IN THE UNITED STATES COURT OF APPEALS
FOR THE FIFTH CIRCUIT

SIERRA CLUB and DEFENDERS OF WILDLIFE, Petitioners, v. UNITED STATES DEPARTMENT OF THE INTERIOR; DAVID BERNHARDT, in his official capacity as Secretary of the U.S. Department of the Interior; U.S. FISH AND WILDLIFE SERVICE, an agency of the U.S. Department of the Interior; AURELIA SKIPWITH, in her official capacity Director of the U.S. Fish and Wildlife Service; and CHARLES ARDIZZONE, in his official capacity as Field Supervisor, Texas Coastal Ecological Services Field Office, Responsible Official Respondents.	Case No. _____

PETITION FOR REVIEW

Pursuant to Administrative Procedure Act, 5 U.S.C. § 702, Section 19(d)(1) of the Natural Gas Act, 15 U.S.C. § 717r(d)(1), and Federal Rule of Appellate Procedure 15(a), SIERRA CLUB and DEFENDERS OF WILDLIFE petition this Court for review of the United States Fish and Wildlife Service's Biological Opinion and Incidental Take Statement, dated October 21, 2019, for the Annova Liquefied Natural Gas Project. In accordance with Local Rule 15.1(b), a copy of

the Biological Opinion and Incidental Take Statement is attached hereto as Exhibit A.

In accordance with Rule 15(c) of the Federal Rules of Appellate Procedure, parties that may have been admitted to participate in the underlying procedure have been served with a copy of this Petition. Pursuant to Federal Rule of Appellate Procedure 15(c), attached hereto is a list of Respondents specifically identifying the Respondents' names and addresses.

In accordance with the Natural Gas Act, 15 U.S.C. § 717r(d)(5), this matter "shall [be] set … for expedited consideration."

Dated: April 20, 2020

Respectfully submitted,

/s/ Eric Huber
Eric Huber (CO40664)
Rebecca McCreary (CO54097)
1650 38th St., Ste. 102W
Boulder, CO 80301
Telephone: (303) 449-5595
Fax: (303) 449-6520
Eric.huber@sierraclub.org
Rebecca.mccreary@sierraclub.org

/s/ Devorah Ancel
Devorah Ancel (CA261038)
6406 North Interstate 35 Frontage Rd.
Austin, TX 78752
Telephone: (415) 845-7847
Fax: (303) 449-6520
Devorah.ancel@sierraclub.org

Counsel for Petitioners

LIST OF RESPONDENTS

Pursuant to Federal Rule of Appellate Procedure 15(c), Petitioners hereby provide a list of Respondents, specifically identifying the Respondents' names and the addresses where Respondents may be served with copies of the Petition for Review. Petitioners hereby certify that on April 20, 2020, the undersigned caused five (5) copies of the foregoing petition to be delivered to the clerk of court for service on the respondents.

United States Department of the Interior
1849 C Street, NW
Washington, D.C. 20240

U.S. Fish and Wildlife Service
1849 C Street NW, Room 3331
Washington, D.C.20240-0001

Hon. David Bernhardt
Secretary
U.S. Department of the Interior
1849 C Street, NW
Washington, D.C. 20240

Aurelia Skipwith
Director
United States Fish and Wildlife Service
1849 C Street, NW Room 3331
Washington, D.C. 20240-0001

Charles Ardizzone
Field Supervisor
Texas Coastal Ecological Services Field Office
4444 Corona Drive Suite 215
Corpus Christi, TEXAS 78411

Respectfully Submitted,

/s/ Eric Huber
Counsel for Petitioners

CERTIFICATE OF SERVICE

In accordance with Federal Rules of Appellate Procedure 15(c)(1) & (2), the undersigned hereby certifies that a true copy of this Petition for Review was served via U.S. Mail on each of the following entities that may have been admitted to participate in the agency proceedings and/or their counsel:

ANNOVA LNG, LLC
1001 Louisiana Street, Suite 2300
Houston, TEXAS 77002

Lamiya Rahman
Brett A. Snyder
Mark R. Haskell
Counsel to Annova LNG Common Infrastructure, LLC; Annova LNG Brownsville A, LLC; Annova LNG Brownsville B, LLC; and Annova LNG Brownsville C, LLC
1825 Eye Street NW
Washington, D.C. 20006
Tel.: (202) 420-2200
lrahman@blankrome.com
bsnyder@blankrome.com
mhaskell@blankrome.co

This petition was also served via U.S. Mail on:

Hon. William Barr
Attorney General
U.S. Department of Justice
950 Pennsylvania Avenue, NW
Washington, D.C. 20530-0001

U.S. Fish and Wildlife Service
Main Interior
1849 C Street NW, Room 3331
Washington, D.C.20240-0001

Hon. David Bernhardt
Secretary
U.S. Department of the Interior
1849 C Street, NW
Washington, D.C. 20240

Aurelia Skipwith
Director
United States Fish and Wildlife Service
1849 C Street, NW Room 3331
Washington, D.C. 20240-0001

Charles Ardizzone
Field Supervisor
Texas Coastal Ecological Services Field Office
4444 Corona Drive Suite 215
Corpus Christi, TEXAS 78411

U.S. Department of the Interior
1849 C Street, NW
Washington, D.C. 20240

This 20 day of April, 2020

/s/ Eric Huber
Eric Huber
Counsel for Petitioners

Exhibit A

SUMMARY OF THE BIOLOGICAL OPINION ON THE EFFECTS TO THE ENDANGERED OCELOT *(Leopardus pardalis),* AND GULF COAST JAGUARUNDI *(Herpailurus yagouaroundi cacomitli)* FROM THE PROPOSED FEDERAL ENERGY REGULATORYCOMMISSION ANNOVA LNG PROJECT'S EFFECTS IN CAMERON COUNTY, TEXAS.

Consultation No. 02ETTXX0-2015-F-0317

Date of the Final Biological Opinion: October 21, 2019

Action agency: Federal Energy Regulatory Commission (FERC or Commission).

Proposed Action: FERC proposes to authorize construction and operation of the Annova Liquified Natural Gas (LNG) Project (Project). Approximately 491 acres of land will be affected by construction of the LNG terminal and marine facilities, temporary and permanent access roads (including temporary workspace) on a 731-acre parcel of land leased from the Brownsville Navigation District (BND). An additional 59 acres within the Brownsville Ship Channel (BSC) will be affected by dredging. The property is located on the south bank of the BSC at approximate mile marker 8.2 in Cameron County, Texas. The Project site was formerly managed by the Lower Rio Grande Valley National Wildlife Refuge (LRGVNWR) on behalf of BND setting aside 4,837 acres as a Loma Ecological Preserve, which now includes the Project site. The BND and the U.S. Fish and Wildlife Service (Service) entered into a lease for management of the preserve; however, BND did not implement the project to deepen the BSC, and the permit for deepening expired in 1987, but the lease management continued between BND and LRGVNWR. The lease agreement was amended for Annova to use part of the Loma Ecological Preserve for this project, since BND is the landowner.

Listed species: Ocelot and Gulf coast jaguarundi

Biological Opinion: It is the opinion of the Service that the proposed construction of the Annova LNG Project will not likely jeopardize the continued existence of the ocelot or Gulf coast jaguarundi.

Incidental Take Statement: There will be loss of ocelot/jaguarundi habitat, and one ocelot or jaguarundi may be harmed from the construction, and for the life of the project (30 years) on 491 acres of the 731-acre BND parcel.

Conservation Recommendations: 1) Where feasible, prioritize, protect, and acquire necessary habitat and conservation for ocelots and jaguarundis (Recovery Plan Tasks 1.2.3.1, 1.2.3.2, 1.2.3.3) 2) Fund experimental translocations, augment existing populations as necessary through translocation (Recovery Plan Tasks 3.2.1, 3.2.2) 3) Fund further thornscrub restoration around populations and secondary areas in Texas (Recovery 1.2.4.2, 1.2.4.3).

United States Department of the Interior

FISH AND WILDLIFE SERVICE
Texas Coastal Ecological Services Field Office
4444 Corona Drive Suite 215,
Corpus Christi, Texas 78411

In Reply Refer To:
FWS/R2/CCES/02ETXX0-2015-F-0317

Kimberly D. Bose, Secretary
Federal Energy Regulatory Commission
888 First Street NE
Washington, DC 20426

Dear Ms. Bose:

This transmits the U.S. Fish and Wildlife Service's (Service) Final Biological Opinion (FBO) based on review of the proposed Federal Energy Regulatory Commission (FERC) authorization to construct and operate the Annova Liquified Natural Gas (LNG) Project (Project) in Cameron County, Texas, and its effects on the endangered ocelot *(Leopardus pardalis*), and Gulf coast jaguarundi *(Herpailurus yagouaroundi cacomitli)* in accordance with section 7 of the Endangered Species Act (Act) of 1973, as amended (16 U.S.C. §1531 et seq.). Your request for formal consultation was received February 15, 2019. The Service responded March 15, 2019 to FERC, that there were conservation agreements to be finalized to have a complete Biological Assessment (BA) and begin formal consultation. This Final Biological Opinion is based on information provided in the *"Final Environmental Impact Statement"* Appendix C, and July 22, 2019, correspondence from the Service approving the additional voluntary conservation measures and agreements to complete the BA, and FERC's response to the Draft BO on October 2, 2019.

Based on current research and information, FERC determined the project "may affect, likely to adversely affect" for the endangered ocelot, and jaguarundi and the FBO addresses these species. FERC also has determined that the proposed construction of the Project "may affect, but is not likely to adversely affect" northern aplomado falcon *(Falco femoralis septentrionalis),* West Indian manatee *(Trichechus manatus),* red knot *(Calidris canutus ssp. rufa),* whooping crane *(Grus americana),* piping plover *(Charadrius melodus)* Kemp's ridley sea turtle *(Lepidochelys kempii),* loggerhead sea turtle *(Caretta caretta),* green sea turtle *(Chelonia mydas),* leatherback sea turtle *(Dermochelys coriacea)* and hawksbill sea turtle *(Eretmochelys imbricata).* FERC determined that designated critical habitat for the piping plover will not be adversely modified. Based on information in the BA, the Service concurs with these determinations.

FERC has also determined that the Project will have no effect to theSouth Texas ambrosia *(Ambrosia cheiranthifolia),* Texas ayenia *(Ayenia limitaris),* or the proposed to be listed as

threatened eastern black rail *(Laterallus jamaicensis jamaicensis)*. Although we do not provide concurrence for "no effect" determinations, we believe FERC complied with Section 7(a)(2) of the Endangered Species Act of 1973, as amended.

Consultation History Please see Appendix A.

BIOLOGICAL OPINION

I. Description of the Proposed Action

Purpose of Project

Approximately 491 acres of a 731-acre parcel of land leased from the Brownsville Navigation District (BND) will be affected by the construction and operation of the LNG terminal, marine facilities, temporary and permanent access roads, and temporary workspace. The Project will be located on the south bank of the Brownsville Ship Channel (BSC) at approximately mile marker 8.2 in Cameron County, Texas. An additional 59 acres within the BSC will be affected by dredging. The new liquefaction facility will include six liquefaction "trains" (liquefaction process facilities arranged linearly for 6 metric tons per annum (mtpa) with a maximum output at optimal operating conditions of 6.95 mtpa. The access road to the liquefaction facility crosses Lower Rio Grande Valley National Wildlife Refuge (LRGVNWR) lands and includes the Service's Loma Ecological Preserve.

Natural gas will be delivered to the site by the approximately 9-mile long, 36-inch-diameter, Valley Crossing Pipeline; a non-jurisdictional intrastate natural gas pipeline lateral. The natural gas will be treated, liquefied, and stored onsite in two single containment storage tanks, each with a net capacity of approximately 160,000 cubic meters. The LNG will be moved using cryogenic piping from the storage tanks to the marine transfer facilities where it will be loaded onto LNG vessels at the berthing dock.

The facilities for the Project include the following major components:

- gas pretreatment
- liquefaction facilities (six liquefaction trains and six approximately 72,000 horsepower electric motor-driven compressors);
- LNG storage tanks;
- boil-off gas handling system;
- flare system;
- marine transfer equipment;
- control, administration, and support buildings;
- access road;
- fencing and sound barrier wall; and
- utilities (power, water, gas and communication).

Annova identified three non-jurisdictional facilities in its application that will be associated with the proposed Project: facilities required to interconnect the LNG terminal to the natural gas supply pipeline; an electrical transmission line and switch yard; and a potable water line. The natural gas supply pipeline is also considered a non-jurisdictional facility. Annova has stated that this pipeline will be owned and operated by a third party.

Voluntary Conservation measures for Gulf coast jaguarundi and ocelot:

Based on comments provided by the Service, Annova incorporated several design changes to minimize potential impacts to ocelots, and jaguarundis. Additionally, Annova will implement numerous measures to further avoid and minimize impacts on ocelots and jaguarundis. Annova also proposes several voluntary measures listed below.

- Voluntary Conservation Measure 1: Off-site Conservation Site 1 - Annova has contributed funding to the perpetual conservation of over 1,000 acres of land, including approximately 390 acres of dense thornscrub, in the Project region, within the South Texas Ocelot Coastal Corridor area near the Laguna Atascosa National Wildlife Refuge (LANWR), to aid in long-term ocelot, and jaguarundi conservation.

- Voluntary Conservation Measure 2: Western Wildlife Corridor - Annova modified the Project layout and expanded its lease area to accommodate a wildlife corridor (185 acres) on the west side of the Project site, where existing dense thornscrub and other habitats would be avoided and preserved, and is proposing to protect the wildlife corridor for the 30 year life of the Project. Annova would install a barrier wall along the southwest edge of the site between the LNG terminal facilities and the wildlife corridor to reduce light and noise impacts on wildlife including the endangered ocelot, and jaguarundi.

- Voluntary Conservation Measure 3: Off-site Conservation Site 2 - Annova has committed to perpetual conservation of at least 250 additional acres of thornscrub habitat within the South Texas Ocelot Coastal Corridor area, near the LANWR.

- Voluntary Conservation Measure 4: Core Ocelot Program for Private Lands -Annova would fund The Core Ocelot Program for Private Lands: Adaptive Research, Conservation and Recovery, a five-year program carried out by the Feline Research Program of the Caesar Kleberg Wildlife Research Institute (CKWRI) at Texas A&M University-Kingsville (TAMUK).

- Voluntary Conservation Measure 5: Fund Graduate Student Fellowships - Annova would fund two graduate student fellowships for adaptive research conducted by the CKWRI Feline Research Program at TAMUK under the supervision of Dr. Michael Tewes.

- Voluntary Conservation Measure 6: Wildlife Crossings - Annova is working to minimize the potential for ocelot, and jaguarundi collisions by incorporating wildlife crossings (culverts) and fencing into the main access road design, in consultation with

the Service. Annova would also mandate a speed limit of 25 miles per hour on the main access road and within the Project site.

- Voluntary Conservation Measure 7: Lighting Plan-Annova would minimize the effects of lighting by evaluating lighting schemes to minimize effects on remaining habitats and minimizing lighting on the main access road to that needed to address safety concerns. In addition, whenever possible, lights would be placed (down shielded) to avoid shining directly on adjacent undisturbed habitats or the beach, and lighting would be extinguished upon completion of work in an area. Prior to construction, Annova will be required to file its Facility Lighting Plan for operation of the LNG terminal with the Secretary, for review and written approval by the Director of Office of Energy Projects.

Status of the Species Ocelot

The ocelot was designated as an endangered species under the Act in 1982, a status that extended U.S. protections to the species throughout its range in 22 countries, including the U.S. (Texas sand Arizona), Mexico, and Central and South America. Critical habitat has not been designated for the ocelot. Ocelot populations gained greater protections in 1989, when the species was upgraded to Appendix I of the Convention on International Trade in Endangered Species of Flora and Fauna (CITES); a protection that prohibits CITES signatories from permitting any trade in the species or its parts. Two subspecies occur in the United States: the Texas ocelot *(Leopardus pardalis albescens)* and the Sonoran ocelot *(Leopardus pardalis sonoriensis).* The Texas ocelot is isolated from the Sonoran ocelot by the Sierra Madre highlands in Mexico (Tewes and Schmidly 1987, Service 1990).

Description

The ocelot is a medium-sized cat, measuring up to three feet in body length and weighing twice as much as a large domestic cat. The ocelot is slender and its coat is covered with irregular-shaped rosettes and spots that run the length of their body. The ocelot's background coloration can range from light yellow, to reddish gray, to gold, to a grayish gold color. They have a white underside. The head has spots, two black stripes on the cheeks, four to five longitudinal black stripes on the neck and their back. Their ears have large white spots on the back. The tail has dark bars or incomplete rings. Although it resembles the margay *(Leopardus wiedii),* the ocelot is approximately twice the size of a margay with a slightly shorter tail (Murray and Gardner 1997, de Oliveira 1998).

Habitat

Tamaulipan brushland is a unique ecosystem, found only in South Texas and northeastern Mexico. Characteristic vegetation of Tamaulipan brushland is dense and thorny; therefore, it is often referred to as thornscrub. It is estimated approximately 95 percent has been cleared for agriculture, urban development, road developments and expansions, and recreation (Service 1990, Jahrsdoerfer and Leslie 1988). Tewes and Everett (1986) found less than one percent of South Texas supported the extremely dense thornscrub used by ocelots. Tewes and Everett (1986) classified ocelot habitat in Texas according to the amount of foliar canopy. Class A, or optimal habitat, has 95 percent canopy cover, Class B, or suboptimal habitat, is between 75 to 95 percent canopy cover; and, Class C, considered inadequate habitat, and has less than 75 percent canopy cover. The most crucial habitat component is probably dense cover near the ground, less than three feet in height. Tewes and Everett (1986) found that core areas of ocelot home ranges on LANWR contained more thornscrub than peripheral areas of their home

ranges. Jackson et al. (2005) suggest that the ocelot in Texas prefers closed canopy to other land cover types, but that areas used by this species tend to consist of more patches with greater edge. The ocelot is reported to occur along watercourses and will readily enter the water (Goodwyn 1970, as cited by Service 1990), but it is unclear if this proximity to water is a habitat requisite or simply an indication of where dense cover is most likely to occur.

Species composition of shrubs used by ocelots was quantified in three plant communities, two in Texas and one in Mexico (Shindle and Tewes 1998, Caso 1994). At the Texas sites, 45 woody species were found at the LANWR in Cameron County and 28 woody species on a private ranch in Willacy County (Shindle and Tewes 1998). The dominant species were granjeno *(Celtis pallida),* crucita *(Eupatorium odoratum),* Berlandier fiddlewood *(Citharexylum berlandieri),* honey mesquite *(Prosopis glandulosa),* and desert olive *(Forestiera angustifolia)* at LANWR, and honey mesquite and snake-eyes *(Phaulothamnus spinescens)* in Willacy County.

Life History

The ocelot is primarily nocturnal, although some diurnal activity has been recorded (Navarro-Lopez 1985, Tewes 1986, Tewes and Schmidly 1987, Laack 1991, Caso 1994). Navarro-Lopez (1985) found ocelots in Texas have two peaks of activity, one at about midnight and the other at dawn. Ocelots are solitary hunters and eat a wide variety of prey, but mammals, especially rodents, make up the bulk of their diet (Bisbal 1986, Emmons 1987, Service 1990). Other items of prey include birds, armadillos, marsupials, monkeys, rabbits, bats, feral hogs, reptiles, fish, and crabs (Emmons 1987, Ludlow and Sunquist 1987, Service 1990, Booth-Bicznik et al. 2013).

The reproductive season is year round, with spring or autumn breeding peaks noted in Texas and Mexico. Laack (1991) observed first reproduction in wild females between 30 and 45 months-of-age, but Eaton (1977) and Tewes and Schmidly (1987) estimated they might produce young at 18-30 months of age. Ocelots can produce young year round and have a gestation period of 70-80 days (Eaton 1977, Laack 1991). Litters contain one, two, or very rarely, three kittens (Eaton 1977, Laack 1991). Laack et al. (2005) reported an average of 1.2 kittens per litter for 16 litters born to 12 female ocelots in Texas. Den sites are usually well hidden and include dense, thorny scrub, caves, hollows in trees or logs, and grass tussocks (Laack 1991, Tewes and Schmidly 1987). The mother provides extended parental care to the young because of the time it takes for them to become proficient at capturing prey. Males are believed to contribute little to direct parental care (Tewes 1986, Laack 1991). Adults of both sexes tend to have home ranges exclusive of other adult individuals of the same sex, but there is considerable home range overlap between the sexes (Emmons 1988, Laack 1991). Adult males have larger home ranges than adult females. The home ranges of sub adult males and females tend to be similar in size to the home ranges of adult females until dispersal (Laack 1991). A number of studies have looked at the home range size of ocelots in Texas and Mexico, as determined from monitoring radio-collared individuals. Home range size generally varies from 0.77 to 6.9 square miles (Caso 1994, Ludlow and Sunquist 1987, Konecny 1989, Dillon 2005). The established adult home ranges of ocelots in Laack's (1991) study of dispersing ocelots did not include semi-isolated patches, and transient home ranges were at times farther from the natal range than the animal's eventual home range.

Ocelots live solitary lives except when a female is with kittens or when pairs come together briefly to breed. They disperse from the natal range at approximately two years of age.

Young males always disperse from their natal areas, while young females may or may not leave their natal area. Laack (1991) reported on the dispersal of five male and four female sub adult ocelots at LANWR. One ocelot dispersed at 14 months-of-age, another at 20 months-of-age, and five at 30-35 months-of-age, but only four lived to establish home ranges. Seven to 9.5 months elapsed between the dispersing from the natal range and establishing an independent home range. One female moved 1.6 miles (distance between home range centers) and the males moved 4.3 to 5.6 miles. During dispersal, theocelots used narrow corridors of brush, between 16.4 and 328 feet wide, along resacas, drainage ditches, and small scrub patches within agricultural or pasture land. The ocelots tended to avoid areas occupied by other adults. According to Laack (1991), none of the dispersing ocelots successfully joined a population outside of LANWR.

Several studies have resulted in the estimation of various annual survival rates. Tewes (1986) reported an annual survival rate of71 percent, based on four mortalities while monitoring 12 radio-tagged ocelots. Haines et al. (2005a) estimated an annual survival rate at 87 percent for resident adults and 57 percent for transient ocelots. For newborn ocelots, Laack et al.(2005) estimated a 68 percent annual survival rate.

Population Dynamics

The U.S. ocelot population is estimated at about 50 individuals and appears to be based around two breeding populations in South Texas. Genetic erosion in ocelots has been documented in LANWR, with ocelots having approximately half of the genetic diversity of ocelots in northern Mexico (Janecka et al. 2007). Ocelot genetic diversity is greater in Willacy County, and significant genetic differentiation exists between the Willacy County and Cameron County populations, which also indicates a lack of genetic exchange between the populations (Janecka et al. 2011).

Tewes and Miller (1987) suggested that several factors might indicate the possibility of inbreeding, including: habitat islands saturated with resident ocelots, frustrated dispersal, and offspring that fail to leave parental home ranges. Habitat fragmentation reduces the ability of ocelots to interact freely, which may reduce the genetic viability of the species over time, and because ocelots have to traverse areas of little or no habitat to interact, may increase the risk of harm to individual ocelots. Genetic studies to determine genetic differentiation have been done on three ocelot populations: LANWR; Willacy County; and Tamaulipas and Vera Cruz, in northern Mexico. Low variability was expected within the Texas populations because of range reduction and fragmentation. Inbreeding was detected in the three populations (Korn and Tewes 2013). The study showed the Willacy and Mexico populations were more closely related genetically than the LANWR population was to either. Walker (1997) suggested that the LANWR and Willacy populations have lost genetic variation when they became isolated from each other and from ocelots in Mexico. While some habitat in South Texas is managed for the ocelot, the quality and quantity of optimal habitat in Texas is on a downward trend and most likely supports a smaller ocelot population than that of the 1980's. The continued existence of the ocelot in its northern habitat is critical in stabilizing and reversing ocelot decline in Texas. Much of the area that could be restored to suitable habitat occurs on private lands. The Lower Rio Grande Valley continues rapidly growing, and agricultural lands are being developed.

A population viability analysis (PVA) for ocelots conducted in 2005 for Cameron County predicted a 65 percent probability of extinction within 100 years if no recovery strategies were implemented (Haines et al. 2005b). Vehicle-cat collisions represent 35 percent of ocelot

mortalities (Haines 2005b), and this effect is magnified as habitat fragmentation has increased and dispersing cats have to travel further distances over roads to find new territories. Haines et al. (2005a) estimated transient ocelot annual survival rate at 57 percent, whereas resident ocelot survival was 87 percent, reflecting the inherent risk of habitat fragmentation and road mortality on dispersing cats.

Status in Project Area

There have been documented sightings of ocelots in and around the Action Area (TPWD 2015). A single, radio-collared male ocelot was captured and tracked by Blanton & Associates biologists in April 1998 within and near the Action Area, and up to 8 miles north of the Action Area on private lands (TPWD 2015). This individual, a young male, was captured on an unnamed loma located between State Highway (SH) 4 and the BSC approximately 2 miles from the Action Area. From April 29 to June 13, 1998, this male traveled along lomas and brushy areas of SH 4 and the Service Loma Ecological Preserve, including Loma del Portrero Cercado, and was last recorded 8 miles north of the Action Area near the LANWR.

Two sightings of ocelots southeast of Brownsville in 1988 and 1989 are reported in the Texas Natural Diversity Database (figure 5-1; TPWD 2015). In 1989, a road-killed ocelot was documented on SH 48 near San Martin Loma, and in 1992, an ocelot was reported on SH 48, 3 miles east of Farm to Market Road (FM) 100 (FWS 2013a). Multiple road mortality events have been recorded on roadways north of the Action Area including FM 106, FM 510, and near the Holly Beach area (Service 2013b; Blanton & Associates 2004). Four ocelots have been documented as road mortalities on SH 100, with three killed within the past five years, approximately 7 miles north of the Action Area (Raymondville Chronicle News 2014). One of three known ocelot-breeding subpopulations is located on LANWR, about 11 miles north of the Action Area.

Conversely, three additional surveys south of SH 100 near the Action Area (1985, 1990, and 2000-2001) failed to document this species (Tewes 2015; Shinn 2002). Annova conducted a camera-trapping survey for ocelots and jaguarundis on BND and private properties in the Project vicinity from January 2016 through January 2017. Over the course of the survey, 121 camera trap sets were installed in the survey area and operated for over 40,000 trap-nights. No ocelots (or jaguarundis) were documented during the camera-trapping survey.

The current size and distribution of loma thornscrub in the Action Area may support transient or resident ocelots. Moreover, the surrounding BND and Service refuge properties outside the Action Area would likely provide additional protection and cover for this species. Given the past documented occurrences of ocelots in and around the Action Area, the proximity of a known ocelot subpopulation in LANWR, and the quality and quantity of dense thornscrub habitat within and around the Action Area, it is possible that ocelots occur within the Action Area.

Reason for Listing

Habitat loss, fragmentation, and loss of connectivity are the primary reasons for ocelot decline in Texas. Ocelots rely upon thick vegetation and the South Texas Tamaulipan brush community for foraging, resting, and establishing dens. They require corridors, such as riparian habitat, shorelines, and natural drainages to travel between optimal habitat areas. Destruction and fragmentation of habitat and travel corridors increases threats to the ocelot, as does incidental trapping, competition from feral dogs and cats, and

primarily, mortality from vehicles. In Mexico, particularly in the northeast, ocelots experience habitat loss due to charcoal production, agriculture, and livestock ranching. Human population increases and associated urban expansion and industrialization in the LRGV has resulted in brush clearing and increased pollution and water quality degradation (Service 1986). Thornscrub habitats have also been converted to rangeland using herbicides (Bontrager et al. 1979), root plowing, and fire (Hanselka 1980).

Lack of suitable habitat has been cited as an important reason for the endangered status of the ocelot in the U.S. (Tewes and Everett 1986, Tewes and Miller 1987). In South Texas, the species occurs predominantly in dense thornscrub communities (Navarro-Lopez 1985, Tewes 1986, Laack 1991). Over 95 percent of this habitat in the LRGV has been altered for agricultural and urban development (Jahrsdoerfer and Leslie 1988, Tremblay et al. 2005). Tewes and Everett (1986) found <1 percent of South Texas supported the extremely dense thornscrub used by ocelots.

Sternberg and Donnelly (2008) conducted a coarse-scale land cover inventory across 40 contiguous counties in South Texas to identify areas of dense canopy shrubland and forest that could potentially be used by ocelot. They found 11,937 individual wooded stands totaling 2.02 million acres with an average size of 171 ha in the southern 40 counties of Texas. Of the counties that are considered part of the recent range of the ocelot (i.e., since 1995), Cameron, Hidalgo, Jim Wells, Kennedy, and Willacy counties, the total acreage of woodlands delineated by Sternberg and Donnelly (2008) was 214,309 acres. It is clear, even from such coarse land cover and habitat assessments, that the conservation of ocelots in Texas is likely to rely heavily on efforts of and partnership with private landowners.

Tewes (1986) found that core areas of ocelot home ranges contained more thornscrub than peripheral areas of their home ranges on LANWR in south Texas. Laack (1991) also found ocelot use of dense thornscrub on LANWR. Caso (1994) found ocelots used primarily forest or woody communities in Tamaulipas, Mexico, and used the open pastures less often. The pastures that were seldom used by ocelots supported little woody cover and were dominated by guinea grass *(Panicum maximum)*. Jackson et al. (2005) suggested that the ocelot in Texas preferred closed canopy to other land cover types, but that areas used by this species tended to consist of more patches with greater edge. Home et al. 2009 reported that ocelots in Texas selected woodland communities with >75 percent visually estimated canopy cover. Other microhabitat features important to ocelots appear to be canopy height (>7.8 feet) and vertical cover (90.4 percent visual obscurity at 3.3 to 6.6 feet). Ground cover at locations used by ocelots was characterized by a high percentage of coarse woody debris (50 percent) and very little herbaceous ground cover (3 percent), both consequences of the dense woody canopy (Home 1998).

Shindle and Tewes (1998) quantified species composition of shrubs in three plant communities used by ocelots. Two of these communities occurred in south Texas and another was located in northeastern Mexico. Within the dense thornscrub communities used by ocelots, 45, species, mostly woody, were found at the LANWR in Cameron County and 28, species, mostly woody, on the Yturria Ranch in Willacy County (Shindle and Tewes 1998). Agriculture pesticides are used year round in the LRGV and drift or overspray from aerial applications occurs periodically. In the LRGV, runoff from cultivated fields may concentrate pesticides and herbicides in permanent bodies of water. The types of pesticide chemical compounds and application rates have been extensive and heavy throughout the LRGV. As a

result, pesticide accumulation in the biota remains a major concern in management of thornscrub. Dichlorodiphenyl dichloroethylene (DDE), polychlorinated biphenyls (PCBs), and mercury have been detected in ocelot blood and hair samples at low concentrations, but are not believed to be a significant problem (Mora et al. 2000).

Although habitat loss in South Texas is mainly attributable to agricultural and urban expansion, there are other contributing factors. These include human modifications of the Rio Grande with dams and reservoirs for flood control and hydroelectric power; floodway systems that remove water from the stream channel during peak flows; water diversions for irrigation, municipal, and industrial usage; and channel restriction and canalization (Coastal Impact Monitoring Program 1995).

Because of increasing economic integration between the U.S. and Mexico, there is increasing pressure for new or improved highways and bridge infrastructure, as well as recently increasing national security concerns and the installation of border fencing and lighting in the Texas/Mexico border region. There are 11 existing international bridges along the Rio Grande between Falcon International Reservoir and the Gulf of Mexico. Local human population growth and rapid industrialization on the Mexican side of the border have raised concerns regarding the placement of road and bridge infrastructure. Increased construction of these facilities may affect the Rio Grande floodplain and its riparian wildlife habitat, disrupting the continuity of the "wildlife corridor."

Importing and exporting skins of many spotted cats became illegal in the U.S. between 1967 and 1973 and the ocelot was added to CITES in 1989. Recommendations have been made by Tewes and Everett (1986) for selective methods of predator control and hunter education to avoid the accidental shooting of ocelots. In 1997, the Service entered into a section 7 consultation with the USDA's Animal Damage Control for the use of leg-hold traps, snares, and M-44s explosive predator baits in South Texas and provided provisions for the protection of ocelots during their control practices.

Data are limited regarding disease in the ocelot, but several diseases and parasites have been documented. They include: Notoedric mange *(Notoedres cati)* (Pence et al. 1995); Hepatozoon in the blood; Cytauxzoon in their red blood cells; fleas *(Pu/ex sp.)*; dog ticks *(Dermacentor variabilis);* and Amblyomma ticks (Mercer et al. 1988). The tapeworm *(Taenia taeniaeformis)* (Service 1990) and helminths (Pence et al. 1995) have been reported in ocelots.

Ocelot mortality has also been attributed to aggression and predation by other animals. Ocelots can be prey of domestic dogs, coyotes, snakes, alligators and bobcats (Service 1990). In the last 30 years, vehicular collisions are the greatest known cause of ocelot mortality in South Texas, accounting for 45 percent of deaths of 80 radio-tagged ocelots monitored by Haines et al. (2005a) between 1983 and 2002. Calculation of known ocelot mortality in the LANWR population since the mid- 1 990s indicates road mortality may be increasing. Of the 33 known ocelot deaths since 1994, 14 (42 percent) were the result of road mortality. Road mortality numbers may be even higher because ocelot carcasses may be depredated or removed from roadways by members of the public before officials can arrive to examine the remains (M. Sternberg pers. comm.). In addition, if an ocelot's carcass is found after decomposition has started; it is often difficult to determine the animal's cause of death. Since 2007, six of the 10 known ocelot deaths (60 percent) have been the result of road mortality (H. Swarts pers. comm.).

TxDOT has installed thirteen wildlife underpasses and several culverts for ocelot use as travel corridors in critical areas, but they have not been monitored for a sufficient length of time to determine if ocelots used them. The construction or improvements to several roads have undergone section 7 consultation, resulting in the placement of additional wildlife crossings. These wildlife crossings may allow ocelots to disperse between patches of suitable habitat and reduce genetic isolation of the populations.

Distribution and Abundance

The ocelot is widely distributed from South Texas to South America (Navarro-Lopez 1985). Although ocelots were historically found in Arizona, a viable resident population has not been substantiated there. It is estimated that about 80 ocelots remain in Texas, with the majority distributed in Cameron and Willacy counties (Tewes and Everett 1986, Jackson et al. 2005, Haines et al. 2006a). Three known breeding populations represent an estimated one-third of the total ocelot population in Texas: one located at LANWR in Cameron County, and two in Willacy County on the Yturria Ranch and East El Sauz Ranch (Laack 1991, Tewes 2011, Tewes 2012).

The LANWR population is the closest resident subpopulation to the Action Area, and is located about 11 miles north. However, in 1998 a dispersing male ocelot was captured, radio-collared, and tracked by B&A biologists in dense thornshrub on lomas in and around the Action Area. Based on tracking, this ocelot eventually travelled north to the LANWR. Outside of the U.S., ocelots are widely distributed and common from Mexico through the southern half of South America; therefore, they are considered a species of least concern by the International Union for Conservation of Nature and Natural Resources (IUCN 2014).

Analysis of the species/critical habitat likely to be affected

The Project will result in the permanent loss of 212 acres of dense South Texas Loma Evergreen Shrubland and South Texas Loma Grassland/Shrubland habitats, which are considered preferred ocelot habitat and often include denning sites for females and kittens. This includes Loma del Potrero Cercado within the Action Area, which represents one of the 22 named lomas located near the Action Area. Loma del Divisadero and an unnamed smaller loma would be within the undisturbed travel corridor that Annova will maintain to the southwest of the site. This loss of about 212 acres within Loma del Potrero Cercado will represent about 6 percent of the approximately 2,075 acres of named lomas in the immediate Project area. This loss of habitat could affect overall ocelot fitness and will adversely affect ocelot movement and foraging behavior. In addition, the Project would also fragment ocelot habitat creating disjointed habitat patches and road barriers that would deter ocelot movement in the Action Area, and to and from Mexico. The Service has indicated that the Project would sever the remaining coastal ocelot corridor to the Rio Grande River and Mexico (FWS 2015b).

Critical Habitat

Critical habitat has not been designated for the ocelot; therefore, there would be no effect and critical habitat is not considered further in this document.

Gulf Coast jaguarundi

The jaguarundi was listed as endangered in 1976 (41FR24064). The jaguarundi is also listed in the CITES Appendix I, which bans international commerce. CITES offers some protection over much of its range. Hunting is prohibited in Argentina, Belize, Bolivia, Columbia, Costa Rica, French Guiana, Guatemala, Honduras, Mexico, Panama, Paraguay, Surinam, Uruguay,

United States, and Venezuela. Hunting is regulated in Peru, while no legal protection is offered in Brazil, Nicaragua, Ecuador, El Salvador, and Guyana.

Description

The jaguarundi has a long slender body, short legs, and sleek un-patterned fur, and looks more like a large weasel or otter than a cat. They are roughly twice the size of a domestic cat, weighing approximately 7 to 22 pounds, standing 10 to 14 inches at the shoulder, and can be up to 4 feet long from nose to tail tip, with the tail a third the length. Its head is long and flat head. The ears are short and rounded, and this is one of the few cat species that does not have a contrasting color on the backs of the ears. Their eyes are small and set closely together.

Jaguarundis have three distinct color phases, black, reddish-brown, and brownish-gray, although the latter phase has also been called blue. The phases are so distinct that at one time they were thought to be separate species, the red one being called *Fe/is eyra.* The black color phase does not occur in Texas (Goodwyn 1970). These cats are not known to be closely related to the other small South American cats. Instead of having 36 chromosomes, like the South American cats, the jaguarundi has 38, like the cougar *(Puma concolor)* (Tewes and Schmidly 1987).

Habitat

Habitat requirements in Texas are similar to those for the ocelot: thick, dense thorny brushlands or chaparral. Approximately 1.6 percent of the land area in South Texas is this type of habitat (Tewes and Everett 1986). The thickets do not have to be continuous, but may be interspersed with cleared areas. Jaguarundis possibly show a preference for habitat near streams (Goodwyn 1970, Davis and Schmidly 1994) and may be more tolerant of open areas than the ocelot. The jaguarundi uses mature forest (i.e., brush) and pasture-grassland (Caso 1994). Jaguarundi habitat use was 53 percent mature forest and 47 percent pasture- grassland. Jaguarundi use open areas for hunting and sometimes resting, but if threatened with a potential danger they will seek cover in brush areas.

The most common plants occurring in habitats in the LRGV where the jaguarundi has been documented are huisache *(Acaciafarnesiana),* blackbrush acacia *(Acacia rigidula),* prairie baccharis *(Baccharis texana),* chilipiquin *(Capsicum annuum),* lotebush, allthorn goatbush *(Caste/a texana),* Texas persimmon *(Diospyros texana),* coyotillo *(Karwinskia humboldtiana),* common lantana *(Lantana horrida),* berlandier wolfberry *(Lycium berlandier),* javelinabrush *(Microrhammus ericoides),* Texas prickly pear *(Opuntia lindheimeri),* retarna *(Parkinsonia aculeata),* honey mesquite, cedar elm *(Ulmus crassifolia),* and lime pricklyash *(Zanthoxylumfagara)* (Goodwyn 1970).

Life history

Most information on the jaguarundi comes from historical writings and information gained from studying the ocelot in South Texas and Mexico. Caso (1994) captured and radio collared jaguarundi in Tamaulipas, Mexico from 1991 to 2005. He found home range sizes averaged 3.8 and 3.2 square miles for males and females, respectively. Both studies captured jaguarundi in undisturbed brush and grasslands with scattered second growth woodlands (Caso 1994). Historical accounts from Mexico suggest that jaguarundi are good swimmers and enter the water freely.

Little is known of jaguarundi reproduction in the wild. Den sites include dense thickets,

hollow trees, spaces under fallen logs overgrown with vegetation, and ditches overgrown with shrubs (Tewes and Schmidly 1987, Davis and Schmidly 1994). In Mexico, they are observed as being solitary, except during November and December when they mate. Young have been born in March and August, with possibly two litters per year. Usually two to four young comprise a litter, with litters being either all of one color phase or containing both the red and gray phases. Jaguarundi kittens are spotted at birth, and lose their markings as they mature. Gestation (based on captive jaguarundi) varies from 63 to 75 days (Goodwyn 1970, Tewes and Schmidly 1987, Davis and Schmidly 1994). Jaguarundis communicate by calls, 13 of which have been identified in captive animals. The largest repertoire occurs during the mating season (Hulley 1976).

The jaguarundi is primarily active during the day, although some nocturnal activity has been recorded (Konecny 1989, Caso 1994). However, they appear to be less nocturnal than the ocelot. They are excellent climbers although they spend most of the time on the ground. They hunt primarily in the morning and evenings. Prey is largely birds, but bird eggs, rats, mice, rabbits, reptiles and fish are also taken (Goodwyn 1970; Tewes and Schmidly 1987; Davis and Schmidly 1994). In Venezuela, Bisbal (1986) found the diet of jaguarundi to be 46 percent mammals, 26 percent birds, and 29 percent reptiles.

Population dynamics

Habitat loss and alteration due to brush-clearing activities, human encroachment, and human persecution are the main causes for the decline in jaguarundi populations (Service 1995). Tracts of at least 75 to 100 acres of isolated dense brush, brush interconnected with other habitat tracts by brush corridors, or smaller tracts adjacent to larger areas of habitat may be used by jaguarundi. Roads, narrow water bodies, and rights-of-way are not considered barriers to movements. Brush strips connecting areas of habitat, such as brushy fence lines and watercourses, are very important in providing escape and protective cover.

The jaguarundi is generally not exploited for commercial trade and does not experience the harvest pressure that is experienced by the ocelot (Sunquist and Sunquist 2002). In Central and South America, Texas, and northeastern Mexico, the coat of the jaguarundi is not highly sought after by the skin trade because of its poor quality and lack of spotting. They are difficult to trap, but may be caught in traps set for commercially valuable species, and may be subject to low intensity hunting pressure around settled areas.

Status and distribution

The jaguarundi historically occurred in southeast Arizona, South Texas, Mexico, Central and South America as far south as northern Argentina. Today the jaguarundi has a similar distribution, but in reduced numbers, although it probably no longer occurs in Arizona (Tewes and Schmidly 1987) and there has not been a confirmed sighting in South Texas since 1986.

They may also be extinct in Uruguay. They are reported to occur at Masaya National Park in Nicaragua, Soberania National Park in Panama and El Imposible National Park in El Salvador (Nowell and Jackson 1996). The presence of jaguarundi in Florida is likely the result of human introduction (Nowak and Paradiso 1983).

In Texas, jaguarundis have been known to occur in Cameron and Willacy counties. Tewes and Everett (1986) analyzed the records of a clearinghouse established in 1981 to coordinate reception and filing of reports of jaguarundi (and ocelots) in Texas. Many of the reports were

solicited by sending out questionnaires to trappers. Jaguarundis were reported from central Texas and the upper Gulf Coast, as well as from South Texas. However, due to lack of any tangible evidence, such as road kills, most of the sightings are believed to have been of black feral house cats. Tewes and Everett (1986) could not estimate the jaguarundi population in South Texas because confirmed sightings were rare. Goodwyn (1970) reported from interviews he conducted in 1969 that jaguarundi were thought to occur in seven specific areas: 1) Santa Ana National Wildlife Refuge, 2) LANWR; 3) "Paso Real", an area along the lower Arroyo Colorado on the border between Cameron and Willacy counties; 4) the southern part of the El Sauz Ranch in northeast Willacy County; 5), a small area west of Olmito in southern Cameron County; 6) an area east of Villa Nueva and 7) an area near the Port Isabel airport in Cameron County.

Several other credible reports of jaguarundi have been documented in Cameron, Willacy and Webb counties (Tewes 1987, Tewes and Everett 1986). One was a road-killed male jaguarundi found near the junction of SH 4 and Farm-to-Market Road (FM) 511 (Keller's Comer) in Cameron County on April 21, 1986 (Tewes 1987, Laack and Rappole 1987).

Unconfirmed jaguarundi sightings in Hidalgo County include: Bentsen Rio Grande State Park, Santa Ana National Wildlife Refuge, LANWR, Cimarron Country Club, Wimberley Ranch, and the Anacua Unit of the Texas Parks and Wildlife Department's Las Palomas Wildlife Management Area, and other areas (Prieto 1990; Benn 1997).

Unconfirmed sightings of a jaguarundi occurred at the Sabal Palm Grove Sanctuary in Cameron County in 1988 (Anonymous 1989) and at the Santa Ana National Wildlife Refuge in March 1998 (Santa Ana National Wildlife Refuge data). Based upon sighting reports, personnel of the Santa Ana National Wildlife Refuge suspect the presence of jaguarundi on the refuge (Benn 1997). The most recent reported sighting was by an Ecological Services biologist at LANWR on November 22, 2004, when two jaguarundis were sighted approximately 0.75 mile north of FM 106 and Buena Vista Road, which is the entrance road to LANWR (Reyes, pers. comm.2008). However, Sunquist and Sunquist (2002) reported the species has likely been extirpated in Texas.

Currently, the known northern range limit of the jaguarundi is northern Mexico. A population exists in the state of Tamaulipas, Mexico, which borders the Texas counties of Cameron, Hidalgo, Starr, and Zapata (Caso 2007). Historically, the jaguarundi is known to have occurred in South Texas from trapping and road-kill reports; however, the last verified jaguarundi in Texas was an individual that was killed on SH 4 near FM 511 east of Brownsville in Cameron County in 1986 (Tewes and Grassman 2005, Grassman 2006, TPWD 2015). A jaguarundi sighting was reported 6 miles east of the Action Area in 1990 along the coastal dunes; however, this record constitutes an unconfirmed Class II sighting (TPWD 2015). (Class II sightings are considered to be reliable sightings for ocelot and jaguarundi without supporting evidence; however, this category likely contains errors, particularly for jaguarundi observations [Tewes and Everett 1986]). Currently, there are no known populations of jaguarundi in Texas.

Reason for Listing

Loss of habitat is one of the main threats to the jaguarundi. Historically, dense mixed brush occurred along dry washes, arroyos, resacas, and the flood plains of the Rio Grande. A majority of shrub land has been converted to agriculture and urban development.

Unfortunately for the jaguarundi, the best soil types used for agricultural crops also grow the thickest brush and thus produce the best habitat for the jaguarundi. Less than five percent of the original brush vegetation remains in the Rio Grande Valley.

Range-wide trend
Nothing is known of jaguarundi population estimates or demographics in the U.S. Based on the natural history of this species, it is anticipated that the same ecological pressures that affect ocelot population dynamics apply to the jaguarundi as well. These pressures primarily include habitat loss, habitat fragmentation, and road mortality. Research in northern Mexico suggests that jaguarundi den between March and August and produce two to four young (USFWS 2013c).

Analysis of the species/critical habitat likely to be affected
The Project will result in the permanent loss of 212 acres of dense South Texas habitat: Loma Evergreen Shrubland, and South Texas Loma Grassland/Shrubland which are considered preferred jaguarundi habitat. This includes Loma del Potrero Cercado within the site, which represents one of the 22 named lomas located near the Action Area. Loma del Divisadero and an unnamed smaller loma will be within the undisturbed travel corridor that Annova will maintain to the southwest of the site. The loss of about 212 acres of habitat within Loma del Potrero Cercado would represent about 6 percent of the approximately 2,075 acres of named lomas in the immediate Project area. This loss of habitat could affect overall jaguarundi fitness and could adversely affect jaguarundi movement and foraging behavior. In addition, the Project will also fragment jaguarundi habitat creating disjointed habitat patches and road barriers that will deter jaguarundi movement in the Action Area, and to and from Mexico. The Service has indicated that the Project would sever the remaining coastal ocelot/jaguarundi corridor to the Rio Grande River and Mexico (FWS 2015b). The effects of the proposed action on ocelots and jaguarundis are considered further in the remaining sections of this FBO.

Critical Habitat
Critical habitat has not been designated for the jaguarundi; therefore, there would be no effect and critical habitat is not considered further in this document.

Environmental Baseline
Under section 7(a)(2) of the Act, when considering the effects of an action on Federally- listed species, the Service is required to take into consideration the environmental baseline. The environmental baseline includes past and ongoing natural factors and the past and present impacts of all Federal, State, or private actions and other human activities in the action area, including Federal projects in the action area that have already undergone section 7 consultation and the impacts of State or private actions which are contemporaneous with the consultation in process (50 CFR402.02).

The Action Area lies within the Rio Grande Delta region, a region characterized by unique and complex landforms created over time by the interaction of sediment deposition and channelization of the Rio Grande, the hypersaline coastal system of the Laguna Madre, and wind driven processes (Griffith et al. 2007). In general, the Action Area consists of the BSC, areas of flat coastal plain at or below 5 feet above sea level, and scattered lomas (clay dunes) rising to nearly 25 feet above sea level. Low-lying tidal and non-tidal wetlands occur along the BSC and within depressions of various sizes and depths within the coastal plain. Unvegetated wind-tidal flats associated with South Bay occur within the eastern edge of the Project site. The region has a subtropical, sub humid, modified marine climate. The historic

average annual rainfall for the Brownsville area is approximately 27.4 inches (NOAA 2014). The prevailing wind is south-southeasterly (on-shore). Average daily temperature extremes are 51°F (low) to 69°F (high) in January and 75°F to 94°F in July (Larkin and Bomar 1983).

Lomas are unique features found in the coastal plains of eastern Cameron County and are characterized as scattered clay dunes that formed by windblown saline clay particles originating from local salt flats that are largely barren of vegetation. Lomas typically range from 5 to 30 feet above mean high tide and from 10 to about 250 acres in size (USDA 1977). Vegetation communities on lomas range from dense mixed thornshrub communities or grassland habitats to nearly barren ground, depending on factors such as soil salinity (which varies from low to very high), erosion, and grazing pressure. Three loma systems are located within the current Action Area: Loma del Potrero Cercado (a large loma system with two distinct peaks), Loma del Divisadero, and the eastern portion of Loma de la Jauja. Loma del Potrero Cercado is located in the northern portion of the Project site, Loma del Divisadero is located in the southern portion of the Project site, and Loma de la Jauja is located along the potential Alternative 2 access road route near State Highway 4.

Outside the lomas, the Action Area consists of relatively flat coastal prairie that is typically 5 feet or less above sea level and is within the 100-year floodplain. Within the coastal prairie are scattered depressions of varying sizes. Within the Project site itself, large depressions up to nearly 40 acres in size occur within the coastal prairie and hold fresh to brackish water for some portion of the year based on plant species observed and review of aerial photography. Along the access road corridor, small (less than 0.5 acre), shallow, saline depressions and swales occur within the coastal prairie. Based on review of historic aerial photography, these depressions may have been influenced by the nearby estuary system; however, with improvements to the BSC and establishment of dredge material placement areas, they are now surrounded by upland areas. They are still located within the 100-year floodplain. The BSC itself contains deep water within the maintained navigation channel and shallow water outside the navigation channel.

The Action Area is located within the Rio Grande basin (U.S. Geological Survey [USGS] Bahia Grande-Brownsville Ship Channel 12-digit Hydrologic Unit Code 121102080900). There are no streams within the Action Area, but the BSC forms the northern border of the Action Area. Most storm water runoff in the Action Area flows away from the BSC, across the flats, and into large depressional areas, where it ponds until it evaporates. Based on published tidal benchmark data at Brazos Santiago Pass on South Padre Island, the Mean High Water of theBSC is approximately 1.4 feet above the mean lower low water (MLLW) elevation (NOAA 2003). Based on the Cameron County soil survey, the depth to water table in the Action Area typically ranges from the surface to 12 inches in the low tidal flats, 20 to 48 inches in the flat coastal prairie covering most of the Action Area, and deeper on the lomas and areas containing dredged material deposits.

Four soil types are mapped within the Action Area: Barrada clay, Point Isabel clay loam, Sejita silty clay loam, and Twin palms-Yarborough complex (NRCS 2016). Barrada clay and Sejita silty clay loam are both saline soils and occur in tidal areas and flat coastal prairie, respectively. Point Isabel clay loam occurs on lomas, and Twin palms-Yarborough complex occurs where dredged materials have been deposited.

Habitats/vegetation communities within the Action Area can generally be described as open

water in the BSC, unvegetated tidal and wind-tidal flats, various wetlands, herbaceous upland prairie, shrubland/grassland, and dense thornscrub. The Action Area is located within a mosaic of mostly public lands used for wildlife management and industrial purposes. As noted earlier, the Action Area is located within a coastal corridor identified by the Service as being important to the travel and dispersal of the ocelot and jaguarundi, and which the Service and other agencies and organizations are actively purchasing properties and obtaining conservation easements.

Other Federal Actions

Several other federal actions have resulted in formal section 7 consultations with the Service and the issuance of incidental take for the ocelot and jaguarundi within the Action Area.

A formal section 7 consultation was conducted with the Federal Highway Administration (FHWA) for SH 48 in 2004. The action included widening and improving approximately 9.7 miles of road. The limits of the proposed construction are from SH 100 in Port Isabel to the Shrimp Basin near Brownsville. The highway was a two lane undivided road, with 12-foot wide main lanes, 8-foot-wide shoulders, and a 4- foot-wide flush median. The project expanded the roadway to a four-lane divided highway, with four 12-foot wide main lanes, two 10-foot wide outside shoulders, and two 4-foot wide inside shoulders with a concrete traffic barrier in the center. To avoid and minimize impacts to the endangered ocelot and jaguarundi. TxDOT implemented a number of measures that included a bridge design wildlife crossing and associated diversion fencing on both sides of the highway. Incidental take was provided for the harassment of one ocelot and one jaguarundi. Also as part of the project, BND granted the Service a 19-year, 1,000-foot wide conservation easement from the highway to the ship channel. This project has been completed, and there has been no reported take of an ocelot or jaguarundi to date. Monitoring of the wildlife crossing with camera traps has not indicated any attempts to use the crossing by either an ocelot or a jaguarundi.

A formal section 7 consultation was completed for FHWA on improvements to FM 106 and Buena Vista Road in January 2005, and revised in June 2013. This action included improving the existing two-lane roadway to meet State highway standards by resurfacing the existing lanes and adding shoulders and graded ditches for approximately 12 miles between FM 1847 and FM 510. The improvements would provide a 44-foot wide rural roadway consisting of two 12-foot wide travel lanes with 10-foot wide shoulders. These improvements would require approximately 10 feet of additional right of way on either side of the road. FM 106 bisects portions of the LANWR and serves as the access road leading into the refuge headquarters. TxDOT installed five wildlife crossings on FM 106 and another three on Buena Vista Road to avoid and minimize effects to the ocelot and jaguarundi and loss of travel corridor habitat. Right of way fencing was also installed. Incidental take was provided for an aggregate of four endangered cats over any five year period related to the construction and use of FM 106. Construction of this project will be completed by fall of 2019.

In 2010, the Service conducted a formal section 7 consultation with the Department of Homeland Security for the installation of a waterline for the Port Isabel Detention Center. The new 12-inch water line connected to an existing line at the intersection of FM 2480 and FM 510. The new line follows FM 510 east to the intersection with FM 106, then turns north along FM 106 until it reaches the detention facility. Incidental take was provided for the harassment of one ocelot and one jaguarundi during construction. Lethal take was not provided. This project has been completed, and there has been no reported take of an ocelot or jaguarundi to date.

Other notable formal consultations have been conducted for the ocelot and jaguarundi outside of the action area, but the incidental take associated with these consultations could affect the LANWR ocelot population. They are:

- In 2012, the Service completed a formal section 7 consultation with FHWA for improvements to U.S. Highway (US) 77, between Interstate Highway 37 in Nueces County and US 83 in Cameron County. The consultation covers construction, improvements, operation, maintenance and the installation of three wildlife crossings (bridges), and appropriate fencing of US 77 for the life of the project. Incidental take was authorized for two endangered cats during any five-year period.

- A 2013 formal consultation was completed with the Federal Aviation Administration (FAA) for the SpaceX Spaceport. The FAA proposed to issue launch licenses and/or experimental permits to authorize SpaceX to launch Falcon 9 and Falcon Heavy orbital or suborbital vehicles from the launch site. SpaceX has constructed facilities, structures, and utility connections to support and operate a vertical launch site and control center on about 56.5 acres of land in Cameron County. The FAA was authorized incidental take of two endangered cats over the life of the project.

- In 2015, the Service completed formal section 7 consultation for the proposed SH 100 project including the implementation of conservation actions targeted at protecting the ocelot and jaguarundi along 7.1 miles of SH 100, beginning about 0.4 mile east of FM 1847 in Los Fresnos and ending about 0.75 miles west of FM 510 in Laguna Vista. TxDOT constructed four new wildlife crossings and rehabilitate an existing wildlife crossing. TxDOT installed 6-foot tall fencing with concrete apron along the 7.1 miles of SH 100, within the area where concrete barrier is located in the center median of the road. Incidental take for one ocelot or jaguarundi was authorized.

- In 2017, the Service completed formal section 7 consultation for APHIS proposing the use of IvomecA® or IvomaxA.® (Ivermectin) pour-on cattle formulation mixed with whole kernel com bait in feeding stations to deliver a systemically active acaricide to control ticks in deer. Incidental take for one ocelot or jaguarundi was authorized.

- In 2018, the Service completed formal section 7 consultation for the South Texas Refuge Complex to issue a Special Use Permits (SUP's) to USDA-APHIS/ TAHC for experimentally grazing cattle treated with injectable acaricides, and feeding white-tailed deer ivermectin-treated com from feeding stations at LANWR. Incidental take for one ocelot or jaguarundi was authorized.

Current and past Customs and Border Protection (CBP) activities have affected the species habitat. Portable and permanent lighting incorrectly positioned illuminates brush vegetation and causes the species to avoid such areas. Clearing of brush for patrol roads, drag roads, and construction of Ports of Entry (POE) have fragmented and eliminated habitat. Border fence construction creating a north-south barrier and loss of connectivity of habitats along the Rio Grande River has species impacts. Multiple roads between the flood levee and the river further fragment the habitat. Encroachment of development around the POEs also resulted in loss, avoidance or fragmentation of habitat. An incidental take statement has been issued by the Service for one ocelot and one jaguarundi for the life of the Operation Rio Grande project.

If all of the incidental take of ocelots that has been authorized since 2016 (State Highway 100 BO) in Cameron County that has occurred, the LANWR population would be extirpated, but no cats have been taken from any of the above projects that we are aware of.

Status of the species within the action area

Ocelots and jaguarundis

Habitat within the Action Area

The Project will affect a total of 212 acres of ocelot/jaguarundi habitat. The ocelot and jaguarundi are treated together here, as in many publications (e.g., Service 1987; Service 1990), the two are thought to exhibit similar habitat preferences in South Texas. They suffer from similar causes of population decline, and benefit from similar recovery efforts. The Action Area occurs within the Tamaulipan Biotic Province (Blair 1950), which supports patches of dense thornshrub species which are important as ocelot cover. This region also is part of the Bahia Grande Coastal Corridor Project (BGCCP), a bi-national, federal, state and private land acquisition effort to link the globally significant Laguna Madre region of South Texas with the Northern Mexico Gulf Coast (BGCCP 2014b).

The Project would be located within the Gulf Coast Prairies and Marshes Ecoregion (TPWD 2016c). This ecoregion is a nearly level, slowly drained plain less than 150 feet in elevation, which is dissected by streams and rivers flowing into the Gulf of Mexico (TPWD 2016c). The majority of the Project site would be less than 5 feet above sea level and is flat with shallow depressions and isolated lomas. Lomas are dunes formed from wind-blown clay that support dense shrub vegetation communities that provide important habitat for protected wildlife species (FWS 2012b). Three distinct lomas - Loma del Potrero Cercado, Loma del Divisadero, and the eastern portion of Loma de la Juaja are located within the Project site. These lomas and their habitat value for wildlife. Portions of the Project site support emergent herbaceous wetlands or are devoid of vegetation due to high concentrations of salt.

Operation and maintenance of the Project would impact approximately 491 acres of land within the Terminal 731-acre lease boundary that will be permanently converted for operations, and would result in permanent loss of vegetation. The construction and operation of the Terminal site would result in the loss of 127 acres of South Texas Loma Evergreen Shrubland and 85 acres of South Texas Loma Grassland/Shrubland habitat within the action area.

South Texas loma evergreen shrubland is an upland vegetation community consisting of dense cover of thornshrub species found at higher elevations on lomas. It occurs on top of all three lomas found within the Project site. Typical vegetation includes ebony (*Ebenopsis ebano*), granjeno (*Celtis ehrenbergiana* [*C. pallida*]), lime prickly-ash (*Zanthoxylum fagara*), honey mesquite (*Prosopis glandulosa*), desert yaupon (*Schaefferia cuneifolia*), lotebush (*Ziziphus obtusifolia*), coma (*Sideroxylon celastrinum*), coyotillo (*Karwinskia humboldtiana*),Texas Lantana (*Lantana urticoides* [*L. horrida*]), Berlandier's fiddlewood (*Citharexylum berlandieri*), Spanish dagger (*Yucca treculeana*), few-flower climbing-dalea (*Dalea scandens* var. *paucifolia)*, goatbush (*Castela erecta* [*C. texana*]), cow-itch vine (*Cissus incisa* [*C. trifoliata*]), old-man's beard (*Clematis drummondii*), threadvine (*Cynanchum barbigerum*), hierba del soldado (*Waltheria indica*), Tamaulipan mistflower (*Tamaulipa azurea*), Lozano's false Indian mallow (*Allowissadula lozanii*), Cuban germander (*Teucrium cubense*), tropical sage (*Salvia coccinea*), guineagrass, big sacaton (*Sporobolus wrightii*), and smutgrass. Approximately 208 acres of this vegetation

community occur within the Project site and along the access road.

The South Texas Loma Grassland/Shrubland community is a mix of grassland and shrubland found at low elevations around the base of lomas and typically forms a continuous ring around the loma. Shrub cover is typically greater than 10 percent. This community occurs throughout the Project site and along the access road at the base of lomas. Typical vegetation includes: big sacaton, guineagrass, whiplash pappusgrass, silver bluestem, witchgrass, short-spike windmillgrass, hooded windmillgrass, smutgrass, multi-flower false rhodesgrass (*Trichloris pluriflora*), hierba del soldado, white mistflower (*Fleischmannia incarnata*), blue mistflower (i), false ragweed (*Parthenium hysterophorus*), goldenweed (*Isocoma drummondii*), Tamaulipan mistflower, cow-itch vine, old- man's beard, threadvine, dwarf morning glory (*Evolvulus alsinoides* var. *angustifolius* [*E. alsinoides* var. *hirtcaulis*]), corona del Christo (*Passiflora foetida* var. *gossypiifolia*), honey mesquite, Spanish dagger, Berlandier fiddlewood, Texas lantana, Texas pricklypear, lotebush, lime prickly-ash, granjeno, coma, tasajillo, coyotillo, cenizo (*Leucophyllum frutescens*), and camphor daisy. At lower elevations, the loma grasslands consist of dense monotypic stands of buffelgrass (*Pennisetum ciliare*) or Angleton bluestem (*Dichanthium aristatum*). Approximately 178 acres of this vegetation community occur within the Project site and along the access road.

Species Presence in the Action Area

The ocelot and jaguarundi are treated together here, as in many publications (e.g., Service 1987; Service 1990); the two are thought to exhibit similar habitat preferences in South Texas. They suffer from similar causes of population decline, and benefit from similar recovery efforts. The Action Area occurs within the Tamaulipan Biotic Province (Blair 1950), which supports patches of dense thornscrub species which are important as ocelot cover. This region also is part of the BGCCP, a bi-national, federal, state and private land acquisition effort that will link the globally significant Laguna Madre region of South Texas with the Northern Mexico Gulf Coast (BGCCP 2014b).

There are several documented sightings of ocelots in and around the Action Area (TPWD 2015). A single, radio-collared male ocelot was captured and tracked by B&A biologists in April 1998 within and near the Action Area, and up to 8 miles north of the Action Area on private lands (TPWD 2015). This individual, a young male, was captured on an unnamed loma located between SH 4 and the BSC approximately 2 miles from the Action Area. From April 29 to June 13, 1998, this ocelot traveled along lomas and brushy areas of SH 4 and the Service's Loma Ecological Preserve, including Loma del Portrero Cercado, and was last recorded 8 miles north of the Action Area near the LANWR.

Two Class II[1] sightings of ocelots southeast of Brownsville in 1988 and 1989 are reported in the Texas Natural Diversity Database; TPWD 2015). In 1989, a road-killed ocelot was documented on SH 48 near San Martin Loma, and in 1992, an ocelot was reported on SH 48, 3 miles east of FM 100 (Service 2013c). Multiple road mortality events have been recorded on roadways north of the Action Area including FM 106, FM 510, and near the Holly Beach area (Service 2013c, B&A 2004. Four ocelots have been documented as road mortalities on SH 100, with three killed during the past five years, approximately 7 miles north of the Action Area (Raymondville Chronicle News 2014). One of three known ocelot breeding subpopulations is located on LANWR, about 11 miles north of the Action Area.

Conversely, three additional surveys south of SH 100 in the vicinity of the Action Area (1985,

1990, and 2000-2001) failed to document this species (Dr. Michael Tewes, personal communication to Dr. Lon Grassman, B&A, December 17, 2015; Shinn 2002). Annova conducted a camera-trapping survey for ocelots (and jaguarundis) on BND and private properties in the Project vicinity from January 2016 through January 2017. Over the course of the survey, 121 camera trap sets were installed in the survey area and operated for over 40,000 trap-nights. The cameras documented 20 species of mammals, along with various bird and reptile species. The mammals included bobcat *(Lynx rufus),* coyote *(Canis latrans),* striped skunk *(Mephitis mephitis),* northern raccoon *(Procyon lotor),* Virginia opossum *(Didelphis virginiana),* nine-banded armadillo *(Dasypus novemcinctus),* white- tailed deer *(Odocoileus virginianus),* nilgai antelope *(Boselaphus tragocamelus),* collared peccary *(Tayassu tajacu),* feral pig *(Sus scrofa),* eastern cottontail *(Sylvilagus floridanus),* black-tailed jackrabbit *(Lepus californicus),* southern plains woodrat *(Neotoma micropus),* Mexican ground squirrel *(Spermophilus .mexicanus),* American badger *(Taxidea taxus),* long-tailed weasel *(Mustelafrenata),* domesticated cats *(Fe/is catus),* horses *(Equus caballus),* cows *(Bos taurus),* and goats *(Capra hircus).* No ocelots (or jaguarundis) were documented during the camera-trapping survey.

[1] A Class II observation is one made by an observer that seems reliable or is experienced in the outdoors accustomed to looking for details (i.e., biologist, trapper, bird watcher, game warden, or hunter) and includes a detailed description of the event.

The current size and distribution of loma thornscrub in the Action Area may support transient or resident ocelots. Moreover, the surrounding BND and Service national wildlife refuge properties outside the Action Area would likely provide additional protection and cover for this species. Given the past documented occurrences of ocelots in and around the Action Area, the proximity of a known ocelot subpopulation in LANWR, and the quality and quantity of dense thornscrub habitat within and around the Action Area, it is possible that ocelots will occur in the Action Area.

There are no documented occurrences of jaguarundi within the Action Area (TPWD 2015). The last confirmed documentation of a jaguarundi in the region an individual that was killed on SH 4 near FM 511 east of Brownsville in Cameron County in 1986 (Tewes and Grassman 2005, Grassman 2006, TPWD 2015). Four independent surveys south of SH 100 in the vicinity of the Action Area (1985, 1990, 1998-2002, and 2000-2001) failed to document this species (Dr. Michael Tewes, personal communication to Dr. Lon Grassman, B&A, December 7, 2015; Shinn 2002, B&A 2003a). There are no other confirmed sightings of jaguarundi in the U.S., and it is unlikely that jaguarundi are currently present in Texas. As a viable jaguarundi population exists in Tamaulipas State, Mexico, and suitable habitat exists within the Action Area, the occurrence of the jaguarundi in the Action Area cannot be ruled out.

Factors Affecting Species Environment within the Action Area Land

Ownership in Project Vicinity

The Project site consists of undeveloped land that is owned by the BND and provides access to manage levees for adjacent dredged material placement areas. The Project site was formerly managed by the Service on behalf of BND as part of mitigation for a canceled project. Under United States Army Corps of Engineers (USACE) Permit 13942 issued to the BND in 1982 (USACE 1982), an area associated with Loma del Potrero Cercado was set aside as mitigation for a

project to deepen the BSC and facilitate construction of multipurpose docks at the deepwater turning basin. Under USACE Permit 13942, mitigation of impacts from the deepwater project included setting aside 4,837 acres as the Loma Ecological Preserve, which now includes the Project site. The BND and Service entered into a lease for management of the preserve; however, the BND did not implement the project to deepen the BSC, and the permit expired in 1987.

In the Project vicinity, major landowners include BND, the Service, and the State of Texas. The Service's properties include the LANWR, located north of the BSC, and the LRGVNWR, located primarily south of the BSC. The Loma Ecological Preserve lies east of the Project site and is owned by the BND and leased by the Service. The Project vicinity is a mosaic of mostly public lands used for wildlife management (Service) and industrial purposes (BND). An understanding of this mosaic of land use provides some context regarding the Project site's function with respect to landscape-scale species (e.g., species with large home ranges) such as the federally endangered ocelot and jaguarundi.

Habitat Acquisition and Management

The South Texas Refuges Complex (STRC) is situated in southernmost Texas, and is made up of three national wildlife refuges: Santa Ana National Wildlife Refuge, LANWR, and LRGVNWR. LRGVNWR owns 22,000 acres (Boca Chica) within the project area. LANWR owns or manages about 101,917 acres of land. LANWR is home to one of the two known subpopulations of ocelots. North of LANWR in Willacy County is big ranch country, which encompasses huge blocks of important wildlife habitat, especially for the other U.S. ocelot subpopulation.

The LANWR Master Plan was completed in 1989, establishing a variety of objectives relative to the protection of endangered species, migratory waterfowl, cultural resource protection, research, investigation, research natural areas, and the provisions of public use and recreation opportunities. LANWR completed a proposed refuge expansion plan (Environmental Assessment and Conceptual Management Plan) in September of 1999. One of the reasons for the expanded management plan was the need to provide additional riparian and thicket habitats for the endangered ocelot and jaguarundi.

The Service continues conserving the South Texas landscape by acquiring land and conservation easements from willing sellers in order to connect LANWR and the Willacy County ocelot subpopulation to the north, LANWR with the Rio Grande to the south. A conservation easement with the Brownsville Navigation District (Puerta de Trancas Loma), located between SH 48 and the Brownsville Ship Channel, and the wildlife crossing on SH 48 both play a key role in the ability of ocelots and jaguarundis to move safely between LANWR and the Mexico border. Directly to the south, across the border in Mexico, are ecologically valuable areas, such as the Laguna Madre of Tamaulipas and the Sierra de los Picachos in Nuevo Leon to the west. These areas are receiving focused conservation attention from the Mexican Government and a number of interested U.S. and Mexican conservation organizations. The Service is working with Mexico to establish a wildlife corridor along the Rio Grande, south of the action area, and in Tamaulipas in order to connect these ecologically important areas. There are many fragmented habitats that need restoration of Tamaulipan thornscrub along the Laguna Madre of Tamaulipas between the Rio Grande and southern Tamaulipas. These habitats lie along the wildlife corridor where ocelots and jaguarundis can be found.

South Texas Coastal Corridor

In addition to understanding the surrounding land uses, it is important to understand the relationship of the Project site to regional resources that may be used by landscape-level species like the ocelot and jaguarundi. The Project area is located within a region considered by the Service as being particularly important to the travel and dispersal of the ocelot. Within the region, the Service has developed a strategic habitat conservation plan, referred to as the South Texas Ocelot Coastal Corridor that has a goal of creating a wildlife corridor connecting the LANWR and LRGVNWR (Service 2015a). The Service's Recovery Plan for the Ocelot *(Leopardus pardalis),* First Revision, July 2016 (Service 2016a) includes the following as a recovery action:

"Protect a bi-national corridor of habitat to connect the Cameron County ocelot population to the northernmost known ocelot population in Tamaulipas. Habitat protection can include conservation easements or fee title acquisition from willing sellers. Creation of a Bi-national Coastal Wildlife Corridor from LANWR, Cameron County, Texas, to the Flora and Fauna Protected Area of the Laguna Madre and Delta del Rio Bravo in Tamaulipas, Mexico, has been identified as a shared goal of the Service and CONANP. This corridor should be at least 0.4 km wide and provide habitat connectivity from the Cameron County ocelot population at LANWR in Texas to the northernmost known ocelot population in Tamaulipas."

The Service has a focus on purchasing properties or obtaining perpetual conservation easements in Cameron County to establish and connect the South Texas Ocelot Coastal Corridor. This conservation landscape, in tum, is linked to more than 2 million acres of private ranchland located north of the LANWR. It also joins the 1.3-million-acre Rio Bravo Protected Area, managed by The National Commission on Natural Protected Areas (known by its Spanish acronym CONANP) in coastal Mexico (NFWF 2015).

Effects of the Action

Under section 7(a)(2) "effects of the action" refers to the direct and indirect effects of an action on a species or critical habitat, together with the effects of other activities that are interrelated and interdependent with that action. The effects of the proposed action are added to the environmental baseline to determine the future baseline that serves as the basis for the determination in this biological opinion. The impacts discussed below are the Service's evaluation of the direct and indirect effects of the proposed action. Indirect effects are those caused by the proposed action that occur later in time, but are still reasonably certain to occur (50 CFR 402.02).

Interrelated and interdependent actions

Interdependent actions are defined as "actions having no independent utility apart for the proposed action," while interrelated actions are defined as "actions that are part of a larger action and depend upon the larger action for their justification" (50 CFR §402.02). The Service has determined that there are no interrelated or interdependent actions apart from the action under consideration.

Beneficial effects

Beneficial effects listed below are those effects of the proposed action that are completely positive, without any adverse effects to the listed species or critical habitat:

- Annova modified the Project layout and expanded its leased area to

accommodate a wildlife corridor (185 acres) on the west side of the Project site, where existing dense thornscrub and other habitats would be avoided and preserved, and is proposing to protect the wildlife corridor for the life of the Project. Annova would install a sound barrier wall along the southwest edge of the site between the LNG terminal facilities and the wildlife corridor to reduce light and noise impacts on ocelots and jaguarundis.

- Wildlife Crossings -Annova is working to minimize the potential for ocelot/jaguarundi collisions by incorporating wildlife crossings (culverts) and fencing into the main access road design, in consultation with the Service. Annova would also mandate a speed limit of 25 miles per hour on the main access road and within the Project site.

- Lighting Plan - Annova would minimize the effects of lighting to minimize effects of light on remaining habitats and minimizing lighting on the main access road to that needed to address safety concerns. Also, whenever possible, lights would be placed (down shielded), so they do not shine directly towards adjacent undisturbed habitats or the beach, and lighting would be extinguished upon completion of work in an area.

Direct effects

Habitat Loss

The terrestrial portion of the Action Area, as part of a formerly Service-managed property, has experienced little disturbance over several years other than periodic road maintenance. As a result, native brush suitable for ocelot habitat has proliferated on the lomas. Pre-construction and construction activities would remove suitable ocelot habitat, possibly leading to avoidance of the area by ocelots. The Project will result in the loss of up to 212 acres evergreen shrubland grassland/shrubland, which is considered ocelot habitat. This loss of habitat may also decrease the effectiveness of habitat linkage within the South Texas Ocelot Coastal Corridor and affect the ability of ocelots to use this area as a potential travel corridor. In recognition of this concern, Annova modified the Project layout to accommodate a wildlife corridor on the Project's western boundary. Annova is proposing that the corridor be held as a conservation easement for the life of the Project.

Human Disturbance

The Project will increase disturbance from human presence during pre- and post- construction, and operational activities. Construction will begin in the third quarter of 2020, if FERC issues the authorization to site, construct, and operate the Project under the current schedule. Construction of the marine transfer facilities, two liquefaction trains, and two LNG storage tanks will require approximately 36 months to complete, with the remaining four liquefaction trains to be completed over a 12-month follow-on period. Following construction, human presence will decrease. Post-construction operation and maintenance will initially require approximately 115 personnel to perform operations, security, management, and administrative functions and will increase up to 165 personnel. Early staffing plans assume that the liquefaction facility will operate 24 hours a day, 7 days a week. The Project design life is 30 years.

Many species are known to avoid areas of disturbance, thereby reducing or eliminating the habitat value of these areas. Disturbance effects from construction operations include noise, visual stimuli, human activity, and pollution. These human activities in the Action Area may discourage ocelot use of the Action Area. Although not documented for the ocelot, several responses to human disturbance can be expected in felines. For example, Florida panthers shifted their habitat use area in response to hunters although no changes related to energy intakes (activity rates, movement rates, or predation success) were noted (Janis and Clark 2002 as cited by Service 2013c). In another study, lynx were found to have a median tolerance limit to approaching humans of 164 feet and they tolerated a closer approach by humans when in denser habitats than in more open areas (Sunde et al. 1998 as cited by Service 2013c). In general, typical wildlife responses to human disturbance may be fleeing, increased vigilance, and changes in habitat selection (Frid and Dill 2002).

Noise

Detailed information on anticipated noise and vibration resulting from Project construction and operations is provided in General Project Description and Air Quality and Noise. Major construction phases for the Project will generally consist of site preparation, foundation construction, building and equipment erection, site clean-up, and facility start-up. Sound levels at the property boundary and noise-sensitive areas (NSAs) will vary with each phase of construction, depending on the construction activity and the associated construction equipment required for each phase. The site preparation phase typically requires the use of heavy, diesel-powered earth moving equipment. In order to assess the future environmental sound levels and to evaluate potential acoustical impacts, an acoustical model was created. The model simulates the outdoor propagation of sound solely from Annova Project equipment and accounts for sound wave divergence, atmospheric and ground absorption, sound directivity, and shielding due to interceding barriers and terrain. This model predicted sound levels at NSAs resulting only from the operation of the Project at less than 35 A- weighted decibels (dBA). The model was also used to predict steady-state sound levels along the Project site boundary. Based on the results of geotechnical investigations, the LNG facilities and marine transfer facilities will be supported with deep pilings. Table DR3-5d in Annova's response to FERC's October 20, 2016, Data Request No. 5 on RR 3 filed with FERC on December 9, 2016, provides information on the type, number, installation method, and expected duration for pilings to be installed during loading dock/berth construction. All piles will be driven by impact hammer, and all piles installed in-water will be sequestered behind land spits or land bridges that will attenuate noise to a significant degree. Annova's response to FERC's October 20, 2016 Data Request No. 5 on RR 3 filed with FERC on December 9, 2016 also provides an analysis of noise pressure levels resulting from pile-driving.

Noise can cause stress in animals and the autonomic responses to noise are varied. Geist 1971 (as cited by Larkin 1996) believed that there was an energetic cost to animals being disturbed by noise. Others have used heart rate as physiological index of energy expenditure, monitored with telemetry, in wild animals exposed to noise. Others have used heart rate changes to indicate alarm or excitement of animals exposed to noise (Larkin 1996). For the proposed project, the most severe noise likely to be encountered by the cats is that from vehicles travelling alongside habitat. The noises vary according to the direction they are measured from (Larkin 1996). Responses of wildlife to noise have included a range of responses from no reaction to alerting, disruption of feeding, and flight (Larkin 1996).

There are no known studies that specifically address the effects of noise on ocelots or jaguarundis. It is reasonable to assume that the cats could display the range of responses to noise; they could have no reaction, become alert, and stop feeding, or display a fight or flight response.

Construction and operation activities will increase noise levels in the Action Area. Ocelots, like most wild felids, will avoid noise if possible. Dr. Michael Tewes, the leading authority on ocelot biology in the U.S. sums up this issue:

"One of the important drivers for ocelot occurrence and movements is the presence of prime habitat scattered over the landscape. Ocelots can withstand a certain level of disturbance, including lights and noise, if they occupy extremely dense thornshrub communities. However, there is a threshold of light and noise that would likely negatively affect ocelot behavior. Although the value of this threshold is unknown, it would probably require relatively less artificial light and noise to affect ocelot behavior if they occurred in open habitat during dispersal or transient movements, compared to dense thornshrub tracts of sufficient size." (Dr. Michael Tewes, personal communication to Dr. Lon Grassman, B&A May 18, 2015.)

The impacts of construction-related disturbance is a function of the species' susceptibility to disturbance, duration of the disturbance, area affected, type of disturbance (e.g., heavy equipment noise versus blasting noise), season, and time of day. Disturbances that last a long time are loud, unpredictable, and/or affect large areas are likely to be the most detrimental (FHWA 2004). Day-to-day road operations have been shown to cause permanent disturbance effects in some species (FHWA 2004).

In South Texas, radio-collared bobcats were shown to avoid two large international bridges (Pharr International Bridge and Hidalgo-Reynosa International Bridge) and the habitat patches between them (Fischer 1998). These bridges constituted the loudest and brightest roadways within the study, which likely discouraged bobcat movements.

Vehicle Collisions

Approximately with 44 percent (12 of27) of known ocelot mortalities from 1982 to 1996 were likely vehicle related (Hewitt et al. 1998) and 45 percent of the total ocelot mortality documented in South Texas between 1983 and 2002 were likely vehicle related (Haines et al., 2005b). Unfortunately, seven more ocelot road mortalities have occurred in South Texas between 2002 and 2016.

Vehicles associated with the Project will drive on the new access road and within the Project site throughout construction and operation. Roads can be complete barriers to wildlife individuals that cannot make their way across and whose road-related mortality can affect their small populations. This is especially true for populations of wide-ranging carnivores who are particularly vulnerable to road traffic accidents, such as the Florida panther (Maehr et al. 1991) and ocelot (Hewitt et al. 1998). Vehicle collision is the leading cause of death of ocelots in Texas; reducing road mortality is considered the single most important strategy in reducing the risk of ocelot extinction in the U.S. (Haines et al. 2006b). It is possible that a vehicle within the Action Area could strike an ocelot; however, Annova is working to minimize the potential for ocelot/jaguarundi collisions by incorporating wildlife crossings (culverts) and fencing into the main access road design, in consultation with the Service.

Annova will also mandate a speed limit of 25 mph on the main access road and within the Project site.

Lighting

Artificial night lighting may increase road mortality of animals and disrupt mammalian dispersal movements and corridor use (Beier 2005). Lighting can have negative effects on protected habitat corridors; if corridors are not dark enough, many of the species that the corridors were intended for will not use them (Vandernoot 2015). An example of a negative effect of artificial lighting was reported for mountain lions in California. Mountain lions were documented avoiding artificially lit areas near roadways in areas with suitable habitat, and instead chose darker, less favorable habitat for crossings (Beier 2005). As noted by conversation with Dr. Michael Tewes (May 18, 2015), ocelots will avoid artificial lighting.

Lighting emissions are light sources that illuminate an area in the surrounding environment. Sources of light emissions may include facility lighting and parking lighting. As the LNG facility will operate 24 hours a day, 7 days a week, lighting will be required for safety and security throughout operations. Lighting effects on terrestrial wildlife species may include avoidance of the area by nocturnal species. Annova will minimize the effects of lighting by evaluating lighting schemes and selecting one to minimize effects of light on remaining habitats and minimizing lighting on the main access road to only address safety concerns. Annova will also evaluate lighting schemes and select one to minimize light pollution outside the Project site especially on the conservation easements.

Indirect effects

Indirect effects are those effects that are caused by or will result from the proposed action and are later in time, but are still reasonably certain to occur.

Climate change

Global climate change is another factor that must be considered for future effects from proposed projects like LNG's along the coastal area. Global climate observations are shifting climate conditions, habitat, sea level rising, and changing ecosystem dynamics where some species will adapt and others will not.

Cumulative Impacts

Cumulative impacts include the effects of future State, local, or private actions that are reasonably certain to occur in the action area considered in this biological opinion. Future Federal actions that are unrelated to the proposed action are not considered in this section because they require separate consultation pursuant to section 7 of the Act. Past and present federal actions near the proposed action are discussed under the Environmental Baseline section.

Each of the three future non-federal activities considered in this section are located within the terrestrial portion of the Action Area. The three activities identified for further consideration in this cumulative effects analysis are non-jurisdictional facilities. Activity #1 is the non-jurisdictional Natural Gas Interconnection, which occurs within the Project boundary and is included in the Project's impacts; it will not have impacts in addition to the Project. Activities #2 and #3 are linear infrastructure that include an overhead transmission line and underground water supply pipeline. Portions of these two utilities are expected to occur within the Action Area along the Project's main access road and in a portion of the Project site. These actions are

expected to result in clearing, grading, and other construction activities that could result in the removal of vegetation, alteration of wildlife habitat, and displacement of wildlife. In addition, these activities will temporarily increase noise, vehicle traffic, and human disturbances in the Action Area during construction. Typically, after overhead transmission lines and underground pipelines are constructed, the rights of way are restored and revegetated, and they have a relatively small area of permanent impact. In addition, transmission lines and pipelines typically have low disturbance during operation. Long-term impacts to important habitats may occur if the utilities are installed through stands of dense thornscrub that provide habitat for the ocelot and jaguarundi and take many years to establish. Typically, routing and construction of linear infrastructure is flexible and can avoid sensitive habitats.

Wind energy projects have drastically increased in the Rio Grande Valley that has impacted habitat used by ocelots and jaguarundis', and it has caused fragmentation of the landscape. Oil and gas development and the rapid economic expansion of the large metropolitan areas with the continuing influx of immigrants, retirees, and increased tourism will likely continue to result in the loss of brushlands, and coastal grasslands. As remaining small islands of suitable habitat and the corridor to connect them are developed and brush encroachment reduces plant diversity for prey species for ocelots and jaguarundis, recovery alternatives are limited. Road expansions to accommodate the Rio Grande Valley development and road network, North American Free Trade Agreement, and border crossings will likely increase loss and fragmentation of habitat corridors and increase road mortality for the cats.

Encroachment from urban development brings increased noise, light, fencing, and human disturbance. Customs and Border Protection operations that include roads, drag roads, off-road impacts, lights, fencing, and road maintenance will also likely result in the loss of habitat for the ocelot and jaguarundi.

The Service is continually working with private and state entities to review proposed projects, offer technical assistance and provide recommendations on avoidance and minimization measures and reintroduction and restoration measures to protect the ocelot, and jaguarundi, and their habitats. By continued cooperative efforts with Annova to replace, secure, and improve such habitats and connect optimal habitat needed for connectivity between the existing national wildlife refuge lands, and private lands within the South Texas Ocelot Coastal Corridor, the Service does not believe that the cumulative effects are likely to jeopardize the continued existence of the ocelot, and jaguarundi.

Amount or Extent of Take Anticipated

The Service anticipates incidental take of an ocelot or jaguarundi in the form of harm and harassment will be difficult to detect because 1) the species is wide-ranging, elusive, and nocturnal; and finding a dead or sick specimen that has resulted from impaired essential behavioral patterns like breeding, feeding, or sheltering is unlikely. The take of an ocelot or jaguarundi, however, can be reasonably anticipated due to increased risk of road mortality and/or by prevented dispersal of cats into otherwise suitable habitat.

Therefore, the Service anticipates one endangered cat, (in aggregate, ocelots or a jaguarundi) could be taken for construction, and for the life of the project (30 years) in the

form of harm and/or harassment from human presence and travelling within the project area for the life of the project. If, during the course of the action, one endangered ocelot or jaguarundi is killed within any 12-month period, Annova LNG will meet with the Service to discuss further recommendations.

Effect of the take

In the accompanying FBO, the Service determined that this level of anticipated take is not likely to result in jeopardy to these species in the wild across their range. There is no critical habitat designated for the ocelot or jaguarundi.

Conclusion

After reviewing the current status of the ocelot and jaguarundi, the environmental baseline for the action area, the effects of the proposed action, and the cumulative effects, it is the Service's biological opinion that the Project, as proposed is not likely to jeopardize the continued existence of the listed ocelot, or jaguarundi. There is no critical habitat listed for these species within the action area, therefore none will be affected.

INCIDENTAL TAKE STATEMENT

Section 9 of the Act and Federal regulations pursuant to section 4(d) of the Act prohibit the take of endangered or 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 by the Service 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 by the Service 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. Incidental take is defined as take that is incidental to, and not the purpose of, the carrying out of an otherwise lawful activity.

Under the terms of section 7(b)(4) and section 7(o)(2), taking that is incidental to, and not intended as part of the agency action is not considered to be prohibited taking under the Act, provided that such taking is in compliance with the terms and conditions of this incidental take statement.

The measures described below are non-discretionary, and must be undertaken by FERC and the Annova LNG, so that they become binding conditions of the project in order for the exemption in section 7(o)(2) to apply. FERC and the Annova LNG have a continuing duty to regulate the activity covered by this incidental take statement. If FERC and the Annova LNG (1) fail to assume and implement the terms and conditions or (2) fail to require any agent acting on behalf of FERC and the Annova LNG to adhere to the terms and conditions of the incidental take statement through enforceable terms that are added to any contracting document, the protective coverage of section 7(o)(2) may lapse. In order to monitor the impact of incidental take, FERC and the Annova LNG must report the progress of the action and its impacts on the species to the Service as specified in the incidental take statement (50 CFR 402.14(i)(3)).

REASONABLE AND PRUDENT MEASURES

As part of the project description, FERC and Annova LNG have agreed on voluntary measures to avoid and minimize impacts to the ocelot, and jaguarundi. The Service believes the following reasonable and prudent measures are necessary and appropriate to minimize the impact of incidental take on these species and assist the Service in improving methods to minimize impacts of incidental take on the ocelot and jaguarundi.

1) Annova must fully implement the Voluntary Conservation Measures proposed in their BO for this project.

2) Annova must notify the Service of any unauthorized take of an ocelot or jaguarundi or if any cat is found dead or injured during project implementation.

3) Annova must provide information and training to all employees and contractors working on the project about ocelot habitat requirements and the measures proposed by Annova or required in the BO to avoid impacts to the ocelot and jaguarundi.

4) Annova must monitor take of the ocelot and jaguarundi and provide periodic monitoring reports to the Service.

Terms and Conditions

In order to be exempt from the prohibitions of section 9 of the Act, FERC and Annova LNG must comply with the following terms and conditions, which implement the reasonable and prudent measures, described above and outline required reporting/monitoring requirements. These terms and conditions are non-discretionary.

The following terms and conditions are necessary to educate contractors and Annova LNG employees to avoid and minimize impacts during construction, maintenance and operational activities.

1) If a cat is spotted or found injured or dead at the project site (including the roadway, ROW, and any other location linked to the project site or its scope of work), all work must stop and Annova must immediately notify the species the South Texas Refuge Complex Dispatch at Santa Ana NWR at (956-784-7520) immediately. The dead or injured cat should not be disturbed in any manner without authorization from the Service.

2) Annova LNG and the Service will coordinate to develop, and design an instructional program training module on the Endangered Species Act (Act), so the Annova LNG supervisors could implement to instruct any current and new Annova LNG personnel, and contractors in the project area on their duties and obligations under the Act to conserve federally listed species, including ocelots and jaguarundis. All workers who will be entering the project area will be required to attend training focused on the conservation measures before work is conducted. They should focus on potential

encounters with endangered species, identifying ocelots and jaguarundis, and learning the correct actions to follow.

3) Annova must hold a pre-construction meeting with its employees and any contractors working on this project to provide specific instruction on the implementation of Annova's proposed Conservation Measures and the Service's Reasonable and Prudent Measures, included in this Incidental Take Statement. Instructions specific to the contractor(s) related to implementation of the Conservation Measures and Reasonable and Prudent Measures must be documented in writing. Annova is ultimately responsible for informing anyone working on this project of these requirements.

4) The Environmental Compliance Manager (ECM) will be on-site during construction activities that may result in the direct take of endangered species, including initial clearing of the Project site, dredging within the BSC, and pile-driving within and adjacent to the BSC. ECM is responsible for overseeing compliance with the conservation measures and any other required terms and conditions resulting from consultation between the FERC and the Service. The ECM will have stop-work authority should a violation of these requirements occur, and would also have the authority to stop work before a violation or issue occurs in cases where a violation/issue is imminent.

5) Annual reports will be submitted to the Assistant Field Supervisor, U.S. Fish and Wildlife Service Texas Coastal Ecological Services, P.O. Box 81468, Corpus Christi, TX 78468-1468, by September 30th of each year until the project and habitat revegetation is completed. Reports should include sightings or road mortalities of cats, the progress on implementation of conservation recommendations and reasonable and prudent measures that have been accomplished during the project.

CONSERVATION RECOMMENDATIONS

Section 7(a)(l) of the Act directs Federal action agencies to utilize their authorities to further the purposes of the Act by carrying out conservation programs for the benefit of endangered and threatened species. Conservation recommendations are discretionary agency activities to minimize or avoid adverse effects of a proposed action on listed species or critical habitat, to help implement recovery plans, or develop information.

For the benefit of ocelots and jaguarundis, the Service recommends the following:

1) Where feasible, prioritize, protect, and acquire necessary habitat and conservation for ocelots (Recovery Plan Tasksl.2.3).

2) Fund experimental translocations, augment existing populations as necessary through translocation (Recovery Plan Tasks 3.2.1, 3.2.2).

3) Fund further thornscrub restoration around populations and secondary areas in Texas ocelot coastal corridor (Recovery 1.2.4.2, 1.2.4.3).

REINITIATION NOTICE

This concludes formal consultation. As provided in 50 CFR 402.16, reinitiation of formal consultation is required where discretionary Federal agency involvement or control over the action has been retained (or is authorized by law) and if: (1) the amount or extent of incidental take is exceeded; (2) new information reveals effects of the agency action that may affect listed species or critical habitat in a manner or to an extent not considered in this opinion; (3) the agency action is subsequently modified in a manner that causes an effect to the listed species or critical habitat not considered in this opinion; (4) a new species is listed or critical habitat designated that may be affected by the action. In instances where the amount or extent of incidental take is exceeded, by a clearing or maintenance operation, the operation causing such take must cease pending reinitiation. In instances where the amount or extent of incidental take is exceeded by vehicular mortality, FERC, Annova LNG and the Service will meet to discuss further options.

If you or your staff have any questions concerning this DBO, please contact Ernesto Reyes at (956) 784-7560 or via email at Ernesto_Reyes@fws.gov.

Sincerely,

Charles Ardizzone
Field Supervisor

cc: Regional Director, ATTN: Assistant Regional Director, Ecological Services

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Appendix A Consultation History:

December 4, 2014	Annova met with Service representatives to introduce the Service to the Project, share the list of agencies to be contacted, share the preliminary Project schedule, and discuss regional and local environmental issues.
March 27, 2015	Annova submitted an informal endangered species consultation letter to Service's Texas Coastal Ecological Services Field Office.
May 8, 2015	Annova met with Service representatives and conducted a site visit. Discussion topics included site selection and facility layout, supporting infrastructure, the FERC filing process, and potential conservation measures. During this meeting, the Service expressed concerns with the Project site, including ocelot and other species habitat, the wildlife corridor, and direct and indirect impacts from noise, lighting, and traffic.
May 14, 2015	Annova provided maps to the Service showing the preliminary Project layout in relation to vegetation communities and water resources, which were requested during the May 8, 2015 site visit.
May 20, 2015	The Service responded to the informal consultation letter and stated that they had many significant environmental concerns regarding the Project. The Service provided comments detailing their need for more specific Project impact, siting, and mitigation information.
June 16, 2015	Annova provided maps to the Service showing the current Project layout in advance of a June 25, 2015 meeting.
June 25, 2015	Annova met with Service representatives to review current plans for the Project and discuss potential ocelot conservation measures.
July 14, 2015	Annova responded to the Service's letter of May 20, 2015. The purpose of this letter was to clarify some of the information provided in the May 20, 2015 letter from Service, and to summarize or update Project information provided to the Service since Annova's letter sent on March 27, 2015.
July 14, 2015	Pat Clements sends additional comments and questions for the Texas LNG ADEIS Section 4 to Kareem Monib with FERC.
September 15, 2015	Annova met with Service representatives at Santa Ana National Wildlife Refuge (NWR) to discuss the latest Project layout and receive input from the Service. The latest Project layout involved the site being shifted to the east based on the Service's comments in a previous meeting. The purpose of the shift was to maintain

	broader and intact native vegetation communities on the west side of the Project boundary that could potentially be used as a travel corridor by ocelots and/or jaguarundis. The new layout would involve a shift of the Project boundary to the east, and Annova agreed to map the vegetation communities on the new parcel. Annova and the Service also discussed conservation strategies and the potential for a new access road location that would minimize impacts to potential cat habitat.
September 30, 2015	Annova provided maps to Service representatives that showed additional property that is owned by BND and leased to the Service. It was agreed that this additional property would be transferred from the Service to Annova to allow Annova to shift the facility layout east and widen the proposed wildlife corridor on the west side of the Project site, as requested by the Service. Annova requested that the Service review these maps and provide comment.
October 5, 2015	Annova followed up to the email correspondence dated September 30, 2015, and requested that Service representatives reply with any questions/concerns or confirm that the Service was in agreement with Annova's Project layout.
October 12, 2015	Annova submitted a letter to the Service proposing an ocelot and jaguarundi survey in and around the Project site. The proposed survey would entail both live trapping and camera trapping within thomshrub habitats and potential travel corridors. Trapping would occur within a survey area consisting of a 10-mile radius around the Project site within U.S. borders.
October 13, 2015	The Service responded to Annova's email dated October 5, 2015, and confirmed that the Service was in agreement with Annova's proposal to shift the facility layout east and widen the proposed wildlife corridor on the west side of the Project site. The Service also asked what type of vegetation was present in the temporary spoil storage area in the southwest comer of the Project site.
October 15, 2015	Annova responded to the Service's email dated October 13, 2015 and provided a map that showed the temporary spoil storage area in relation to vegetation communities. This email stated that the temporary spoil storage area is not a loma, and the vegetation within the area is Sea Ox-eye Daisy Flat and Salt and Brackish Wetland.
October 20, 2015	The Service, FERC, and Annova participated in a conference call to discuss the Section 7 process under the ESA as well as outline the roles of each entity during this process. The BA, Resource Reports (for the FERC NEPA process), and SSAR were discussed.

November 13, 2015	The Service responded to Annova's letter dated October 12, 2015, and stated that the Service does not believe surveys are necessary and that company resources could be better expended offsetting potential Project effects on ocelot andjaguarundi recovery. The Service also stated that the proposed ocelot/jaguarundi survey is not necessary for the endangered species consultation.
December 2, 2015	Annova met with Service representatives to provide a status report on Project activities. Discussion included the assessment of baseline conditions in the expanded study area, analysis of three access road alternatives, routing of the linear infrastructure, potential plans for and concerns regarding the coastal cat corridor, and the importance of corridor linkages on both sides of the BSC.
December 4, 2015	Annova responded to the Service's letter dated November 13, 2015, and stated Annova's interest in proceeding with an ocelot andjaguarundi trapping survey. Annova also requested accessto the Service's refuge lands to conduct the survey.
January 7, 2016	The Service responded to Annova's letter dated December 4, 2015, and reiterated that the Service still does not believe surveys are necessary and that company resources could be better expended offsetting potential Project effects on ocelot and jaguarundi recovery. The Service also stated that the results of the survey will not affect the outcome of the ESA consultation or conservation and/or monitoring requirements. Further, the Refuge will not issue a special use permit to conduct surveys on its property.
January 8, 2016	Annova responded to the Service's letter dated January 7, 2016 and provided a modified proposal to conduct an ocelot and jaguarundi survey on property owned or controlled by the Port, State of Texas, and other private properties in the Project vicinity. Surveys would not occur on Service properties. Annova also stated that they do not anticipate that the survey results will change their informal consultation or their current expectations for avoidance, minimization, or conservation measures, although it may confirm their approach.
January 12, 2016	Annova emailed the Service regarding plans to begin surveys for ocelot andjaguarundi in and around the project area on private, BND, and State lands. The proposed survey would utilize live trapping, and camera trapping and begin January 14, 2016.
January 13, 2016	The Service responded to Annova's email of January 12, 2016, the Service responded to Annova's email of January 12, 2016, survey approval for ocelot/jaguarundi surveys on non-Service land. In the interest of individual cat safety, the Service did not approve the live-trapping portion of the proposed survey plan.

March 30, 2016	Representatives from Service, BND, and Annova met to discuss the status of the Project. Specifically, Annova's environmental objectives that were pertinent to this meeting were identified as (1) avoid and minimize impacts to dense thomshrub communities and (2) preserve wildlife travel linkages within the South Texas Coastal Corridor. Modifications of the Project to meet these objectives were discussed.
April 14, 2016	Annova provided the Service with an overview map and UTM location data of the ocelot camera trapping survey locations.
May 27, 2016	The Service emailed Annova requesting maps showing the original and revised project layouts. Annova provided the requested map (similar to Figure 7 of this **SSAR).**
September 22, 2016	Annova met with Service representatives to discuss Project status and items involving the Service, including the future BA, wildlife travel corridor, Redhead Ridge Conservation Easement, other potential conservation easements, ocelot camera survey results to date, use of the existing Service access road, wetland mitigation, Project schedule, and Service comments on Resource Reports.
October 10, 2016	Annova emailed the Service meeting notes for the 9/22/2016 meeting and requested comments.
October 17, 2016	Annova emailed two letters to the Service: Letter 1 requested specific guidance from Service on: (1) the appropriate process and documentation to gain authorization for eroject use and improvement of the existing access road on Service property as a permanent access road; and (2) on the process to transfer and receive credit for a proposed conservation easement in exchange for use of the road. Letter 2 requested specific guidance from Service on the appropriate process and documentation for the transfer of and receipt of credit for: (1) the Project's proposed Western Wildlife Corridor; and (2) the BND Redhead Ridge Conservation Easement.
October 21, 2016	Annova requested the Service confirm receipt of the October 17, 2016, letters and provide a timeline for receiving feedback from regional office staff.
November 7, 2016	Annova requested the Service provide a timeline for receiving feedback on the October 17, 2016, letters.
November 7, 2016	The Service responded to Annova's email of November 7, 2016 and stated that regional office staff had been contacted but that the Service had higher priorities to address.
December 1, 2016	Annova requested the Service provide a timeline for receiving feedback on the October 17, 2016, letters.

December 2, 2016	The Service responded to Annova's email of December 2, 2016, and stated that a response to Annova's request would be provided soon after January 1, 2017. The Service also requested information that would be used to initiate the right-of-way process with the Realty Division in Albuquerque as soon as the FERC permit is approved.
January 24, 2017	Pat Clements (Service) provided comments and recommendations on the May 2016 SSAR and draft agenda for a meeting to discuss the comments.
January 31, 2017	Annova met with Service representatives to discuss Service comments and recommendations on the SSAR. Also discussed were Project updates, cumulative impacts assessments, and use of the existing access road across Service property.
March 9, 2017	Annova sent Service representatives: (1) a contact report summarizing the January 31, 2017 meeting; (2) the cumulative impacts analysis from the July 2016 application and the supplemental cumulative impacts analysis submitted in January 2017; and (3) a response to the Service's question about how funding the 5-year program and graduate fellowships at Caesar Kleberg Wildlife Research Institute (CKWRI) will advance recovery goals of the Ocelot Recovery Plan.
March 9, 2017	Annova sent Service representatives the cumulative impacts analysis on the ocelot movement corridor.
June 8, 2017	Ed Miller with Annova sends the Service the proposed access road and associated proposed conservation area that will be protected as part of the wildlife corridor.
September 15, 2017	Annova sends a letter to Robert Jess (LRGVNWR) requesting a ROW permit for Annova to use as Alternative 2 route to use as access to their project.
September 27, 2017	The Service's ES office completed a section 7 Intra-Service Consultation with LRGVNWR for the proposed Alternative 2 route ROW access to allow Annova to use the existing road that goes through LRGVNWR to minimize impacts to clearing of ocelot thornscrub habitat.
October 13, 2017	Jason Schindler with Blanton & Associates, Inc. filed the results of the camera survey for ocelot/jaguarundi to FERC on the Annova project.
December 18, 2018	Eric Tomasi (Environmental Engineer) with FERC sent an email that the DEIS was issued December 14th.

February 15, 2019	Eric Tomasi with FERC sends Service an email with a cover letterof Section 7 concurrence to start formal consultation for the Annova project. Included is a BA.
March 7, 2019	Regional Environmental Officer sends comments to FERC on the Annova LNG DEIS.
March 7, 2019	A meeting between Annova, Refuge, and ES takes place at Santa Ana to discuss ROW for access Alt. #2, Draft EIS, and BA.
March 7, 2019	Stephanie Engwall (Annova Representative) sends Ernesto Reyes a copy of the Holly Beach Agreement of 390 acres that Annova purchased for off-site voluntary conservation measures for ocelot/jaguarundi habitat been impacted by the LNG project.
March 8, 2019	Janine Whitken sends an email to the Service to show the route of the proposed Utility Corridor drawings for the gas pipeline, water pipeline, and transmission line will avoid impacts to the Loma de la Jauja.
March 18, 2019	The Service sent FERC a section 7 Consultation letter responding to the February 15, 2019, letter asking the Service that FERC wants to initiate formal consultation for the Annova LNG project. The Service requested conservation measure commitment (conservation easement agreement) between BND and Annova to protect the wildlife corridor on BND property, and any offsite voluntary conservation measures to have a complete BA to start the BO clock. Need this information to analyze impacts to cats from the proposed project.
May 13, 2019	The Service and Annova had a meeting at Santa Ana NWR to discuss project and permitting update, confirm schedule and next steps for section 7 consultation, and confirm schedule and next steps for Right- of-Way for Use of Alternative Access Road 2, and Little San Martin Lake wetland mitigation. Annova was not aware of section 7 letter sent to FERC and that the Service needed to make sure the conservation agreements for ocelot/jaguarundi were negotiated and agreed upon by BND, and Annova to start the Section 7 formal consultation.
May 29, 2019	Ernesto Reyes sends an email to Gertrude F. Johnson (FERC) that the Service had sent a response letter to FERC on March 18, but FERC did not receive the letter that we had sent in response to FERC's letter of February 15, 2019. The Service met with Annova and that is how we found out. We discussed the deficiencies of the BA (conservation easement agreements) with BND, so Annova can provide that information, so the Service can respond back that we have all the information needed to have a complete BA and can start the formal section 7 consultation.

May 30, 2019	Gertrude F. Johnson sent an email to Ernesto Reyes that she received the Section 7 Consultation letter and the voicemail message. Eric Tomasi is the FERC Environmental Project Manager and Gertrude sent him the letter.
June 4, 2019	Janine Whitken sends an email to the Service with a draft summary of our meeting of May 13, 2019 at SANWR.
June 5, 2019	Ernesto Reyes (ES) sends an email to Anibal Vazquez (RO Natural Resource Planner) a DBO environmental analysis that Anibal needs for the EA document for the LRGVNWR ROW Special Use Permit for Annova's Alternative 2 access road.
June 10, 2019	Ernesto Reyes sent an email update to Janine Whitken (Principal Project Manager for Ecology and Environment, Inc.) that he has followed up with Anibal and Yvette and sent them a Draft BO - language that they needed from the BO on June 5th, so they can use on their EA for the Alt. 2 road ROW.
July 16, 2019	The Refuge and ES met with Annova at Santa Anna NWR to discuss updates on ocelot conservation measures, and some changes from voluntary conservation easements previously proposed by Annova, because BND would not agree to have a perpetual conservation easement as the Service had recommended in the FEIS; the conservation easement would be only for the life of the project (50 years). Annova was going to look into off-site voluntary conservation easements that would have perpetual conservation measures that would be more beneficial for long-term conservation of ocelots and jaguarundis.
July 19, 2019	Jason Schindler with Blanton & Associates sends an email to Ernesto Reyes with the new proposed voluntary conservation measures committed to perpetual conservation of at least 250 additional acres of thornshrub within the South Texas Ocelot Coastal Corridor area, near the LANWR. This perpetual conservation of at least 250 acres replaces the previously proposed temporary extension of the existing 44-acre Redhead Ridge Conservation Easement, and the 200-acre Loma de la Juaja, and was developed through continued consultation with the Service, who preferred long-term conservation in perpetuity rather than temporary conservation for the life of the Project.
July 22, 2019	Ernesto Reyes sends Jason Schindler an email that he had received the new ocelot voluntary conservation measures, and that all the information that was requested by the Service to have a complete BA was received.
July 30, 2019	The Service and Annova have a conference call to get an update

	of the proposed voluntary conservation measures from Annova, make sure that the Service has all the biological information needed to have a complete BA and initiate formal consultation. The incidental take statement and progress of the DBO was discussed.
August 2, 2019	The Service sent a concurrence letter to FERC that all information required to initiate formal consultation was received.
August 16, 2019	The Service provided FERC with a DBO for review and comment.
October 2, 2019	FERC provided comments on DBO
October 21, 2019	Final BO was issued.

Document Content(s)