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

Pursant 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 1, 2019, for the Rio Grande Liquefied Natural Gas and Rio Bravo Pipeline Projects. 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 14, 2020

Respectfully submitted,

/s/ Eric Huber
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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 14, 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:

Rio Grande LNG, LLC
1000 Louisiana Street
Suite 3900
Houston, TX 77002

Enbridge Inc. (formerly Rio Bravo Pipeline Company, LLC)
200, Fifth Avenue Place
425 - 1st Street S.W.
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Canada T2P 3L8

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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
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Washington, D.C.20240-0001

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

This 14 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 REGULATORY COMMISSION RIO GRANDE LNG AND RIO BRAVO PIPELINE PROJECT'S EFFECTS IN CAMERON, WILLACY, KENEDY AND KLEBERG COUNTY, TEXAS.

Consultation No. 02ETTXX0-2019-F-0372

Date of the Final Biological Opinion: October 1, 2019

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

Proposed Action: FERC proposes authorization to construct a natural gas liquefaction facility and liquefied natural gas (LNG) export terminal approximately 9.8 miles east of Brownsville and about 2.2 miles west of Port Isabel on 750.4 acres of a 984.2-acre parcel in Cameron County, Texas, along the north embankment of the Brownsville Ship Channel (BSC), and associated 135 mile long Rio Bravo Pipeline (RB Pipeline) in Cameron, Willacy, Kenedy, and Kleberg counties which interconnects to RGLNG terminal in Cameron, County. The remaining approximately 234 acres of land comprised of the pilot channel that connects Bahia Grande to the BSC and two areas outside of the permanent fence line (one outside of the eastern fence line boundary and the other outside of the western fence line boundary) that will be used as natural buffers during the Terminal's operation. The pipeline system will include two parallel, 42-inch-diameter pipelines (Pipeline 1 and Pipeline 2) approximately 135 miles long, three compressor stations, an approximately 2.4-mile-long header system to interconnect with a network of existing natural gas transmission pipelines, two interconnect booster stations for injection of additional natural gas into the two pipelines from existing natural gas transmission pipelines (downstream from the northern-most compressor station), associated metering stations, mainline valve sites, access roads, and temporary contractor/pipe yards.

Listed species: Ocelot and Gulf coast jaguarundi

Biological Opinion: It is the opinion of the Service that the proposed construction of the RGLNG, and RB Pipeline 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 750.4 acres of a 984.2-acre parcel, and 73.3 acres out of 135.9 acres for the pipeline.

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/02ETXX0-2019-F-0372

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

Dear Secretary 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 Rio Grande LNG Project (RGLNG) in Cameron County and associated 135 mile long Rio Bravo Pipeline (RB Pipeline) in Cameron, Willacy, Kenedy, and Kleberg counties, Texas which interconnects to RGLNG terminal in Cameron County, Texas, and 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 on October 25, 2018. The Service responded in a letter dated July 17, 2019, to FERC that the piping plover (*Charadrius melodus*), and its critical habitat, and the northern aplomado falcon (*Falco femoralis septentrionalis*) should be a "*may effect, not likely to adversely affect"* determination. The Service also requested additional Biological Assessment (BA) information and details of other voluntary conservation measures for ocelot/jaguarundi habitat. This FBO is based on August 5, 2019, correspondence to the Service with the details for a complete BA, and FERC's response to the Draft BO on September 26, 2019.

Based on current research and information, the Service concurs with FERC's determination of "may affect, likely to adversely affect" for the endangered ocelot and jaguarundi. FERC has determined that the proposed construction of the RGLNG and its RB Pipeline 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*), or its critical habitat, black lace cactus (*Echinocereus reichenbachii* var. *albertii*), slender rush-pea (*Hoffmannseggia tenella*), Kemp's ridley sea turtle (*Lepidochelys kempii*), loggerhead sea turtle (*Caretta caretta*), green sea turtle (*Chelonia mydas*), leatherback sea turtle (*Dermochelys coriacea*), and the hawksbill sea turtle (*Eretmochelys imbricata*), and its nesting habitat. Based on information in the BA, the Service concurs with this determination.

Consultation History (Please see Appendix A)

BIOLOGICAL OPINION

I. Description of the Proposed Action

Purpose of the Project

RGLNG proposes to construct a natural gas liquefaction facility and liquefied natural gas (LNG) export terminal approximately 9.8 miles east of Brownsville and about 2.2 miles west of Port Isabel on 750.4 acres of a 984.2-acre parcel in Cameron County, Texas, along the north embankment of the Brownsville Ship Channel (BSC). The remaining approximately 234 acres of land comprised of the pilot channel that connects Bahia Grande to the BSC and two areas outside of the permanent fence line (one outside of the eastern fence line boundary and the other outside of the western fence line boundary) that will be used as natural buffers during the Terminal's operation. RB Pipeline proposes to construct an associated pipeline system to interconnect with the RGLNG terminal within the state of Texas to provide gas feedstock to the terminal. For purposes of consultation, the terminal and pipeline system will be referred to as the "Project."

The FERC has assigned the Rio Grande LNG Project Docket Number CP16-454-000 and the associated RB Pipeline Project Docket Number CP16-455-000. The FERC issued the Final Environmental Impact Statement for the Project April 26, 2019 (FERC Accession Number 20190426-3020).

The facilities for the Project include the following major components:

- six liquefaction trains;
- four LNG storage tanks;
- docking facilities for two LNG vessels and a turning basin;
- marine transfer equipment;
- control, administration, and support buildings;
- utilities (power, water, gas, and communications);
- LNG truck loading facilities with four loading bays; and
- Pipeline System's Compressor Station 3, a metering site, and the interconnection to the pipeline system.

The Project has been proposed in staged construction phases where the terminal site would be developed over the course of about 7 years, with the first LNG train becoming operational in year 4 of construction and the final LNG train becoming operational by year 7. Construction stage 1 would include site preparation and security fencing of the entire work area, construction of LNG Train 1, and construction of all infrastructure required for the operation of said train. Each subsequent stage of construction would begin about 6 to 9 months after construction of the previous train and would include additional infrastructure required for that train. RGLNG anticipates starting construction (i.e., site preparation) in first quarter 2020.

During the construction of the terminal, RGLNG would utilize the following temporary offsite facilities: 25.1-acre offsite parking and storage area at the Port of Brownsville, 4-acre area at Port

Isabel storage yard, Port Isabel dredge pile, and a 0.1-acre temporary bulk water loading area within the Port of Brownsville.

The pipeline system will include two parallel, 42-inch-diameter pipelines (Pipeline 1 and Pipeline 2) approximately 135 miles long, three compressor stations, an approximately 2.4-mile-long header system to interconnect with a network of existing natural gas transmission pipelines, two interconnect booster stations for injection of additional natural gas into the two pipelines from existing natural gas transmission pipelines (downstream from the northern-most compressor station), associated metering stations, mainline valve sites, access roads, and temporary contractor/pipe yards. The two parallel 42-inch pipelines will run north to the south from a starting point (milepost [MP] 0.0) in Kleberg County, and transit through Kenedy, Willacy, and Cameron counties before terminating at the terminal. The pipeline system will have a header system at its upstream end with multiple interconnects to the existing natural gas pipeline grid located in the Agua Dulce market area.

Construction of the pipelines will follow a set of sequential operations. Pipeline 1 will be installed in uplands within a nominal 125-foot total construction right-of- way (ROW) with a 75-foot permanent ROW maintained following completion of Pipeline 1. Approximately 18 months following complete installation and restoration associated with Pipeline 1, a second 42-inch-diameter pipeline (Pipeline 2) will be installed adjacent to the first pipeline within the same 75-foot-wide permanent easement, positioned at a 25-foot offset to the working side from Pipeline 1. Pipeline 2 will be installed using the same construction footprint for Pipeline 1.

RB Pipeline plans to commence construction of the pipeline system approximately two years after the start of construction of the Terminal. The pipeline system will be constructed in a staggered process timed to ensure that Pipeline 1 construction is completed by the time Stage 1 of Terminal construction process is completed, and Pipeline 2 construction is completed by the time Stage 4 of Terminal construction is completed. The compression capacity of each compressor station will be incrementally increased, as necessary, to raise the Pipeline System throughput capacity to match Terminal natural gas liquefaction capacity coming on in six stages.

Voluntary Conservation measures for Gulf coast jaguarundi and ocelot:

Based on comments provided by the Service, RGLNG incorporated several design changes to the proposed pipeline system to avoid and minimize effects of disturbance and habitat loss on ocelot and jaguarundi habitat. RGLNG is also proposing additional voluntary conservation and mitigation measures for direct impacts from the proposed Terminal and RB Pipeline. These measures include:

- Voluntary Conservation Measure 1: Off-site Conservation Site - RGLNG will purchase 1,050 acres of ocelot/jaguarundi habitat for placement into conservation lands within the Project region (South Texas Ocelot Coastal Corridor) in order to aid in long-term ocelot conservation. This land acquisition will benefit ocelots/jaguarundis by conserving better habitat connectivity within the South Texas Ocelot Coastal Corridor between Laguna Atascosa National Wildlife Refuge (LANWR) and the Bahia Grande Unit.

- Voluntary Conservation Measure 2: - Realignment of Pipeline - RB Pipeline has realigned the pipeline route to avoid 62.6 acres out of 135.9 acres of ocelot and jaguarundi habitat, and will horizontal directionally drill (HD) other crossings of endangered cat habitat including Red Head Ridge Loma Conservation Easement off State Highway 48.

- Voluntary Conservation Measure 3: Lighting Plan – RGLNG would minimize the effects of lighting by evaluating lighting schemes 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 and lighting would be extinguished upon completion. Prior to construction, RGLNG will be required to file its Facility Lighting Plan for operation of the LNG terminal with the Secretary of FERC for review and written approval by the Director of the 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 attractive, 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 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, has 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 Laguna Atascosa National Wildlife Refuge (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 to have two peaks of activity, one at about midnight and the other at daybreak. 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, and 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, and 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 leaving 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, the ocelots 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 of 71 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 currently estimated at about 50 individuals and appears to be based around three 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 and Cameron County populations, which also indicates a lack of breeding 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 used (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 had 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 RGLNG project area (TPWD 2015). A single, radio-collared male ocelot was captured and tracked by Blanton & Associates biologists in April 1998 within and near the project area, and up to 8 miles north 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 1/2 miles from the project 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 project area near the LANWR. Two Class 1 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 project area including Farm- to-Market Road (FM) 106, FM 510, and near the Holly Beach area (FWS 2013b; Blanton & Associates 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.

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 adjacent to and 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 in 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 along the LRGV and the South Texas Tamaulipan brush community for foraging, resting, and establishing dens. They require corridors, such as riparian habitat along rivers, 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 suffer from 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 90% 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% 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 scrubland 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 acres 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 southern 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 much 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 3.28 to 6.56 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 southern Texas and another was located in northeastern Mexico. Within the dense thornscrub communities used by ocelots, 45, mostly woody species, were found at the LANWR in Cameron County and 28, mostly woody species, 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, other contributing factors 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, wind energy, and solar energy projects; and channel restriction and canalization (Coastal Impact Monitoring Program 1995).

As a result 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 fence and lighting in the Texas/Mexico border region. There are 11 existing and one proposed international bridge 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 in the LRGV. 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, the ocelot was added to The Convention on International Trade in Endangered Species of Wild Fauna, and Flora (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 is 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 aeniaeformis)* (Service 1990) and helminthes (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-1990s 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 of the Action Area. 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 into 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 ocelot breeds in two locations in South Texas, including the vicinity of the proposed Rio Bravo pipeline system in Kenedy and Willacy counties, as well as in the LANWR, adjacent to the RGLNG terminal. At least some ocelots of the Willacy/Kenedy County population are known to den in the El Jardin and San Perlita Conservation Area, about 2.6 miles north of the proposed pipeline system at MP 79.0. Direct and indirect impacts on the ocelot's preferred habitat (upland shrub habitat, particularly with thornscrub vegetation) would result from the pipeline construction and operation. Within the lower LANWR, indirect impacts on the ocelot may occur from an increase in ambient sound levels, which may also render suitable habitat unattractive to ocelots. In addition, 189.1 acres of suitable habitat would be lost within the terminal site boundaries, and 73.3 acres lost along the pipeline route. The loss of suitable habitat, directly or indirectly, has the potential to result in significant impacts on ocelots and ocelot recovery.

The Project would result in the permanent loss of 262.4 acres of dense loma evergreen shrubland, and loma grassland/shrubland, and upland shrub thornscrub habitat for the proposed RGLNG terminal and pipeline system, which are considered preferred ocelot habitat. This includes Loma del Rincon Chiquito on the site, one of the 22 named lomas near the Action Area. This loss of habitat could affect overall ocelot fitness, and would 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.

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 about 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 taking up about a third the length. It has a long and flat head instead of a round one. 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 *Felis 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 and 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 known to occur are huisache *(Acaciafarnesiana),* blackbrush acacia *(Acacia rigidula),* prairie baccharis *(Baccharis texana),* chilipiquin *(Capsicum annuum),* 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),* retama *(Parkinsonia aculeata),* honey mesquite (*Prospsis glandulosa*), cedar elm *(Ulmus crassifolia),* and lime pricklyash *(Zanthoxylum fagara)* (Goodwyn 1970).

Life history

Most information gathered on the jaguarundi comes from historical writings and information gained from studying the ocelot in South Texas and in Mexico. Caso (1994) captured and radio collared jaguarundi in Tamaulipas, Mexico from 1991 to 2005. He found home range sizes averaged 3.8 and 3.22 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, of which 13 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). 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 cause 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 jaguarundis 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, and 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 are rare. Goodwyn (1970) reported from interviews he conducted in 1969 that jaguarundi were thought to occur in seven specific areas: Santa Ana National Wildlife Refuge, LANWR; "Paso Real", an area along the lower Arroyo Colorado on the border between Cameron and Willacy counties; the southern part of the El Sauz Ranch in northeast Willacy County, a small area west of Olmito in southern Cameron County; an area east of Villa Nueva, and 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 State Highway 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 the LANWR (Reyes 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 State Highway 4 near Farm-to-Market Road 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 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 jaguarundi habitat is considered to the same as the ocelot habitat. At least some ocelots of the Willacy/Kenedy County population are known to den in the El Jardin and San Perlita Conservation Area, which lies about 2.6 miles north of the proposed Pipeline System at MP 79.0. Direct and indirect impacts on the jaguarundi preferred habitat (upland shrub habitat, particularly with thornscrub vegetation) would result from the Project pipeline construction and operation. Within the lower LANWR, indirect impacts on the jaguarundi may occur from an increase in ambient sound levels, which may also render suitable habitat unattractive to jaguarundi. In addition, suitable habitat would be lost (189.1 acres) within the Terminal site boundaries, and (73.3 acres) along the pipeline route. The loss of suitable habitat, through either direct or indirect pathways, has the potential to result in significant impacts on jaguarundi.

The Project would result in the permanent loss of 262.4 acres of dense loma evergreen shrubland, loma grassland/shrubland, and upland shrub thornscrub habitat from the proposed Terminal and pipeline. These areas are considered preferred jaguarundi habitat. These include Loma del Rincon Chiquito, which represents one of the 22 named lomas located near the Action Area. This loss of habitat could affect overall jaguarundi fitness, and would adversely affect jaguarundi movement and foraging behavior. In addition, the Project would also fragment jaguarundi and habitat creating disjointed habitat patches and road barriers that would deter jaguarundi movement in the Action Area.

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 CFR 402.02).

The Action Area lies within the Rio Grande Delta region, a region that is characterized by a unique and complex array of 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 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. The region has a subtropical, subhumid, 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 five 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. The Loma del Rincon Chiquito system is located within the current Action Area.

The action area is considered the construction ROW footprint of the Pipeline System from MP 48.8 to MP 135.5 and the 750.4-acre construction footprint of the Terminal. The Service considers the action area to be any area where direct or indirect effects associated with the proposed Project could occur to the ocelot or jaguarundi. The Project could result in adverse effects to the ocelot and jaguarundi from harm and harassment due to noise, harm and harassment due to nighttime lighting, loss of habitat and habitat connectivity, as well as direct injury or death if an ocelot is killed or injured during construction and operation. Indirect effects extend beyond the timeframe and confines of the direct Project construction and operational areas and include the loss of genetic viability and demographic robustness of the ocelot population located in and around LANWR and the Lower Rio Grande National Wildlife Refuge (LRGVNWR) that could occur if any mortality or displacement were to occur due to project related circumstances. Therefore, the Service considers the action area to be all areas that are within the normal activity range of the ocelot and jaguarundi population centered in and around LANWR and LRGNWR, as well as those portions of Willacy and Kenedy counties including and adjacent to the El Jardin and San Perlita Conservation Area.

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 Federal Highway Administration (FHWA) for SH 48 in 2004. The action included widening and improving approximately 9.7 miles of SH 48. 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 type wildlife crossing with diversion fencing on both sides of the highway. Incidental take was provided for the harassment of one ocelot and one jaguarundi.

The Brownsville Navigation District granted the Service a 19-year conservation easement, 1,000-foot wide from the SH 48 to the ship channel. This project has been completed, and there has been no reported take of an ocelot or jaguarundi to date. An ocelot wildlife crossing was placed on SH 48 between the conservation easement on BND property and Red Head Ridge on Bahia Grande Refuge property. Monitoring of the wildlife crossing, using camera traps, has not indicated any attempts to use the crossing by either an ocelot or a jaguarundi at this time.

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 proposed 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 ROW 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 proposed to install 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. ROW fencing would also be 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 Isabell Detention Center. The new 12- inch water line connected to an existing line at the comer of FM 2480 and FM 510. The new line followed FM 510 east to the intersection with FM 106, then turned north along FM 106 until it reached the detention facility. Incidental take was provided for the harassment of one ocelot and one jaguarundi during construction. Lethal take was not issued. 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 US 77, between IH 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 with the Federal Aviation Administration (FAA) for SpaceX. The FAA proposed to issue launch licenses and/or experimental permits to authorize Space X to launch Falcon 9 and Falcon.

- Heavy orbital or suborbital vehicles from the launch site. SpaceX proposed to construct 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 IvomecÂ® or IvomaxÂ® (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 corn 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 impacts to the species. 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 262.4 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 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).

The Terminal site is low-lying, with the exception of several lomas (coastal clay dunes) and dredge spoil piles along the BSC. The regional landscape is influenced by coastal winds and dominated by hydric, poorly drained, saline soils, which influence the vegetative communities present. A lagoon and associated tidal flats and marshes dominate the eastern portion of the site, while the western end of the site is occupied by a large mud and salt flat complex with adjacent mangrove wetlands. The central portion of the site is dominated by a large terrace that is bounded by a manmade levee on the north and the BSC on the south. This area was historically used to contain dredge spoils from the original excavation of the BSC in 1936 (Garza and Long 2010).

The Terminal's current design includes approximately 750 acres of land within the Terminal 984-acre lease boundary that will be permanently converted for operation; with the remaining approximately 234 acres of land is comprised of the existing pilot channel that connects Bahia Grande to the BSC and two areas outside of the permanent fence line of the Terminal (one outside of the eastern fence line boundary and the other outside of the western fence line boundary) that will be used as natural buffers during operation. Within the operational footprint of the Terminal, the dominant upland habitats are South Texas loma evergreen shrubland, South Texas salty thorn scrub, south Texas loma grassland, coastal sea ox-eye daisy flats, gulf coast salty prairie, and dredge spoil. South Texas loma evergreen shrubland consists of mesquite (*Prosopis glandulosa*), prickly pear (*Opuntia*

spp.), Spanish dagger (*Yucca gloriosa*), Texas ebony (*Ebenopsis ebano*), and huisachillo (*Acacia schaffneri*), as well as grasses such as gulf cordgrass (*Spartina spartinae*). South Texas salty thornscrub is dominated by dominated by a mesquite overstory with other common shrub species, including whitebrush (*Aloysia gratissima*), blackbrush (*Coleogyne ramosissima*), granjeno (*Celtis pallida*), lotebush (*Zizyphus obtusifolia*), brasil (*Condalia hookeri*), and prickly pear. Common herbaceous understory includes buffelgrass (*Cenchrus ciliaris*), Kleberg bluestem (*Dichanthium annulatum*), and whorled dropseed (*Sporobolus pyramidatus*). The South Texas loma grassland occur at low elevations around the base of lomas. Dominant herbaceous species include gulf cordgrass, shoregrass, and saltwort (*Batis maritima*). Evergreen shrubs such as mesquite, Spanish dagger, prickly pear, and huisachillo comprise a smaller component of these communities.

The construction and operation of the Terminal site would result in the loss of 189.1 acres of upland shrub habitat (138.4 acres of salty thorn scrub and 50.7 acres of loma evergreen shrubland) within the action area. A portion of the upland shrub habitat is found on a 63.9-acre loma located within the central portion of the Terminal site.

During the construction of the Terminal, RGLNG would utilize the following temporary offsite facilities: 25.1-acre offsite parking and storage area at the Port of Brownsville, 4-acre area at Port Isabel storage yard, Port Isabel dredge pile, and 0.1-acre temporary bulk water loading area within the Port of Brownsville. The temporary use of these sites would no impact any woody/shrub habitat.

Pipeline System

The Pipeline System crosses three natural regions: the Coastal Sand Plains, South Texas Brush Country, and Gulf Coast Prairies and Marshes (TPWD 2011a). The Coastal Sand Plains natural region is dominated by thorny brush, such as mesquite and prickly pear mixed with grasslands (TPWD 2015c) and occurs in the action area between MP 48 to MP 88.7. The South Texas Brush Country is dominated by thorny brush and grassland with large tracts in the lower Rio Grande Valley developed as agricultural land. This natural region is crossed by the pipelines from MP 88.7 to MP 125.9, with this portion of the route dominated by row crops and South Texas disturbance grassland. The Gulf Coast Prairies and Marshes region is primarily comprised of barrier islands on the coast, estuarine marshes surrounding channels and bays, and patches of upland prairies and woodlands. This natural region is crossed by the pipelines from MP 125.9 to MP 135.3. This portion of the route is dominated by estuarine wetlands and South Texas loma evergreen shrubland.

As currently designed, the construction and operation of the Pipeline System would affect 135.9 acres of habitat within the action area. The dominant habitats comprising ocelot habitat along the pipeline that would be impacted are South Texas sandy mesquite woodland, shrubland, and South Texas loma evergreen shrubland. South Texas sandy mesquite woodland and shrubland is characterized by mesquite woodlands, with prickly pear, granjeno, huisache, and lotebush also commonly occurring, and is regularly interspersed with patches of savanna grassland. The current design of the pipeline has incorporated measures to avoid and reduce impacts to ocelot habitat. These measures include the avoidance of habitat through the use of horizontal directional drilling crossing

method between MPs 82.1- 82.3, 99.7-100.1, 116.4-116.6, 118.9-119.0, and 134.5 – 135.2 and the use of conventional bore crossing method at MP 117.2. Minimization measures implemented along the pipeline route include the collocation of the pipeline with the existing Valley Crossing Pipeline ROW between MPs 48.6-69.8 and the reduction of the construction ROW width at MPs 103.3, 103.8, and 119.3.

To further reduce direct impacts to ocelot habitat, RB Pipeline will re-route the pipeline between MP 69.9 to MP 79.2, to avoid 62.6 acres of habitat. RB Pipeline will move the route south into existing row crop agricultural land and collocate with an existing transmission line ROW. The re-route will not result in any additional impacts to ocelot habitat. With the implementation of these avoidance and minimization measure, the Pipeline System will affect 73.3 acres of habitat.

Ocelots prefer thornscrub communities with greater than 95 percent canopy cover (Horne 1998). They are believed to use a narrow range of microhabitats (Emmons 1988, Horne 1998). Microhabitat features that are important for ocelot use appear to be; a canopy height of greater than 7.9 feet, and vertical cover with about 90 percent visual obscurity at 3-6 feet (Horne 1998). Resacas (oxbows), rivers, irrigation canals, irrigation drains, natural drainages, shorelines fence lines and road verges all provide suitable travel corridors for ocelots, especially as density and percent cover of thornscrub vegetation increase (Tewes et al. 1995). Even brush tracts as small as five acres, when adjacent to larger areas of habitat, may be used by ocelots. Historically, potential ocelot habitat occurred throughout south Texas, but in the 20th century, it was reduced to less than one percent by conversion into agricultural and suburban land use (Tewes and Everett 1986).

Many of the past and present land uses in the action area have had the net result of vegetation removal or alteration. Overgrazing, the suppression of prairie fires, and other changes in land use patterns have also been associated with the transformation of native habitats (ICE 2010). Collins (1984) remarked that brush clearing was a threat to endangered cats and the implementation of protective measures for brushy areas was an immediate concern. The native thornscrub serves to support a variety of wildlife species and is used as habitat or travel corridors by ocelots and jaguarundi. Since the 1920's, more than 95 percent of the original native thornscrub and about 90 percent of the riparian vegetation has been converted to agriculture or urban use (USFWS 1988).

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 Blanton & Associates (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 USFWS 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; 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 (USFWS 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 (USFWS 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 near the Action Area (1985, 1990, and 2000-2001) failed to document this species (Dr. Michael Tewes, personal communication to Dr. Lon Grassman, Blanton and Associates, December 17, 2015; Shinn 2002). Annona 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 (*Mustela frenata*), and domesticated cats (*Felis catus*), horses (*Equus caballus*), cows (*Bos taurus*), and goats (*Capra hircus*). No ocelots (or jaguarundis) were documented during the camera-trapping survey.

The current size and distribution of loma thornshrub 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 thornshrub 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 near 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, December17, 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 Terminal will be constructed and operated on land that is owned by BND. On March 6, 2019, RGLNG developers executed a lease agreement with the BND for the 984-acre parcel for an initial term of thirty years, with two options to renew and extend the term of the lease for periods of ten years each, which is the maximum term allowable under Texas Water Code, Title 4, Chapter 60, Sec. 60.039(a). The pipeline facilities would be located in Jim Wells, Kleberg, Kenedy, Willacy, and Cameron counties. These facilities would generally be sited on rural, unincorporated areas, with the northern portion of the pipeline route through Kleberg and Kenedy counties characterized by large tracts of land used for ranch and cattle operations. King Ranch, an 825,000-acre ranch, makes up the majority of the land. As the pipeline route moves south into Willacy and Cameron counties, the land is predominately grassland and cropland. Based on field investigations, the primary crops currently in production in the Project area include cotton, sorghum, and corn.

In the Project vicinity, major landowners include the BND, the Service, and the state of Texas. The Service's properties include LANWR, located north of the BSC, and the Lower Rio Grande Valley National Wildlife Refuge (LRGVNWR), located primarily south of the BSC. The Loma Ecological Preserve, which is located south of the Project site, 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 (*Leopardus pardalis*) and Gulf Coast jaguarundi (*Herpailurus yagouaroundi cacomitli*; henceforth "jaguarundi").

Habitat Acquisition and Management

The South Texas Refuges Complex (STRC) is situated in southernmost Texas, and is made up of three NWR's: Santa Ana NWR, 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 population of ocelots in the ocelot habitat located to the north of LANWR is the Texas ranch country, which includes huge

blocks of important wildlife habitat, including the other U.S. ocelot population, located in Willacy County.

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 jaguarundis.

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, and Boca Chica to Falcon Dam to the west. 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 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 (USFWS 2015a). The Service's Recovery Plan for the Ocelot (*Leopardus pardalis*), First Revision, July 2016 (USFWS 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 FWS 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 identified as a focus for purchasing properties or obtaining perpetual conservation easements within Cameron County to establish, and connect the South Texas Ocelot Coastal Corridor. The acquisition of properties and easements within this corridor will eventually connect the main LANWR tracts, the Bahia Grande Unit of the LANWR, LRGVNWR units, and Boca Chica State Park, resulting in a contiguous conservation landscape (National Fish and Wildlife Foundation [NFWF] 2015). This conservation landscape, in turn, is linked to more than 2 million acres of private ranchland located north of the LANWR with 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 are those effects of the proposed action that are completely positive, without any adverse effects to the listed species or its critical habitat:

- RB Pipeline has realigned the pipeline route to avoid 62.6 acres of endangered cat habitat out of 135.9 acres of impacts to cat habitat, and will directionally drill (HD) on other crossings of cat habitat, and HD the Red Head Ridge Loma Conservation Easement off SH 48. The direct impacts of the remaining 73 acres from the proposed pipeline will be offset under Voluntary Conservation Measure 2.

- RGLNG would minimize the effects of lighting by evaluating lighting schemes 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 and lighting would be extinguished upon completion of

work in an area. Prior to construction, RGLNG will be required to file with the Secretary, for review and written approval by the Director of OEP, its Facility Lighting Plan for operation of the LNG terminal.

Direct effects

Habitat Loss

Long-term effects are related to clearing and maintenance of suitable ocelot and jaguarundi habitat associated with the pipeline system and the terminal site. Other direct effects would be in the form of harm or harassment due to modifications of normal feeding, breeding, or sheltering activities that result in reduced fitness or other injury to individuals or populations. Direct injury or death due to construction activities is not likely.

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 189.1 (Terminal) and 73.3 (Pipeline) acres of loma evergreen shrubland and loma grassland/shrubland, and upland shrub thornscrub habitat 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.

Along with habitat loss and degradation, most biologists agree that habitat fragmentation is a major cause of reduced biodiversity (Noss et al 2001). Habitat fragmentation is the separation of a landscape into various land uses (development, agriculture, etc.) resulting in numerous small disjointed habitat patches left for use by wildlife. Fragmentation eliminates areas needed for breeding, feeding, and sheltering for species like the ocelot and jaguarundi that require large, unbroken blocks of habitat. Fragmentation can also isolate cats from travel corridors and reduce dispersal for breeding. In a small population, such as the ocelot and jaguarundi in South Texas, inbreeding can reduce fitness of individuals and loss of genetic variability can reduce the ability of an animal to adapt to a changing environment (Lande 1988) and increase population-level disease susceptibility as immunity profiles homogenize.

Additionally, the small habitat patches resulting from fragmentation may not provide the food and cover resources necessary for the species; therefore, they may not use the habitat patch. This can result in an increased risk of death by predation if the animal has to venture beyond the cover of the patch to find new resources.

The proposed boundary fencing for the Terminal would act as a barrier to ocelot movements, resulting the loss of habitat available for traveling cats. The vegetation clearing of the Terminal site would result in the loss of the 182.4 acres of the foraging habitat. The clearing of 73.3 acres of potential cat habitat along the pipeline route will result in additional habitat fragmentation in those areas and could act as a barrier to ocelot movements and the loss of foraging habitat.

Human Disturbance

The Project is scheduled for seven years of discontinuous construction, and thus would consist of intermittent disturbances of varying intensity. The Project is anticipated to start in the first quarter of 2020 and take seven years to complete. Disturbances associated with the

construction and installation of the pipeline system would be of finite duration, except for ROW maintenance activities and unexpected pipeline repairs. The intensity and severity of the installation and construction of the pipeline system would be significant during actual installation but would diminish rapidly once the pipelines have been placed underground.

Disturbance from the terminal will be permanent, with indirect long-term effects occurring after construction and throughout the life of the facility. The intensity and severity of the facility impacts will be significant and permanent, as the entire site will be cleared and occupied with industrial scale development and noises.

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 the 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 USFWS 2013c). In general, typical wildlife responses to human disturbance may be fleeing, increased vigilance, and changes in habitat selection (Frid and Dill 2002).

Noise

Noise associated with construction, operation, and maintenance of the project would have the potential to affect individuals that occur within proximity to the Project area. Where the LANWR is near the northern boundary of the RGLNG terminal site, the sound level increase over ambient levels during terminal site preparation and construction would be below 3 decibels and would not likely be perceptible. Similarly, at the wildlife corridor underSH-48 (about 2.4 miles west of the of the Terminal site's center), sound levels from site preparation would result in a negligible increase over existing ambient levels that would not likely be perceptible, and construction would not result in an increase in ambient sound levels (see table 4.7.1-3 of the April 26, 2019 FEIS). Construction of the pipeline system would occur over a limited duration at any one location (see Section 4.11.2.3 of the April 26, 2019 FEIS).

Operational noise would result in an increase in the ambient sound levels in the immediate vicinity of the Project. At the boundary of the Terminal site, operational sound levels would be about 75 decibels Where the LANWR is near the northern boundary of the LNG Terminal site, noise levels during terminal operations would be 71.4 dBA, and would result in an expected increase of about 11.9 dB over ambient levels. Within about 1 mile, construction noise would drop to about 60 dBA, which is audible, but likely, not a nuisance, and at a distance of about 2 miles, noise would drop to about 50 dBA, which is considered quiet. The wildlife corridor under SH-48 is about 2.4 miles west of the center of the Terminal site; at this distance, noise levels from site preparation, construction, and operation of the Terminal would result in a negligible increase (less than 1 dB) over existing ambient

levels (see table 4.7.1-4). Sound would attenuate with increased distance from construction activity and general wildlife is expected to be accustomed to similar sound levels due to the current noise levels produced by high-speed vehicles on highways (70 to 80 dBA at 50 feet) and recreational marine vessels along the BSC (generally around 86 dBA) (FHWA 2003, Coast Guard 2003). Since conducting the noise impact analysis, RGLNG has adopted certain mitigation (see section 4.11.2.3 of the April 26, 2019 FEIS); however, these modifications did not result in significant changes in noise attenuation identified above.

The April 26, 2019, FEIS reviewed habitat within the LANWR that falls within a 1-mile radius of the proposed Terminal site where construction noise from the Terminal would be about 60 dBA, as described above. In total, about 2,464 acres would fall within the 1-mile radius, of which about 437 acres (17.7 percent) are classified as having scrub-shrub vegetation (TPWD 2017a). Although this habitat would not be directly impacted by the project facilities, any change in ocelot behavior, including temporary or permanent displacement away from noisy areas, may increase intra-species competition for home ranges and resources; therefore, increases in noise within suitable habitat in the southern portion of the LANWR could affect individual ocelots using the area.

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 being used to travel to check the bait stations through or 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, in fact, information about the effect of noise on felines is lacking. 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, an 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, Blanton &Associates 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 44 percent (12 of 27) of known ocelot mortalities from 1982 to 1996 are likely vehicle related (Hewitt et al. 1998) and 45 percent of the total ocelot mortality documented in South Texas between 1983 and 2002 was likely vehicle related (Haines et al., 2005b). An additional seven ocelot road mortalities 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, RGLNG will also mandate a speed limit of 25 miles per hour 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 sites 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. RGLNG will minimize the effects of lighting by

evaluating lighting schemes to minimize effects of light on remaining habitats and minimizing lighting on the main access road to that needed to address safety concerns. RGLNG will also evaluate lighting schemes to minimize light pollution outside the Project site.

The overall increase in nighttime lighting during construction and operation of the Project would result in a permanent, but minor impact on ocelots, if they utilize habitat in the lower LANWR. RGLNG has developed mitigation measures to minimize the impacts of nighttime lighting at the Terminal site, including limiting the amount of outdoor lighting installed, dimming lights at night, and directing light downward.

Indirect effects

Indirect disturbance from habitat loss or fragmentation along the Pipeline System could result in short-term displacement if the habitat were occupied, and disruption of dispersion from natal areas and transient movements, which typically follow habitat corridors. To provide habitat and a safe travel corridor for wildlife, but particularly for ocelots, the FWS has identified a Texas Coastal Ocelot Corridor acquisition area which, when acquired by the agency and its partners, would protect land between the Bahia Grande Unit of the LANWR (directly north of the Terminal site) and a larger unit located further north in Cameron County; the acquisition area would not be crossed by the Project. However, potential habitat would be crossed by the Pipeline System outside of the acquisition area, including about 77.3 acres of upland shrub/forest habitat, which would be disturbed during construction of the Pipeline System.

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.

The geographic scope for cumulative impacts on the ocelot and jaguarundi was considered terrestrial projects located within the HUC-12 sub watershed affected by the proposed LNG terminal. Thorn scrub habitat associated with the lomas on the Project site provide suitable habitat for ocelot and jaguarundi, and occupied habitat is known to be present in the adjacent Laguna Atascosa NWR. While suitable habitat is present on the Project site and is within the known range of ocelots and jaguarundi, the Project site likely serves only as stopover or temporary habitat for transient individuals rather than a breeding pair due to its size and lack of connectivity with larger more contiguous tracts, such as those present within the LANWR. If an ocelot or jaguarundi is present on the site at the start of construction activities it would be flushed

from the property during pre-construction surveys and hazing and would likely relocate to suitable adjacent habitat.

The primary threat to ocelot and jaguarundi populations in the United States is habitat loss, degradation, and fragmentation (FWS 2010b). Due to the large home ranges of ocelots and importance of corridor habitat, even incremental habitat loss could be significant. In addition, the population size in Texas and growing isolation due to loss of habitat connectivity with ocelot and jaguarundi populations in Mexico are contributing to a growing threat of genetic inbreeding in the Texas ocelot and jaguarundi populations. Moreover, the construction of roads through ocelot and jaguarundi habitat has resulted in high rates of road mortality, further inhibiting population growth and connectivity with adjacent populations (FWS 2010a). These are important factors to consider when addressing potential cumulative impacts on these species.

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. Number 1 and 2 are linear infrastructure that include an overhead transmission line and underground water supply pipeline, respectively.

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 thornshrub 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 affected 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, ocelots', jaguarundis', and falcons' 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 that brings increased noise, light, fencing, and human disturbance; Customs and Border Protection operations that include roads, drag roads, off-road impacts, lights, etc. 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 to replace, secure, and improve such habitats as RGLNG proposes to voluntarily conserve 1050 acres off-site, and connect optimal habitat that exists on national wildlife refuge lands and private lands, the Service does not believe that the cumulative effects are likely to jeopardize the continued existence of the ocelot or 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 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 increasingly fragmented habitat use for travel corridor and increased risk of road mortality. These may harm or harass and prevented dispersal of cats into otherwise suitable habitat.

Therefore, the Service anticipates one endangered cat, (ocelot or jaguarundi) could be taken for construction and the life of the project in the form of harm and/or harassment from human presence and travelling within the project area. If, during the course of the action, one endangered ocelot or jaguarundi is killed within any 12-month period, RGLNG will meet with the Service to discuss further recommendations.

Effect of the take

In the accompanying biological opinion, 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 proposed RGLNG project and, the RB Pipeline as proposed is not likely to jeopardize the continued existence of the listed ocelot, and 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 the RGLNG, and RB Pipeline, so that they become binding conditions of the project in order for the exemption in section 7(o)(2) to apply. The RGLNG and RB Pipeline has a continuing duty to regulate the activity covered by this incidental take statement. If the RGLNG, or RB Pipeline (1) fails to assume and implement the terms and conditions or (2) fails to require any agent acting on behalf of the RGLNG, or RB Pipeline 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, the RGLNG, and RB Pipeline 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, RGLNG, and Rio Bravo Pipeline have agreed on voluntary conservation 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) RGLNG and Rio Bravo Pipeline must fully implement the Voluntary Conservation Measures proposed in their BO for this project.

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

4) RGLNG and Rio Bravo Pipeline 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, RGLNG 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.

1) If a cat is 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 RGLNG, or RB Pipeline 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) RGLNG and the Service will coordinate to develop, and design an instructional program training module on the Endangered Species Act, so the RGLNG and RB Pipeline supervisors can instruct any current and new RGLNG, and RB Pipeline personnel and contractors in the project area on conserving 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.

3) RGLNG must hold a pre-construction meeting with its employees and any contractors working on this project to provide specific instruction on the implementation of RGLNG's and RB Pipeline'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. RGLNG and RB Pipeline is ultimately responsible for informing anyone working on this project of these requirements.

4) The Environmental Compliance Manager (ECM) would be responsible for overseeing compliance with the conservation measures and any other required terms and conditions resulting from consultation between the FERC and the Service including initial clearing of the project site, dredging within the BSC, and pile-driving within and adjacent to the BSC. The ECM would have stop-work authority should a violation of these requirements occur, and would have the authority to stop work before a violation or issue occurs in cases where a violation/issue is imminent, and contact the Service immediately.

5) In the event that activities result in the direct take (killing, harming, or maiming) of an ocelot, or jaguarundi, the person(s) responsible for monitoring shall notify the

Service. Should an ocelot or jaguarundi be spotted on the project site, they are to call the South Texas Refuge Complex Dispatch at Santa Ana NWR at (956) 784-7520 immediately. If RGLNG, RB Pipeline or contractors locates a dead, injured, or sick ocelot or jaguarundi, initial notification must be made to the Ecological Services Office at Alamo (956) 784-7560 or Dispatch Center listed above. To the extent practicable, the finder has the responsibility to ensure that evidence intrinsic to the specimen is not unnecessarily disturbed.

6) Annova must monitor and report the amount of incidental take from this project to the Service. Monitoring reports must include a summary of construction actions implemented during the previous six-month period and any known incidental take that has occurred and the reasons for that take. Annual reports will be submitted to the Assistant Field Supervisor, U.S. Fish and Wildlife Service Ecological Services, 4444 Corona Dr., Suite 215, Corpus Christi, TX 78411-4300, by September 30 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 (Recovery 1.2.4.2, 1.2.4.3).

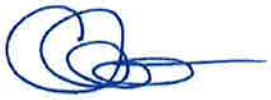
REINITIATION NOTICE

This concludes formal consultation on the actions outlined in the request. 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, RGLNG and the Service will meet to discuss further options.

If you or your staffs have any questions concerning this opinion, 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

August 6, 2015	Request approval and concurrence from U.S. Fish and Wildlife Service (Service) to implement compensatory mitigation measures within the Laguna Atascosa National Wildlife Refuge. The Service expressed an interested in acquiring land adjacent to their property to mitigate habitat fragmentation. They are specifically interested in creating a corridor to link populations of protected species. The specific species of concern are three regional ones: ocelot, northern aplomado falcon and Gulf Coast jaguarundi.
March 2, 2015	Project introduction meeting with Ecological Sevices, Laguna Atascosa and Lower Rio Grande Valley National Wildlife Refuges (NWRs), Texas Parks & Wildlife Department (TPWD), and South Texas Refuge Complex. It was indicated that: Federally protected wildlife species potentially occur near the Project area; of these, the primary species of concern will be ocelot, piping plover, and northern aplomado falcon. Proposed Terminal site is actually located east of the NWRs primary area of concern for the ocelot. The Service is trying to secure enough land through the southern three counties to create a continuous and perpetual conservation easement or corridor for the ocelot to travel between Mexico and the US; this is considered a "critical coastal link" for this endangered species. NWRs recommended the Project to contact Blanton and Associates, an environmental consulting firm that has completed significant work for the Port of Brownsville and has carried out ocelot tracking telemetry work. This work provided evidence that this species swims across the Brownsville Shipping Channel. The 1000-ft wide corridor located about one quarter of a mile west of the proposed Terminal

	site is an ocelot conservation easement with the Port of Brownsville. E & E indicated that coordination with the Project engineers has taken place to determine the viability of a potential HDD underneath this natural corridor.
August 10, 2015	Ernesto Reyes receives kmz file of the proposed Rio Bravo Pipeline Project route from Eric Swenson (Energy, WO).
September 29, 2015	Discussion of previous consultation letters sent to the Service and continued consultation regarding potential impacts to federally listed threatened and endangered species from the Project.
February 4, 2016	The Service, FERC and other agencies met for a site visit of all three LNG sites to look at proposed terminal facilities and impacts to different types of habitat.
March 3, 2016	Pre-application meeting with the Service and TPWD to present the vegetative and biological resource assessment findings for the Terminal and Pipeline System; discuss preliminary evaluation of potential impacts; receive agency feedback on findings; and discuss potential off-site wetland mitigation options.
March 29, 2016	The Service provided FERC with comments on the Draft Resource report for the DEIS.
December 2, 2016	Meeting with the Service and TPWD to provide the agencies with Project updates including permit status, current schedule, and updated project design and environmental surveys, discuss proposed pre-construction field surveys and other avoidance and minimization measures for protected species, discuss proposed vegetation clearing procedures that would be in compliance with MBTA; and discuss the status of mitigation efforts. The Service inquired about the re-route in Willacy County and RG Developers indicated that it was made upon the request of the landowner. The re-route has resulted in moving

the pipeline ROW further to the east from the El Jardin and San Perlita conservation easement that was established for the ocelot conservation.

The Service stated that they need to conduct a more thorough review of habitat impacted by the Project, particularly the Pipeline System, to determine the extent of potential ocelot habitat as ocelot habitat varies depending on location.

The Service also stated that clearance surveys in potential ocelot habitat are recommended. Other recommended measures include limiting nighttime construction, incorporating general safety measures to protect ocelots and wildlife in general (i.e. slow speeds, fencing), carpooling to reduce traffic, and down-shielding lighting.

The Service requested that RG Developers look at areas on the north side of the Brownsville Ship Channel which are also on Brownsville Navigation District owned land. The area south of Del Mar Heights between the Palo Alto Battlefield and the Laguna Atascosa National Wildlife Refuge is an area to consider for mitigation lands. The area includes wetlands as well as potential northern aplomado falcon and ocelot habitat so it could serve multiple mitigation efforts and would likely require minimal functional uplift.

The Service stated that there is a potential ocelot habitat on the west side of Highway 77 near the Yturria ranch property to consider for conservation. Ocelot crossings have been approved in an area north of the pipeline route.

March 7, 2017

Joint Evaluation Meeting (JEM) with the Service, U.S. Army Corps of Engineers (USACE), TPWD, Texas General Land Office (GLO), U.S. Environmental Protection Agency (EPA), and National Marine Fisheries Service. The JEM focused on a review of the Project's conceptual mitigation plan (CMP), including input and feedback from all attending agencies on the future development of the mitigation plan for the

	Project. The following were the main objectives of the meeting: provide status of and updates to the Project; present an overview of the Project's CMP; and discuss the components of the CMP and identify the next steps in refining the mitigation plan.
August 18, 2017	Meeting with the Service to provide an update on the Project and review the proposed philosophy being developed to address the portions of the Rio Bravo Pipeline impacted by the Valley Crossing Pipeline project. The Service stated that there were several ocelot crossing along U.S. Highway 77 and that these crossings should be avoided during the re-routing process. Additionally, RG Developers should minimize impacts to any of the woody vegetation habitat that provides connectivity and/or a corridor to the crossings. The Service provided the coordinates for one of the crossings and stated that remaining locations could be provided.
November 7, 2017	Joint Evaluation Meeting (JEM) with the Service, USACE, TPWD, GLO, and EPA. The purpose of the JEM was to discuss the findings of the project Mitigation Alternatives Analysis. The JEM focused on a review of the Mitigation Alternatives Analysis and input/feedback from all attending agencies. The following were the main objectives of the meeting: provide status of and updates to the Project; present a summary of the Mitigation Alternatives Analysis; and identify the next steps in refining the Compensatory Mitigation Plan.
February 12, 2018	Jenny McCoy with Edge Engineering and Science sends the Service the Rio Grande LNG - Administrative draft EIS Sections 1-4 for review.
March 9, 2018	The Service provide comments to FERC on the ADEIS Sections 2.0, 3.0, and 4.0 of Rio Grande LNG/ Rio Bravo Pipeline Project.
May 7, 2018	RG Developers met with the Service and TPWD to provide an update on the Project and discuss

	some outstanding FERC data requests, the recent M Opinion regarding MBTA enforcement and the Project's wetland mitigation plan. Specifically, RG Developers discussed the adjustments to the layout of Terminal and the pipeline route that were made due to the Enbridge's Valley Crossing Pipeline (VCP) project.
May 7, 2018	Meeting to provide the Service an update on the development of the Project, which mainly consisted of describing the engineering related data requests that were issued by FERC on June 2, 2018. RG Developers inquired regarding the outstanding FERC data request that requested a review and evaluation by the Service of the potential impacts to piping plover and ocelots from the modeled operational noise of the Terminal. The Service commented that they were not entirely sure how to evaluate noise impacts based on the modeled numbers. As noise impacts are often based on site specific condition and though there is literature that addresses impact to wildlife from noise, the data is limited. It was agreed that this subject would be revisited upon the publishing of the FERC DEIS. The Service requested an updated KMZ file of the pipeline route to review the changes that were highlighted during the meeting. Of particular interest to USFWS, was if the pipeline route crossed the Los Norias Division of the King Ranch that support favourable ocelot habitat. USFWS indicated that portions of VCP mitigated impacts to ocelot habitat in the Los Norias Division by reducing the width of the construction ROW in appropriate areas. The Service stated that they would review the updated KMZ of the RB Pipeline route to see if it intersects ocelot habitat on the Los Norias Division.
May 14, 2018	Jason Zoller (*Operations Manager)* with Ecology and Environment, Inc. sent an updated KMZ of the Rio Bravo Pipeline and a scanned copy of the meeting attendance.

July 30, 2018	The Service provides comments on Section 4 of the ADEIS.
August 24, 2018	The Service provides comments on the most recent version of the ADEIS Sections 1 and 2 to FERC.
August 31, 2018	FERC released the Notice of schedule for environmental review of the Rio Grande LNG Project. Issuance of Notice of Availability of the final EIS - April 26, 2019. 90-day Federal Authorization Decision Deadline - July 25, 2019.
October 12, 2018	The draft EIS for the Rio Grande LNG project was issued by FERC for review by cooperating agencies.
October 25, 2018	FERC sends a letter to Ernesto Reyes with FERC's Section 7 effect determination for each federally listed species seeking Service concurrence.
November 7, 2018	Meeting with RG Developer to provide the Service an update on the development of the Project and discuss the findings and recommendation of the FERC October 12, 2018 Draft Environmental Impact Statement (DEIS) for the Project. The discussion of the DEIS focused on the FERC's effects determination for the aplomado falcon, piping plover, and ocelot under the Section 7 consultation process. The Service noted that during their review of the Administrative DEIS, they commented about the cumulative impact of the loss of both aplomado falcon and ocelot habitat due to the ongoing development in the Rio Grande Valley. RG Developer reviewed the finding of the DEIS regarding the loss of potential ocelot habitat due to the construction and operation of the Terminal. This would result in the loss of approximately 189 acres of potential ocelot habitat for the terminal site. However, as indicated in the DEIS, the potential ocelot habitat within the Terminal

site is not suitable to support breeding pairs and would likely serve only as stopover or temporary habitat for transient individuals due to its size and lack of connectivity with larger more contiguous tracts. Additionally, this potential habitat is isolated between State Highway 48 to the north and the Brownsville Ship Channel to the south and is not directly connected to the established wildlife crossing along State Highway 48 located to the west of the Bahia Grande Channel.

The Service requested the permanently impacted potential ocelot habitat be voluntarily mitigated for through the preservation of habitat as part of the wildlife conservation corridor that abuts the Laguna Atascosa National Wildlife Refuge (NWR), the Lower Rio Grande Valley NWR, and the recently established conservation lands. The Service recommended working with a conservation entity to identify suitable ocelot habitat for conservation. The Service stated that they knew of available land near State Highway 100 (~ 400 acres).

The Service stated that the Valley Crossing Pipeline (VCP) voluntarily mitigated impacts to ocelot habitat through reduced construction footprint and through the purchase of ocelot habitat for preservation using a 4:1 mitigation ratio. The RG Developers stated that they would provide the Service with the latest KMZ of the RB Pipeline route and would review the route directly with the Service to determine if there were any specific areas crossed by the route that were considered high quality ocelot habitat. If suitable habitat were identified, then the RG Developers would work with the Service to determine measures to minimize habitat impacts, either through avoidance or a reduction of workspace.

RG Developers identified the locations of the pipeline route that had already been modified to reduce impacts to ocelot habitat based on the previous recommendations of the Service.

	The Service stated that they would provide the location of the ocelot crossings along State Highway 77 and the locations where VCP adjusted their workspace to minimize impacts to ocelot habitat. The Service highlighted that the prime areas of ocelot habitat were near MPs 70-115. The Service indicated that they prefer the restoration/preservation of ocelot habitat north of the Brownsville Ship Channel within the wildlife conservation corridor.
November 13, 2018	The Service sends a letter to the Corps of engineers that the Permit Application that the RG Developers sent to the Corps is incomplete, and that the Corps has made a determination that the proposed action would affect listed species or its critical habitat. RG Developers need to identify types of habitat impacts and acres impacted for each federally listed species.
November 19, 2018	Gertrude Fernandez Johnson (FERC) sent an email to the Service about the schedule for the Rio Grande LNG Project FEIS; the FEIS will be issued on April 26. The Service sends FERC a letter with comments as a cooperating agency to their DEIS.
November 26, 2018	Gertrude Fernandez Johnson responded to Pat Clements question of who to address the Section 7 response letter that the Service was preparing. Ms. Johnson responded to Pat Clements' that the letter being prepared by the Service can be addressed to David Swearingen.
November 28. 2018	The Service sends a Section 7 consultation letter response to FERC'S October 25, 2018 letter requesting initiation of formal consultation. The Service responded to their endangered species effect determinations, requests additional information on habitat impacts to ocelot and how RG Developers are going to avoid, minimize, or mitigate for loss of habitat; this information is

	needed to have a complete BA to start formal consultation.
December 12, 2018	Email from Nancy Fox Fernandez to Ernesto Reyes and Pat Clements that she had received the November 28, 2018 letter today from the Service responding to the Section 7 consultation requesting additional information to have a complete BA to initiate formal consultation. Nancy Fox asked us in the future to address the letter to the Secretary of FERC, so it can go through the FERC process.
March 26, 2019	Meeting to provide the Service an update on the development of the Project, discuss the status of the formal Section 7 consultation, and discuss the Project's Compensatory Mitigation Plan. The Service stated that formal consultation under Section 7 had not been initiated; however, they anticipated starting soon. RG Developers offered to visit the Santa Anna National Wildlife Refuge to meet with Mr. Ernesto Reyes to specifically discussed potential impacts to ocelot active areas along the pipeline route. The Service anticipates that the Project's Biological Opinion will contain an Incidental Take Authorization (ITA) for one ocelot/jaguarundi. The Service treats both species interchangeable in terms of the consultation process. They expect that each of the proposed LNG projects will receive an ITA of one ocelot/jaguarundi. RG Developers stated that they would incorporate similar BMPs and mitigation measures that the Valley Crossing Pipeline Project incorporated to mitigate impacts to ocelot habitat. These mitigation measures included the potential avoidance or minimization of habitat along the pipeline route through neck-downing of the construction right-of-way or use of HDD/bores.

	RG Developers also stated that they were currently in discussions with a conservation entity regarding the funding for the acquisition of conservation easement to offset the impacts to potential ocelot habitat from the construction of the Project. The focus of the discussion is on the conservation parcels along the South Texas Ocelot Coastal Corridor that was identified by the Service in an email to the U.S. Army Corps of Engineers. The Service stated that formal consultation for the ocelot can be conducted independently of informal consultation for the federal listed plant species and the completion of the required plant surveys. Pat Clements emails Nancy Fox Fernandez (Project Manager) asking if she had received the Service response to the October 25, 2018, letter on initiation of formal consultation. Pat asked if FERC was going to send the Service a BA or if FERC was using Section 4.7 of the AEIS as their BA. Pat Clements sent Nancy Fox the October 25, 2018, letter from FERC and the Service's November 28, 2018, response letter requesting additional information to have a complete BA.
April 18, 2019	Meeting with the Service to review the Rio Bravo Pipeline route to identifies location of suitable ocelot foraging habitat. The Service identified the northern extent of ocelot habitat along the pipeline route as milepost 48.8. The Service stated that oak motte habitat was of particular interest. The Service identified multiple locations along the pipeline route that looked like suitable foraging habitat for the ocelot. RG Developers committed to creating a Google Earth file that would reflect the ocelot habitat

	along the pipeline based on guidance provided during the meeting. The Service stated that ocelot acreage impacts would include both the habitat impacted within the construction footprint of the Pipeline System and the Terminal.
June 5, 2019	NextDecade sends a document of Best Management Practices on endangered plants to the Service.?
June 12, 2019	A meeting was held to provide the Service an update on the development of the Rio Grande LNG and Rio Bravo Pipeline projects (Project) and discuss the status of the formal Section 7 consultation. The Service emphasized not to clear the ROW before surveys of the pipeline for federal T&E plant are conducted. NextDecade confirmed federal T&E plant surveys would be conducted prior to land clearing and it would also be a condition of the FERC Order. RG Developers presented acreage of ocelot/jaguarundi (ocelot) habitat identified for the terminal and pipeline. The Service suggested RG Developers submit a formal letter describing how many acres of ocelot habitat were identified and how it will be mitigated for (proposed voluntary mitigation). Ocelot habitat should also be presented in figures and kmz files. RG Developers stated they would send the Service project background information to be incorporated into the Biological Opinion (BO) including consultation history. The Service will use the FEIS and project information to develop a BO for the project. The Service stated that for the ocelot habitat files, RG Developers should ensure workspaces and

	HDD crossings are clear in order to understand habitat that will be avoided. RG Developers stated that they would incorporate similar BMPs and mitigation measures that the Valley Crossing Pipeline Project incorporated to mitigate impacts to ocelot habitat. These mitigation measures included the potential avoidance or minimization of habitat along the pipeline route through neck-downing of the construction right-of-way or use of HDD/bores. These BMPs will be provided to the Service. RG Devlopers presented a tract of land (488 acres) to the Service as voluntary ocelot habitat mitigation. The Service stated that he is looking for a habitat mitigation ratio of 4:1 ratio to remain consistent across all projects.
June 18, 2019	NextDecade sends the Service the kmz files for the alignment of the proposed RG Pipeline for the Service to assess impacts (areage) to ocelot/jaguarundi habitat.
June 20, 2019	Project meeting between the Service and NextDecade to discuss progress on Section 7 formal consultation. Mr. Reyes stated that the official initiation of formal consultation would not start until he received the voluntary mitigation parcels that are to be proposed to offset the Project's impacts. Once the official clock has started on the formal consultation, Mr. Reyes stated that he would aim to complete and issue the BO in less than the 135-day timeline [90 days for formal consultation + 45 days preparation of the BO]. He said that he would start pulling together the material for development of the BO prior to the official clock starting on the formal consultation process. NextDecade presented two parcels as ocelot habitat voluntary mitigation. Mr. Reyes stated

	that one of the parcels is not suitable due to lack of ocelot habitat (parcel contains aplomado falcon habitat) and the Service would not accept this parcel for ocelot voluntary mitigation. Mr. Reyes committed to evaluating the other proposed parcel and would coordinate with the refuge manager to determine if it is acceptable and will inform NextDecade the conclusion. NextDecade committed to identifying an additional parcel to replace the parcel with Aplomado falcon habitat and sending it to Mr. Reyes for review by 6/28/19. NextDecade and the Service agreed to meet again in Corpus Christi, TX on 7/9/19 at 1pm to discuss BO progress including ocelot voluntary mitigation parcels.
June 21, 2019	NextDecade sends a document with information requested by the Service to address impacts and analysis to ocelots and jaguarundis from the proposed terminal and pipeline.
June 25, 2019	Jason Zoller with NextDecade sends an email to Ernesto Reyes and Pat Clements on Project Specific Language for the BO, KMZ file of pipeline workspace, KMZ file of ocelot habitat along the pipeline route, KMZ file of the HDD locations, KMZ of the Yturria property that will be avoided by a re-route, and Excel file of the acreage of the ocelot habitat polygons in the KMZ file.
July 5, 2019	NextDecade sent the Service Best Management Practices for Federally Listed Plant Species (black lace cactus, slender rush-pea, South Texas ambrosia). BMPs will be implemented by Rio Bravo Pipeline, LLC (RB Pipeline) during construction on portions of the Rio Bravo Pipeline Project that have the potential to support the black lace cactus, slender rush-pea, South Texas ambrosia. In accordance with FERC Condition 28 of the April 26, 2019 Final Environmental Impact Statement for the Rio Grande LNG Project, prior to construction RB Pipeline will conduct pre-

	construction surveys for the three plant species and file the results of the survey with FERC and the Service.
July 9, 2019	The Service met with Next Decade at the Corpus Christi ES office along with a conservation entity to discuss Section 7 ESA status, ocelot voluntary mitigation update (Conservation entity), biological opinion status, FERC, FEIS, recommendations status. NextDecade introduced a parcel of land as the location of the voluntary mitigation site of 1,050 acres that will contribute towards purchasing 3200 acres. This site is within the South Texas Ocelot Coastal Corridor that will be protected for long term recovery for the ocelot. The Service stated that they had made good progress on the DBO since the last meeting and expected to have the draft complete in 1-2 weeks as the Service waits for the commitment letter to initiate formal consultation, and reduce the 135 day process. Next Decade reminded the Service of the 90-day federal authorization deadline and requirement to submit a letter to FERC regarding the status of the consultation before July 23, 2019.
July 17, 2019	The Service sent the Secretary for FERC a letter that Next Decade has committed to pre-construction plant surveys for the proposed RB Pipeline once it obtains right-of-entry and file results to FERC and the Service. As soon as the Service gets a letter of commitment from Next Decade on the voluntary conservation measures, then the Service can start formal consultation. The Service has a DBO in process which allows expedited completion of the final BO.
August 5, 2019	The Service receives a letter of intent from NextDecade with voluntary conservation measures to offset direct impacts to ocelot and jaguarundi habitat from the proposed LNG Terminal facility and Rio Bravo pipeline.
August 13, 2019	The Service sent a concurrence letter to FERC that all information required to initiate formal consultation was received.

September 4, 2019	The Service provided FERC with a DBO for review and comment.
September 26, 2019	FERC provided comments on DBO
October 1, 2019	Final BO was issued.

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