 1865 and stands as a rare historic landscape that has remained largely  
579 unchanged since that time (NPS 2020).

580

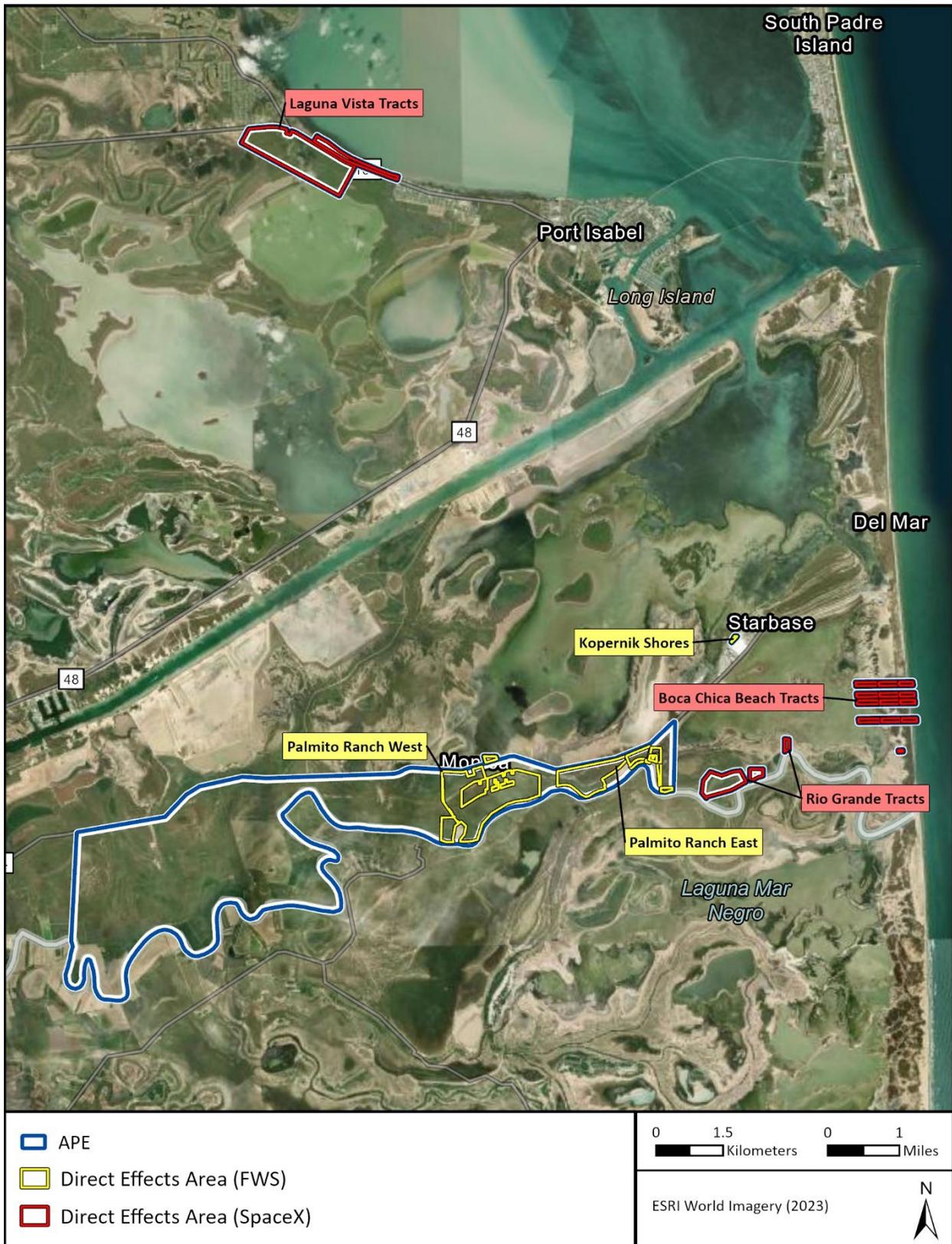
581 SpaceX began acquiring land near Boca Chica in 2014 to develop Starbase, an industrial complex  
582 and rocket launch facility that now serves as the company’s headquarters. In 2025, local voters  
583 approved the incorporation of Starbase as a new city. Starting in 2023, the U.S. Fish and Wildlife  
584 Service (USFWS) initiated discussions with SpaceX regarding a potential land exchange in the

585 area, with the goal of reducing fragmented ownership and consolidating lands managed by the  
586 National Wildlife Refuge.

587  
588 The divested lands are mostly located between State Highway 4 and the Rio Grande River, with  
589 approximately 7.4 acres located along the north side of State Highway 4 and 1.4 acres located  
590 along the north side of Starbase (Figure 1). The bulk of the divested lands are approximately 3.5  
591 miles west of the SpaceX Vertical Launch Area where testing, launches, and landings of the  
592 SpaceX Starship and Super Heavy vehicles occur and approximately 1.5 miles southwest of  
593 Starbase and SpaceX manufacturing facilities. The divested lands are fragmented by private lands  
594 owned by SpaceX. These intervening private lands include the SpaceX Massey Test Site used to  
595 test space launch vehicles and vehicle components and lands under development by SpaceX for  
596 residential, commercial, and perhaps other uses. The 1.3 acres at Starbase are adjacent to developed  
597 lands used by SpaceX for manufacturing.

598  
599 The acquired lands are in two general locations. One set of parcels totals 216.1 acres located south  
600 of Starbase and the Vertical Launch Area in an area informally known as “Las Palomas” (Las  
601 Palomas Parcels). The Las Palomas Parcels are surrounded by lands of the Lower Rio Grande  
602 Valley National Wildlife Refuge. Accessing the Las Palomas Parcels requires travel through the  
603 refuge on unimproved vehicle trails or by off-road transit. The other set of parcels totals 476.4  
604 acres located between the communities of Laguna Vista and Laguna Heights, with parcels along  
605 both sides of State Highway 100 (Laguna Heights Parcels). The Laguna Heights Parcels are  
606 adjacent to a portion of the Laguna Atascosa National Wildlife Refuge and include frontage along  
607 the Laguna Madre and Laguna Larga.

608 ATTACHMENT B. AREA OF POTENTIAL EFFECTS AND DIRECT EFFECTS AREA  
609



611 ATTACHMENT C. PALMITO RANCH NATIONAL HISTORICAL LANDMARK  
612 DIRECT EFFECTS AREA



613



614  
615

616 **ATTACHMENT D. HISTORIC PROPETIES IDENTIFIED IN THE AREA OF**  
617 **POTENTIAL EFFECT AND DIRECT EFFECTS AREA**

618

619 The following table lists the historic properties identified in the area of potential effect and direct  
620 effects area for the SpaceX and United States Fish and Wildlife Service land exchange. A  
621 description of each type of potential adverse effect is provided below and discussed below.

622

623 **Transfer of Federally Owned Property**

624

625 The transfer of the federally owned property within the Palmito Ranch Battlefield NHL will  
626 constitute an adverse effect to the NHL unless adequate and legally enforceable restrictions or  
627 conditions to ensure long-term preservation are put into place through the development of this  
628 Programmatic Agreement. Because SpaceX does not have plans in place for the development of  
629 the property within the APE's DEA, and because with the exception of the deed restriction  
630 included in **Stipulation IV.B** the property within the DEA will not be subject to conditions or  
631 restrictions to development, other direct and indirect effects to the NHL and other historic  
632 properties within the DEA are unknown at this time.

633

634 **Potential Visual/Indirect Effects to the Palmito Ranch NHL**

635

636 Visual effects to the APE and DEA may result from the introduction of new, permanent structure  
637 and infrastructure development within the DEA. The visual introduction of residential, industrial,  
638 or other development within the Palmito Ranch NHL may alter the characteristics that qualify it  
639 for listing in the NRHP and diminish its integrity (i.e., integrity of setting and feeling), or its  
640 ability to convey its significance. It is not possible to specify visual or other indirect effects at  
641 this time, as SpaceX has not developed plans for future use of parcels within the DEA.

642

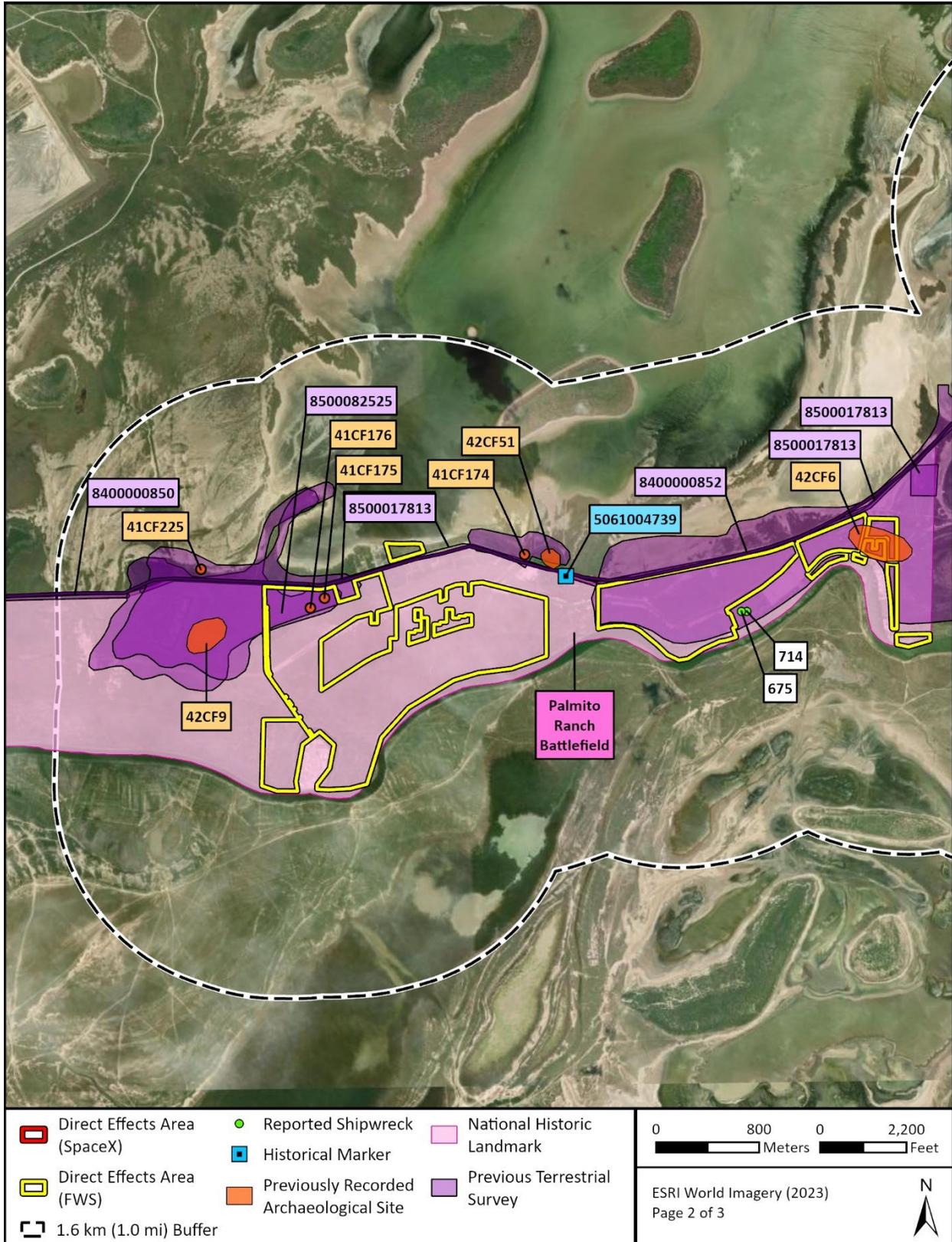
643 **Avoidance, Minimization, and Resolution of Effects**

644

645 Effects resulting from the transfer of federally owned property within the Palmito Ranch  
646 Battlefield NHL to SpaceX will be avoided, minimized, and/or resolved through archaeological  
647 monitoring in sensitive loma areas during ground disturbing activities; the establishment of a  
648 preservation area in the White's Ranch vicinity with development limitations in parcel numbers  
649 173530, 173531, 173532, and 173533; the construction of a viewing platform that includes  
650 interpretive signs/materials in the preservation area, and the inclusion of information about the  
651 Battle of Palmito Ranch and the locations of historical markers, maps, and other interpretive  
652 materials on the Starbase City website; and the development of a trail or trail system providing  
653 connectivity to the viewing platform with surrounding parcels within and outside of the Palmito  
654 Ranch Battlefield NHL.

**Table D-1. Summary table of historic properties within the APE.**

Resource #	Resource Name	Site Type	National Register Eligibility	Historic Value	FWS Determination of Effect
41CF175	Camp #Q	Historic, 19 <sup>th</sup> -century camp artifact scatter	Not Eligible – not relocated and lacks integrity	1846 US Army camp associated with broader Camp Belknap.	No effect
41CF176	Camp #P	Historic, 19 <sup>th</sup> -century camp artifact scatter	Not Eligible – not relocated and lacks integrity	Likely related to 1846 Camp Belknap.	No effect
41CF6 (including newly recorded Site JB-17 and IF JB-18)	White's Ranch	Historic, mid-19 <sup>th</sup> century artifact scatter (1860s)	Eligible and contributes to the Eligibility of the National Historic Landmark	Civil War blockade runner camp; possible Kennedy-King cotton site.	Adverse effect (transfer of federally owned property)
IF JB-11		Historic, mid-19 <sup>th</sup> century Minie ball and button	Not Eligible (individually), contributes to the Eligibility of the National Historic Landmark	Civil War era artifacts associated with the battle	Adverse effect (transfer of federal property)
JB-12		Historic, mid-19 <sup>th</sup> century Minie ball, button, and lead objects	Not Eligible (individually), contributes to the Eligibility of the National Historic Landmark	Civil War era artifacts associated with the battle	Adverse effect (transfer of federal property)
JB-15/16		Historic, mid-19 <sup>th</sup> century Minie ball and glass bottle fragments	Not Eligible (individually), contributes to the Eligibility of the National Historic Landmark	Civil War era artifacts associated with the battle	Adverse effect (transfer of federal property)
IF JMN-01		Historic, mid-19 <sup>th</sup> century 3 ring Minie ball and brass/copper fragment	Not Eligible (individually), contributes to the Eligibility of the National Historic Landmark	Civil War era artifacts associated with the battle	Adverse effect (transfer of federal property)
41CF93 (NRHP No. 93000266	Palmito Ranch Battlefield NHP	Civil War Battlefield	NRHP Listed 1993; Designated NHL 1997	Landscape, setting, and feeling that contribute to the integrity and interpretation of the site; intact physical remains (e.g., features, artifacts, datable materials), including potential subsurface remains.	Adverse effect (transfer of federally owned property)



**ATTACHMENT E. SUMMARY OF TRIBAL CONSULTATION AND INVOLVEMENT DURING THE NEPA AND SECTION 106 PROCESSES FOR THE PROPOSED FWS/SPACEX LAND EXCHANGE**

Section 106 Initiation letters were sent to the Apache Tribe of Oklahoma, the Comanche Nation of Oklahoma, the Kiowa Tribe of Oklahoma, the Mescalero Apache Tribe of New Mexico, and the Tonkawa Tribe of Oklahoma on 5 November 2025.

The FWS received a response from the Comanche Nation on 20 November 2025 stating that they were unaware of historic properties of concern to the tribe in the Area of Potential Effect.

Tribal consultation letters on determinations of NRHP eligibility and determinations of affects to historic properties were sent to the Apache Tribe of Oklahoma, the Comanche Nation of Oklahoma, the Kiowa Tribe of Oklahoma, the Mescalero Apache Tribe of New Mexico, and the Tonkawa Tribe of Oklahoma on 6 February 2026.

**ATTCHMENT F. CONSULTING PARTY CONTACTS**

Mr. Joseph Bell  
State Historic Preservation Officer  
Texas Historical Commission  
1511 Colorado Avenue  
PO Box 12276  
Austin, TX 78711-2276

ACHP  
Advisory Council on Historic Preservation  
401 F Street NW, Suite 308  
Washington, DC 20001

National Park Service Regional Office  
Justin Henderson  
Heritage Partnerships Program Manager  
One Denver Federal Center, Bldg 50  
Lakewood, CO 80225

National Park Service  
Palo Alto Battlefield NHP  
600 E. Harrison Street, Room 1006  
Brownsville, TX 78520

National Park Service  
Padre Island National Seashore  
P.O. Box 181300  
Corpus Christi, TX 78480

International Boundary and Water Commission  
ATTN: Mark Howe  
4191 North Mesa St.  
El Paso, TX 79902-1423

U.S. Customs and Border Protection  
Program Management Office Directorate  
ATTN: Michelle Barnes  
1300 Pennsylvania Ave 6.5E Mail Stop 1039  
Washington, DC 20229-1100

Section 106 PA for SpaceX/USFWS Land Exchange

Texas Parks and Wildlife Division  
ATTN: Cultural Resources  
4200 Smith School Rd.  
Austin, TX 78744

American Battlefield Trust  
ATTN: Consulting Party Request  
1030 15<sup>th</sup> Street NW, Suite 900 East  
Washington, DC 20005

United Daughters of the Confederacy  
ATTN: Consulting Party Request  
325 N. Arthur Ashe Boulevard  
Richmond, VA 23220

National Trust for Historic Preservation  
ATTN: Consulting Party Request  
600 14<sup>th</sup> Street NW, Suite 500  
Washington, DC 20005

Texas Historical Foundation  
ATTN: Consulting Party Request  
3003 Swiss Avenue  
Dallas, TX 75204

Brownsville Historical Association  
ATTN: Consulting Party Request  
1325 E. Washington Street  
Brownsville, TX 78520

Texas Department of Transportation  
ATTN: Cultural Resources  
125 East 11<sup>th</sup> St.  
Austin, TX 78701

Friends of the Texas Historical Commission  
ATTN: Consulting Party Request  
P.O. Box 13497  
Austin, TX 78711

Cameron County Historical Commission  
ATTN: Consulting Party Request  
1100 E. Monroe St.  
Brownsville, TX 78520

Cameron County  
ATTN: Consulting Party Request  
1100 E. Monroe St.  
Brownsville, TX 78520

University of Texas – Rio Grande Valley  
CHAPS Program  
ATTN: Roseann Bacha-Garza  
1201 West University Dr.  
Edinburg, Texas 78539-2909

Apache Tribe of Oklahoma  
Chairman Durrell Cooper  
P.O. Box 1330  
Anadarko, OK 73005

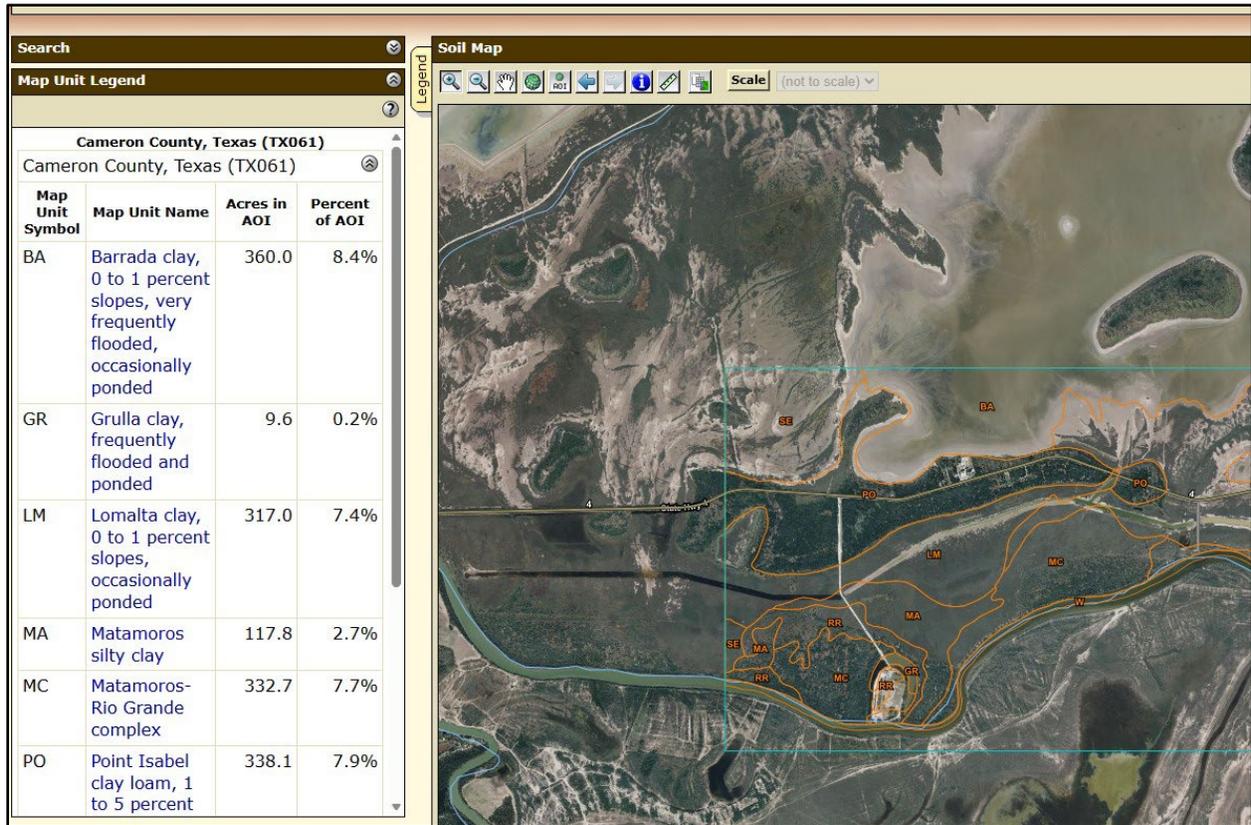
Mescalero Apache Tribe  
ATTN: Holly Houghton – THPO  
P.O. Box 227  
Mescalero, NM 88340

Comanche Nation  
ATTN: Martina Minthorn – THPO  
P.O. Box 908  
Lawton, OK 73502

Tonkawa Tribe  
President Russell Martin  
1 Rush Buffalo Rd  
Tonkawa, OK 74653

Wichita and Affiliated Tribes  
ATTN: Robin Williams – THPO  
P.O. Box 729  
Anadarko, OK 73005

**ATTCHMENT G. NRCS SOIL MAP**

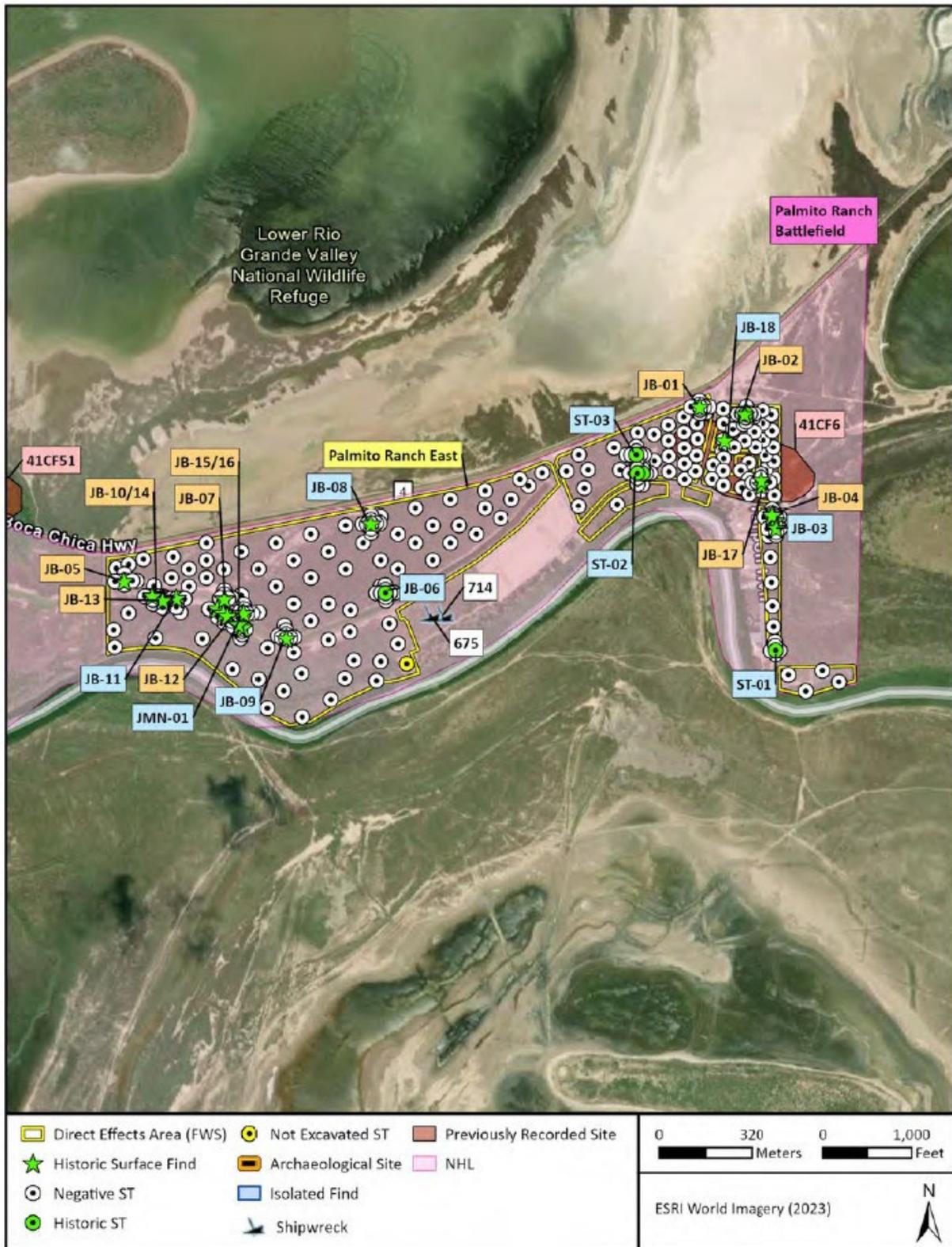


**NRCS Soil map showing Point Isabel clay loam (PO) where archaeological monitoring of earth disturbance will be required.**

**ATTACHMENT H. WHITE'S RANCH PRESERVATION AREA**



### ATTACHMENT I. LOCATIONS DESIGNATED FOR ARTIFACT COLLECTION



Artifacts will be surface collected and curated from IF JB-11, Site JB-12, Site JB 15/16 and IF JMN-01 (shown on this map).