BIOLOGICAL ASSESSMENT (REVISED)

RAYMONDVILLE DRAIN PROJECT

HIDALGO COUNTY AND WILLACY COUNTY

NOVEMBER 21, 2025

SUBMITTED TO:

Hidalgo County Drainage District No. 1

Raul Sesin, P.E., CFM
902 N. Doolittle Road
Edinburg, Texas 78542

SUBMITTED BY:

RRP Consulting Engineers, LLC

Point of Contact:
Daniel Garces, P.E.
5400 N. 10th Street
McAllen, Texas 78504
Phone: 956.926.5000
Email: dgarces@rrpeng.com

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SECTION 1: INTRODUCTION

Hidalgo County Drainage District No. 1 (HCDD1) is developing a proposed project to improve the existing regional stormwater drainage system in Hidalgo and Willacy Counties, Texas. The proposed drainage system improvement project, known as the Raymondville Drain Project (RDP), would expand the existing Raymondville Drain, in length and width, and potentially construct new drainage system elements (i.e., detention pond, alternative conveyance channels, etc.) to provide flood mitigation benefits within low-lying areas of Hidalgo and Willacy Counties.

This Biological Assessment (BA) has been prepared by RRP Consulting Engineers, LLC, (RRP) consultant to HCDD1, to fulfill the US Army Corps of Engineers (USACE) requirements as outlined in Section 7 of the Endangered Species Act of 1973, as amended (ESA). Section 7 assures that, through consultation with the US Fish and Wildlife Service (USFWS), Federal actions do not jeopardize the continued existence of any species listed or proposed as threatened or endangered or result in the destruction or adverse modification of critical habitat. Section 7(a)(2) of the ESA specifically requires Federal agencies to evaluate the effects of their proposed actions on species that are listed, or proposed for listing, as threatened or endangered under the ESA, as well as designated critical habitat for such species.

This BA demonstrates that the RDP complies with Section 7 of the ESA. The findings of this BA will be incorporated into the Feasibility Report and Environmental Assessment for the RDP, as appropriate.

1.1 STUDY BACKGROUND AND STUDY AREA

The existing Raymondville Drain consists of an authorized Federal project under the Project for Flood Control, Lower Rio Grande Basin, Texas under Title IV, Section 401 of the Water Resource Development Act of 1986. The RDP would include improvements to the Raymondville Drain and would be partially funded with Federal resources; therefore, the RDP constitutes a Federal action for the purposes of the ESA.

The existing drainage system is comprised of the Raymondville Drain, the HCDD1 North Main Drain system, and the International Boundary and Water Commission (IBWC) Floodway (IBWC Main Floodway and IBWC North Floodway). The existing Raymondville Drain system, including outfalls, was designed in the late 1960s and was originally intended to convey agricultural runoff (from the generally northern portions of the study area) from a 9.5-year storm event through the Laguna Madre to the Gulf of Mexico. The North Main Drain was constructed with the intent to convey stormwater runoff from the developed portions of Hidalgo County (generally southern portions of the study area) through the Laguna Madre to the Gulf of Mexico. The primary purpose of the IBWC Floodway (conveying runoff from areas south of the study area) is to provide an additional way to convey flows towards the Gulf of Mexico (via the Laguna Madre), therefore reducing flooding along the Rio Grande. The IBWC infrastructure requires pumps to convey water into the floodway during storm events.

The limits of the RDP originate at a point east of Edinburg Lake in Hidalgo County (western project terminus) and extend eastward to a point approximately 2 miles upstream of State Highway (SH) 186 in Willacy County near Port Mansfield (eastern project terminus) (see **Appendix A – Exhibits,** Exhibit 1 – Vicinity Map and Exhibit 2 – Site Location Map). The RDP would ultimately be constructed within a right-of-way (ROW) that would be 350 to 450 feet wide from the western project terminus to the eastern project terminus. The study area for this BA consists of a 600-foot-wide ROW which extends 300 feet to either side of the centerline of the RDP ROW.

1.2 CONSULTATION HISTORY

The RDP is being developed under the USACE Specific, Measurable, Attainable, Risk-Informed, and Timely (SMART) planning process and is currently in the Alternative Evaluation & Analysis milestone phase. This is the second of four phases outlined in the USACE SMART planning process. During this phase, the economic and

environmental benefits, impacts, and costs of project alternatives are evaluated, and a Tentatively Selected Plan (TSP) is identified from among the evaluated alternatives. Formal consultation is initiated with resource and regulatory agencies that may have an interest in, or jurisdiction over, the proposed project. This BA addresses effects that would occur as a result of the implementation of the TSP.

Coordination with state and Federal agencies that may have an interest in, or jurisdiction over, the proposed action was initiated on March 22, 2023, by mailing early coordination letters to representatives of those agencies. Early coordination letters served to introduce or re-introduce the proposed action to agency personnel and request their comments regarding environmental and other considerations. Federal agencies to whom early coordination letters were mailed included the USFWS and the National Marine Fisheries Service (NMFS); state agencies included the Texas Parks and Wildlife Department (TPWD).

TPWD formally replied to the early coordination letter on May 11, 2023, in a letter that listed TPWD's concerns regarding the proposed action as well as recommendations to address those concerns. Additional coordination with TPWD was conducted on June 28, 2023, via an email to Nathan Fuller, PhD, a bat biologist for TPWD.

Additional coordination was conducted with the USFWS and the NMFS regarding the potential of the RDP to affect Federally listed species and their habitat. As part of coordination process, the RDP project delivery team held meetings with the NMFS on May 11, 2023, and with the USFWS on May 17, 2023.

This BA was included as an attachment to the RDP Feasibility Report and Environmental Assessment. Coordination with the USACE for review of the RDP under the National Environmental Policy Act was initiated on June 25, 2025. In light of the amount of time that had elapsed from the development of the original version of this BA in 2023, the USACE requested an additional review of Federally listed species that may occur in the action area, with revisions made to the BA as appropriate.

SECTION 2: PROJECT DESCRIPTION

This section describes the proposed action and the action area. Additional information, including project alternatives that were considered, can be found in the RDP Feasibility Report and Environmental Assessment.

2.1 ACTION AREA

For the purposes of this BA, the action area consists of a 600-foot-wide corridor extending from the western project terminus in Hidalgo County to the eastern project terminus in Willacy County, as well as the footprint of a proposed 272-acre detention pond. The proposed detention pond would be located on the south side of the proposed diversion drain, approximately 1.3 miles east of IH 69C/US 281 (see **Appendix A – Exhibits,** Exhibit 3 – Topographic Map, 2022, Sheets 3 and 4; and **Appendix A – Exhibits,** Exhibit 4 – Aerial Photograph, 2022, Sheets 3 and 4). The action area is characterized by the existing Raymondville Drain, multiple other drainage channels which flow into the Raymondville Drain, and roadways of varying size which traverse the Raymondville Drain (see **Appendix A – Exhibits,** Exhibit 4 – Aerial Photograph, 2022; and **Appendix B – Site Photographs**).

During the development of this BA, clearing and grubbing activities were being conducted within the existing Raymondville Drain as part of the Raymondville Drain RESTORE Act Project. The potential effects that this project would have on species in the action area were identified and analyzed in a separate BA dated September 2021; a Letter of Concurrence (02ETTX00-2021-I-2868) was issued by the USFWS on October 21, 2021. Consequently, the ROW of the existing Raymondville Drain was not considered part of the action area for the proposed action and was excluded from analysis for this BA.

Major highways that traverse the RDP study area include, from west to east: IH 69C/US 281, Farm-to-Market Road (FM) 490, SH 186, US 77 Business, and IH 69E/US 77. The general character of the action area is that of a rural, agricultural region located near the Texas coast and the US-Mexico border. Undeveloped areas primarily consist of agricultural/row crop farms or ranchland. Notable developments and land uses near the action area include the South Texas International Airport and the Lopez State Jail-Segovia Unit in Edinburg, the City of Raymondville, the City of San Perlita, unincorporated communities (Hargill and Lasara), parks, and multiple tracts of the Lower Rio Grande Valley National Wildlife Refuge (LRGVNWR). One control structure is present within the existing Raymondville Drain. This control structure is located south of the LRGVNWR and controls the amount of water that flows into La Sal Vieja, a lake located in the LRGVNWR. Wind turbines are present near the action area east of IH 69E/US 77.

The surface topography of the RDP study area is generally flat, with elevations ranging from 95 feet above mean sea level (AMSL) in the footprint of the proposed detention pond to 5 feet AMSL near the end project terminus, which represents an average slope of approximately 0.04%. Elevations near the begin project terminus are approximately 80-85 feet AMSL (see **Appendix A – Exhibits,** Exhibit 3 – Topographic Map, 2022).

The RDP traverses two ecoregions, as defined by the TPWD: 1) the South Texas Plains and 2) the Gulf Prairies and Marshes. Most of the RDP study area lies within the South Texas Plains ecoregion, which consists of a nearly level to rolling plain that is slightly to moderately dissected with watercourses (Hatch et al. 1990). According to The Vegetation Types of Texas, Including Cropland (McMahan et al. 1984), the three primary vegetation types within the RDP study area include: 1) Crops, within most of Hidalgo and Willacy County, 2) Mesquite-Granjeno Parks, in a relatively small area of Hidalgo County, and 3) Other Native and/or Introduced Grasses.

Vegetation communities observed within the action area consist mainly of row crops and cattle pasture. Other observed vegetation communities include unmaintained grassland and scrub-shrub areas, residential lawns, and thornscrub. Thornscrub is defined in this BA as scrub-shrub habitat in which the canopy cover consists of woody species with thorns, including honey mesquite (*Prosopis glandulosa*) and huisache (*Vachellia farnesiana*).

Potential waters of the US, including wetlands, were identified via desk-based research using the USFWS National Wetlands Inventory (NWI). The NWI classifies potential wetland areas and deepwater habitats based on trained analysis of aerial imagery conducted by the USFWS as well as various partner organizations. The NWI classifies the existing Raymondville Drain and other stormwater drainage ditches in the region as excavated riverine habitats; potential freshwater wetlands are mapped in the NWI at various locations within and near the action area. Field investigations for potential waters of the US, including wetlands, within the action area would be conducted at a later date prior to construction.

Several stormwater drainage culverts outfall into the Raymondville Drain; most culverts originate from nearby roadside drainage ditches. Properties adjacent to the Raymondville Drain include ranches, agricultural fields (i.e., row crops), undeveloped land, Delta Lake, the LRGVNWR, residential areas, and wind turbine farms. Improved (paved) roadways or maintained/unimproved (unpaved, dirt) roadways are located within the properties adjacent to the Raymondville Drain. Existing unimproved roadways (maintained and non-maintained dirt/native material roads) are located within the action area.

2.2 PROPOSED ACTION

The proposed action consists of the construction of approximately 13.8 miles of new diversion drains in Hidalgo County, approximately 43 miles of drain improvements in Hidalgo and Willacy Counties, a 272-acre detention pond near the South Texas International Airport in Edinburg, and five control structures located at the junction of the Raymondville Drain with other existing drains and at the detention pond. Approximately 50 miles of the proposed RDP would be constructed within a ROW from 350 to 450 feet wide consisting of 10-foot vegetative buffers and 20-foot access roads on both sides, in channel maintenance benches, and a pilot channel 60 feet wide and 5 feet deep. West of the El Sauz Ranch property, a 100-foot-wide spoil bank would be sited on the right bank of the drain in specific locations; the spoil bank would be comprised of soil excavated during the expansion of the existing Raymondville Drain or the construction of the new drain channel (see **Appendix C – Supporting Documentation,** Raymondville Drain Project Proposed Typical Section). The spoil bank would be sited and constructed to avoid environmentally sensitive areas (e.g., wetlands); the gaps in the spoil bank would allow overland sheet flow to flow into the drain. The remaining 6.8 miles of the proposed RDP, from the western boundary of the El Sauz Ranch property to the eastern project terminus, would be constructed within a 350-foot-wide ROW as the spoil bank would not be constructed in this location. The proposed 272-acre detention pond would be constructed approximately 1.3 miles east of IH 69C/US 281, east of and adjacent to the Lopez State Jail-Segovia Unit. An outlet structure would allow water to flow from the basin of the detention pond into the diversion channel (see **Appendix C – Supporting Documentation,** Raymondville Drain Project Detention Pond Site Grading Layout). The RDP ROW would be located within, but is distinct from, the action area.

The proposed diversion would transfer water flows from the North Main Drain to a new extension of the Raymondville Drain at a new control structure near Edinburg Lake. The transferred North Main Drain flow comes from areas generally north and west of Edinburg. Reducing flow upstream in the North Main Drain would improve regional stormwater capacity, significantly reducing damages in the vicinity of the proposed action, and would additionally reduce flooding downstream in the watershed. The TSP would provide relief in Hidalgo and Willacy Counties simultaneously by providing increased in-line storage throughout the system, increased flow through capacity in the Raymondville Drain, and controlled flow from Hidalgo County to Willacy County. The TSP would significantly reduce flood damages and flood risk in the region, benefiting more than 38,000 residential and commercial structures.

The proposed action would construct a diversion drain to connect the existing North Main Drain and the Raymondville Drain, improvements along the Raymondville Drain, a detention pond located in Hidalgo County, and five control structures to regulate the flow of water. The diversion channel would start approximately 0.4 mile east of Edinburg Lake with a control structure along the North Main Drain and proceed generally north before

crossing I-69C/US 281 approximately 0.7 miles north of El Cibolo Road. From there, the drain would proceed generally eastward toward Brushline Road, with the proposed detention pond and control structure located in-line with the pilot channel. From Brushline Road, the drain would proceed north to a point 0.4 mile north of FM 490 where it would turn east and connect to the existing Raymondville Drain (locally known as West Hargill Drain Lateral 5); a second control structure is proposed south of 12th Street before FM 490 to divert water toward Delta Lake for the irrigation purposes (Delta Lake Irrigation District). The proposed new drain, from the start to this point, would be approximately 13.8 miles long, with an approximately 270-acre detention pond.

The proposed action continues with drain widening to match the proposed diversion drain's cross section and continues from the start of the Raymondville Drain (West Hargill Lateral 5) approximately 2.7 miles north; and then proceeds west along the Raymondville Drain (West Hargill Drain) approximately 7.8 miles, and then flows into the Raymondville Drain (North Hargill Drain), with a control structure located at the Hidalgo and Willacy County line. The drain improvements continue along the existing Raymondville Drain in a northeasterly, then east, direction past I-69E/US 77 approximately 30.2 miles to an unnamed private bridge, approximately 2.0 miles north of where the Raymondville Drain flows underneath SH 186. An existing control structure between the drain and its connection to La Sal Vieja, north of SH 186, would be replaced due to the channel widening. The length of the channel improvements is 43.0 miles, and the overall length of the proposed action is 56.8 miles. The construction of the RDP is anticipated to be conducted over a period of 10 years following final environmental clearance and approvals. Construction would be completed in 11 segments (7 segments in Hidalgo County and 4 segments in Willacy County); upstream segments would only be constructed and operated once downstream segments are capable of conveying the resulting flow.

SECTION 3: SPECIES CONSIDERED

The RDP has the potential to affect the following Federally-listed species protected by the ESA that may occur in the general area of the proposed action (see **Appendix C – Supporting Documentation,** USFWS, Texas Coastal Ecological Services Field Office, List of Threatened and Endangered Species):

- Eastern Black Rail (*Laterallus jamaicensis jamaicensis*)
- Ocelot (*Leopardus (=Felis) pardalis*)
- Gulf Coast Jaguarundi (*Herpailurus (=Felis) yagouaroundi cacomitli*)
- Cactus Ferruginous Pygmy-owl (*Glaucidium brasilianum cactorum*)
- Northern Aplomado Falcon (*Falco femoralis septentrionalis*)
- Piping Plover (*Charadrius melodus*)
- Red Knot (*Calidris canutus rufa*)
- Star Cactus (*Astrophytum asterias*)
- Texas Ayenia (*Ayenia limitaris*)
- Walker's Manioc (*Manihot walkerae*)

In addition to the species listed above, the Tricolored Bat (*Perimyotis subflavus*) was assessed for potential effects that may occur as a result of the proposed action following comments from USFWS personnel in the coordination meeting on May 17, 2023. The USFWS proposed to list the Tricolored Bat as endangered under the ESA on September 14, 2022.

The legal protections for these species are provided by the ESA, as well as by the Texas Administrative Code under 31 TAC 65.176. Species that may occur in the action area which are state-listed but not Federally listed are outside the scope of this BA; impacts to state-listed species will be assessed in the Environmental Impact Statement for the RDP (see **Appendix C – Supporting Documentation,** TPWD Annotated County List of Rare Species, Hidalgo County and Willacy County).

3.1 EASTERN BLACK RAIL

The Eastern Black Rail (*Laterallus jamaicensis jamaicensis*) is a small marsh bird. Adults of this species range in size from 2-3 inches long and have a wingspan of 4-5 inches; males and females are similar in size. Eastern Black Rails have black bills, red eyes, and feathers that range from pale gray to very dark gray or black. Males have darker feathers than females. Juveniles have an appearance similar to adults, but with duller plumage and eyes that are darker in color (USFWS, 2018).

The current range of the Eastern Black Rail includes coastal areas of Texas, Louisiana, Florida, Georgia, South Carolina, and North Carolina; in these areas, the Eastern Black Rail can be found year-round. In the spring and summer, the Eastern Black Rail can also be found in coastal areas of Maryland and southern New Jersey. Occurrences of the Eastern Black Rail in Texas have been reported primarily in counties to the north of the action area. South of the action area, in 2019 per USFWS communications, six Eastern Black Rails were documented across four different survey periods in Cameron County largely outside the managed habitats for the Laguna Atascosa NWR (USFWS Personal Communication, Woodrow, 2021). There are no known documented occurrences of this species in either Hidalgo or Willacy County based on a review of data available from the USFWS Environmental Conservation Online System.

The Eastern Black Rail is Federally-listed as threatened by the USFWS and is state-listed as threatened by the TPWD. The primary reason for the Eastern Black Rail's listing status consists of the fragmentation and conversion of the species' native habitat to other land uses. Additional threats to the species generally include the alteration

of native plant communities from grasslands to woodlands, altered hydrologic regimes, sea level rise, and oil and chemical spills.

3.1.1 HABITAT

The Eastern Black Rail generally requires large, wet meadows with an open canopy and abundant herbaceous vegetation (i.e., marsh vegetation). Soils must be moist or flooded to a shallow depth (less than 3 inches); the water in the marsh vegetation may consist of salt, brackish or freshwater and may be tidally or non-tidally influenced. Marshes occupied by the Eastern Black Rail are primarily composed of fine-stemmed rushes, grasses, and sedges with high stem densities. Marshes of the Atlantic Coast vary from those of the Gulf Coast in tidal regime and in plant community structure; consequently, the habitat occupied by the Eastern Black Rail varies by location.

In coastal Texas, the Eastern Black Rail occupies salt marshes in high elevation zones and impounded intermediate marshes. The Eastern Black Rail shows a strong preference for gulf cordgrass (*Spartina spartinae*) and salt meadow cordgrass (*Spartina patens*) for reasons that are currently unknown (Tolliver, 2017). The Eastern Black Rail occasionally occurs in meadows dominated by sedges (*Juncus* spp.) and bulrushes (*Schoenoplectus* spp.) when *Spartina* species are not present. Vegetation in marshes occupied by Eastern Black Rail is generally no more than 3.28 feet (one meter) in height. The Eastern Black Rail may tolerate limited amounts of cover by shrubs, but the presence of too much woody cover creates an area unsuitable as habitat (USFWS, 2018). The exact amount of absolute cover which makes an area unsuitable to the Eastern Black Rail is not currently known.

In addition to marsh vegetation, the Eastern Black Rail requires nearby areas of dense herbaceous cover (elevated marsh areas) in which the birds may take refuge during high water or storm events. This species does not flush from cover often; when flushing, this species flies for only a short distance before returning to cover. When possible, the birds prefer to travel under cover using ground trails that have been created by the movements of rodents or other animals through and underneath grasses (USFWS, 2018).

3.1.2 ENVIRONMENTAL BASELINE CONDITIONS

Information regarding the current population and habitat conditions of the Eastern Black Rail was obtained from the *Species Status Assessment Report for the Eastern Black Rail, Version 1.2*, published by the USFWS in July 2018.

As the Eastern Black Rail prefers to remain in cover when possible, this species tends to be elusive and is rarely seen. The Eastern Black Rail vocalization patterns vary by region but are generally infrequent and dependent on ambient noise and weather conditions, making this species difficult to detect by sound (Tolliver, 2017). Due to the elusive nature of the rail and the difficulty in detecting the presence of the rail in the species' natural habitat, population trends and estimates for the Eastern Black Rail are uncertain. In the 2018 *Species Status Assessment Report*, researchers with the USFWS concluded that the amount of habitat available to this species is declining. This conclusion is based on available reports regarding marsh habitats in the Eastern Black Rail's range, which show significant habitat losses since the mid-1950s.

According to the 2018 *Species Status Assessment Report*, the loss (degradation and fragmentation) of habitat is the primary threat to the Eastern Black Rail. Historically, this degradation and fragmentation of habitat occurred as a result of the conversion of marshes and other wetlands to agricultural land and urban areas. In recent years, the USFWS concluded that most of the current degradation and fragmentation of the Eastern Black Rail's habitat is the result of sea level rise in coastal areas. Excessive grazing on grasslands, as well as poorly timed or planned prescribed fires, also contribute to habitat degradation by reducing the amount of available herbaceous cover on which the rail depends.

Additional threats to the Eastern Black Rail include the alteration of native plant communities, the alteration of natural hydrologic regimes, and oil and chemical spills. The alteration of plant communities mainly occurs in the form of the spread of woody species into areas that have historically been dominated by herbaceous plants; the

2018 *Species Status Assessment Report* attributes this spread to fire suppression activities. Natural hydrologic regimes have been altered by the construction of infrastructure such as levees, dams, and drainage channels; additionally, the depletion of groundwater resources for irrigation and other human activities has led to withdrawals of groundwater and surface waters in coastal and inland areas that makes conditions too dry for marshes and other wetlands to form. Data on the direct effects of oil and chemical spills on the Eastern Black Rail is scarce. Although the release of oil and other hazardous materials into the natural environment has decreased in amount and frequency in recent years, such events continue to pose a threat to marsh birds. The Eastern Black Rail feeds on the water surface, which makes this species susceptible to contaminants such as those associated with the 2010 Deepwater Horizon oil spill (McMaugh, 2019).

3.2 OCELOT

The Ocelot (*Leopardus (=Felis) pardalis*) is a medium-sized wild cat with round ears and a long tail. The fur color of the Ocelot ranges from white and pale yellow to gray and reddish gray. A defining characteristic of the Ocelot's appearance is a pattern of elongated ringed spots which run obliquely along the sides of the Ocelot's body. The Ocelot is a predator and carnivore whose prey includes rabbits, rodents, and birds.

The Ocelot is an elusive and nocturnal animal which spends the day resting in thornscrub that is so thick that humans cannot easily move through the habitat; consequently, population estimates for this species are difficult to determine. Eyewitness reports of Ocelot sightings are not uncommon, but the Ocelot physically resembles the bobcat (*Lynx rufus*) which has a similar fur coat and patterns of dark-ringed spots (see **Appendix C – Supporting Documentation**, USFWS Identification Guide for Ocelots and Bobcats).

Historically, the Ocelot could be found throughout the southern United States from Arizona to Arkansas. Currently, the species is only found within the southernmost areas of Texas. Internationally, the Ocelot is distributed from Mexico to South America, occurring as far south as Argentina.

The Ocelot is Federally listed and State listed as endangered by USFWS and TPWD, respectively. The primary reason for this listing status is the loss of habitat. The USFWS estimates that 95% of the native thornscrub vegetation which the Ocelot uses as habitat has been altered or replaced by agricultural land and urban development (USFWS, 2016). Other reasons for the Ocelot's listing and population decline include death by vehicle strikes and low genetic diversity, which are driven and exacerbated by habitat loss.

Only two breeding populations of Ocelots are known to exist within the United States. One known breeding population, consisting of less than 100 individuals located within the East Foundation and El Sauz Ranch properties in Willacy County, is managed by the non-profit East Foundation. The East Foundation and El Sauz Ranch properties encompass over 35,000 acres in Willacy County and Kennedy County, and is the site of several ongoing ecological research projects including investigations of environmental factors that improve Ocelot conservation. Projects at El Sauz Ranch are conducted by researchers from the East Foundation as well as partner organizations including TPWD and the Caesar Kleberg Wildlife Research Institute. A segment of the proposed action flows through the El Sauz Ranch and East Foundation properties (see **Appendix A – Exhibits**, Exhibit 5 – Habitat Areas Map).

The only other known breeding population of Ocelots is located in the Laguna Atascosa NWR in Cameron County, approximately 17 miles south of the RDP ROW (see **Appendix A – Exhibits**, Exhibit 2 – Site Location Map).

3.2.1 HABITAT

The Ocelot is considered a habitat specialist species, meaning that the Ocelot only uses habitat that meets specific criteria and does not acclimate well to new or changing environments. In Texas, the Ocelot occurs in dense thornscrub, which consists of thorny shrubs and small trees that cover at least 75% of the ground surface. Studies by TPWD indicate that optimal Ocelot habitat consists of thornscrub with canopy covering at least 95% of the

ground surface; thornscrub vegetation with less than 95% canopy cover is considered suboptimal and thornscrub vegetation with less than 75% canopy cover is considered inadequate for the Ocelot (TPWD, 2021). Ocelots have been documented in open grasslands and floodplains, but studies have linked the highest indices of Ocelot occurrence to areas of dense canopy cover (Shindle and Tewes 1998, Horne et al. 2009).

Thornscrub vegetation includes a variety of woody plant species including granjeno (*Celtis pallida*), catclaw acacia (*Senegalia greggii*), and honey mesquite (*Prosopis glandulosa*). Ocelots in south Texas have been observed using corridors of woody vegetation 16 to 328 feet in width to disperse from one area of optimal habitat to another (USFWS, 2016). Such travel corridors may be located along rivers, relict oxbows of rivers, drainage ditches, shorelines, fencelines and roadsides. The more densely vegetated a travel corridor is with thornscrub, the more frequently that travel corridor is likely to be used by Ocelots. Ocelots may, however, utilize suboptimal habitat for dispersal (movement of an individual from one habitat site to another). During dispersal, Ocelots have used small, isolated patches of thornscrub vegetation as temporary homes. Ocelots typically return to the original home habitat when the Ocelot is large or experienced enough to displace a resident adult, or when the home habitat experiences a vacancy that allows the Ocelot to claim a territory in the home habitat.

3.2.2 ENVIRONMENTAL BASELINE CONDITIONS

In south Texas, the Ocelot is primarily threatened by habitat loss, vehicle strikes, and low genetic diversity. According to the *Recovery Plan for the Ocelot*, the greatest of these threats is habitat loss. Less than 5% of the dense thornscrub habitat which originally supported the Ocelot remains in what is now the LRGV. Most of the thornscrub habitat type along the proposed action area was converted to agricultural land and urban development long ago. Brush-clearing for various land or ranch management strategies also contributes to habitat loss. The loss and fragmentation of thornscrub habitat drives the two other major threats to the species' survival (vehicle strikes and reduced genetic diversity). Additional threats to the Ocelot may include being preyed upon by other Ocelots, domestic dogs, or coyotes. Competition with bobcats or coyotes for habitat, loss of prey to pesticides, and climate change (increases in the frequency of storms, droughts, etc.) are also threats to the Ocelot.

Information regarding the current population and habitat conditions of the Ocelot in south Texas was obtained from the *Recovery Plan for the Ocelot, First Revision*, published by the USFWS in July 2016. Additional information regarding Ocelots in Willacy County was provided by a wildlife biologist employed by the East Foundation (associated with El Sauz Ranch). According to the East Foundation wildlife biologists, no known Ocelots from one of the two known populations in south Texas (El Sauz Ranch and Laguna Atascosa NWR) have traveled or dispersed to the other known population. While the East Foundation maintains confidential telemetry data on tagged ocelots, communications have been encouraged between the East Foundation and the USFWS to share information on travel/dispersion among the two known Ocelot populations. Lacking documented Ocelot telemetry/tracking data, this information cannot be relied upon or utilized in this BA for the confirmation of dispersal patterns or for decision-making purposes related to the species. Whether the two Ocelot populations intermingle or not, the lack of genetic diversity among the south Texas Ocelot populations is a limiting factor in the development of healthy populations in future generations.

The occurrence of species that are state-listed as threatened or endangered are recorded by TPWD using the Texas Natural Diversity Database (NDD). The NDD records the locations in which "elements" including species, native plant communities and animal aggregations (e.g., waterbird rookeries) are or were present in a particular geographic area (see **Appendix A – Exhibits**, Exhibit 6 – TPWD Natural Diversity Database Map). The NDD data provided documentation of historical occurrences of the species within the geographic area of the proposed action and was reviewed as an additional source of information in the preparation of this BA.

In addition to the NDD data, the potential presence of Ocelots in the geographic area of the proposed action included the review of available information on vehicle strikes. The Port Isabel Press (online newspaper article dated July 3, 2015) reported that on June 8, 2015, a mature female Ocelot was killed by a vehicle on SH 186

between Raymondville and Port Mansfield. This particular Ocelot had been studied since 2011 through the use of remote camera trapping by members of the Caesar Kleberg Wildlife Research Institute on El Sauz Ranch in Willacy County. The Port Isabel Press article also stated that between 1989 and 2004 at least five additional Ocelots were killed by vehicle collisions on SH 186 between Raymondville and Port Mansfield. The news article reflects the continued presence of the Ocelot near the action area since the occurrences recorded in the NDD in the 1980s. The most recent ocelot (male) roadkill was recorded on SH 186 on August 19, 2025. The USFWS publishes resources and online information for individuals that observe dead Ocelots along roadsides resulting from vehicle strikes (see **Appendix C – Supporting Documentation**, USFWS Identification Guide for Ocelots and Bobcats).

3.3 TRICOLORED BAT

The Tricolored Bat is a small species of insectivorous bat named for the coloration of its fur. Each hair of the Tricolored Bat's fur appears dark at the base, light in the middle, and dark again at the tip. Tricolored Bats most often appear in a pale yellow to yellow-orange color, but may also have gray, brown, or black coloration. Male and female Tricolored Bats have a similar appearance; however, females generally have more body mass. The Tricolored Bat is also distinguished by having a spur of cartilage on the inner side of each ankle.

The range of the Tricolored Bat encompasses 39 US states, four Canadian provinces, and several Mexican states, primarily in the eastern half of North America. The species expanded its range in recent decades to include the states of Colorado, New Mexico, South Dakota, Texas, and Wyoming. This expansion is most often attributed to the recent appearance of suitable nesting sites in these states, including trees adjacent to rivers, abandoned mines, and other artificial structures.

The USFWS has proposed the Tricolored Bat to be Federally listed as endangered under the ESA; a formal proposal was published in the Federal Register on September 14, 2022 (87 FR 56381-56393). The TPWD currently lists the Tricolored Bat as a Species of Greatest Conservation Need; this status confers no legal protection, but indicates that TPWD considers the species to be in need of attention to recover its population and prevent a need for it to be listed as threatened or endangered.

3.3.1 HABITAT

The Tricolored Bat is a habitat generalist which dwells in trees, caves, and bridges. During the spring, summer, and fall, the Tricolored Bat roosts in live or recently dead deciduous hardwood trees, as well as bridges. A study by Newman et al (2021) observed Tricolored Bats using bridges as roosts individually and in small clusters of 2-3 bats. During the winter, the species hibernates in caves and mines. In areas where caves and mines are not available, the Tricolored Bat has been observed hibernating in roadside culverts, tree cavities, and abandoned water wells. Tricolored Bats which hibernate in roadside culverts remain in torpor for shorter periods than those which hibernate in caves or mines, and have been observed to move within and between culverts. Individual Tricolored Bats, especially females, often return to the same site to hibernate year after year.

A population of Tricolored Bats requires a matrix of interconnected habitat that have the resources necessary for migration in the spring, colony formation in the summer, swarming and mating in the fall, and hibernation in the winter. The longest observed migration distance between winter hibernation sites and summer roosting sites is approximately 151 miles. The mean foraging area of an adult male Tricolored Bat encompasses approximately 5,800 acres, while the mean foraging area for an individual female encompasses approximately 899 acres. Tricolored Bats are more frequently observed in areas of continuous forest coverage and tree corridors; therefore, large areas of urban development are expected to adversely affect the connectivity of habitat patches.

3.3.2 ENVIRONMENTAL BASELINE CONDITIONS

Information regarding the current population and habitat conditions of the Eastern Black Rail was obtained from the *Species Status Assessment Report for the Tricolored Bat, Version 1.1*, published by the USFWS in December 2021.

The 2021 *Species Status Assessment Report* lists four main threats to the survival of the Tricolored Bat: White-nose syndrome, wind turbine-related mortality, climate change, and habitat loss. White-nose syndrome is a disease caused by the fungus *Pseudogymnoascus destructans* which afflicts 12 species of bats across North America as of July 2025. Bats infected with white-nose syndrome arouse during hibernation more frequently and for longer durations, which results in the premature depletion of body fat stores which bats need to survive the winter. The depletion of fat stores results in some infected bats starving to death during the winter and forces others to come out of hibernation early where they encounter adverse conditions and limited availability of prey insects. White-nose syndrome has been detected in Texas, primarily in the central areas of the state.

Many species of bats, including the Tricolored Bat, have experienced significant mortality from being struck by wind turbines. The rate of wind turbine-related mortality varies between seasons, facilities, and species. Mortality rates specific to the Tricolored Bat have not yet been documented; however, the 2021 *Species Status Assessment Report* notes that there is a significant spatial overlap between occurrences of wind turbines and Tricolored Bats. Wind turbines are present within and adjacent to the action area in areas of farmland north and northwest San Perlita.

Based on available data, the 2021 *Species Status Assessment* identifies white-nose syndrome as the greatest threat to the Tricolored Bat, followed by wind turbine-related mortality. Climate change and habitat loss represent threats that are pervasive throughout the Tricolored Bat's range, but neither is currently believed to be a direct cause of the largest declines in the species' population.

The current range of the Tricolored Bat, as mapped by the USFWS and TPWD, includes Hidalgo County, Willacy County, and adjacent areas. Information on the overall health and stability of the Tricolored Bat population specifically in Hidalgo County and Willacy County is sparse. As this species is not currently listed as threatened or endangered, element occurrences (EOs)of this species are not recorded in the NDD.

3.4 OTHER FEDERALLY LISTED SPECIES

The USFWS Information for Planning and Consultation (IPaC) online tool was used as a resource for this BA. The IPaC data was used to generate a list of threatened and endangered species, as well as any designated areas of critical habitat, which may be located near the RDP action area (see **Appendix C – Supporting Documentation**, USFWS Texas Coastal Ecological Services Field Office, List of Threatened and Endangered Species). As construction activities would occur only within shallow areas of water that are more than 9 miles upstream of the Laguna Madre, the proposed action would not affect any Federally listed aquatic species such as the West Indian Manatee, Green Sea Turtle, Hawksbill Sea Turtle, Kemp's Ridley Sea Turtle, Leatherback Sea Turtle or Loggerhead Sea Turtle. The IPaC data did not identify any designated areas of critical habitat within the action area. Terrestrial species which are included on the IPaC generated list are described below.

The Gulf Coast Jaguarundi (*Herpailurus (=Felis) yagouaroundi cacomitli*) is a wild cat, slightly larger than a domestic cat, which resembles a large weasel or otter. The Gulf Coast Jaguarundi is Federally listed as endangered primarily due to the destruction, degradation, and fragmentation of habitat. Within the US, the Gulf Coast Jaguarundi is only known to occur in south Texas. According to the *Gulf Coast Jaguarundi Recovery Plan, First Revision*, habitat for this species consists of dense, thorny shrublands and woodlands; this species also sometimes inhabits bunchgrass pastures adjacent to such shrublands and woodlands. No areas of critical habitat for this species have been designated. Due to the similarity between the Jaguarundi and Ocelot habitat requirements, it is anticipated that the proposed action would have similar effects on both species.

The Cactus Ferruginous Pygmy-owl (*Glaucidium brasilianum cactorum*) is a small bird of prey and a subspecies of the Ferruginous Pygmy-owl (*G. brasilianum*). The Ferruginous Pygmy-owl was Federally listed as endangered in 1997, then delisted due to recovery in 2006. The subspecies *cactorum* is Federally listed as threatened primarily due to habitat loss/fragmentation and the degradation of vegetation quality in remaining habitat. According to the *Species Status Assessment Report for Cactus Ferruginous Pygmy-owl* (*Glaucidium brasilianum cactorum*), habitat for this species generally consists of semi-open areas of thornscrub and woodlands; in Texas, this species is primarily found in live oak-mesquite forests, mesquite and ebony brush, and riparian areas. It exhibits a preference for areas that are dominated by trees that are at least 10 inches in diameter at breast height and that have at least 50% areal coverage by understory vegetation (i.e., shrubs and saplings). This species is a secondary cavity nester which nests in woodpecker holes as well as natural cavities in giant cacti, trees, and sand banks; however, cavities in Live Oak (*Quercus virginiana*) trees are strongly preferred as nesting sites. No critical habitat has been designated for the Cactus Ferruginous Pygmy-owl in Texas.

The Northern Aplomado Falcon (*Falco femoralis septentrionalis*) is a bird of prey which historically occurred in southern parts of Arizona, New Mexico, and Texas, but which is now found only in the southernmost counties of Texas and parts of eastern Mexico. This species is Federally listed as endangered primarily due to habitat loss and poisoning by organochlorine pesticides. Habitat for the Northern Aplomado Falcon is variable throughout its range but features open terrain with relatively low ground cover and scattered trees to provide nesting sites.

The Piping Plover (*Charadrius melodus*) is a small, migratory shorebird with a short, stout bill, pale underparts, and orange legs. This species is Federally listed as threatened within Texas; in some states this species is Federally listed as endangered. Coastal Texas is a part of the Piping Plover's winter range. According to the *Piping Plover (*Charadrius melodus*) Atlantic Coast Population Revised Recovery Plan*, habitat for this species in its winter range generally consists of sparsely vegetated sandy areas including beaches, mud flats, algal flats, salt marshes, and washout areas, as well as the shorelines of coastal waters and salt marshes. Final critical habitat has been designated for this species. No critical habitat is present within the action area; the areas of Piping Plover critical habitat that are closest to the action area are located approximately 4.3 miles east of the eastern project terminus, adjacent to the Laguna Madre.

The Red Knot (*Calidris canutus rufa*) is a medium-sized migratory shorebird distinguished by red plumage on its face, breast, and upper belly. This species is Federally listed as threatened. According to the *Species Status Assessment Report for the Rufa Red Knot*, Red Knot habitat in Texas is primarily located in coastal areas and includes muddy or sandy coastal areas near bays and estuaries, tidal flats, and unimproved tidal inlets. This species additionally requires its wintering habitat to consist of open areas of sparse vegetation. Critical habitat for the Red Knot has been proposed by the USFWS, but has not yet been finalized; no areas of proposed critical habitat are located within or near the action area.

The Star Cactus (*Astrophytum asterias*) is distinguished by having a small size and a spineless, disk- or dome-shaped body. This species is Federally listed as endangered. Within the US, the Star Cactus is only known to occur in Hidalgo and Starr Counties. According to the *Recovery Plan for the Star Cactus*, this species grows in grasslands and thornscrub of the Rio Grande, on gravelly clays or loams. The primary threats to this species are habitat destruction and modification, as well as collection.

Texas Ayenia or Tamaulipan Kidneypetal (*Ayenia limitaris*) is a spineless shrub that has soft, heart-shaped leaves and small (0.24 inch wide) yellow flowers. This species is Federally listed as endangered. Within the US, Texas Ayenia is only known to occur in Hidalgo, Willacy, and Cameron Counties. According to the *Recovery Plan for the Tamaulipan Kidneypetal (Texas Ayenia) (*Ayenia limitaris*)*, habitat for this species consists of shrublands and woodlands dominated by Texas ebony (*Ebenopsis ebano*) in the deltas of rivers draining into the Gulf of Mexico; however, individual Texas Ayenia plants can occur in association with other shrub species in a variety of alluvial soils. Texas Ayenia requires some sunlight in order to reproduce and is unlikely to occur in areas that exhibit dense

canopy cover. The recovery plan identifies the primary threats to this species as habitat loss, competition from invasive grass species, and trampling by foot traffic.

Walker's Manioc (*Manihot walkerae*) is a spindly, vine-like perennial forb with palmate, five-lobed leaves. This species is Federally listed as endangered. The USFWS has recorded this species as occurring in southern Hidalgo County, near the Rio Grande. According to the *Walker's Manioc* (Manihot walkerae) *Recovery Plan*, as amended in 2019, the primary threats to this species are competition with the invasive species Buffelgrass (*Pennisetum ciliare*), predation by feral hogs, and land development. The specific habitat requirements for Walker's Manioc are still under review; however, all known populations of this species occur near exposed outcrops of caliche or in shallow sandy soil located over limestone formations.

SECTION 4: METHODS

The field investigation of the RDP ROW was conducted from April 3-6, 2023, and from May 1-3, 2023. RRP environmental scientists visually observed all accessible areas of the RDP ROW, as well as adjacent land as permissible by right-of-entry (ROE) authorizations. Accessible areas of the RDP ROW were generally investigated from downstream to upstream. All plant and animal species conclusively identified by RRP environmental scientists and subcontractors were recorded (see **Appendix C – Supporting Documentation,** Vegetation and Wildlife Inventory for Raymondville Drain Project Action Area).

To evaluate the existing conditions of the action area, as well as the likely effects of the proposed action, the RDP action area was divided into 92 Habitat Areas (HAs) that were defined by the contiguous occurrence of similarly structured vegetation communities (see **Appendix D – Data Forms for Habitat Areas**). HAs that could be accessed or visually observed from adjacent areas, as determined by ROE authorizations, were photographed in the field and observations of the vegetation community's structure (species observed) and composition were recorded. Canopy coverage by each identified species within a HA was estimated as a percentage of the overall area, based on observations made in the field. Transitions from one HA to another were mapped using a handheld Trimble Global Positioning System (GPS) unit with sub-meter accuracy. HAs that were not accessible during field investigations were evaluated to the extent practicable using remote sensing methods, including aerial imagery and recorded observations of species considered for this BA. The boundaries of inaccessible HAs were identified by examining the most recent available aerial imagery. Following the field investigations, each HA was assigned to one of 12 categories based on the structure and composition of the vegetation community therein: Row Crops, Pasture, Rangeland, Thornscrub, Shrubland, Lawn, Washout, Herbaceous Wetland, Orchard, Drainageway, Woodland-grassland, and Barren. The ROWS of the existing Raymondville Drain, IH 69C/US 281, and IH 69E/US 77 were not included in any HA.

Table 1: Habitat Requirements for Considered Species

Species	Habitat Requirements
Eastern Black Rail	Marsh vegetation dominated by sedges, cordgrasses, or bulrushes.
Ocelot and Gulf Coast Jaguarundi	At least 75% canopy cover by thornscrub vegetation.
Tricolored Bat	Mature trees near water and bridge structures.
Cactus Ferruginous Pygmy-owl	Woodlands with large trees and moderately to densely vegetated understory.
Northern Aplomado Falcon	Grassland (including pasture, if grazing is light) with scattered trees.
Piping Plover and Red Knot	Sparsely vegetated sandy areas.
Star Cactus	Grasslands or thornscrub on gravelly clay or loamy soils.
Texas Ayenia	Shrublands and woodlands with light canopy cover and little/no cover by invasive grasses.
Walker's Manioc	Exposed outcrops of caliche, shallow sandy soils.

The observed conditions in each HA were compared to the habitat requirements of each species considered for this BA; special attention was paid to the habitat requirements of the Eastern Black Rail, the Ocelot, and the Tricolored Bat. Conditions considered during these comparisons included the vegetation observed, the physical structure of the vegetation community, the size and maturity of trees (if any), and the presence of potential environmental stressors (e.g., vehicle traffic and other human activities). A summary of the habitat requirements for each species is presented in the table below.

Specific characteristics that were examined for potential Eastern Black Rail habitat included the species composition of the vegetation in the area, the percentage of the area that was covered by open water, the presence or absence of visible water flow, and the presence or absence of nearby areas of higher ground which also contained the requisite vegetation.

Specific characteristics that were examined in areas of potential Ocelot and Gulf Coast Jaguarundi habitat included the species composition of the canopy, the proximity of other patches of thorn scrub vegetation, and adjacent land cover types. Specific characteristics that were examined in areas of potential Tricolored Bat habitat included the size of trees present and proximity to water bodies and woodland edges, both of which are features that improve the overall quality of Tricolored Bat foraging habitat.

SECTION 5: EFFECTS ANALYSIS

This section of the BA analyzes the direct and indirect effects of the proposed action, and any interrelated and interdependent actions, on the species considered (see Table 2). An interrelated action consists of an activity that is part of the proposed action and depends on the proposed action for justification. An interdependent action is an activity that has no independent utility apart from the action under consultation.

Table 2: Proposed Action Effects

Proposed Action	Interrelated Action	Interdependent Action
Expand the Raymondville Drain in length and width.	Widen existing the existing channel from west of Hargill to west of Port Mansfield.	Remove vegetation within a 350-foot-wide ROW.
	Construct new drainage channel from east of Edinburg Lake to west of Hargill.	

No designated areas of critical habitat for any Federally listed species are present within or adjacent to the RDP ROW; therefore, no designated areas of critical habitat would be affected by the proposed action. No critical habitat for any species considered in this BA was observed in the field. No species considered in this BA was directly observed during the field investigation; habitat assessment was the focus of the field investigation.

5.1 EASTERN BLACK RAIL

Multiple HAs were categorized as herbaceous wetlands; however, these HAs lack specific elements that the Eastern Black Rail relies upon for habitat. Almost all HAs classified as herbaceous wetlands were vegetated primarily by cattail (*Typha* spp.), shoregrass (*Monanthochloe littoralis*), and/or slender glasswort (*Salicornia europaea*), which the Eastern Black Rail is not known to use for habitat in coastal Texas. Additionally, the ground surface in these HAs was sparsely vegetated and frequently exhibited large areas of bare ground that the Eastern Black Rail avoids. The proposed action is not anticipated to impact any potential Eastern Black Rail habitat.

5.2 OCELOT

Eight HAs were observed to meet the habitat requirements of the Ocelot. These HAs consist of thornscrub vegetation that covers more than 75% of the ground surface and have no significant environmental stressors that would deter Ocelots from using the HAs as temporary refuges.

Most areas of dense thornscrub within and near the action area are small (8-23 acres), linear in shape, and surrounded by agricultural fields. Large, contiguous areas of dense thornscrub were only directly observed within the East Foundation property outside of the action area (the El Sauz Ranch property was not assessed during the field investigation). Published research indicates that Ocelots prefer areas of dense thornscrub that are larger than 23 acres (Jackson, Laack and Zimmerman, 2005) and which do not have linear shapes (Lombardi, *et al*, 2020). Consequently, seven of the eight HAs which meet the Ocelot's habitat requirements were determined to be suitable only as temporary refuges that Ocelots could use during dispersal.

While the Ocelot is unlikely to use the identified HAs for long-term habitation, the presence of thornscrub vegetation within and near the action area, in any density, may be suitable 1) for use as a dispersal corridor, 2) to move among disconnected areas of thornbush located in the same general area, and/or 3) to move from one optimal HA to another within the same general area (e.g., HA 88 in particular). Ocelots may disperse or move east

and west along the existing Raymondville Drain to connected or disconnected HAs or north and south through the Raymondville Drain to large contiguous undeveloped parcels of land on either side of the Raymondville Drain.

The NDD data obtained from TPWD as part of this BA records four EOs of the Ocelot near the RDP ROW (see **Appendix A – Exhibits**, Exhibit 6 – TPWD Natural Diversity Database). The first EO is located Hidalgo County, generally between Edinburg and Hargill. Land in the area of the third occurrence currently consists of residential areas, urban developments, and roadways; therefore, the first EO is not anticipated to indicate the current presence of the Ocelot in this area. Aerial photography of the area between Edinburg and Hargill is presented in **Appendix A – Exhibits**, Exhibit 4 – Aerial Photograph, 2022. The second EO is located in the vicinity of San Perlita, overlapping with the EO of three state-listed species. Land in the area of the second EO is developed or has been converted to agriculture; therefore, the second EO is not anticipated to indicate the current presence of the Ocelot. The third and fourth Ocelot EOs are located in Willacy County, generally south of HA 88, and coincide with the location of the El Sauz Ranch and East Foundation properties.

All other NDD EOs within and near the action represent species or vegetation communities that are State listed, but not Federally listed, and are therefore outside the scope of this BA (see **Appendix C – Supporting Documentation**, TPWD Annotated County List of Rare Species, Hidalgo County and Willacy County).

The staff of the East Foundation are frequently asked by members of the public to identify wildlife species from photographs. In the majority of cases in which members of the public claim to have photographed an Ocelot, the staff of the East Foundation have identified the photographed specimen as a bobcat which has a spotted fur pattern similar to that of the Ocelot.

Considering the frequency with which this error is made by members of the public, the landowners' reports of Ocelot sightings cannot be relied upon to determine the species' presence in the action area. Bobcats are considered habitat generalists that can survive in a variety of habitats, including those which have been heavily altered by human activity. Bobcats and Ocelots also share habitats.

Dispersal habits of the Ocelot are an ongoing area of research. The *Recovery Plan for the Ocelot* records instances in which Ocelots used narrow strips of thornscrub as dispersal corridors, especially when such strips are located along streams or drainage ditches (such as the Raymondville Drain). Overgrown fencelines (consisting of suboptimal habitat) may also be utilized by Ocelot as optimal habitat is not required for dispersal. Areas of thornscrub that are linear, isolated, sparsely vegetated or otherwise suboptimal may provide the necessary cover for Ocelot movement/dispersal to or from more optimal habitats.

The staff of the East Foundation utilize GPS telemetry as a tool to monitor the movements of individual Ocelots, which have been collared with a GPS device, on the El Sauz Ranch and East Foundation properties. While the East Foundation maintains confidential telemetry data on the collared/tagged ocelots, communications have been encouraged between the East Foundation and the USFWS to share information on dispersal/travel in the area. Lacking documented Ocelot telemetry/tracking data, this information cannot be relied upon or utilized in this BA for the confirmation of dispersal patterns or for decision-making purposes related to the species.

Thornscrub habitat is more abundant on the East Foundation and El Sauz Ranch properties than on land to the west of El Sauz Ranch; most land west of El Sauz Ranch consists of agricultural fields (see **Appendix A – Exhibits**, Exhibit 4 – Aerial Photograph, 2020, and Exhibit 5 – Habitat Areas Map). The areas of thornscrub habitat to the north and south of the Raymondville Drain in HA 88 are anticipated to provide the local Ocelot population with the optimal coverage for habitat, foraging, and dispersal activities. Individual Ocelots are not anticipated to be directly affected by the proposed action but may be indirectly impacted by the RDP through the removal of thornscrub vegetation.

The following information identifies the potential indirect impacts to HAs suitable for the Ocelot and the minimization and avoidance plans to be implemented within the action area:

HA 3

This HA consists of approximately 99.47 acres thornscrub vegetation located approximately 0.78 mile west of IH 69E/US 281. The density of canopy coverage varies considerably. Areas of additional, contiguous thornscrub vegetation extend beyond the action area. This area was inaccessible during the field investigation due to a lack of ROE authorization from the property owner; therefore, the interior portion of HA 3 was assessed remotely using aerial imagery from Google Earth. This HA is traversed by several vehicle trails and ROWs. Thornscrub vegetation occurs generally in rectangular patches separated by areas of open ground cover or light thornscrub canopy.

HA 3 encompasses a single property parcel; the form of land use associated with this property could not be determined from aerial imagery or publicly available property records. Overall, HA 3 represents low-quality habitat for the Ocelot and is anticipated to be suitable only as a temporary refuge.

HA 6

This HA consists of approximately 12.75 acres of dense thornscrub vegetation with an open understory located approximately 0.21 mile east of IH 69E/US 281. Honey Mesquite and Johnsongrass (*Sorghum halepense*) are the dominant species observed. Areas of additional, contiguous thornscrub vegetation extend beyond the action area to the south; another, non-contiguous area of thornscrub habitat is located nearby to the northeast, north of the action area. HA 6 is surrounded by areas of agricultural and residential land use. Overall, HA 6 represents low-quality habitat for the Ocelot and is anticipated to be suitable only as a temporary refuge.

HA 14

This HA consists of approximately 8.01 acres of dense thornscrub vegetation with an open understory located in the southeast corner of the proposed detention pond. Areas of additional thornscrub and shrubland vegetation are present to the south, separated from HA 14 by an unpaved private road, but do not exhibit canopy coverage that is sufficiently dense to be preferred by the Ocelot. Most of the land adjacent to this HA consists of row crops; a small herbaceous wetland (HA 13) is present nearby to the west. As this HA is entirely located within the footprint of the proposed detention pond, the proposed action would remove it entirely. Due to its small size, adjacency to agricultural fields, and isolation from additional thornscrub habitat, HA 14 represents very low-quality habitat for the Ocelot and is anticipated to be suitable only as a temporary refuge.

HA 38

This HA consists of approximately 14.53 acres of dense thornscrub vegetation located north of the existing Raymondville Drain, adjacent to County Road 10 on the west and east. Honey Mesquite, Prickly Pear (*Opuntia stricta*), and Sixweeks Threeawn (*Aristida adscensionis*) are the dominant species observed here. Multiple private vehicle trails traverse this HA, and its proximity to SH 186 (located approximately 0.42 mile to the north) produces significant traffic noise. Areas of additional, contiguous thornscrub vegetation extend beyond the action area to the north. Overall, HA 38 represents moderate-quality habitat for the Ocelot that would be suitable as a temporary refuge.

HA 44

This HA consists of approximately 2.98 acres of dense thornscrub vegetation with an open understory located north of the existing Raymondville Drain, approximately 0.11 mile west of County Road 25. Marina Road, an unpaved rural roadway, traverses this HA in a generally west-east orientation. Additional thornscrub vegetation extends northward beyond the action area; however, no other areas of thornscrub vegetation are located nearby, making this HA relatively isolated. Overall, HA 44 represents moderate-quality habitat for the Ocelot that would be suitable as a temporary refuge. The proposed action would expand the RDP ROW south of Marina Road, thereby avoiding impacts to HA 44.

HA 68

This HA consists of approximately 1.77 acres of dense thornscrub vegetation located north of the existing Raymondville Drain, approximately 0.25 mile east of County Road 141. This area was inaccessible during the field investigation due to a lack of ROE authorization from the property owner; therefore, HA 67 was assessed remotely using aerial imagery from Google Earth. Additional thornscrub vegetation extends northward beyond the action area. Together, HA 68 and the adjacent thornscrub vegetation comprise a long and linear patch of habitat flanked by pasture to the west and row crops to the east; published research indicates that Ocelots prefer areas of dense thornscrub that are larger than 23 acres (Jackson, Laack and Zimmerman, 2005) and which do not have linear shapes (Lombardi, *et al*, 2020). HA 68 represents low-quality habitat for the Ocelot and is anticipated to be suitable only as a temporary refuge.

HA 76

This HA consists of approximately 3.34 acres of dense thornscrub vegetation located north of the existing Raymondville Drain, approximately 0.11 mile west of County Road 25. Brushline Road traverses the southern edge of this HA in a west-east orientation. Additional thornscrub vegetation extends northward beyond the action area; the density of canopy cover in this additional vegetation is highly variable. Together, HA 76 and the adjacent thornscrub vegetation comprise a long and linear patch of habitat flanked by row crops to the west, south, and east. HA 76 represents low-quality habitat for the Ocelot and is anticipated to be suitable only as a temporary refuge. The proposed action would expand the RDP ROW south of Brushline Road, thereby avoiding impacts to HA 76.

HA 88 (El Sauz Ranch, East Foundation Property)

This HA consists of approximately 294.48 acres of thornscrub vegetation on both sides of the existing Raymondville Drain, located on two large property parcels immediately west of the eastern project terminus. The properties are aligned east and west; the eastern property consists of a private hunting ranch and the western property consists of an ecological research ranch owned by the nonprofit East Foundation. The private hunting ranch was inaccessible during the field investigation due to a lack of ROE authorization from the property owner and was assessed remotely.

A breeding population of Ocelots is maintained on the East Foundation property. Although pockets of wetland and grassland habitat were observed in HA 88, most of this HA consists of dense thornscrub vegetation and additional areas of contiguous dense thornscrub extend beyond the action area to the north and south. Canopy cover by thornscrub in HA 88 was generally observed to be less than 95% in the areas in which it was observed, and the understory was open enough in most areas for a human to walk through. HA 88 therefore represents fair quality habitat for the Ocelot and is anticipated to be used frequently, although not continuously inhabited.

According to the Willacy County appraisal district information and the East Foundation website, the East Foundation owns approximately 27,000 acres of land adjacent to the proposed action. Based on a review of available aerial photographs and Google Earth imagery, an estimated 9,781 acres of land on the East Foundation property consist of thornscrub habitat that may be used by the Ocelot. Approximately 148 acres of woodland-grassland and thornscrub habitat would be cleared in the RDP ROW in this HA. The proposed action would result in impacts to approximately 1.5% of the thornscrub habitat (out of 9,781 acres total) located within the East Foundation property.

The construction activities proposed within the RDP ROW would begin at the easternmost extent of this HA (eastern project terminus). To avoid potential Ocelot habitat impacts within the corridor of the existing Raymondville Drain, no construction activities would occur within the two miles between the eastern project terminus and the SH 186 bridge. Existing habitat (including thornbush, wetlands, etc.) within HA 88 would be avoided to the extent practicable (see **Appendix A – Exhibits**, Exhibit 5 – Habitat Areas Map).

Overgrown thornscrub areas that are within the action area but outside of the RDP ROW would be avoided to the extent practicable. The proposed action would not affect vegetation outside of the RDP ROW; areas of dense thornscrub habitat occur outside the RDP ROW primarily within the East Foundation and El Sauz Ranch properties.

No areas of optimal habitat were observed in the field within the action area. Direct impacts to thornscrub vegetation would result from the RDP construction activities including the removal of woody thornscrub vegetation adjacent to the existing Raymondville Drain channel. Direct impacts to thornscrub HAs may result in indirect impacts to the Ocelot.

HAs 11, 16, 37, 45, 58, 62, 74, and 83 consist of thornscrub vegetation; however, each exhibited less than 75% canopy cover during field investigations, which is insufficient to serve as Ocelot habitat. HAs 53 and 69 also consist of thornscrub vegetation, but are very small (2.90 and 3.55 acres, respectively), isolated from additional thornscrub, and located adjacent to paved roadways in residential areas. These 10 HAs are not anticipated to be used by Ocelots, even as temporary refugia.

Indirect impacts to the Ocelot within the RDP ROW would include removal of suboptimal thornbush habitat (though dense in some areas) as well as noises and the movement of machinery/equipment during the RDP construction activities. Equipment noises and movements may discourage the presence of Ocelot in areas in which the equipment is operating. As construction activities would occur during the day and the Ocelot is a nocturnal animal, Ocelots are anticipated to remain within the areas of optimal (>95% coverage) thornscrub habitat during the day (away from construction areas). Dense HAs (75% coverage or more) are sparsely located within the action area (see **Appendix A – Exhibits**, Exhibit 5 – Habitat Areas Map).

Any effects to Ocelots resulting from the proposed action would be indirect and may consist of limiting the vegetation which would provide cover for the dispersal of Ocelots to and from HA 88. Direct effects to the Ocelot would be avoided or minimized through the avoidance and minimization of impacts to existing thornbush habitat within the action area outside of the RDP ROW and the implementation of conservation measures (see Section 5.4 – Conservation Measures).

The interrelated and/or interdependent actions (see Table 2) that may be undertaken by the RDP are not anticipated to affect areas outside of the proposed action area. As stated previously, the RDP ROW does not encompass the entire action area and may be realigned to avoid impacts to certain areas that are particularly sensitive. Therefore, the proposed action would not remove the potential dispersal corridors used by the Ocelot or have any effects on the Ocelot beyond those which are caused by the proposed action.

5.3 TRICOLORED BAT

Seven HAs were determined to meet the habitat requirements of the Tricolored Bat: HAs 16, 22, 26, 35, 43, 45, and 88. This determination was made based on the presence of mature trees in which bats may roost during the spring, summer, and fall. The removal of mature trees that are close to water would represent a permanent loss of roosting habitat for the Tricolored Bat. Additionally, 44 bridge structures in which bats may roost currently traverse the existing Raymondville Drain; each bridge over the existing Raymondville Drain would be replaced with a new, longer bridge that that would span the expanded Raymondville Drain channel. The replacement of bridges over the Raymondville Drain would represent a temporary loss of roosting habitat as new, longer bridge structures would be installed in the same locations following construction activities. Additionally, five new bridges and three new culverts are proposed to be installed along the new diversion drains in Hidalgo County. The new bridges would provide new roosting habitat for the Tricolored Bat, while the new culverts would provide new hibernation sites.

5.4 CUMULATIVE EFFECTS ANALYSIS

The USFWS defines *cumulative effects* as "those effects of future State or private activities, not involving Federal activities, that are reasonably certain to occur within the action area of the Federal action subject to consultation" (50 C.F.R. § 402.02). For the purposes of this BA, local government activities have also been considered in this analysis.

The action area subject to consideration consists of a 600-foot-wide ROW extending from a point near Edinburg Lake in Hidalgo County to a point approximately 2 miles upstream of SH 186 in Willacy County. Post-construction activities that are reasonably certain to occur on a routine basis consist of periodic maintenance activities (i.e., mowing, slope repair, maintenance road repair, etc.) and monitoring of the existing Raymondville Drain as well as emergency maintenance activities as needed, particularly following storm events. Such activities may require the clearing or removal of vegetation within the RDP ROW. No other state actions are currently scheduled to take place in the action area.

Future activities that are reasonably certain to occur within the action area consist of the illegal disposal of solid waste in and near the existing Raymondville Drain. Waste disposal activities are already occurring within and near the RDP ROW; solid waste was observed in most areas of the RDP ROW and included broken appliances, furniture, tires, household litter, and food containers. Wastes related to hazardous materials were not observed in the RDP ROW. The disposal of solid waste in the existing Raymondville Drain is anticipated to continue on occasion whether the proposed action is completed or not. The effects of the proposed action were additionally considered in relation to past, present, and reasonably foreseeable future actions which may occur in the vicinity of the action area. Available public records were reviewed to inventory other projects to determine if they would have a cumulative effect on considered species when combined with the effects of the proposed action. Projects which contribute to potential cumulative effects are described in the following sections.

5.4.1 PAST ACTIONS

Some maintenance activities have been deferred for a long enough period of time to allow vegetation to grow within the existing Raymondville Drain channel, side slopes, and maintenance roads. Areas within and immediately adjacent to the existing Raymondville Drain were, or are currently being, cleared of vegetation and debris as part of the Raymondville Drain RESTORE Act Project.

Most of the native landscape and vegetation community of Hidalgo and Willacy Counties has been converted to agricultural land (e.g., row crops, pasture, rangeland) and/or urban developments. The past development of infrastructure projects (e.g., roads, RD, etc.) and the maintenance of those projects have additionally resulted in the removal of native vegetation, including thornscrub vegetation. Agricultural and other development activities have resulted in the destruction, degradation, and fragmentation of native habitats for the species considered in this BA. Two Federally listed endangered plant species, Texas Ayenia and Walker's Manioc, have additionally been affected by the introduction of invasive grass species. Buffelgrass, an invasive species, was observed in abundance within several HAs. Native seed mixes would be utilized to stabilize any bare earth areas within the RDP ROW following construction activities. Approximately 2.0 miles of the existing Raymondville Drain upstream of SH 186 in Willacy County would retain the existing habitat characteristics on both sides of the channel. Additional conservation measures (see Section 6.0) would be implemented to prevent cumulative effects to Ocelot habitat in combination with past land conversion actions in the general area of the RDP.

5.4.2 PRESENT ACTIONS

As previously mentioned, household waste and other types of refuse are frequently illegally disposed within the existing Raymondville Drain. The effects that the disposal of solid waste has on the Eastern Black Rail, the Ocelot, the Tricolored Bat, or other terrestrial species is not known. Most of the waste observed in the RDP ROW during the field investigation was located in the existing Raymondville Drain channel, which was not assessed as part of

this BA. The proposed action is not anticipated to result in cumulative effects on the species considered in this BA in combination with the illegal disposal of solid waste in the existing Raymondville Drain channel.

Population growth in Hidalgo and Willacy Counties is anticipated to result in the conversion of agricultural and other undeveloped land to urban development. The restoration of native habitat types is considered to be more feasible in agricultural and other undeveloped land (USFWS, 2016); therefore, the expansion of urban development is anticipated to reduce the opportunities available to restore the habitat of the Eastern Black Rail, the Ocelot, and other terrestrial species. The proposed action is not anticipated to result in cumulative effects to threatened or endangered species in combination with population growth or associated urban development in the general area of the RDP ROW.

5.4.3 FUTURE ACTIONS

Population growth in Hidalgo and Willacy Counties is anticipated to continue in the future. As with current trends, the proposed action is not anticipated to have cumulative effects on species considered for this BA in combination with future population growth or associated urban development. The proposed action would widen some segments of the existing Raymondville Drain within the action area; this would result in the clearing of vegetation that is currently adjacent to the Raymondville Drain. The construction of the diversion channel and detention pond associated with the RDP, as well as the widening of existing channels, may result in the loss of habitat for the species considered in this BA by converting existing vegetation communities to stormwater management infrastructure.

The effects of past, present, and reasonably foreseeable future actions were analyzed to determine if these actions would have a cumulative effect on the species considered in this BA when combined with the effects of the proposed action. A summary of this analysis is presented in Table 3.

Table 3: Analysis of Cumulative Effects on Considered Species

Species	Past Actions	Present Actions	Proposed Action	Future Actions	Cumulative Effects?
Eastern Black Rail	Conversion of land to agriculture and urban development, construction of RD	Disposal of solid waste in RD	Construction of diversion channel and detention pond	Disposal of solid waste in RD	No
Ocelot	Conversion of land to agriculture and urban development, construction of RD	Population growth, urban development	Clearing of vegetation and construction of new channel in action area	Population growth, urban development	No
Tricolored Bat	Conversion of land to agriculture and urban development, construction of RD	Population growth, urban development	Clearing of vegetation, replacement of existing bridges, construction of new bridges	Population growth, urban development	No
Other Terrestrial Species	Conversion of land to agriculture and urban development, construction of RD	Population growth, urban development	Clearing of vegetation, including invasive grasses, in action area	Population growth, urban development	No

No cumulative effects in the action area are anticipated to occur to the species considered in this BA, or to the habitat of these species.

SECTION 6: CONSERVATION MEASURES

Conservation measures proposed for the proposed action consist of best management practices (BMPs) primarily based on published TPWD guidance, as well as recommendations provided by TPWD during agency coordination. The following BMPs will be implemented as a part of these actions to avoid and/or minimize impacts to the Federally listed Ocelot and Jaguarundi, as well as other species considered in this BA.

6.1 GENERAL CONSERVATION MEASURES

General BMPs

1. Prior to any construction activities, a kick-off meeting will be scheduled. One of the primary purposes will be to discuss the BMPs and education training for all on-site workers.
2. Individual Federally listed animals found in the project area will not be harassed and will be allowed to leave on their own volition. An individual with the authority to stop construction activities will be on-site during construction activities, and will halt all activities immediately upon report of an Ocelot or Jaguarundi sighting. Contact USFWS immediately at (956) 354-6125 or (956) 784-7520 if a federally listed animal is seen in the project vicinity during normal business hours. After hours, please call (956) 784-7520 (Refuge Dispatch).
3. During construction activities, a biological monitor, with authority to temporarily suspend construction at any time the appropriate BMPs are not being properly implemented, will be present on site. Duties of the monitor will include ensuring that activities stay within designated project areas, evaluating the response of individuals that come near the project site, and implementing the appropriate BMP.
4. Vegetation clearing beyond the design parameters needed for construction and maintenance and use will be avoided. The perimeter of all construction or maintenance areas will be clearly demarcated using flagging or temporary construction fence, and no disturbance outside that perimeter will be authorized.
5. Materials such as sand will be obtained from existing developed or previously used sources, not from undisturbed areas adjacent to the project area.
6. If new or improved access is needed, plans will be coordinated with USFWS.
7. Tree and brush removal would be minimized, and permanent loss will be restored with native vegetation.
8. Dispose of all food related trash items such as wrappers, cans, bottles, and food scraps in closed containers and remove daily from the project site to eliminate attraction of predators.
9. All equipment, materials, and vehicles will be staged in designated areas that are currently cleared and covered with aggregate.
10. Construction and maintenance activities will be conducted only during daylight hours to avoid noise and lighting issues at night. Noise levels would be minimized, and all generators would be in baffle boxes (a sound-resistant box that is placed over or around a generator), have an attached muffler, or use other noise-abatement methods in accordance with industry standards.
11. Vehicle traffic associated with the project will remain on established roads and reduce speeds to the maximum extent practicable.
12. No fences or barriers should bisect or fragment jaguarundi or ocelot dispersal corridors or prevent access to fresh water.
13. All herbicides will be applied in the presence of an herbicide applicator who is licensed in the State of Texas.
14. Waste water (water used for project purposes that is contaminated with construction materials or water used for cleaning equipment and thus carries oils or other toxic materials or other contaminants in

accordance with state regulations) would also be stored in closed containers on-site until removed for disposal.

15. The project management plan will provide for a report describing the implementation of the BMPs and their effectiveness. All personnel involved with the on-the-ground construction or maintenance for the proposed action will receive training in the affected species, the agreed upon BMPs, and the role of the construction monitor.

Contractor Education and Training

During the kick-off meeting for the construction of the RDP, contractors and employees (i.e., engineers, equipment operators, etc.) would be educated on the Ocelot species identification and Federal endangered species status, characteristics/markings on an Ocelot, and preferred HAs. Training would additionally include detailing the importance of working within designated areas, protecting native thornbush buffer zones, and ensuring that agreed upon conservation measures will be implemented throughout the duration of the project. Daily, weekly, or periodic briefings (as appropriate to the location of construction activities) would be conducted to identify potential violations of the established conservation measures or other operational considerations (i.e., problematic construction/equipment areas) encountered or anticipated to be encountered in a particular area of the RDP ROW. On-site education and training would be conducted and/or provided in English and Spanish.

If a rare species is encountered that will not or cannot readily leave the action area, contractors would contact an individual authorized by TPWD (for state-listed species) or USFWS (for Federally listed species) to translocate the animal or plant. Reptiles would be translocated the minimum distance from the action area necessary to avoid impacting them, but not more than one mile from the location at which they were encountered.

Equipment Considerations

Machinery and petroleum products would not be stored in close proximity to the Raymondville Drain, floodplains, or wetlands to prevent possible contamination of water and soils. Machinery would be checked daily for leaks prior to operating within the RDP ROW.

Wildlife

Sediment control fencing would be installed in such manner as to exclude terrestrial wildlife from construction areas. Fencing would be buried at least 6 inches below the ground surface and extend at least 24 inches above the ground surface. Fencing installed as part of the RDP would be maintained in place until construction activities are complete and disturbed areas are revegetated with site-specific native species. Construction contractors would inspect areas inside fencing daily for the presence of wildlife species that have become trapped in impact areas; trapped wildlife would be provided the opportunity to safely exit the fenced area prior to the initiation of construction activities.

Vegetation and Buffer Zones

Existing roads would be utilized for ingress and egress to the RDP ROW to avoid or minimize impacts to native habitats to the extent practicable. Where practicable, and as soon as practicable, disturbed areas would be seeded and/or revegetated with a native seed mix to prevent the colonization of the action area by invasive species. Vegetative species to be used for soil stabilization purposes would consist of regionally adapted native species; these species would be selected from the Texas Department of Agriculture Native Tree and Plant Directory and/or the Lady Bird Johnson Wildflower Center Native Plant Database. Revegetation activities would focus on planting native, herbaceous species as well as plant species that provide cover and food for wildlife. No-till drilling, hydromulching, and/or hydroseeding would be used to apply soil stabilization materials, including seed and

mulch, as such methods would not present entanglement hazards to snakes and other wildlife species. Hydromulch containing microplastics would not be used.

Biological monitor(s) would ensure that work areas and buffer zones are identified and marked in the field, and that conservation measures are implemented throughout the RDP project limits. Native thornscrub vegetation will be carefully monitored in HA 88, in which known populations of Ocelot reside. In the event that listed species are encountered during RDP construction activities, work would be immediately stopped, and coordination would be conducted with the USFWS, as appropriate. Additionally, the biological monitor would oversee equipment movements within the RDP ROW to prevent direct impacts to any observed Ocelot and minimize impacts to their habitat. Prior to the initiation of construction activities, field reconnaissance investigations would be conducted within the previously inaccessible portion of HA 88 to assess habitat within the RDP ROW as well as assess entry and exit points for vehicles and heavy equipment.

A qualified botanist with experience with rare plants of south Texas would survey previously inaccessible areas for the presence of Federally listed plants, including the Texas Ayenia, using survey protocols established by the USFWS. The USFWS and TPWD would be contacted if any Federally listed plants are encountered during such surveys.

Approximately 2.0 miles of the existing Raymondville Drain, from SH 186 near Port Mansfield to the eastern project terminus, will be avoided to maintain existing HAs along the Raymondville Drain. A vegetated island within the Raymondville Drain channel near SH 186 will remain in place as this island is located within the 2.0-mile section which will be avoided.

The establishment of buffer zones (strips of vegetation which remain in place) within the RDP ROW would preserve natural resources (including dense thornscrub) during construction activities. Buffer zones would be physically marked in the field along the RDP ROW with fencing and/or flagging; no equipment or materials would be placed inside these buffer zones. Biological monitors would ensure that the buffer zones are avoided throughout the construction of the RDP.

Migratory and Non-Game Birds

The Migratory Bird Treaty Act prohibits taking, attempting to take, capturing, killing, selling, purchasing, possessing, transporting, and importing migratory birds, their eggs, parts, or nests, except when specifically authorized by the Department of the Interior. The Texas Parks and Wildlife Code, section 64.002, prohibits catching, killing, injuring, pursuing, or possessing a bird that is not a game bird.

To avoid impacts to migratory birds which may be in the action area, vegetation clearing activities would be scheduled to occur outside of the general bird nesting season (March 15 through September 15). If disturbance must be scheduled during the nesting season, areas of vegetation and bare ground to be impacted would be surveyed for active nests by a qualified biologist prior to clearing; surveys would be conducted no more than five days prior to clearing activities. If active nests are encountered, a buffer would be established in a 100-foot radius around the active nests until eggs have hatched and the young birds therein have fledged. Buffers around observed raptor nests would have a 325-foot radius and would remain in place during the raptor nesting period (February 1 through July 15). The size of buffers around individual nests may be adjusted following coordination with the USFWS and TPWD.

LRGVNWR Considerations

The minimization of impacts to water quality and existing vegetation is important within all project areas but is particularly important near the LRGVNWR. The clearing of native vegetation on top of the bank of the existing Raymondville Drain would be minimized as much as possible to reduce soil erosion and sedimentation in the

channel from stormwater runoff due to lack of vegetation along the banks of the channel. If practicable, the alignment of the RDP ROW would be shifted to avoid direct impacts to the LRGVNWR.

Invasive Species

Care would be taken to avoid the spread of aquatic invasive plants from infested water bodies into areas not currently infested. All machinery and equipment that comes in contact with water would follow the "Clean, Drain and Dry" procedure as described by TPWD to prevent potential spread of invasive vegetation. The procedure involves removing all plants and foreign objects from equipment and machinery, draining all water that may be present on or in the equipment, and drying the equipment before using that equipment in another water body.

Colonization by invasive plants would be actively prevented on disturbed sites. Vegetation management would include removing invasive species as soon as practical, while allowing existing native plants to revegetate the disturbed areas. Invasive species that were not removed during the clearing and grubbing activities associated with the Raymondville Drain RESTORE Act Project would be removed early on. All equipment utilized for clearing, grubbing, and construction would be washed/cleaned to ensure it is free of plant material, thereby preventing the spread of invasive plants and disease.

Erosion/Sedimentation Considerations

Clearing of native vegetation along the RDP ROW on top of the bank would be minimized, to the extent practicable, to reduce soil erosion and sedimentation build-up in the channel from stormwater runoff due to the lack of vegetation along the banks of the channel. Seeding and vegetation retention along the Raymondville Drain would minimize impacts to water quality and require less revegetation after the construction of the RDP. Plastic mesh matting would not be used for erosion control, as it would present an entanglement hazard to wildlife.

A Stormwater Pollution Prevention Plan (SWPPP) would be prepared prior to the initiation of the RDP. Temporary silt fences, biodegradable erosion control socks, rock filter dams, and/or rock bedding would be installed to minimize erosion of disturbed soil surfaces and sedimentation of the existing and proposed Raymondville Drain channel.

Precautions would be taken to ensure sediment loading does not occur to the Raymondville Drain. To prevent and/or minimize soil erosion and compaction associated with clearing and grubbing activities, the unnecessary clearing of vegetation would be avoided, and vehicles would use established roadways for ingress and egress to the Raymondville Drain and the RDP ROW whenever practicable.

Disturbed areas would be seeded following the completion of construction activities to stabilize the soil on the banks of the Raymondville Drain and to suppress the spread and/or establishment of invasive plant species such as Carrizo Cane (*Arundo donax*). In accordance with Executive Order 13112 on Invasive Species and the Executive Memorandum on Beneficial Landscaping (42 CFR 26961), where possible, any landscaping associated with project plans would be limited to seeding and replanting with native species. A mixture of grasses and forbs appropriate to the area would be planted when seed is reasonably available to address potential erosion issues and establish long-term cover. The use of Bermudagrass (*Cynodon dactylon*) and other introduced species would be avoided to the extent practicable. As woody vegetation would be removed to improve the free flow of water in the channel, trees and shrubs would not be replanted within the RDP ROW. The USFWS would be provided the opportunity to review the seed mixture before disturbed areas are revegetated.

6.2 TAXON-SPECIFIC CONSERVATION MEASURES

Ocelot and Jaguarundi

1. During construction, a biological monitor with authority to temporarily suspend construction when appropriate BMPs are not being properly implemented will be present on site.
2. Removal of wetland habitat or riparian vegetation beyond the design parameters will be avoided. Removal of dense thorn scrub will be minimized and restricted to the design parameters. When removing scrub habitat, root systems will be left intact where possible.
3. Documentation of observed Ocelots and Jaguarundi in the project and activity areas will be reported to USFWS.
4. No restoration activities, including monitoring, will occur between November and December to avoid the peak reproductive season of the Jaguarundi.
5. In order to minimize potential loss of felid prey species, the use of herbicides will be limited to the minimum amount necessary to achieve adequate control of Carrizo Cane.
6. Down shield lighting to illuminate facility or parking areas and do not shine on surrounding vegetated areas as the ocelot and jaguarundi are usually active at night or at dawn and dusk.
7. Protect riparian areas or canals from construction and/or use, as these are areas that are used as travel corridors for cats; maintain a vegetative buffer.

Amphibians

Contractors would be advised of the potential to encounter Federally listed amphibians in the action area and instructed to avoid negatively impacting them if encountered. Impacts to water features and adjacent vegetation would be minimized. Erosion control BMPs (see above) would be installed. Staging areas and fuels or other potential hazardous materials used during construction would be located in areas where potential leaks and/or spills would not enter aquatic areas.

Reptiles

Contractors would be informed of the potential for Federally listed reptiles to occur in the action area and advised to avoid impacts to them as long as the safety of the workers is not compromised. Most snake species that occur in the Lower Rio Grande Valley are non-venomous. Snakes and other reptiles encountered in the action area during construction would be permitted to safely leave the area on their own. Reptiles would only be relocated if found in areas in which imminent danger is present, in which case an exclusion fence would be installed to ensure that the relocated reptiles do not re-enter the dangerous area. Construction activities that occur after October, when reptiles become inactive and may be using burrows in the action area, would be preceded by surveys for tortoises or indicators of tortoise presence (e.g., the presence of burrows or pallets under Prickly Pear Cactus, *Opuntia stricta*).

Aquatic Species

Erosion and sediment controls would be maintained in the action area until the completion of construction activities. Riparian and streambank vegetation would be retained, and access roads across creeks or drainageways would be installed only when necessary. If dewatering, fill, or trampling activities are determined to be necessary for construction of the RDP, native aquatic resources, including fish and mussels, would be relocated under the terms of an Aquatic Resource Relocation Plan approved by TPWD.

Bats

Bridges and trees within the RDP ROW would be surveyed for the presence of roosting bats by a qualified biologist no more than one year before construction activities are initiated in the immediate area. If the biologist determines that bat occupancy of a potential roosting site is highly probable but unconfirmed, the site would be surveyed again no more than 4 weeks prior to the disturbance of the site. All appropriate measures would be taken to avoid harming bats, such as implementing non-lethal exclusion activities or phasing construction activities to occur when the roosting site is unoccupied.

Large, mature trees would be retained wherever practicable. Where it is necessary to remove mature trees, removal would be scheduled to occur outside of bat pup season (May through July), if practicable. Culverts in the action area, which may act as bat hibernation sites, would be left in place during the Tricolored Bat's hibernation season (September through April). The USFWS monitors the spread of white-nose syndrome and the fungus *P. destructans*. As of July 2023, *P. destructans* has not been detected in either Hidalgo County nor Willacy County, nor has it been detected in any adjacent areas. Equipment that would be used in the construction of the RDP would be decontaminated prior to the initiation of construction activities according to the USFWS National White-Nose Syndrome Decontamination Protocol, updated October 2020.

SECTION 7: CONCLUSIONS AND DETERMINATION OF EFFECTS

Data collected during the field investigation and from available information resources was analyzed to determine what effects, if any, the proposed action would have on Federally listed species considered in this BA.

7.1 EASTERN BLACK RAIL

RRP has determined that the proposed action would have no effect on the Eastern Black Rail. No areas of suitable habitat for this species were observed within the action area; therefore, the species is not anticipated to occur within the action area during construction activities, and the proposed action would not remove habitat on which the Eastern Black Rail depends.

7.2 OCELOT

RRP has determined that the proposed action "may affect, but is not likely to adversely affect" the Ocelot. While the Ocelot is unlikely to use the HAs identified in the action area for long-term habitation, the presence of thornscrub vegetation along the RDP ROW, in any density, may be suitable as temporary refuge 1) for use as a dispersal corridor, 2) to move among disconnected areas of thornbush located in the same general area, and/or 3) to move from one optimal HA to another within the same general area. Documented Ocelots and associated habitat are located adjacent to the proposed action (specifically in the East Foundation and El Sauz Ranch properties) which has led to the "may affect, but is not likely to adversely affect" determination.

Prior to construction activities within HA 88, a field investigation within the previously inaccessible property parcels would be conducted. The avoidance of 2.0 miles of the existing Raymondville Drain through the East Foundation property, the avoidance and minimization of impacts to thornscrub vegetation (where practicable), and the commitment to the conservation measures (described in Section 6.0) provides the means by which to preserve the Ocelot and requisite habitat as well as advance the RDP.

7.3 TRICOLORED BAT

RRP has determined that the proposed action "may affect, but is not likely to adversely affect" the Tricolored Bat. The removal of trees which provide potential roosting habitat would be compensated by the extension of 44 existing bridges and the construction of five new bridges. The construction of three culverts associated with the RDP would provide this species with new hibernation sites without removing any existing hibernation sites. Conservation measures specific to bats (see Section 6.2) would be implemented during construction to preserve the Tricolored Bat while advancing the RDP.

7.4 OTHER FEDERALLY LISTED SPECIES

Due to the similarity between the Jaguarundi and Ocelot habitat requirements, RRP has determined that the proposed action "may affect, but is not likely to adversely affect," the Gulf Coast Jaguarundi. According to East Foundation staff, the Gulf Coast Jaguarundi has been identified on the East Foundation property.

RRP has determined that the proposed action "may affect, but is not likely to adversely affect" the Cactus Ferruginous Pygmy-owl. This species was not observed during field investigations. HAs 14, 78, and 88 were observed to contain mesquite trees of sufficient size as well as a shrub stratum that exhibited greater than 50% areal coverage. HAs 78 and 88 are additionally considered to be riparian habitat for the purposes of this BA, as they are located adjacent to the existing Raymondville Drain. No Live Oak trees were observed and no cavities were observed in the Honey Mesquite (*Prosopis glandulosa*) trees present in the action area; therefore, these HAs are anticipated to be suitable only for foraging and temporary shelter. As the RDP ROW is smaller in width than the action area, not all of the potential Cactus Ferruginous Pygmy-owl habitat observed during field investigations would be lost to construction activities. Individual pygmy-owls which occur in the action area are anticipated to temporarily relocate away from the action area during construction activities and return to remaining mesquite brush and riparian areas when construction activities are complete.

RRP has determined that the proposed action "may affect, but is not likely to adversely affect" the Northern Aplomado Falcon. This species was not observed during field investigations; only HA 89, a cattle pasture, was determined to be suitable habitat for this species. This determination was based on the size and frequency of trees in the area, the dominance of tall grass favorable to the Northern Aplomado Falcon's prey species, and the low intensity with which this pasture is grazed. HA 89 was inaccessible due to a lack of ROE authorization; therefore, the condition of the pasture was made based on aerial photography and observations, made from SH 186, of contiguous pasture outside the action area. HA 89 is approximately 25.64 acres in size. The average habitat patch for this species is estimated to be larger than 312 acres. As the RDP ROW is smaller in width than the action area, not all of the potential Northern Aplomado Falcon habitat observed during field investigations would be lost to construction activities. Individual falcons may relocate away from HA 89 during construction activities, but are anticipated to return when construction in the area has ceased and associated equipment has been removed.

Due to the similarity between the habitats that they require in Texas, the Piping Plover and the Red Knot were assessed concurrently. These species were not observed during the field investigation, and no areas of suitable habitat were observed within the action area. HAs 27 and 33 consist of washout areas on both sides of the drain containing large sandy areas with sparse vegetation; however, they are located approximately 37.71 miles and 34.91 miles, respectively, from the coast. In Texas, the Piping Plover roosts on beaches and other areas adjacent to saltwater, while the Red Knot requires estuarine waters. The existing Raymondville Drain, where it flows through HAs 27 and 33, is not tidally influenced. RRP has determined that the proposed action would have no effect on these species.

The Star Cactus was not observed during the field investigation; soils within the RDP ROW are primarily sandy instead of the gravelly clays and loams which this species prefers (see **Appendix C – Supporting Documentation**,

Natural Resources Conservation Service, Custom Soil Resource Report). The Star Cactus is not anticipated to occur within the RDP ROW. RRP has determined that the proposed action would have no effect on this species.

Texas Ayenia was not observed during the field investigation, and no areas of suitable habitat (shrubland or woodland dominated by Texas ebony) were observed within the RVD ROW. Buffelgrass, which outcompetes this species, was observed in abundance within the RVD ROW. RRP has determined that the proposed action would have no effect on this species.

Walker's Manioc was not observed during the field investigation, and no areas of suitable habitat (outcrops of exposed caliche) were observed within the action area. Buffelgrass, which outcompetes this species, was observed in abundance within the RDP ROW. RRP has determined that the proposed action would have no effect on this species.

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APPENDIX A

EXHIBITS

Exhibit 1: Vicinity Map
Exhibit 2: Site Location Map
Exhibit 3: Topographic Map, 2022
Exhibit 4: Aerial Photograph, 2022
Exhibit 5: Habitat Areas Map
Exhibit 6: TPWD Natural Diversity Database

Data Provenance:

ESRI - Navigation Map

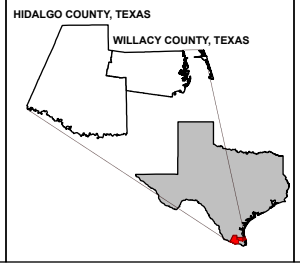
Legend:

- Action Area
- County Boundary
- US/Mexico Border

N

0 5 10

Miles



RRP
YOUR RELIABLE PARTNER

Exhibit 1

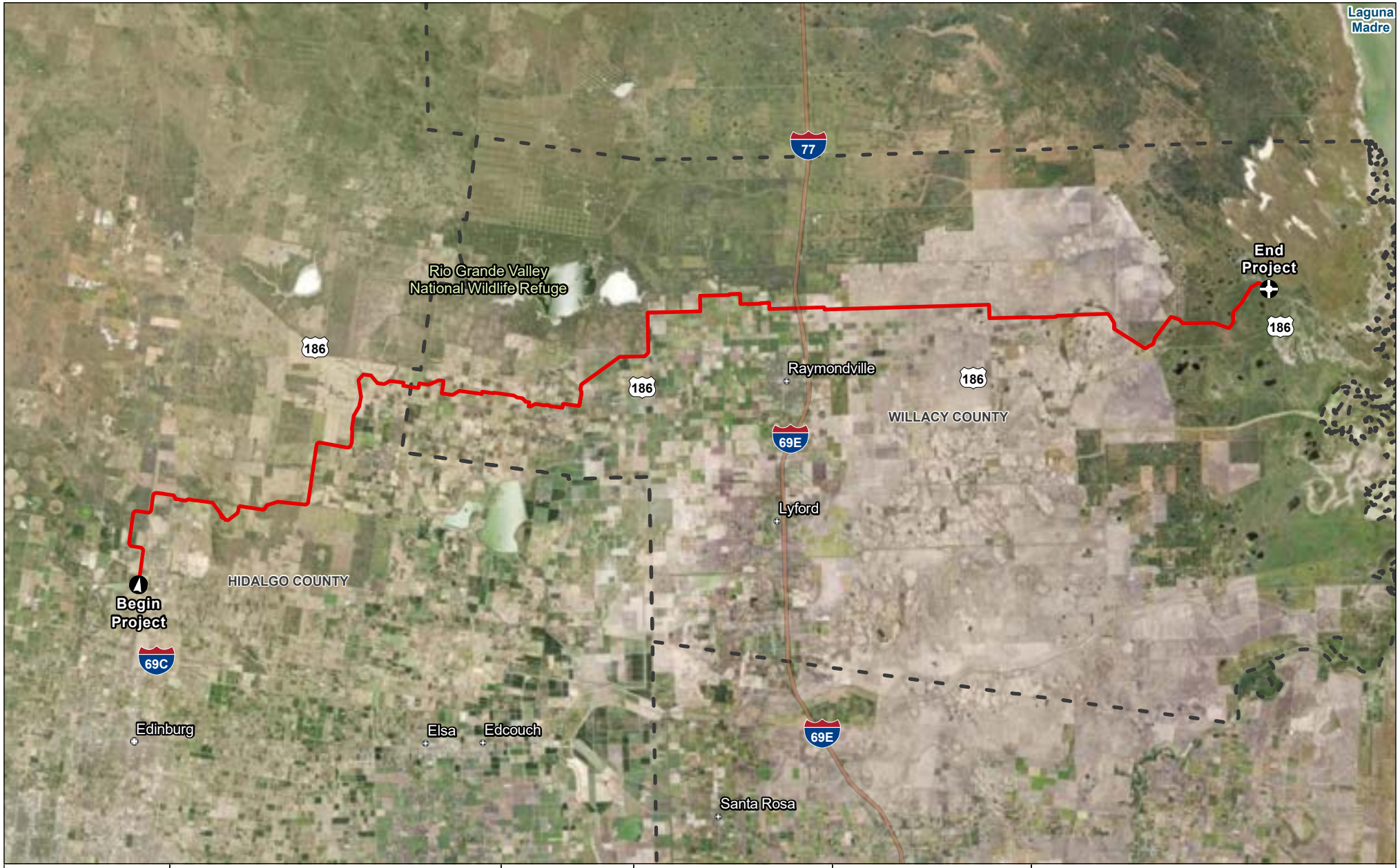
Vicinity Map

Raymondville Drain Project

Author :	Joel F. Aguirre	Updated :	3/13/2023

DISCLAIMER: S&B Infrastructure makes no guarantees as to the accuracy of 3rd party data used in the construction of this map.

Path: S:\projects\34000\600_ProjectRepository\GIS\U192_RVD.aprx



Data Provenance:

ESRI - NAIP Imagery Map (2022)

Legend:

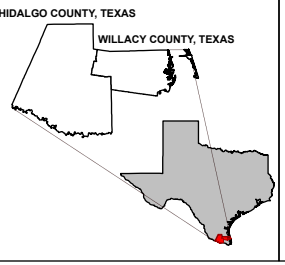
Action Area

County Boundary

N

0 2 4

Miles



RRP
YOUR RELIABLE PARTNER

Exhibit 2

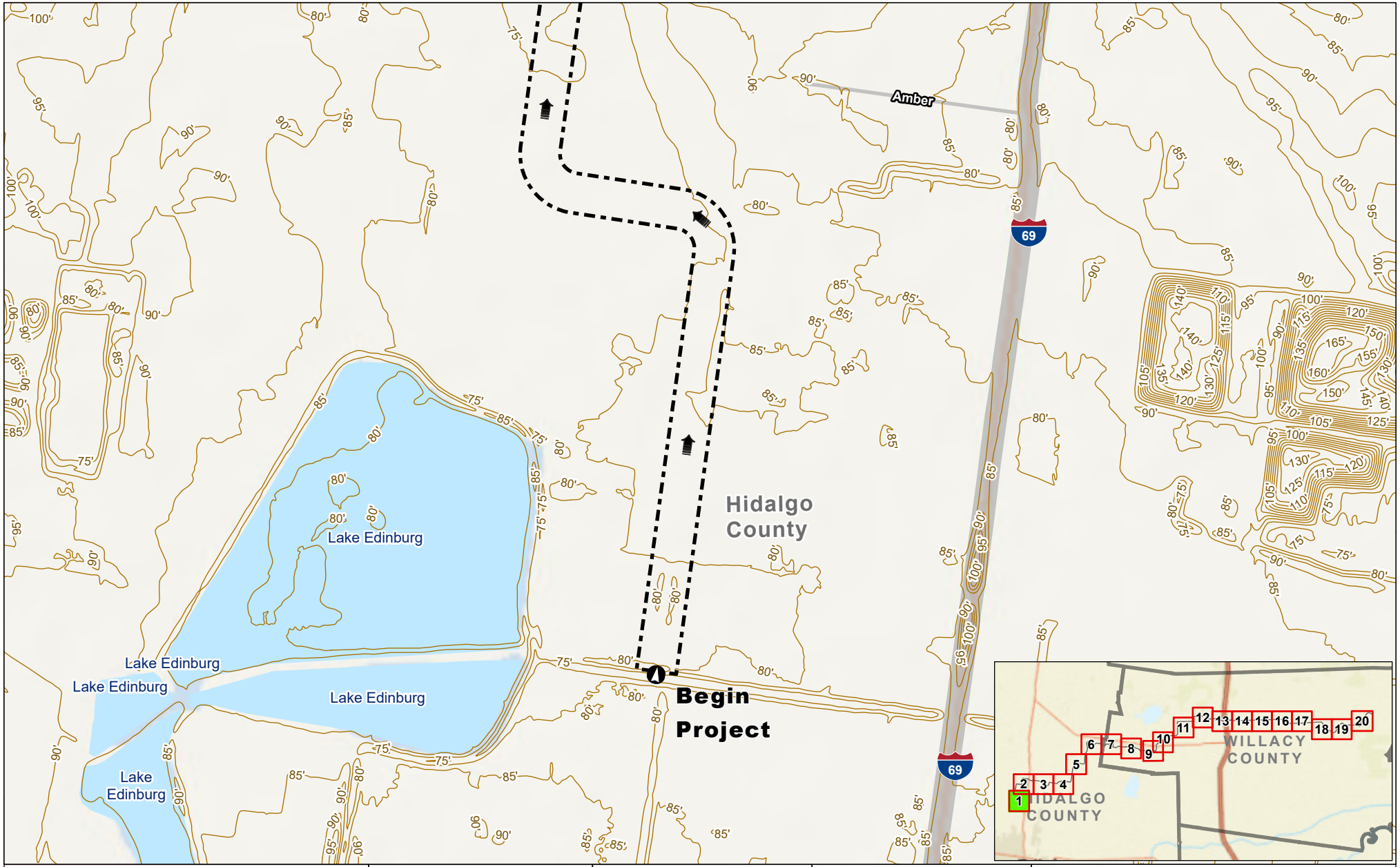
Site Location Map

Raymondville Drain Project

Author :	Joel F. Aguirre	Updated :	3/13/2023

DISCLAIMER: S&B Infrastructure makes no guarantees as to the accuracy of 3rd party data used in the construction of this map.

Path: S:\projects\34000\800_Project\Repository\GIS\U192_RVD.aprx



Legend:

- Action Area
- Drain Flow
- Elevation Contour

N

0 1,000 2,000

US Feet

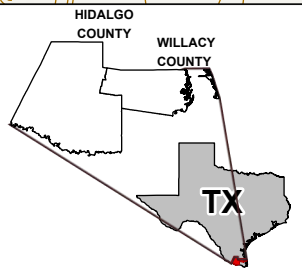


Exhibit 3

Topographic Map (2022)

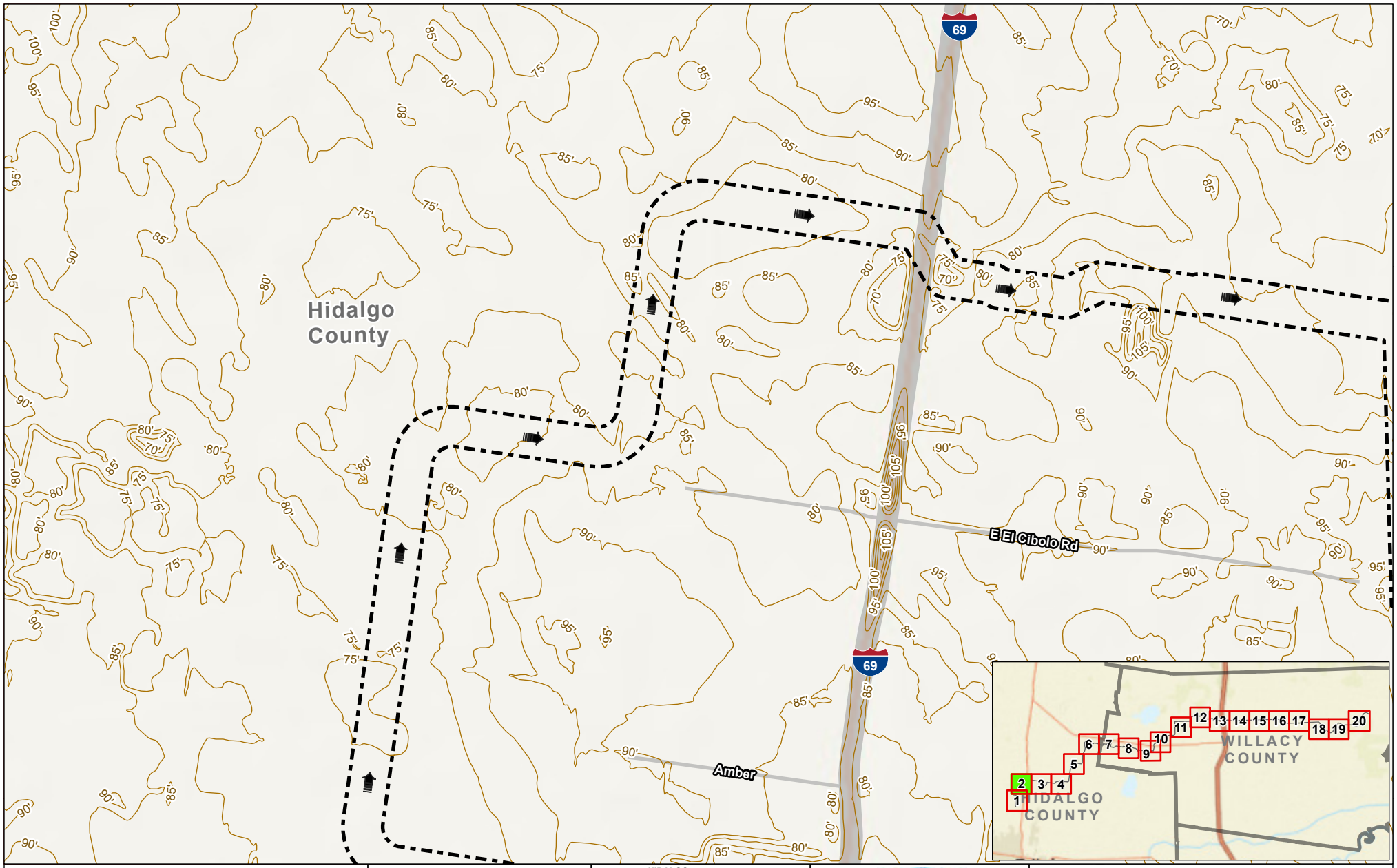
Sheet 1 of 20
Raymondville Drain Project

Author : Joel F. Aguirre **Updated :** 7/20/2023

DISCLAIMER: S&B Infrastructure makes no guarantees as to the accuracy of 3rd party data used in the construction of this map.

Data Provenance: ESRI - World Ocean Basemap (2022), USGS - Elevation Contour Lines (2022)

Path: S:\projects\3408\800_ProjectRepository\GIS\RDP_End-to-End_Series.aprx



Legend:

- Action Area
- Drain Flow
- Elevation Contour

N

0 1,000 2,000

US Feet

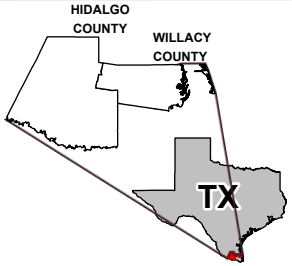


Exhibit 3

Topographic Map (2022)

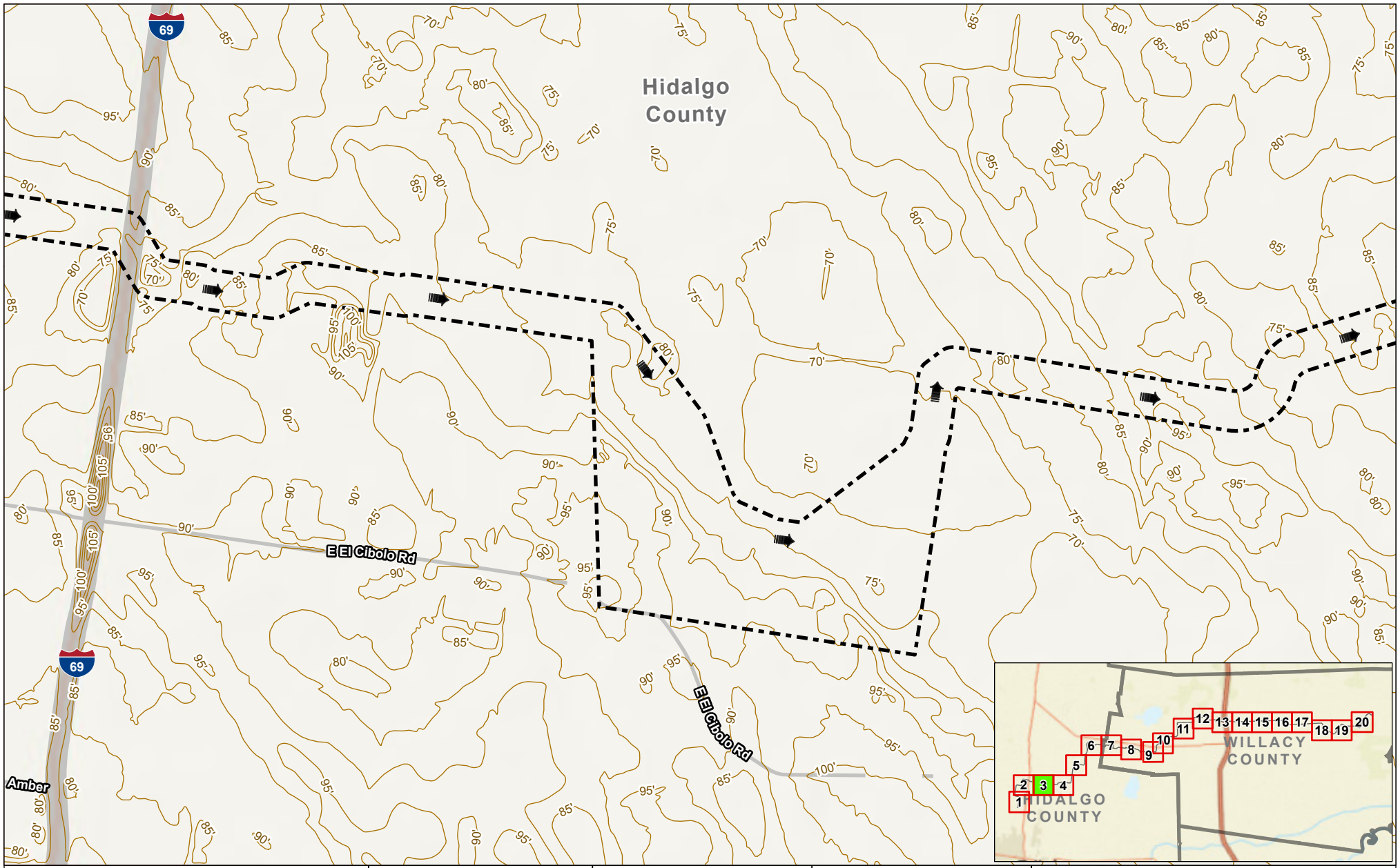
Sheet 2 of 20
Raymondville Drain Project

Author : Joel F. Aguirre | **Updated :** 7/20/2023

DISCLAIMER: S&B Infrastructure makes no guarantees as to the accuracy of 3rd party data used in the construction of this map.

Data Provenance: ESRI - World Ocean Basemap (2022), USGS - Elevation Contour Lines (2022)

Path: S:\projects\3408\800_ProjectRepository\GIS\RDP_End-to-End_Series.aprx



Legend:

- Action Area
- Drain Flow
- Elevation Contour

N

0 1,000 2,000

US Feet

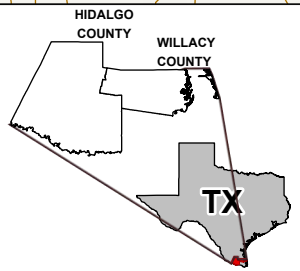


Exhibit 3

Topographic Map (2022)

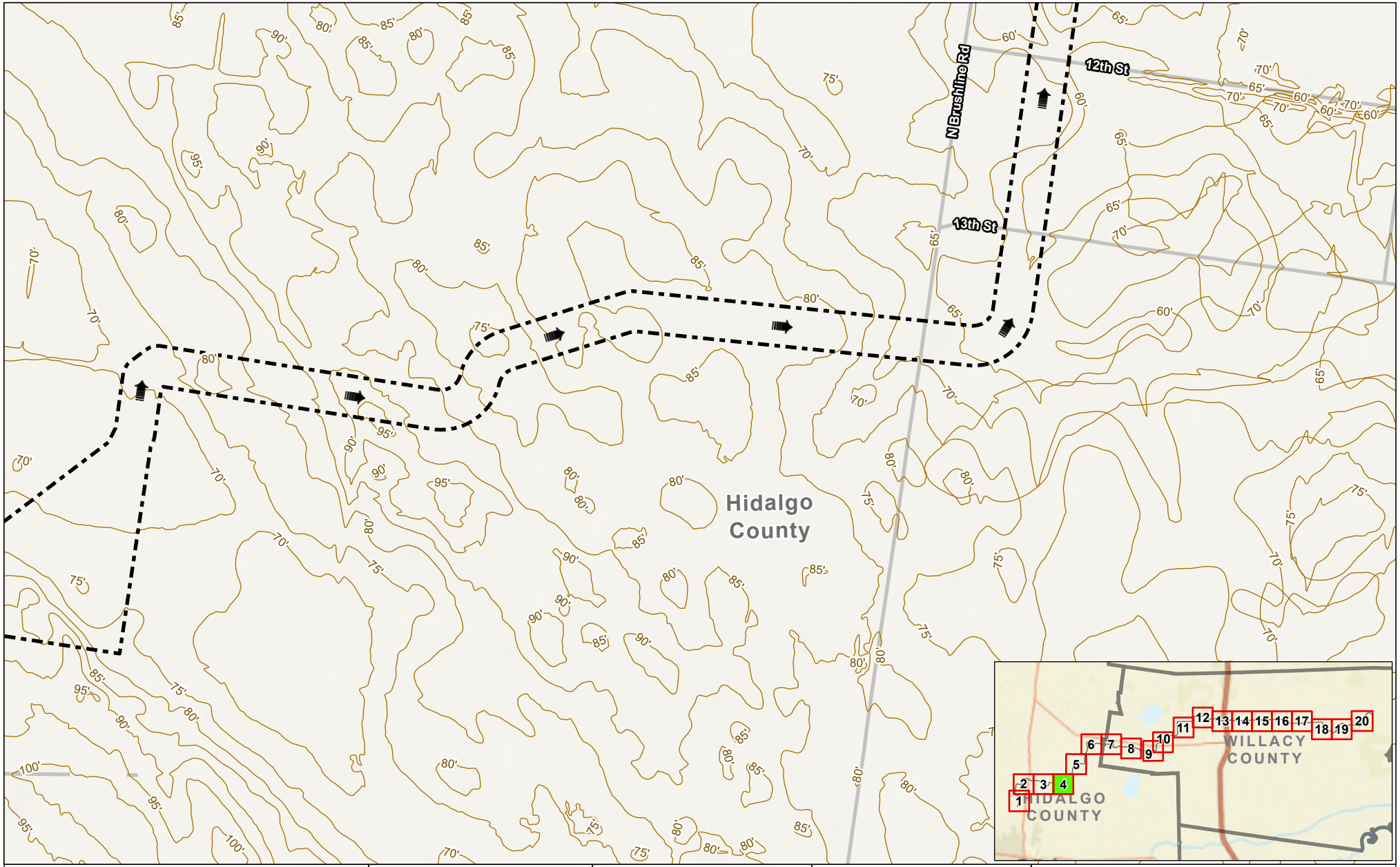
Sheet 3 of 20
Raymondville Drain Project

Author :	Joel F. Aguirre	Updated :	7/20/2023

DISCLAIMER: S&B Infrastructure makes no guarantees as to the accuracy of 3rd party data used in the construction of this map.

Data Provenance: ESRI - World Ocean Basemap (2022), USGS - Elevation Contour Lines (2022)

Path: S:\projects\3408\800_ProjectRepository\GIS\RDP_End-to-End_Series.aprx



Legend:

- Action Area
- Drain Flow
- Elevation Contour

N

0 1,000 2,000

US Feet

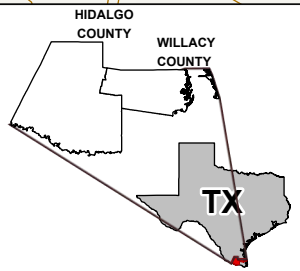


Exhibit 3

Topographic Map (2022)

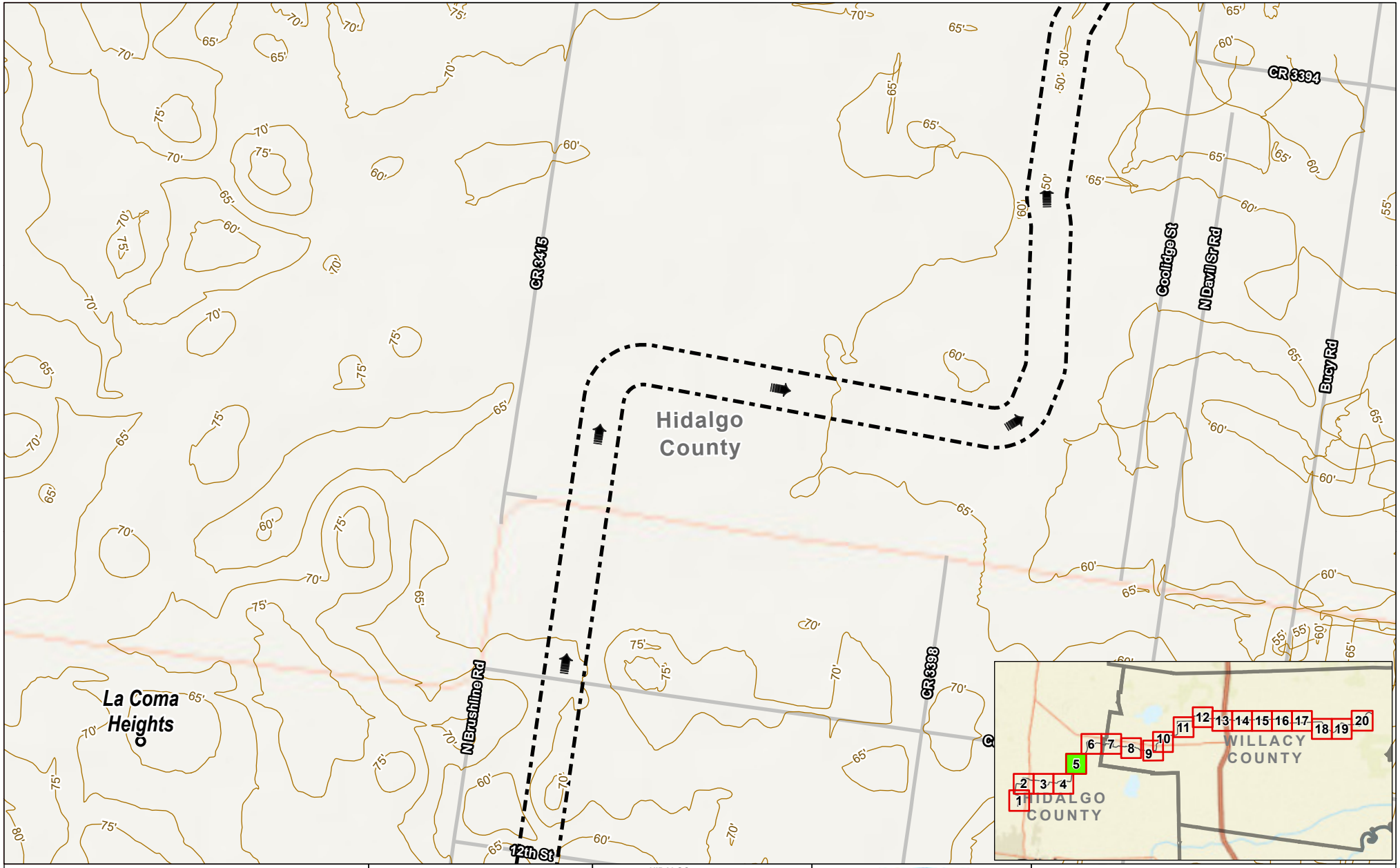
Sheet 4 of 20
Raymondville Drain Project

Author :	Joel F. Aguirre	Updated :	7/20/2023

DISCLAIMER: S&B Infrastructure makes no guarantees as to the accuracy of 3rd party data used in the construction of this map.

Data Provenance: ESRI - World Ocean Basemap (2022), USGS - Elevation Contour Lines (2022)

Path: S:\projects\3408\800_ProjectRepository\GIS\RDP_End-to-End_Series.aprx



Legend:

- Action Area
- Drain Flow
- Elevation Contour

N

0 1,000 2,000

US Feet

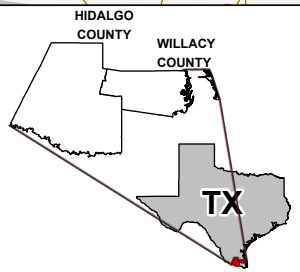


Exhibit 3

Topographic Map (2022)

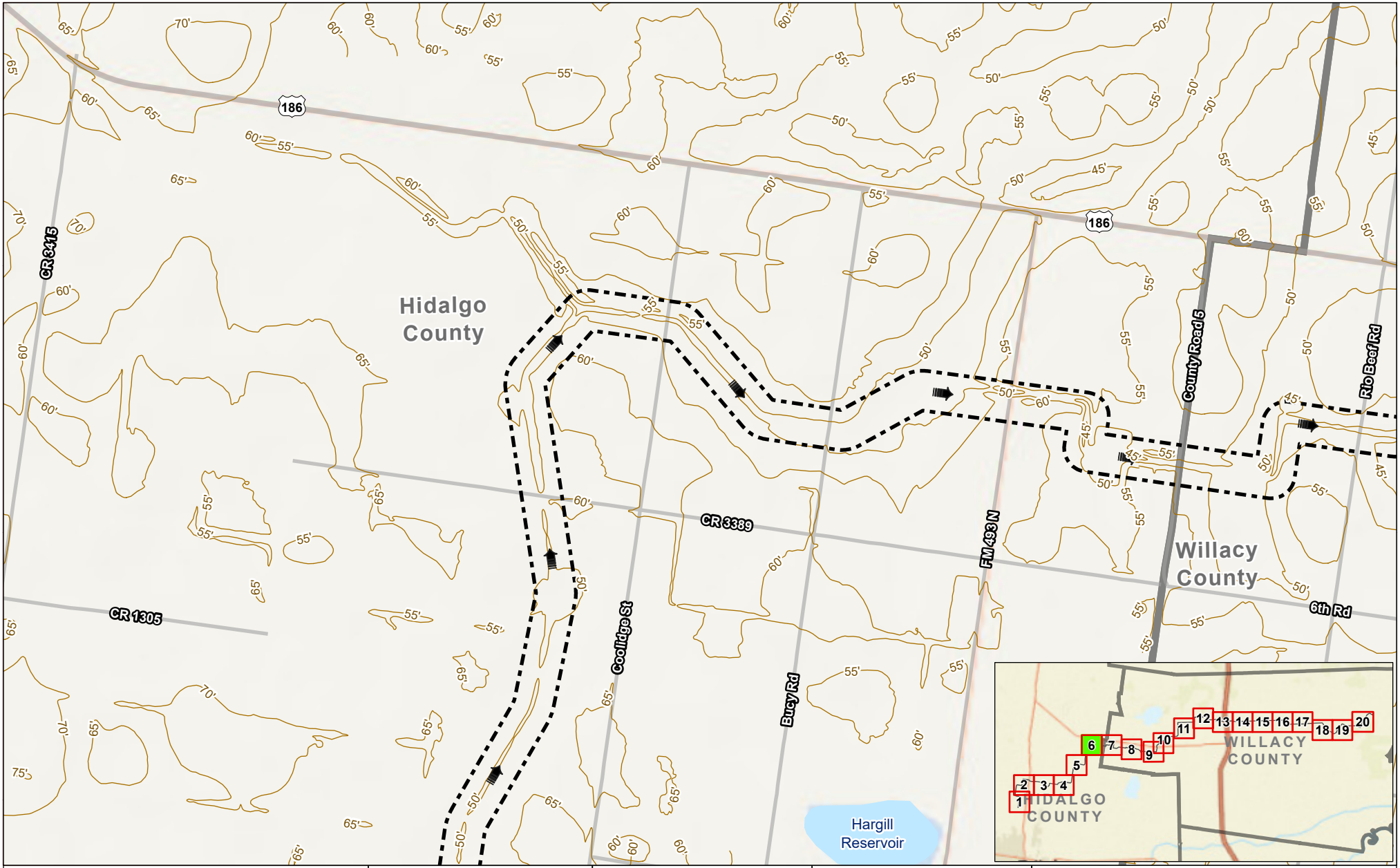
Sheet 5 of 20
Raymondville Drain Project

Author :	Joel F. Aguirre	Updated :	7/20/2023

DISCLAIMER: S&B Infrastructure makes no guarantees as to the accuracy of 3rd party data used in the construction of this map.

Data Provenance: ESRI - World Ocean Basemap (2022), USGS - Elevation Contour Lines (2022)

Path: S:\projects\3408\800_ProjectRepository\GIS\RDP_End-to-End_Series.aprx



Legend:

- Action Area
- Drain Flow
- Elevation Contour

N

0 1,000 2,000

US Feet

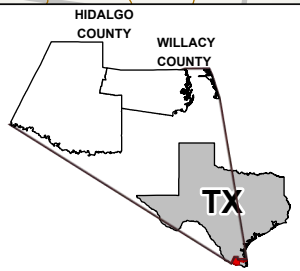


Exhibit 3

Topographic Map (2022)

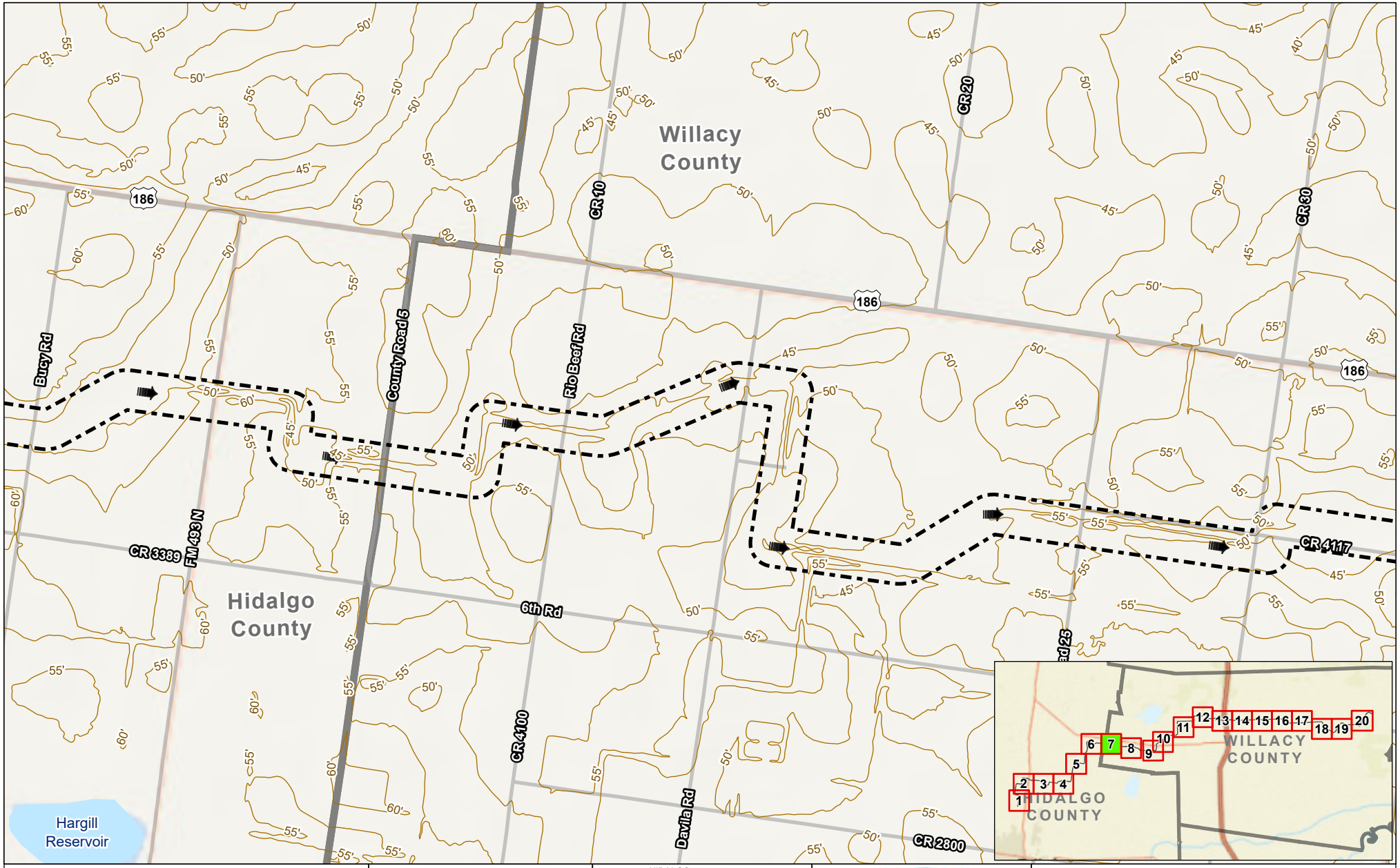
Sheet 6 of 20
Raymondville Drain Project

Author :	Joel F. Aguirre	Updated :	7/20/2023

DISCLAIMER: S&B Infrastructure makes no guarantees as to the accuracy of 3rd party data used in the construction of this map.

Data Provenance: ESRI - World Ocean Basemap (2022), USGS - Elevation Contour Lines (2022)

Path: S:\projects\3408\800_ProjectRepository\GIS\RDP_End-to-End_Series.aprx



Legend:

- Action Area
- Drain Flow
- Elevation Contour

N

0 1,000 2,000

US Feet

HIDALGO COUNTY

WILLACY COUNTY

TX

Exhibit 3

Topographic Map (2022)

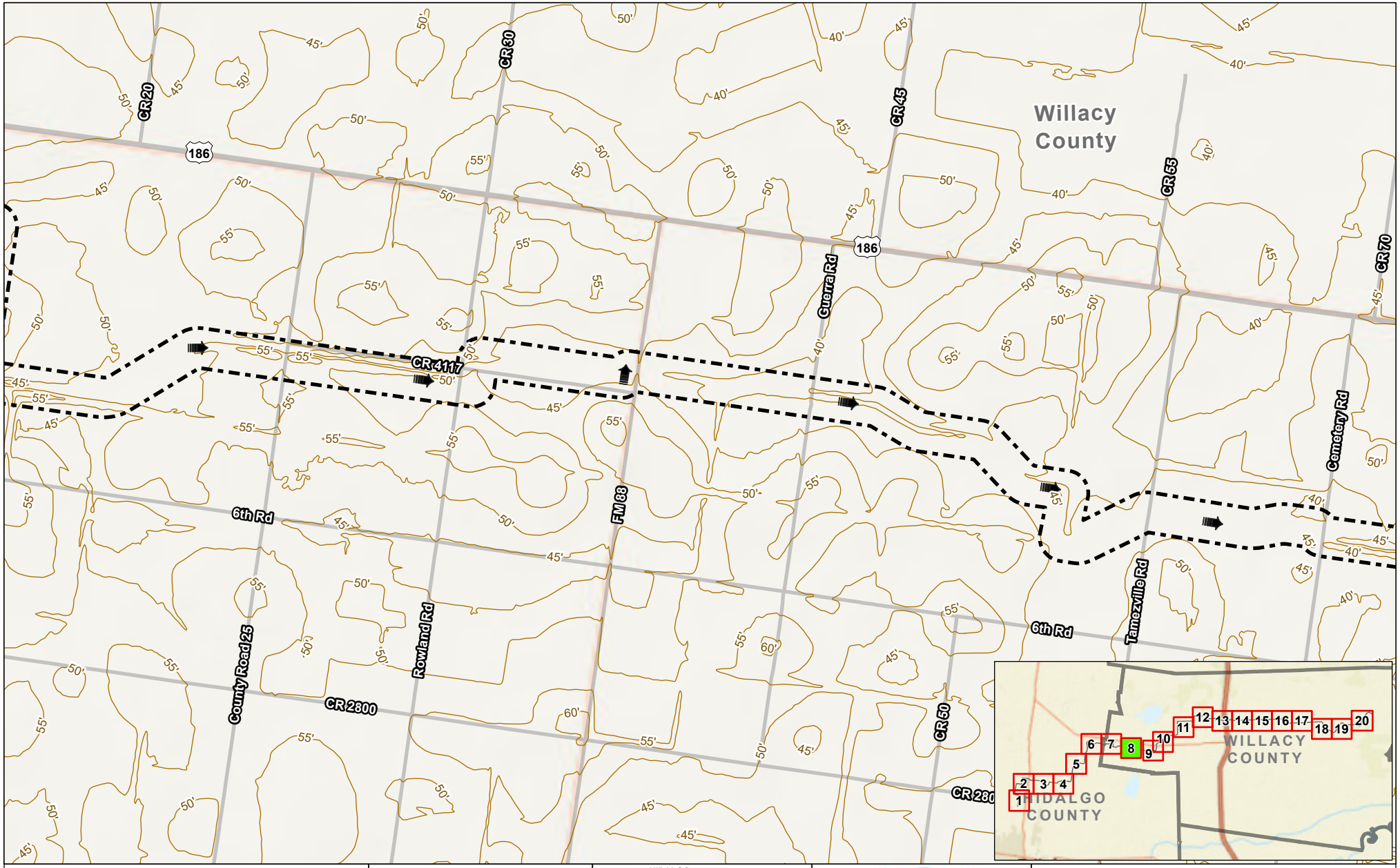
Sheet 7 of 20
Raymondville Drain Project

Author :	Joel F. Aguirre	Updated :	7/20/2023

DISCLAIMER: S&B Infrastructure makes no guarantees as to the accuracy of 3rd party data used in the construction of this map.

Data Provenance: ESRI - World Ocean Basemap (2022), USGS - Elevation Contour Lines (2022)

Path: S:\projects\3408\800_ProjectRepository\GIS\RDP_End-to-End_Series.aprx



Legend:

- Action Area
- Drain Flow
- Elevation Contour

N

0 1,000 2,000

US Feet

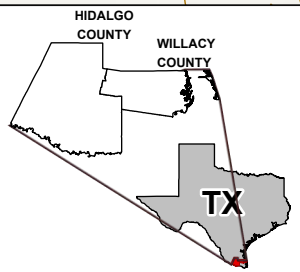


Exhibit 3

Topographic Map (2022)

Sheet 8 of 20
Raymondville Drain Project

Author : Joel F. Aguirre **Updated :** 7/20/2023

DISCLAIMER: S&B Infrastructure makes no guarantees as to the accuracy of 3rd party data used in the construction of this map.

Data Provenance: ESRI - World Ocean Basemap (2022), USGS - Elevation Contour Lines (2022)

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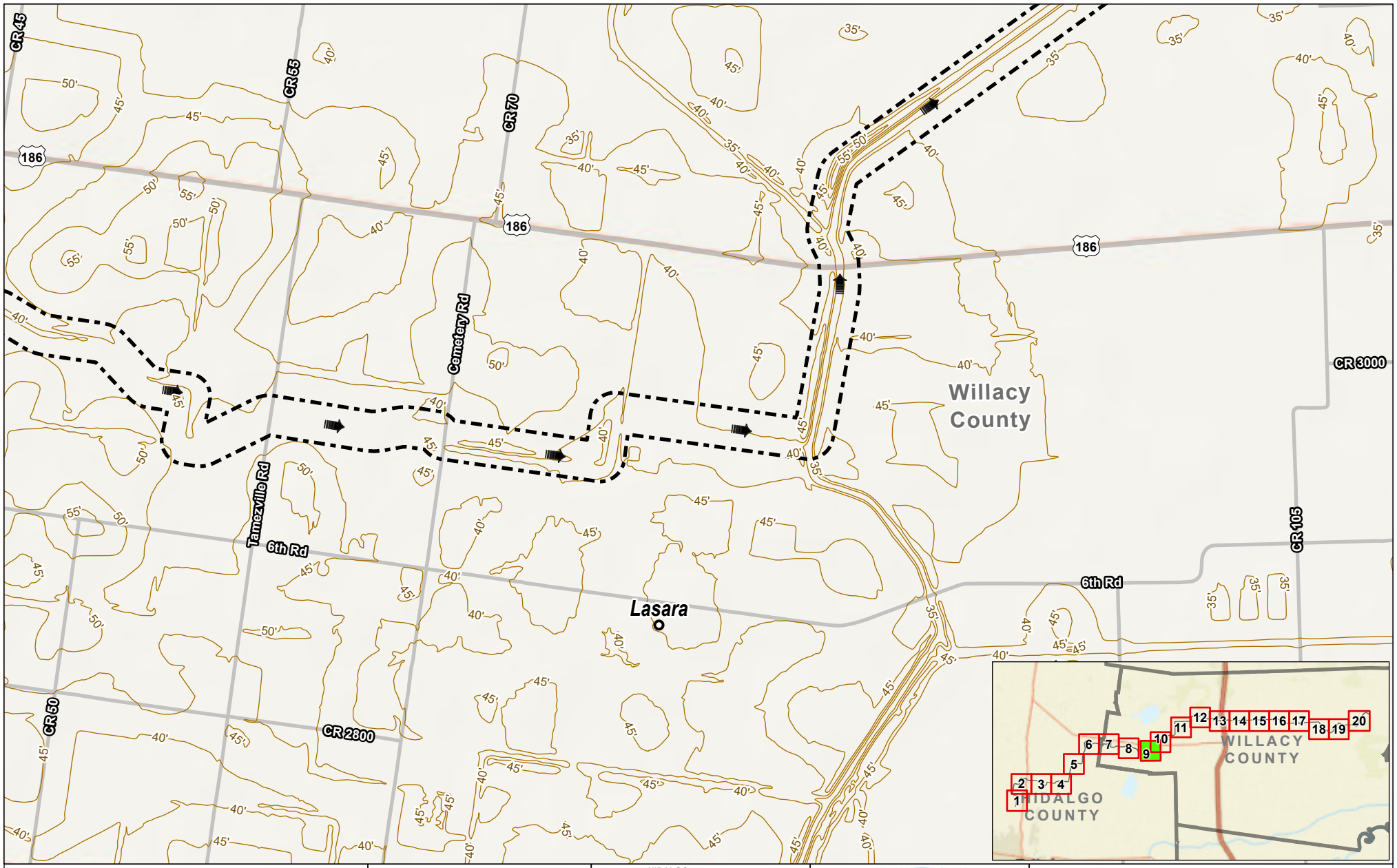


Legend:

- Action Area
- Drain Flow
- Elevation Contour

N

0 1,000 2,000

US Feet

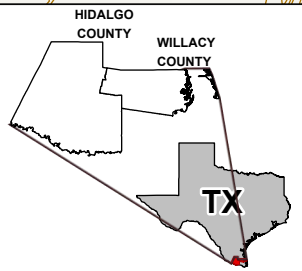


Exhibit 3

Topographic Map (2022)

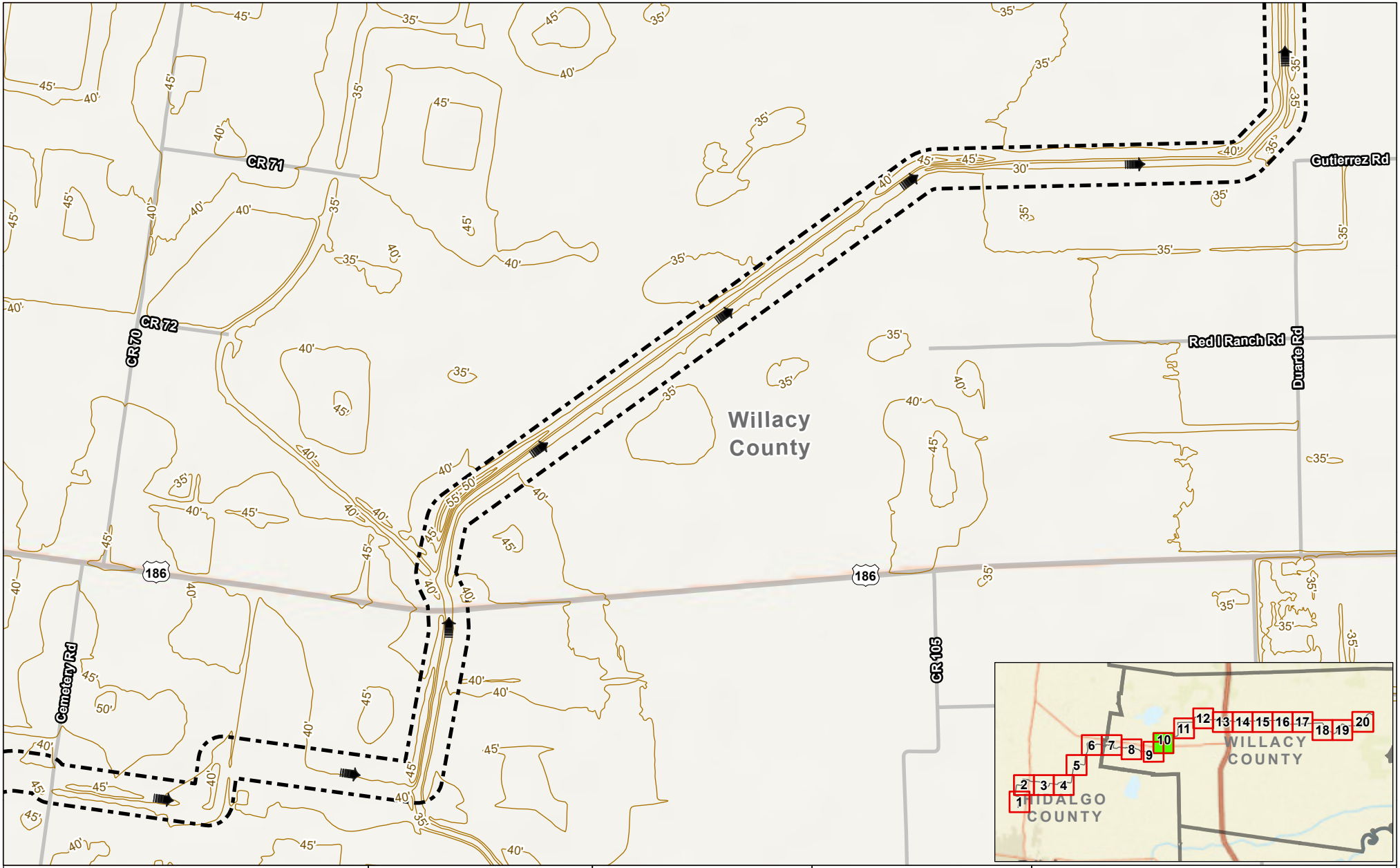
Sheet 9 of 20
Raymondville Drain Project

Author :	Joel F. Aguirre	Updated :	7/20/2023

DISCLAIMER: S&B Infrastructure makes no guarantees as to the accuracy of 3rd party data used in the construction of this map.

Data Provenance: ESRI - World Ocean Basemap (2022), USGS - Elevation Contour Lines (2022)

Path: S:\projects\3408\800_ProjectRepository\GIS\RDP_End-to-End_Series.aprx



Legend:

- Action Area
- Drain Flow
- Elevation Contour

N

0 1,000 2,000

US Feet

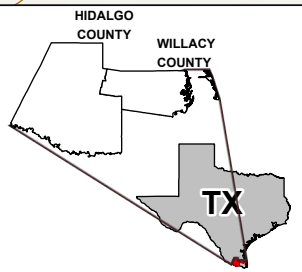


Exhibit 3

Topographic Map (2022)

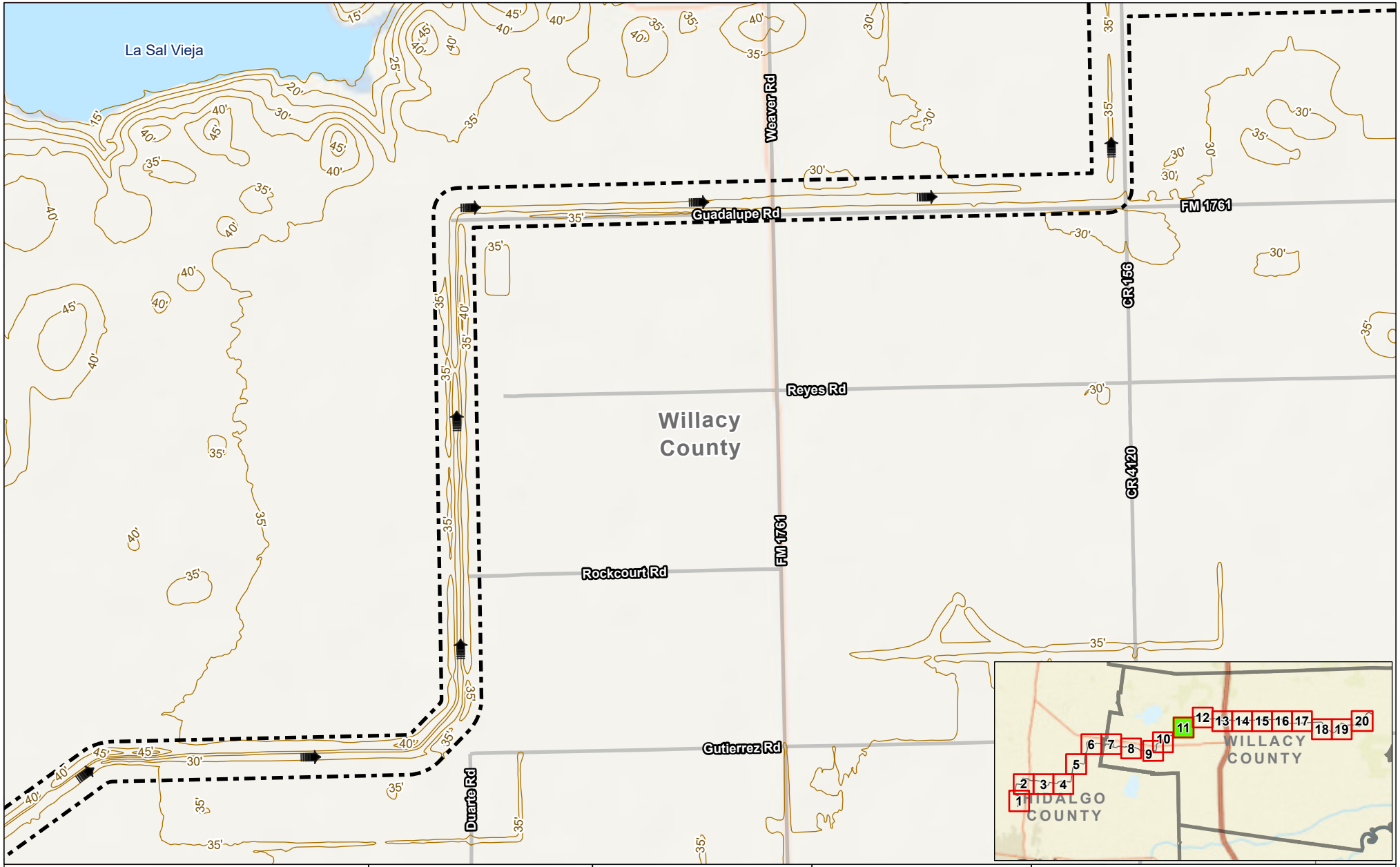
Sheet 10 of 20
Raymondville Drain Project

Author : Joel F. Aguirre **Updated :** 7/20/2023

DISCLAIMER: S&B Infrastructure makes no guarantees as to the accuracy of 3rd party data used in the construction of this map.

Data Provenance: ESRI - World Ocean Basemap (2022), USGS - Elevation Contour Lines (2022)

Path: S:\projects\3408\800_ProjectRepository\GIS\RDP_End-to-End_Series.aprx



Legend:

- Action Area
- Drain Flow
- Elevation Contour

N

0 1,000 2,000

US Feet

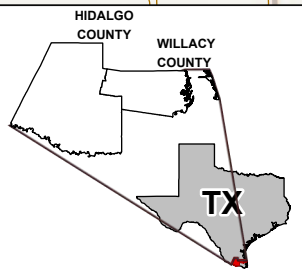


Exhibit 3

Topographic Map (2022)

Sheet 11 of 20
Raymondville Drain Project

Author :	Joel F. Aguirre	Updated :	7/20/2023

DISCLAIMER: S&B Infrastructure makes no guarantees as to the accuracy of 3rd party data used in the construction of this map.

Data Provenance: ESRI - World Ocean Basemap (2022), USGS - Elevation Contour Lines (2022)

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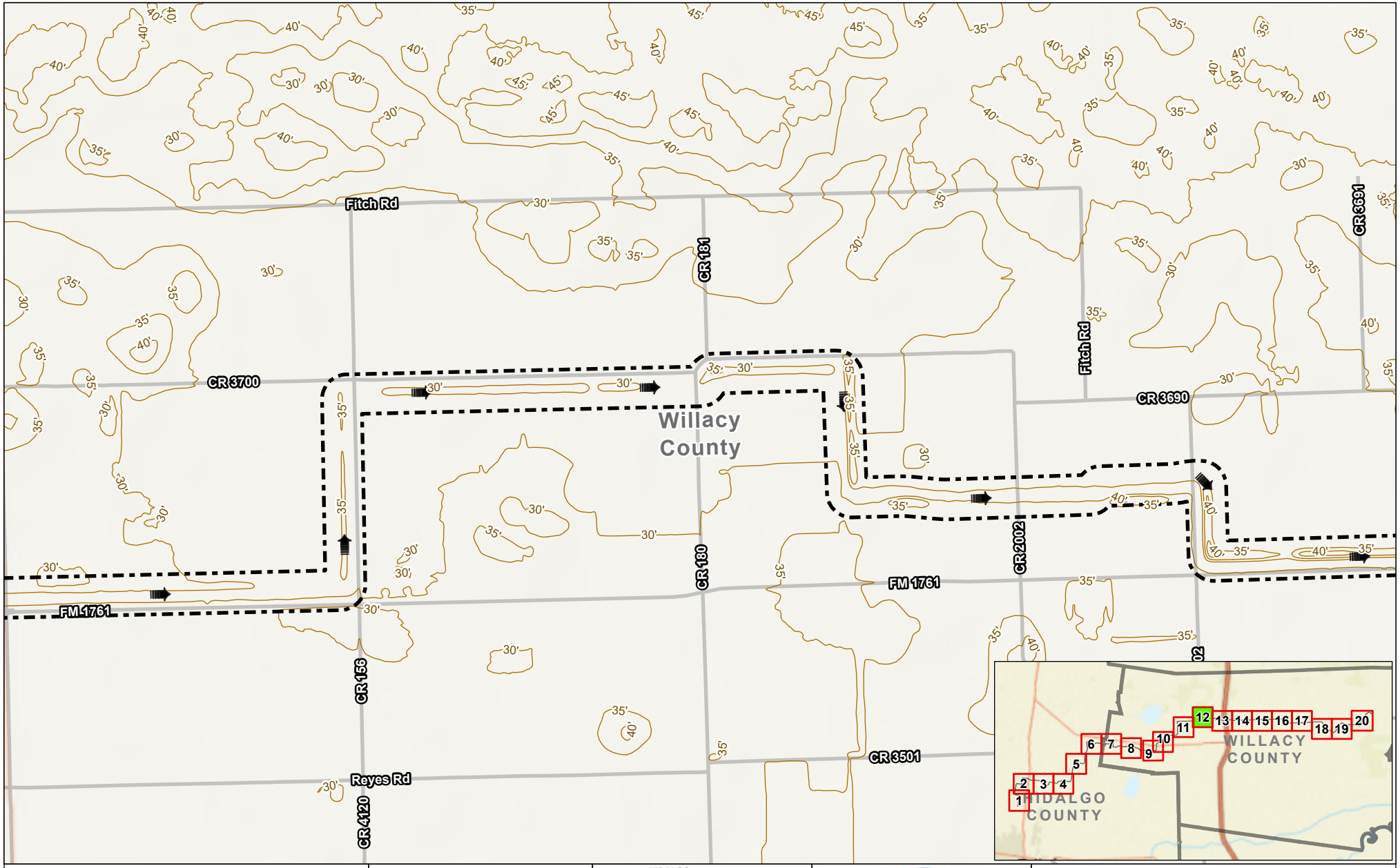


Legend:

- Action Area
- Drain Flow
- Elevation Contour

N

0 1,000 2,000

US Feet

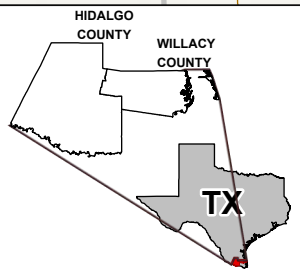


Exhibit 3

Topographic Map (2022)

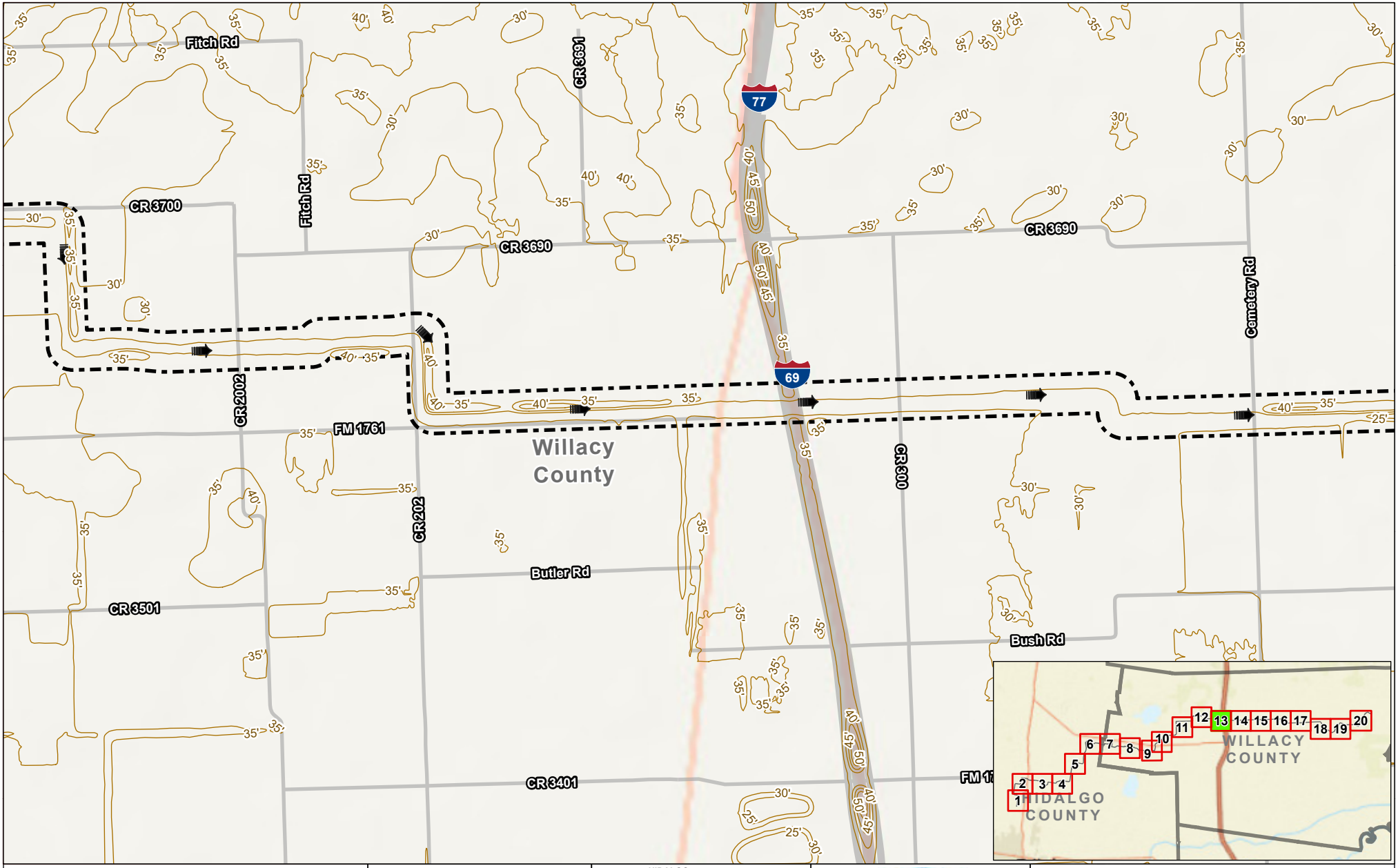
Sheet 12 of 20
Raymondville Drain Project

Author :	Joel F. Aguirre	Updated :	7/20/2023

DISCLAIMER: S&B Infrastructure makes no guarantees as to the accuracy of 3rd party data used in the construction of this map.

Data Provenance: ESRI - World Ocean Basemap (2022), USGS - Elevation Contour Lines (2022)

Path: S:\projects\3408\800_ProjectRepository\GIS\RDP_End-to-End_Series.aprx



Legend:

- Action Area
- Drain Flow
- Elevation Contour

N

0 1,000 2,000

US Feet

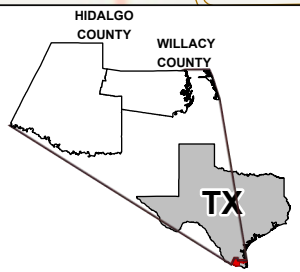


Exhibit 3

Topographic Map (2022)

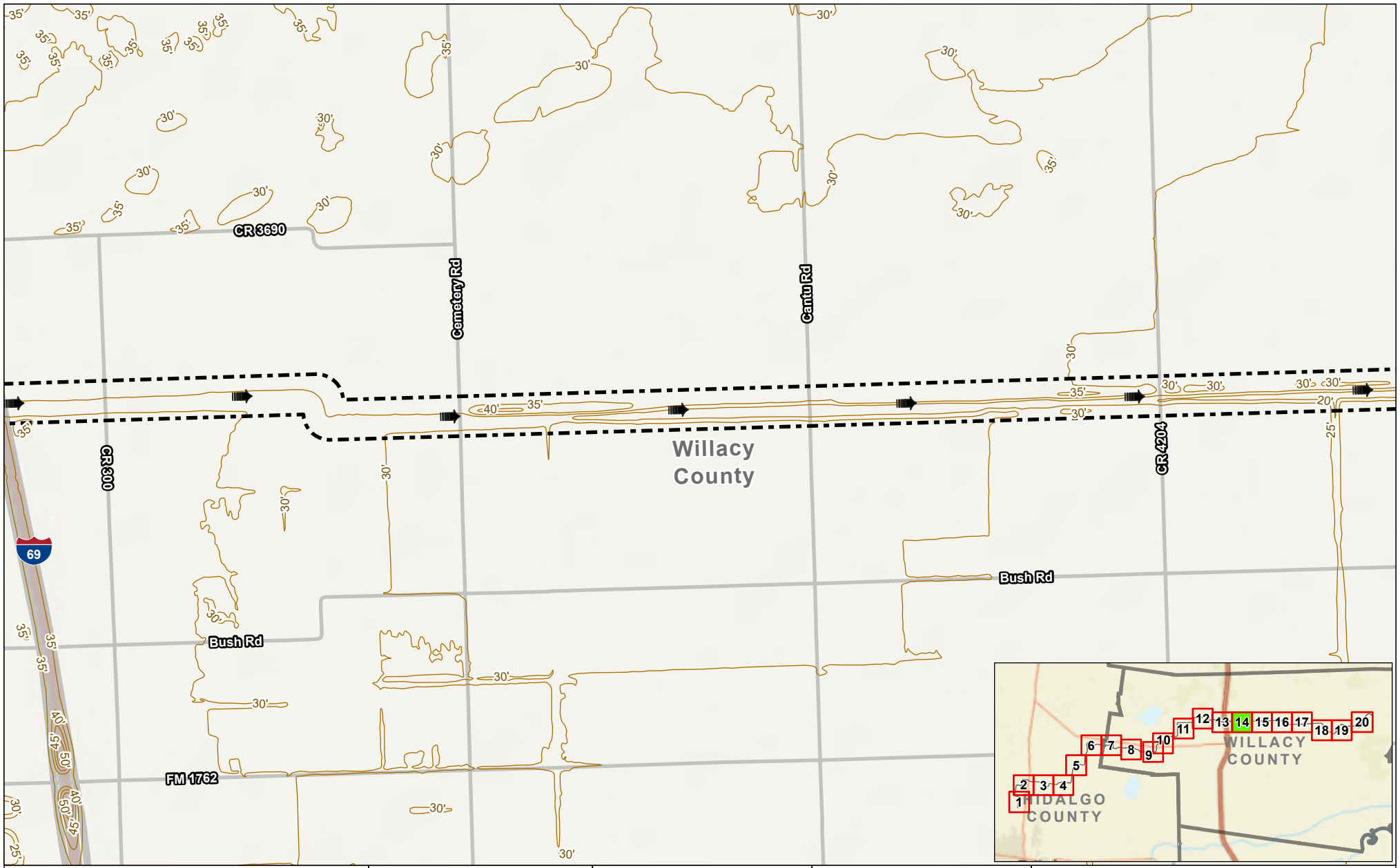
Sheet 13 of 20
Raymondville Drain Project

Author : Joel F. Aguirre **Updated :** 7/20/2023

DISCLAIMER: S&B Infrastructure makes no guarantees as to the accuracy of 3rd party data used in the construction of this map.

Data Provenance: ESRI - World Ocean Basemap (2022), USGS - Elevation Contour Lines (2022)

Path: S:\projects\3408\800_ProjectRepository\GIS\RDP_End-to-End_Series.aprx



Legend:

- Action Area
- Drain Flow
- Elevation Contour

N

0 1,000 2,000

US Feet

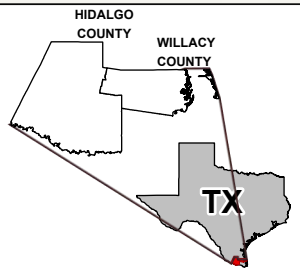


Exhibit 3

Topographic Map (2022)

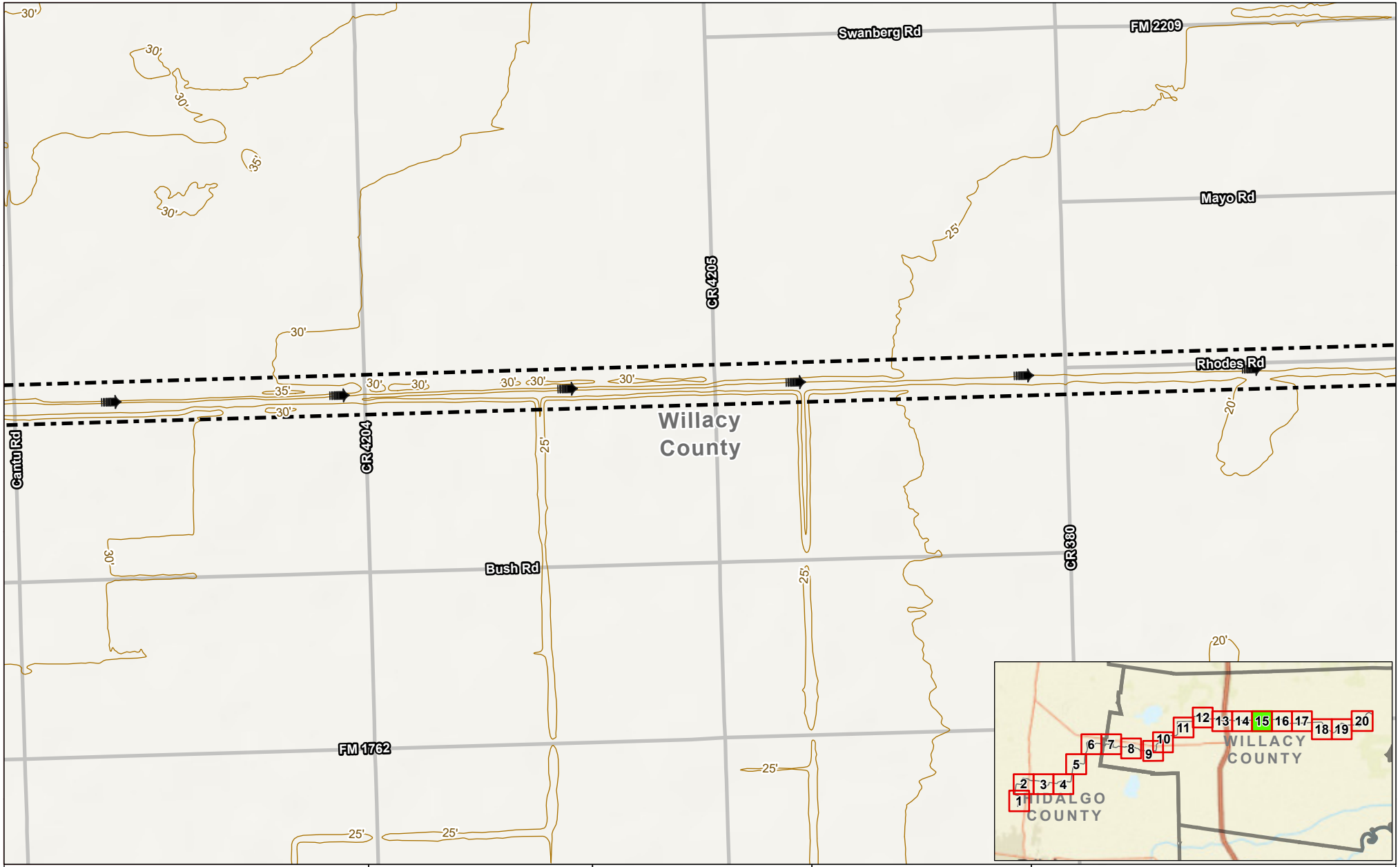
Sheet 14 of 20
Raymondville Drain Project

Author :	Joel F. Aguirre	Updated :	7/20/2023

DISCLAIMER: S&B Infrastructure makes no guarantees as to the accuracy of 3rd party data used in the construction of this map.

Data Provenance: ESRI - World Ocean Basemap (2022), USGS - Elevation Contour Lines (2022)

Path: S:\projects\3400\800_ProjectRepository\GIS\RDP_End-to-End_Series.aprx



Legend:

- Action Area
- Drain Flow
- Elevation Contour

N

0 1,000 2,000

US Feet

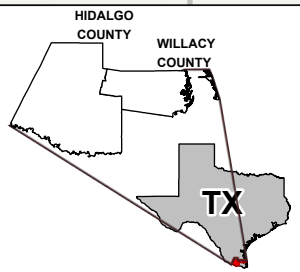


Exhibit 3

Topographic Map (2022)

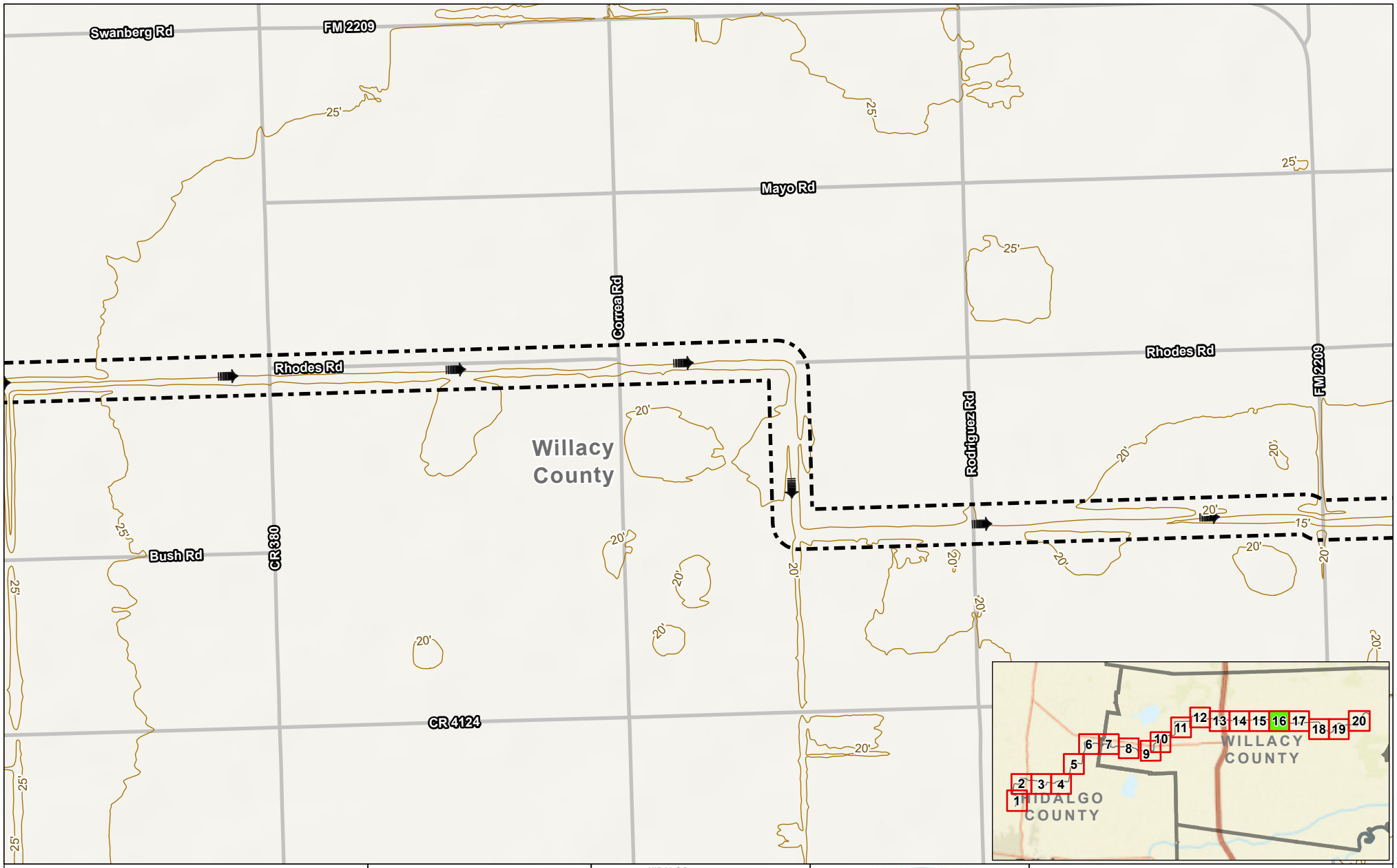
Sheet 15 of 20
Raymondville Drain Project

Author :	Joel F. Aguirre	Updated :	7/20/2023

DISCLAIMER: S&B Infrastructure makes no guarantees as to the accuracy of 3rd party data used in the construction of this map.

Data Provenance: ESRI - World Ocean Basemap (2022), USGS - Elevation Contour Lines (2022)

Path: S:\projects\3408\800_ProjectRepository\GIS\RDP_End-to-End_Series.aprx



Legend:

- Action Area
- Drain Flow
- Elevation Contour

N

0 1,000 2,000

US Feet

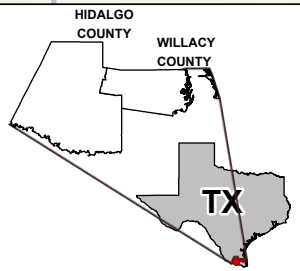


Exhibit 3

Topographic Map (2022)

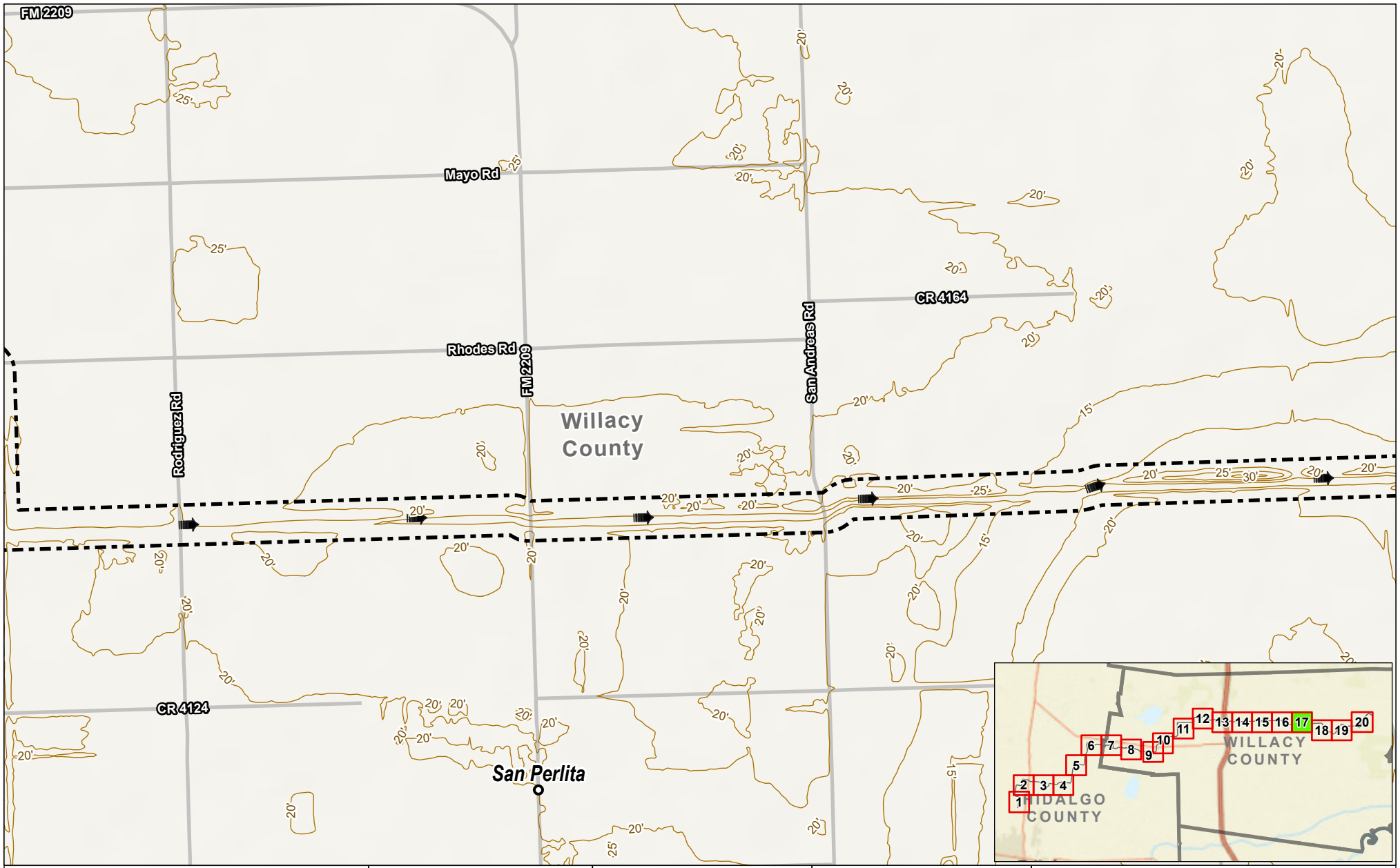
Sheet 16 of 20
Raymondville Drain Project

Author :	Joel F. Aguirre	Updated :	7/20/2023

DISCLAIMER: S&B Infrastructure makes no guarantees as to the accuracy of 3rd party data used in the construction of this map.

Data Provenance: ESRI - World Ocean Basemap (2022), USGS - Elevation Contour Lines (2022)

Path: S:\projects\3408\800_ProjectRepository\GIS\RDP_End-to-End_Series.aprx



Legend:

- Action Area
- Drain Flow
- Elevation Contour

N

0 1,000 2,000

US Feet

HIDALGO COUNTY

WILLACY COUNTY

TX

Exhibit 3

Topographic Map (2022)

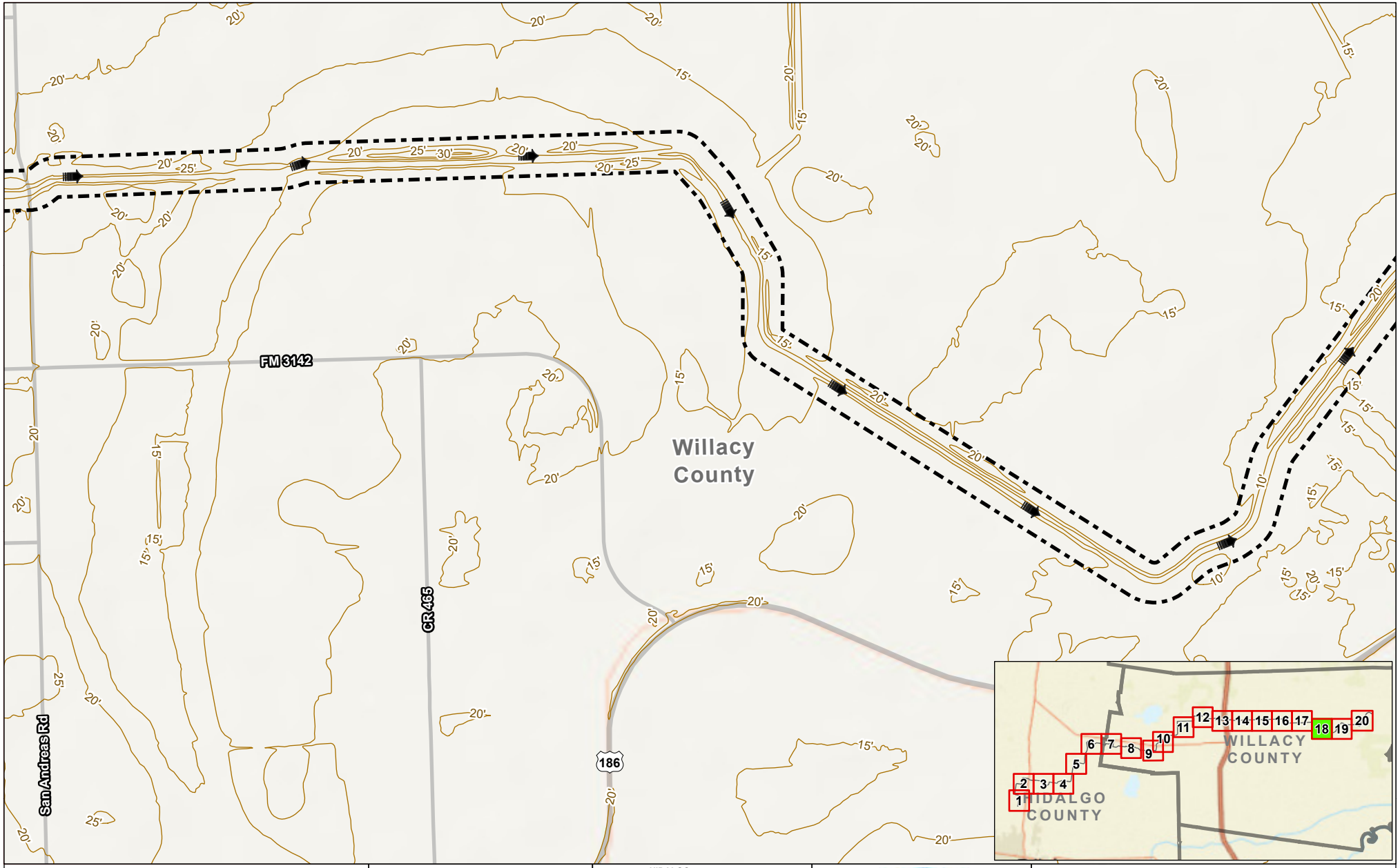
Sheet 17 of 20
Raymondville Drain Project

Author :	Joel F. Aguirre	Updated :	7/20/2023

DISCLAIMER: S&B Infrastructure makes no guarantees as to the accuracy of 3rd party data used in the construction of this map.

Data Provenance: ESRI - World Ocean Basemap (2022), USGS - Elevation Contour Lines (2022)

Path: S:\projects\3408\800_ProjectRepository\GIS\RDP_End-to-End_Series.aprx



Legend:

- Action Area
- Drain Flow
- Elevation Contour

N

0 1,000 2,000

US Feet

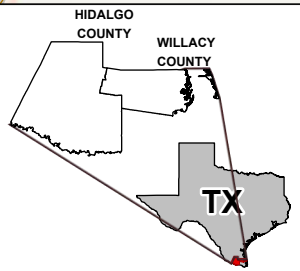


Exhibit 3

Topographic Map (2022)

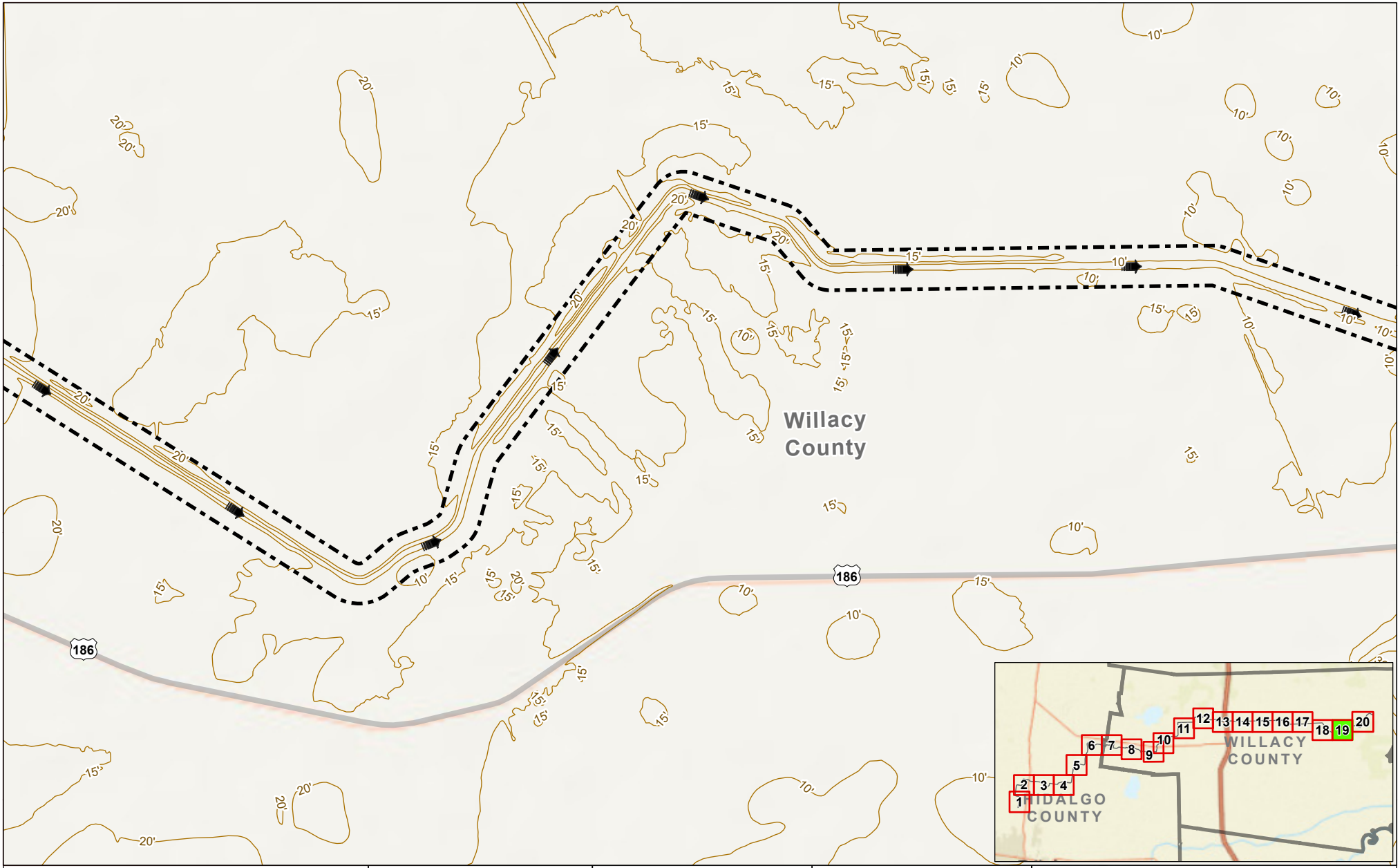
Sheet 18 of 20
Raymondville Drain Project

Author :	Joel F. Aguirre	Updated :	7/20/2023

DISCLAIMER: S&B Infrastructure makes no guarantees as to the accuracy of 3rd party data used in the construction of this map.

Data Provenance: ESRI - World Ocean Basemap (2022), USGS - Elevation Contour Lines (2022)

Path: S:\projects\3408\800_ProjectRepository\GIS\RDP_End-to-End_Series.aprx



Legend:

- Action Area
- Drain Flow
- Elevation Contour

N

0 1,000 2,000

US Feet

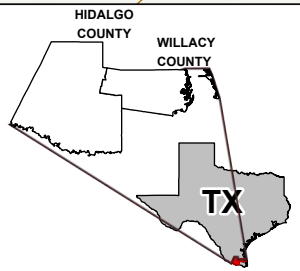


Exhibit 3

Topographic Map (2022)

Sheet 19 of 20
Raymondville Drain Project

Author :	Joel F. Aguirre	Updated :	7/20/2023

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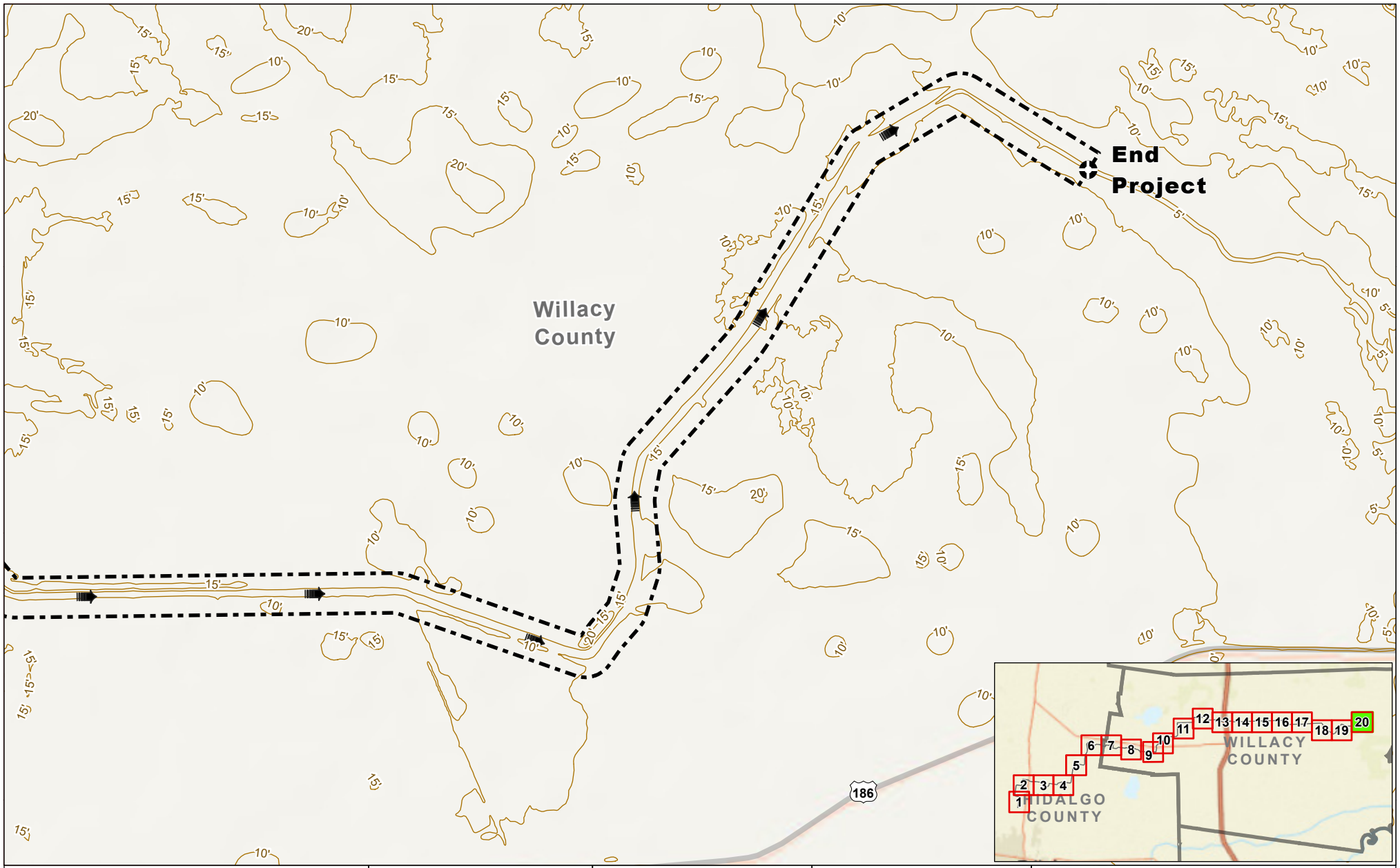
Data Provenance: ESRI - World Ocean Basemap (2022), USGS - Elevation Contour Lines (2022)

Path: S:\projects\3408\800_ProjectRepository\GIS\RDP_End-to-End_Series.aprx



Legend:

- Action Area
- Drain Flow
- Elevation Contour

N

0 1,000 2,000

US Feet

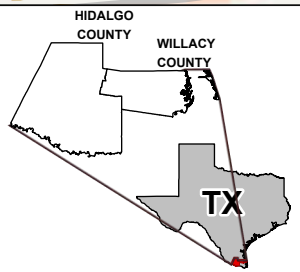


Exhibit 3

Topographic Map (2022)

Sheet 20 of 20
Raymondville Drain Project

Author :	Joel F. Aguirre	Updated :	7/20/2023

DISCLAIMER: S&B Infrastructure makes no guarantees as to the accuracy of 3rd party data used in the construction of this map.

Data Provenance: ESRI - World Ocean Basemap (2022), USGS - Elevation Contour Lines (2022)

Path: S:\projects\3408\800_ProjectRepository\GIS\RDP_End-to-End_Series.aprx

Legend:

- Action Area
- Drain Flow

N

0 1,000 2,000

US Feet

Exhibit 4

Aerial Photograph (2022)

Sheet 1 of 20
Raymondville Drain Project

Author : Joel F. Aguirre | **Updated :** 7/20/2023

DISCLAIMER: S&B Infrastructure makes no guarantees as to the accuracy of 3rd party data used in the construction of this map.

Data Provenance: NAIP World Aerial Imagery (2022)

Legend:

- Action Area
- Drain Flow

N

0 1,000 2,000

US Feet

Exhibit 4

Aerial Photograph (2022)

Sheet 2 of 20
Raymondville Drain Project

Author : Joel F. Aguirre **Updated :** 7/20/2023

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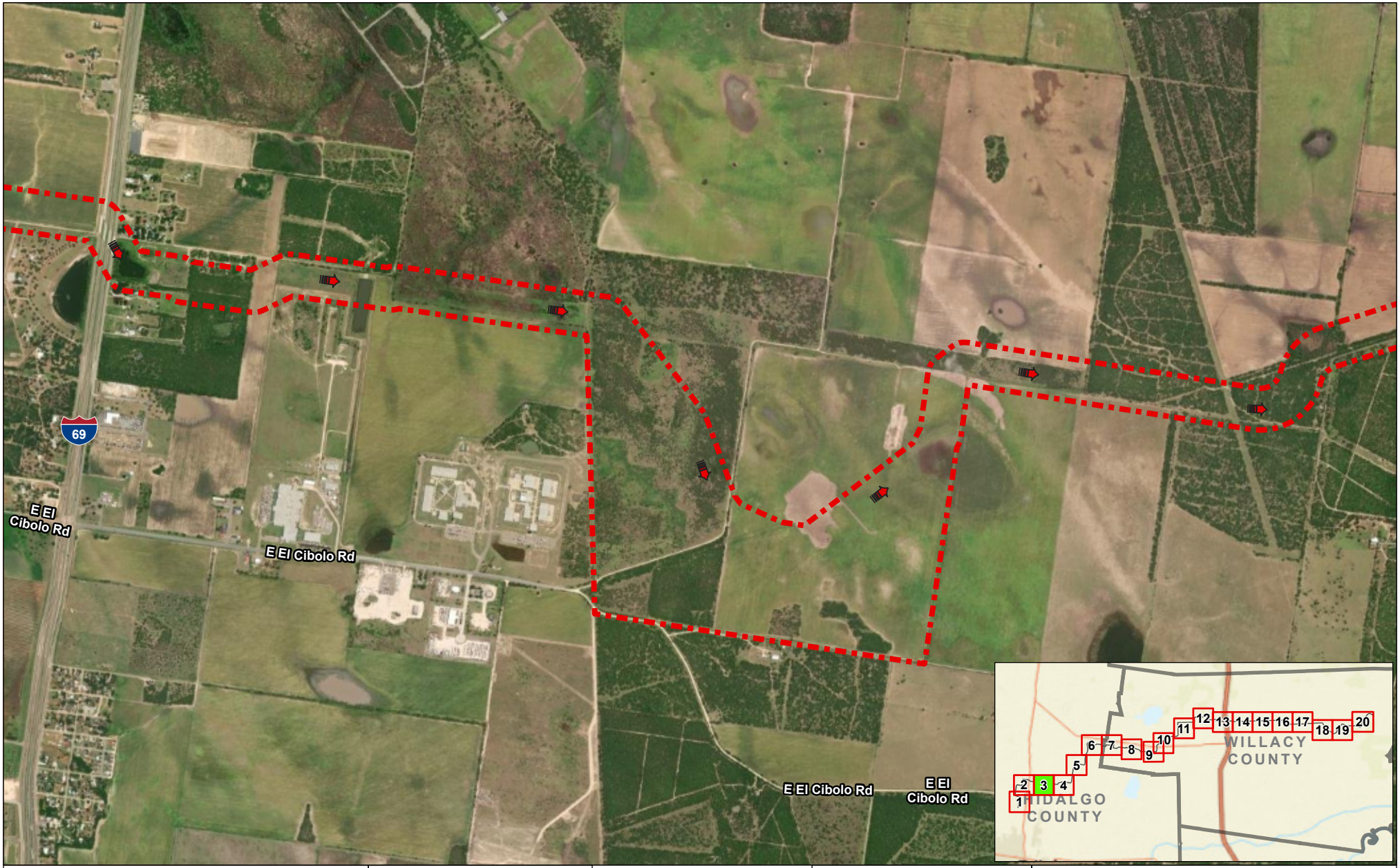
Data Provenance: NAIP World Aerial Imagery (2022)

Path: S:\projects\3408\800_ProjectRepository\GIS\RDP_End-to-End_Series.aprx



Legend:

- Action Area
- Drain Flow

N

0 1,000 2,000

US Feet

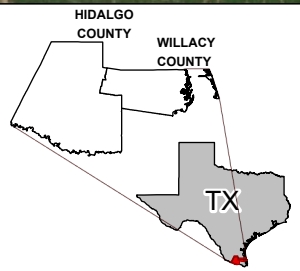


Exhibit 4

Aerial Photograph (2022)

Sheet 3 of 20
Raymondville Drain Project

Author :	Joel F. Aguirre	Updated :	7/20/2023

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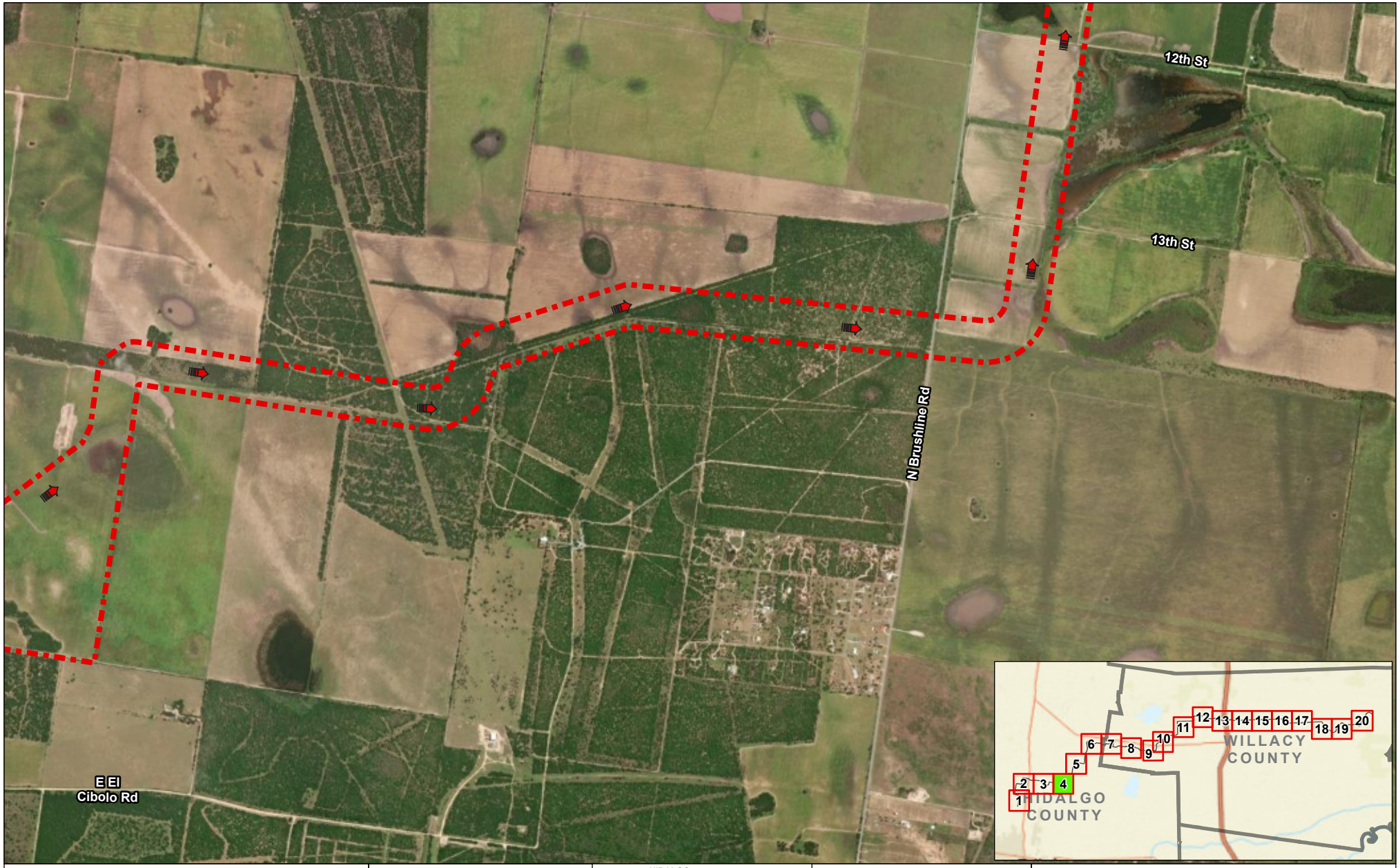
Data Provenance: NAIP World Aerial Imagery (2022)

Path: S:\projects\3408\800_ProjectRepository\GIS\RDP_End-to-End_Series.aprx



Legend:

- Action Area
- Drain Flow

N

0 1,000 2,000

US Feet

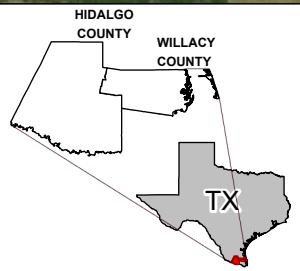


Exhibit 4

Aerial Photograph (2022)

Sheet 4 of 20
Raymondville Drain Project

Author :	Joel F. Aguirre	Updated :	7/20/2023

DISCLAIMER: S&B Infrastructure makes no guarantees as to the accuracy of 3rd party data used in the construction of this map.

Data Provenance: NAIP World Aerial Imagery (2022)

Path: S:\projects\3408\800_ProjectRepository\GIS\RDP_End-to-End_Series.aprx

Legend:

- Action Area
- Drain Flow

N

0 1,000 2,000

US Feet

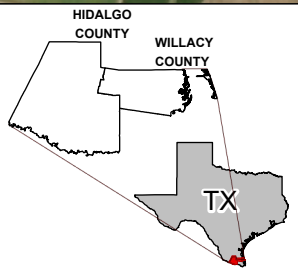


Exhibit 4

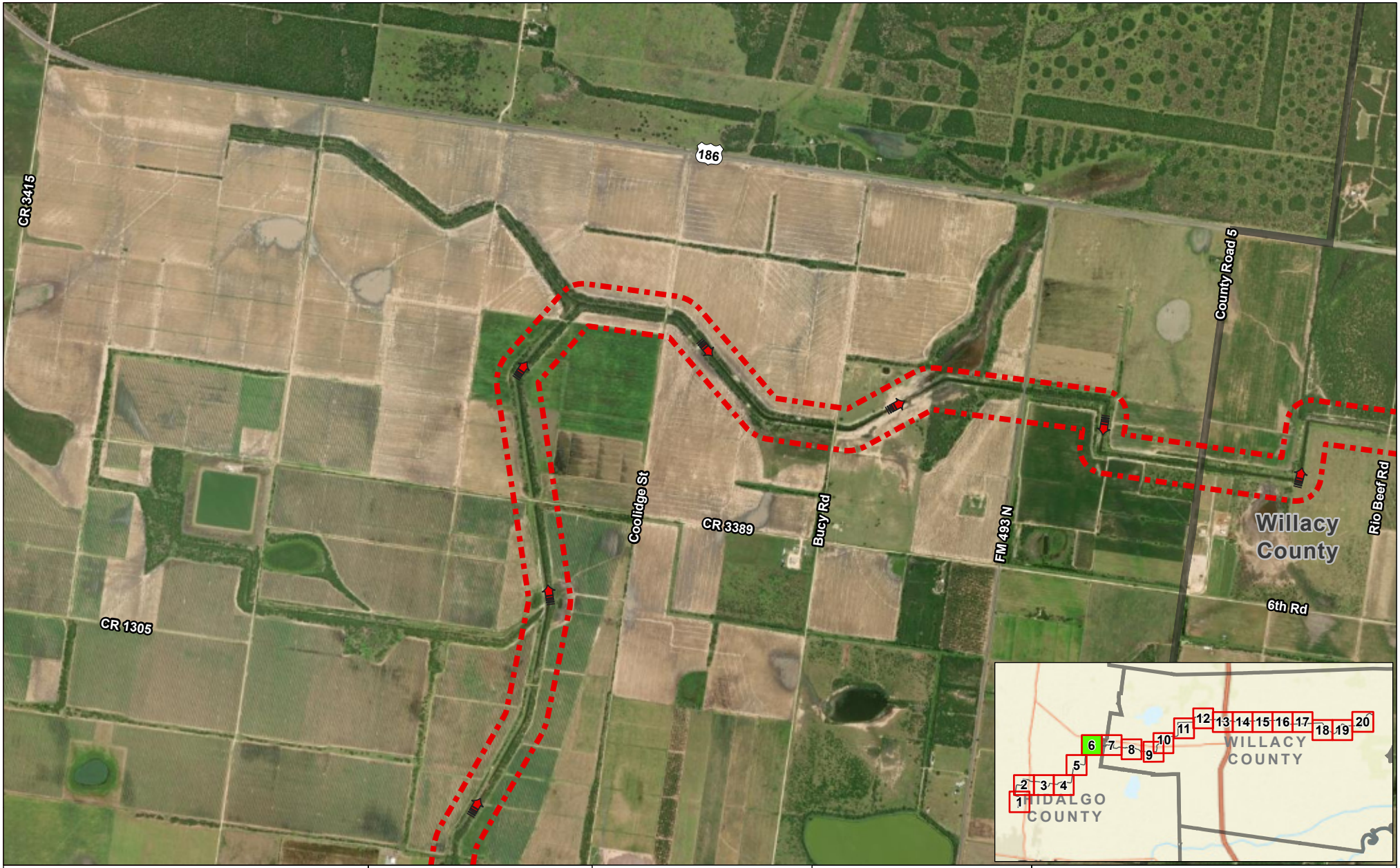
Aerial Photograph (2022)

Sheet 5 of 20
Raymondville Drain Project

Author : Joel F. Aguirre **Updated :** 7/20/2023

DISCLAIMER: S&B Infrastructure makes no guarantees as to the accuracy of 3rd party data used in the construction of this map.

Data Provenance: NAIP World Aerial Imagery (2022)



Legend:

- Action Area
- Drain Flow

N

0 1,000 2,000

US Feet

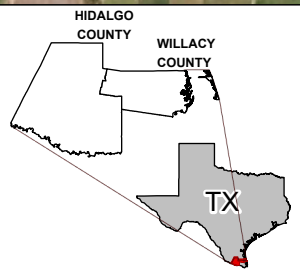


Exhibit 4

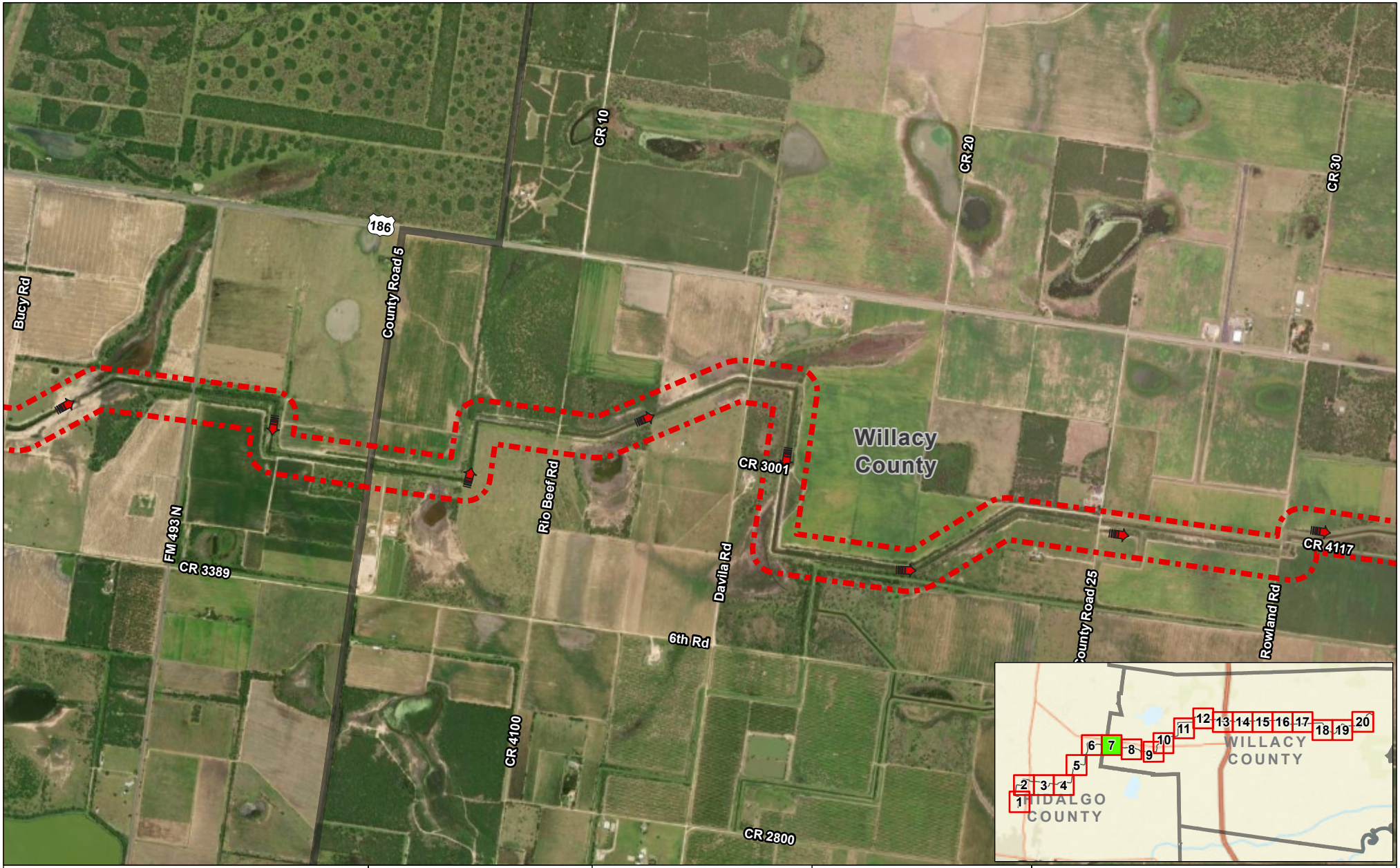
Aerial Photograph (2022)

Sheet 6 of 20
Raymondville Drain Project

Author : Joel F. Aguirre **Updated :** 7/20/2023

DISCLAIMER: S&B Infrastructure makes no guarantees as to the accuracy of 3rd party data used in the construction of this map.

Data Provenance: NAIP World Aerial Imagery (2022)



Legend:

- Action Area
- Drain Flow

N

0 1,000 2,000

US Feet

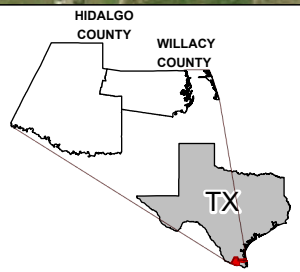


Exhibit 4

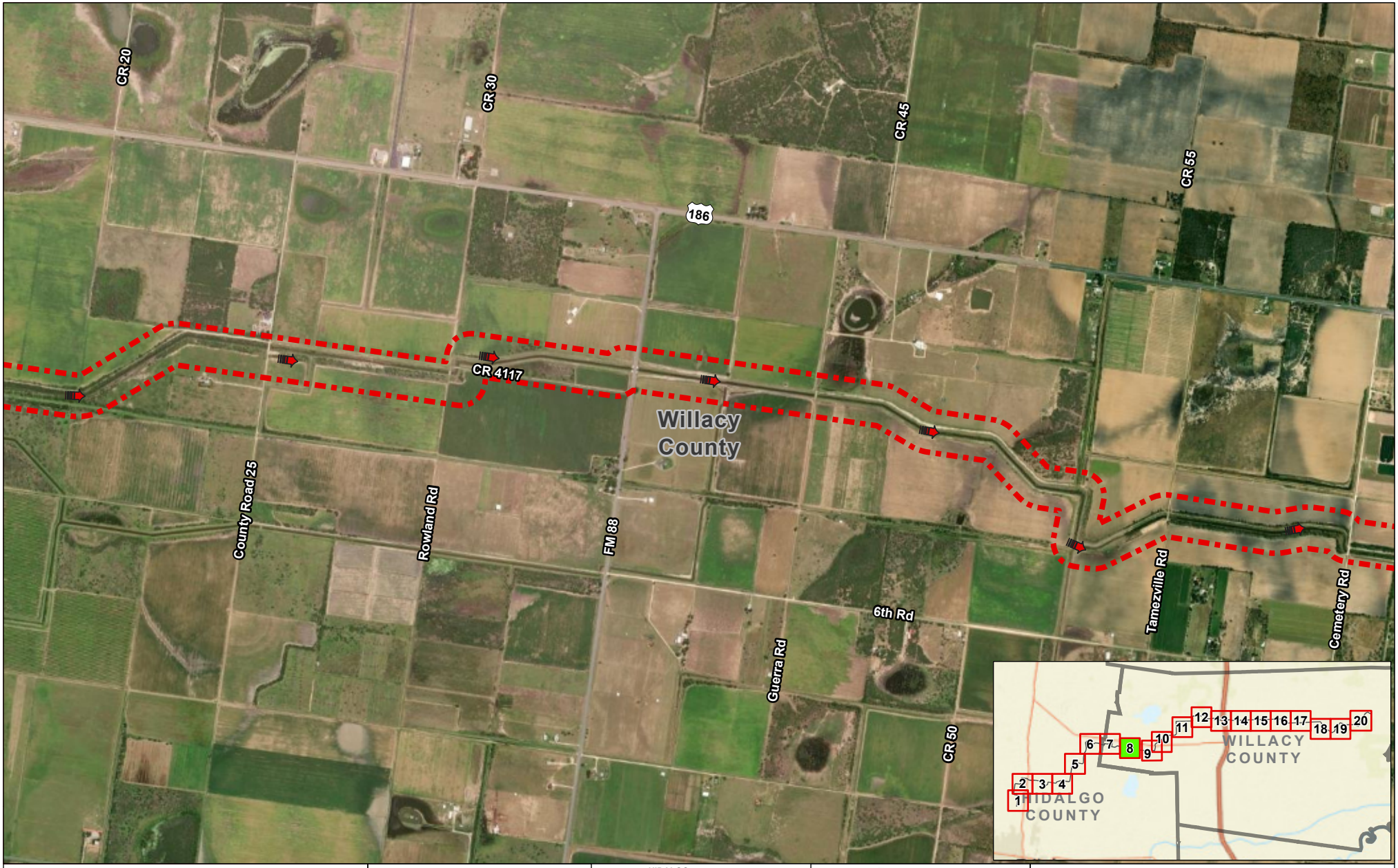
Aerial Photograph (2022)

Sheet 7 of 20
Raymondville Drain Project

Author : Joel F. Aguirre **Updated :** 7/20/2023

DISCLAIMER: S&B Infrastructure makes no guarantees as to the accuracy of 3rd party data used in the construction of this map.

Data Provenance: NAIP World Aerial Imagery (2022)



Legend:

Action Area

Drain Flow

N

0 1,000 2,000

US Feet

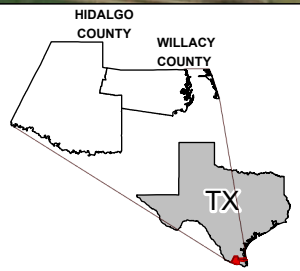


Exhibit 4

Aerial Photograph (2022)

Sheet 8 of 20
Raymondville Drain Project

Author : Joel F. Aguirre | **Updated :** 7/20/2023

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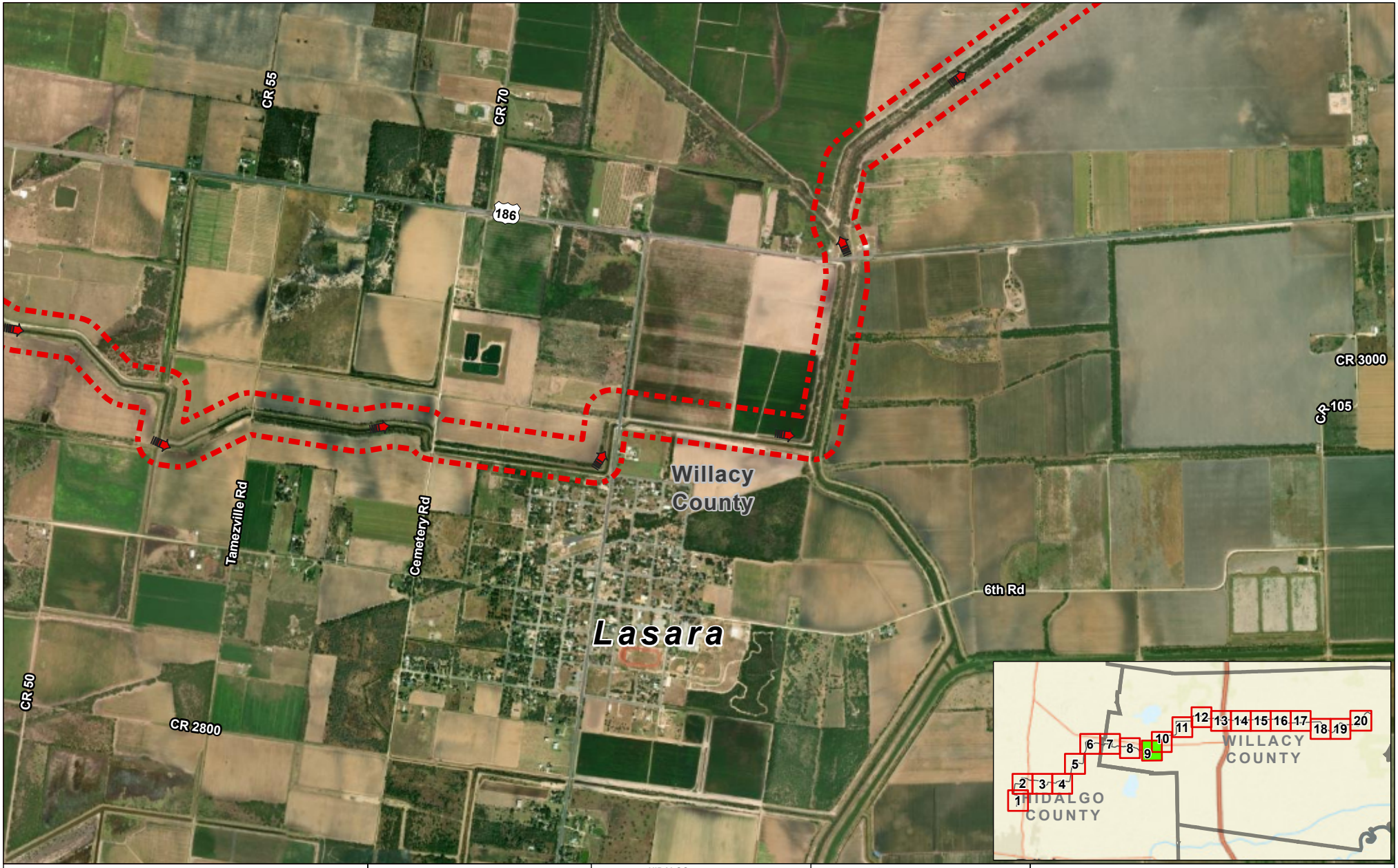
Data Provenance: NAIP World Aerial Imagery (2022)

Path: S:\projects\3408\800_ProjectRepository\GIS\RDP_End-to-End_Series.aprx



Legend:

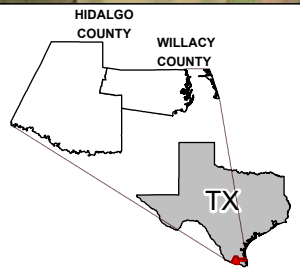
Action Area

Drain Flow

N

0 1,000 2,000

US Feet



RRP
YOUR RELIABLE PARTNER

Exhibit 4

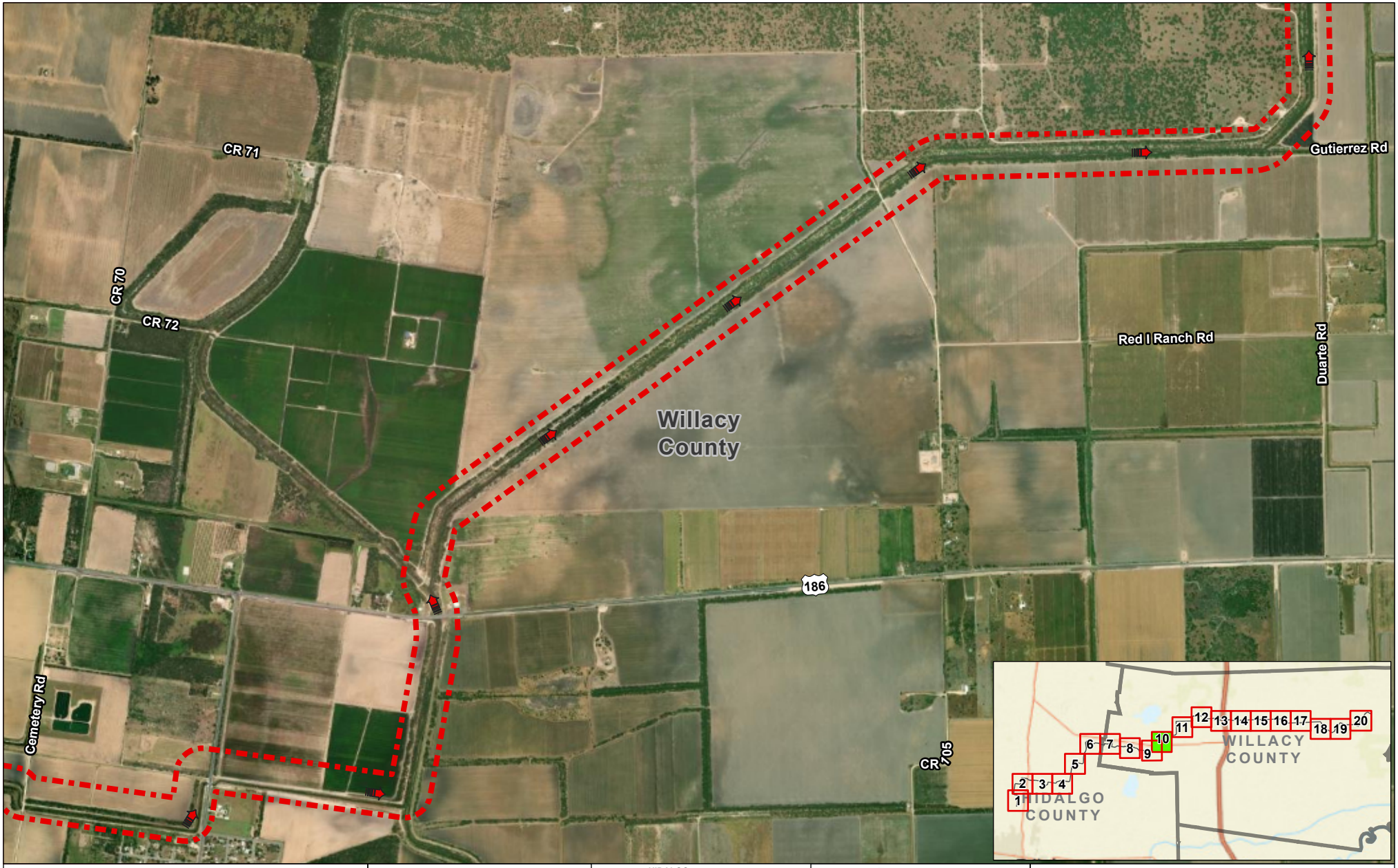
Aerial Photograph (2022)

Sheet 9 of 20
Raymondville Drain Project

Author : Joel F. Aguirre **Updated :** 7/20/2023

DISCLAIMER: S&B Infrastructure makes no guarantees as to the accuracy of 3rd party data used in the construction of this map.

Data Provenance: NAIP World Aerial Imagery (2022)



Legend:

- Action Area
- Drain Flow

N

0 1,000 2,000

US Feet

Exhibit 4

Aerial Photograph (2022)

Sheet 10 of 20
Raymondville Drain Project

Author : Joel F. Aguirre | **Updated :** 7/20/2023

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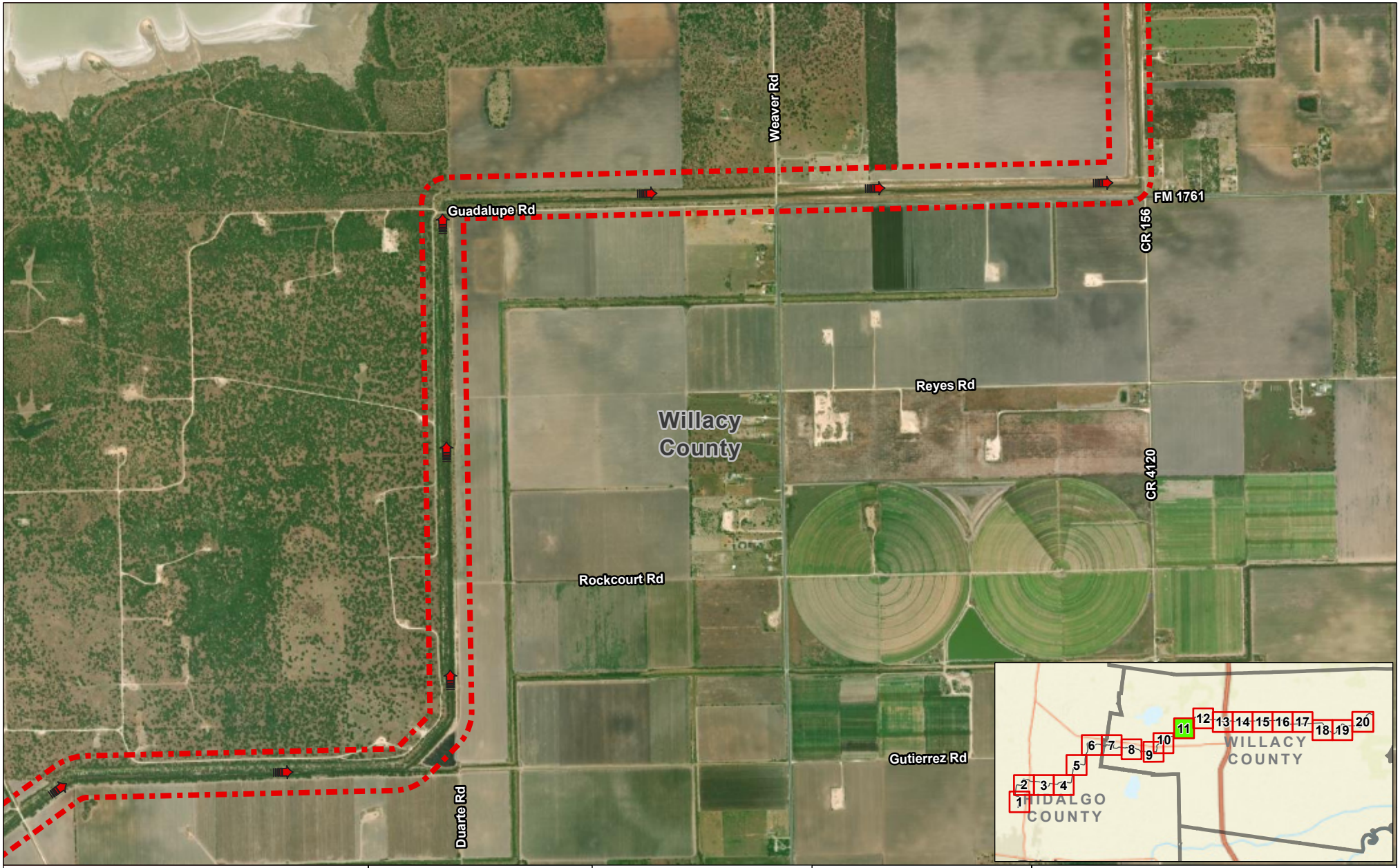
Data Provenance: NAIP World Aerial Imagery (2022)



Legend:

- Action Area
- Drain Flow

N

0 1,000 2,000

US Feet

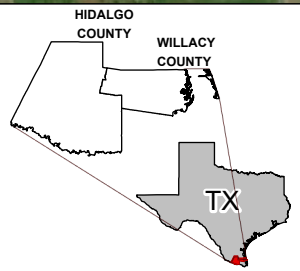


Exhibit 4

Aerial Photograph (2022)

Sheet 11 of 20
Raymondville Drain Project

Author : Joel F. Aguirre **Updated :** 7/20/2023

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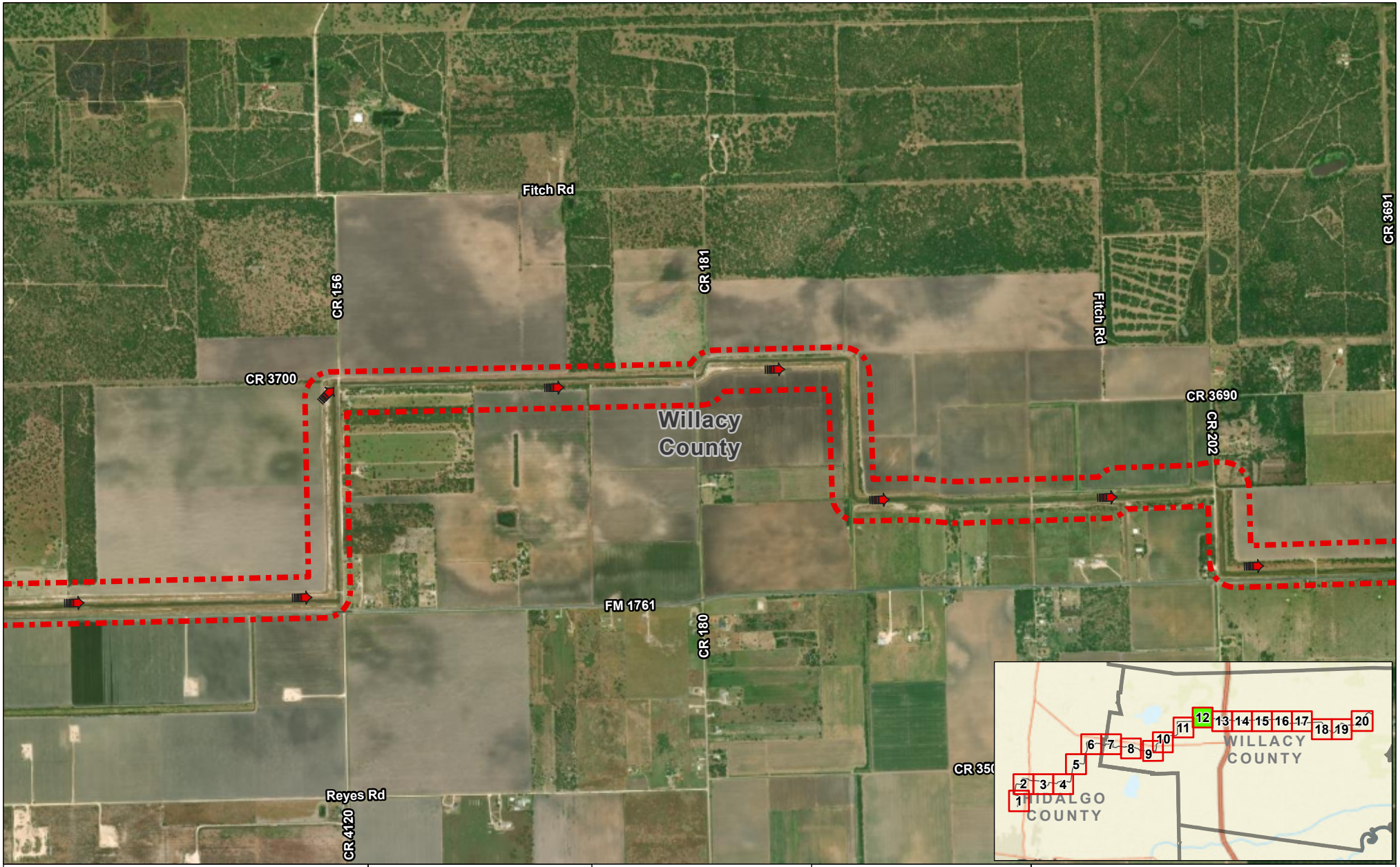
Data Provenance: NAIP World Aerial Imagery (2022)



Legend:

- Action Area
- Drain Flow

N

0 1,000 2,000

US Feet

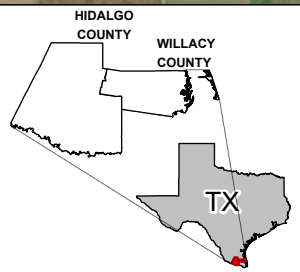


Exhibit 4

Aerial Photograph (2022)

Sheet 12 of 20
Raymondville Drain Project

Author : Joel F. Aguirre **Updated :** 7/20/2023

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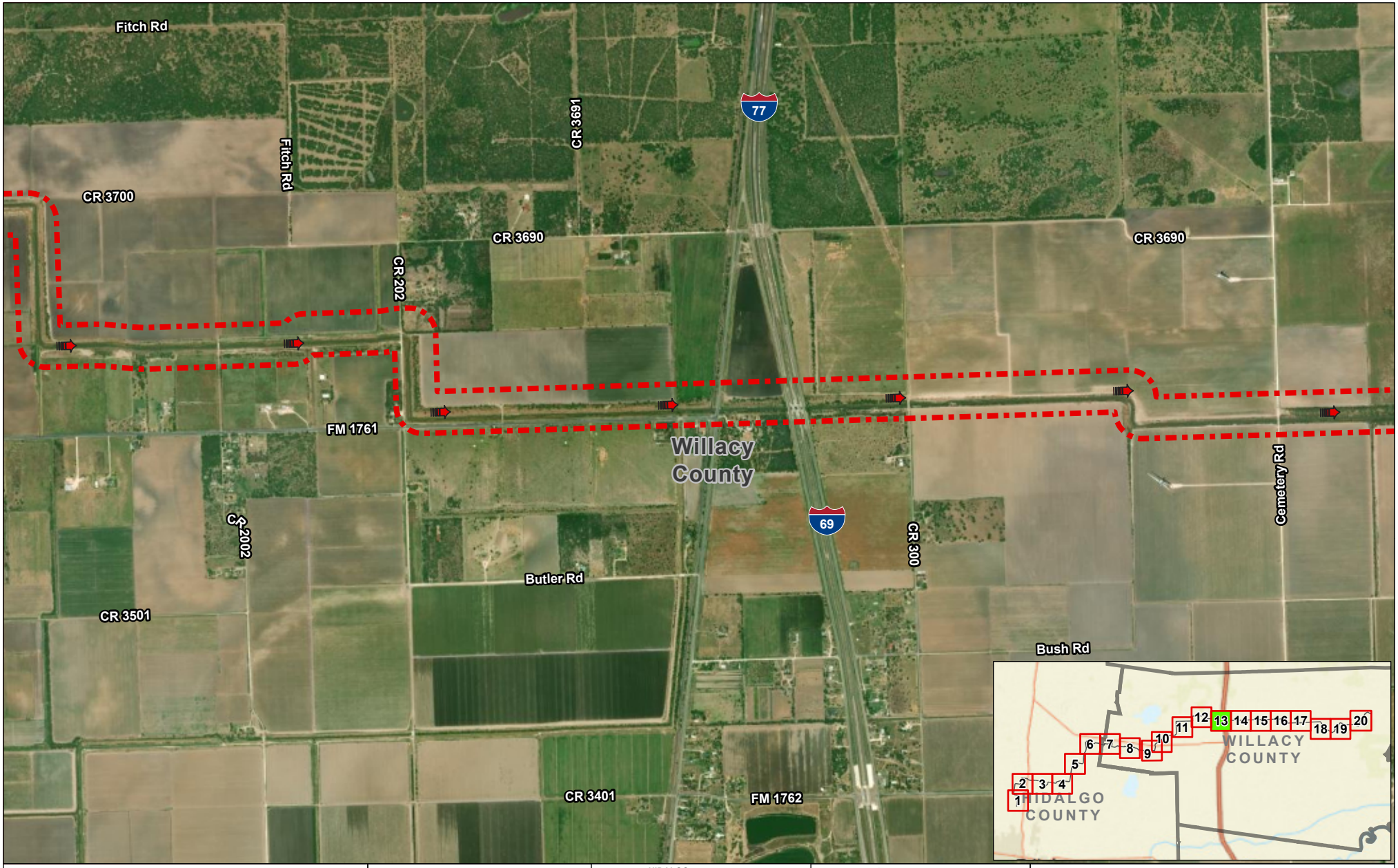
Data Provenance: NAIP World Aerial Imagery (2022)

Path: S:\projects\3408\800_ProjectRepository\GIS\RDP_End-to-End_Series.aprx



Legend:

- Action Area
- Drain Flow

N

0 1,000 2,000

US Feet

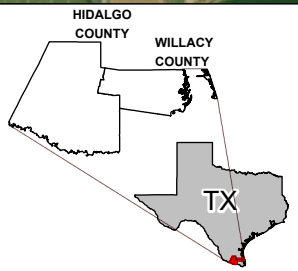


Exhibit 4

Aerial Photograph (2022)

Sheet 13 of 20
Raymondville Drain Project

Author : Joel F. Aguirre **Updated :** 7/20/2023

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Data Provenance: NAIP World Aerial Imagery (2022)

Path: S:\projects\3408\800_ProjectRepository\GIS\RGP_End-to-End_Series.aprx

Legend:

- Action Area
- Drain Flow

N

0 1,000 2,000

US Feet

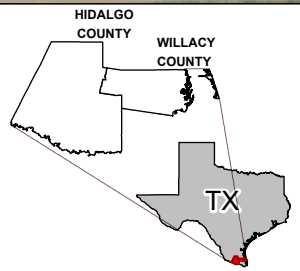

Exhibit 4

Aerial Photograph (2022)

Sheet 14 of 20
Raymondville Drain Project

Author : Joel F. Aguirre **Updated :** 7/20/2023

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Data Provenance: NAIP World Aerial Imagery (2022)

Path: S:\projects\3408\800_ProjectRepository\GIS\RGP_End-to-End_Series.aprx

Legend:

- Action Area
- Drain Flow

N

0 1,000 2,000

US Feet

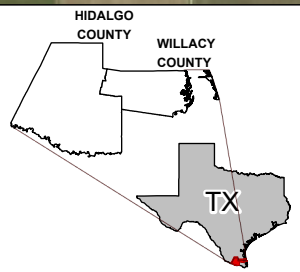

Exhibit 4

Aerial Photograph (2022)

Sheet 15 of 20
Raymondville Drain Project

Author : Joel F. Aguirre | **Updated :** 7/20/2023

DISCLAIMER: S&B Infrastructure makes no guarantees as to the accuracy of 3rd party data used in the construction of this map.

Data Provenance: NAIP World Aerial Imagery (2022)

Path: S:\projects\3408\800_ProjectRepository\GIS\RDP_End-to-End_Series.aprx

Legend:

- Action Area
- Drain Flow

N

0 1,000 2,000

US Feet

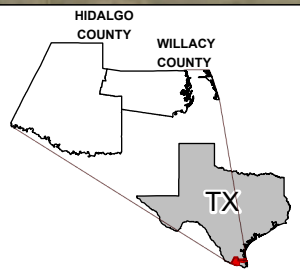

Exhibit 4

Aerial Photograph (2022)

Sheet 16 of 20
Raymondville Drain Project

Author : Joel F. Aguirre **Updated :** 7/20/2023

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Data Provenance: NAIP World Aerial Imagery (2022)

Path: S:\projects\3408\800_ProjectRepository\GIS\RDP_End-to-End_Series.aprx

Legend:

- Action Area
- Drain Flow

N

0 1,000 2,000

US Feet

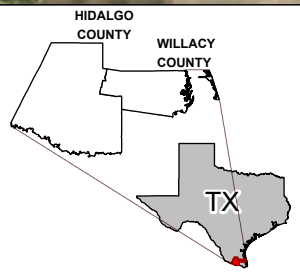

Exhibit 4

Aerial Photograph (2022)

Sheet 17 of 20
Raymondville Drain Project

Author : Joel F. Aguirre | **Updated :** 7/20/2023

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Data Provenance: NAIP World Aerial Imagery (2022)

Path: S:\projects\3408\800_ProjectRepository\GIS\RDP_End-to-End_Series.aprx

Legend:

- Action Area
- Drain Flow

N

0 1,000 2,000

US Feet

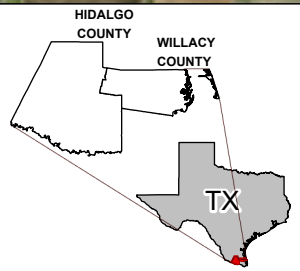

Exhibit 4

Aerial Photograph (2022)

Sheet 18 of 20
Raymondville Drain Project

Author :	Joel F. Aguirre	Updated :	7/20/2023

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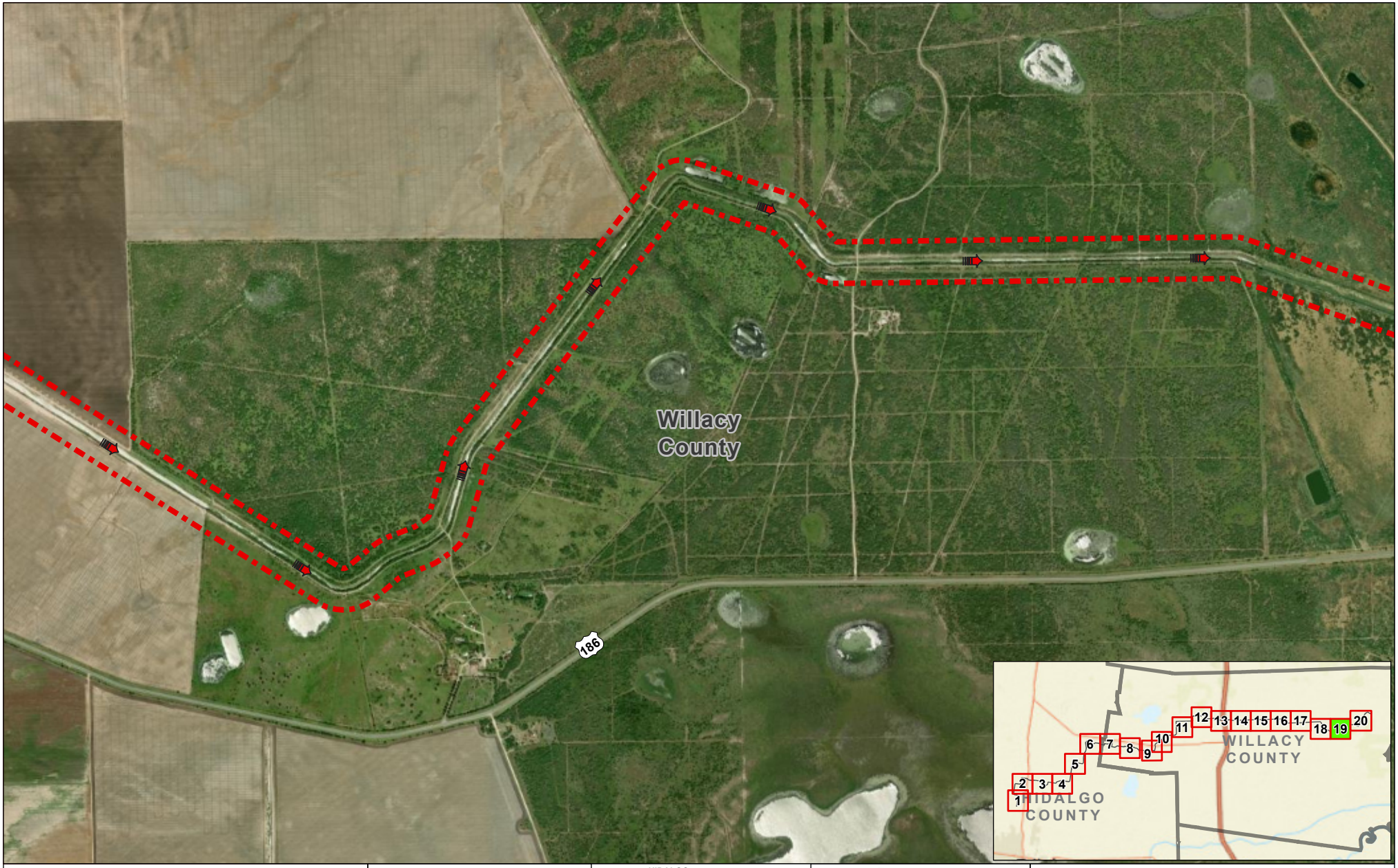
Data Provenance: NAIP World Aerial Imagery (2022)

Path: S:\projects\3408\800_ProjectRepository\GIS\RDP_End-to-End_Series.aprx



Legend:

- Action Area
- Drain Flow

N

0 1,000 2,000

US Feet

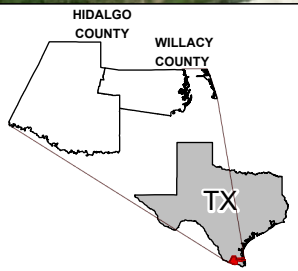


Exhibit 4

Aerial Photograph (2022)

Sheet 19 of 20
Raymondville Drain Project

Author :	Joel F. Aguirre	Updated :	7/20/2023

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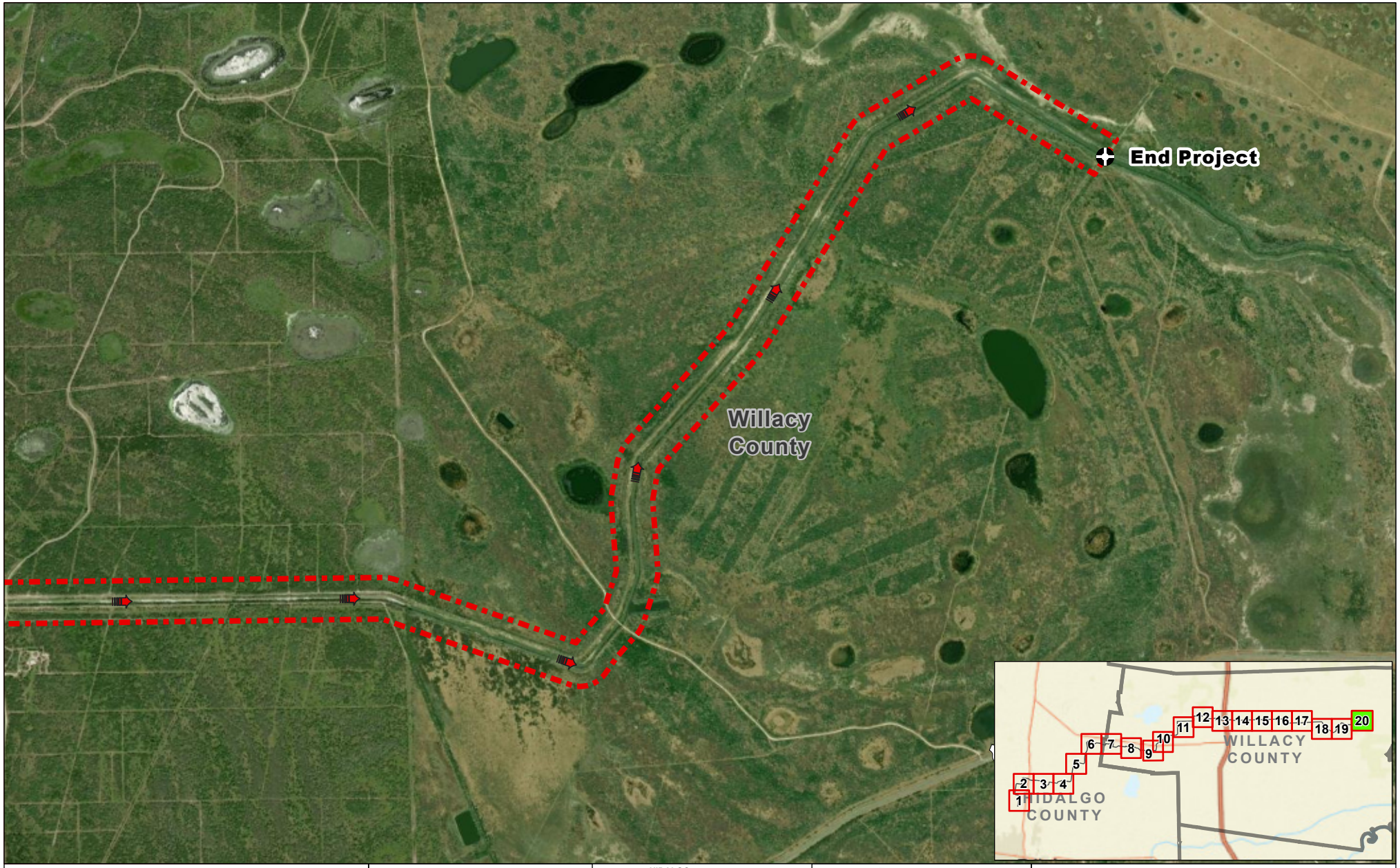
Data Provenance: NAIP World Aerial Imagery (2022)

Path: S:\projects\3408\800_ProjectRepository\GIS\RGP_End-to-End_Series.aprx



Legend:

Action Area

Drain Flow

N

0 1,000 2,000

US Feet

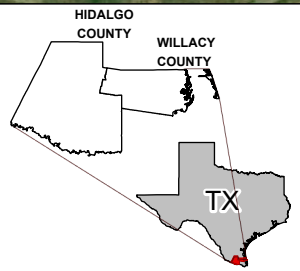


Exhibit 4

Aerial Photograph (2022)

Sheet 20 of 20
Raymondville Drain Project

Author : Joel F. Aguirre **Updated :** 7/20/2023

DISCLAIMER: S&B Infrastructure makes no guarantees as to the accuracy of 3rd party data used in the construction of this map.

Data Provenance: NAIP World Aerial Imagery (2022)

Legend:

- Drain Flow
- Barren
- Row Crop

N

0 1,000 2,000

US Feet

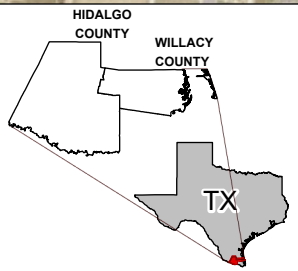


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Exhibit 5

Habitat Areas Map

Sheet 1 of 20
Raymondville Drain Project

Author : Joel F. Aguirre **Updated :** 7/14/2023

DISCLAIMER: RRP makes no guarantees as to the accuracy of 3rd party data used in the construction of this map.

Data Provenance: ESRI World Imagery (2022)

Legend:

- Drain Flow
- Rangeland
- Row Crop
- Shrubland
- Thornscrub

N

0 1,000 2,000

US Feet

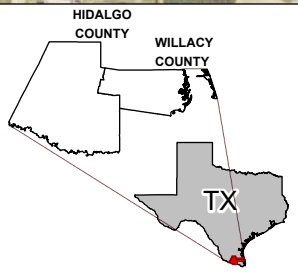

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Exhibit 5

Habitat Areas Map

Sheet 2 of 20
Raymondville Drain Project

Author : Joel F. Aguirre **Updated :** 7/14/2023

DISCLAIMER: RRP makes no guarantees as to the accuracy of 3rd party data used in the construction of this map.

Data Provenance: ESRI World Imagery (2022)

Legend:

- Drain Flow
- Herbaceous Wetland
- Pasture
- Rangeland
- Row Crop
- Shrubland
- Thornscrub

N

0 1,000 2,000

US Feet

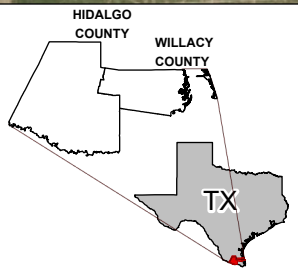

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Exhibit 5

Habitat Areas Map

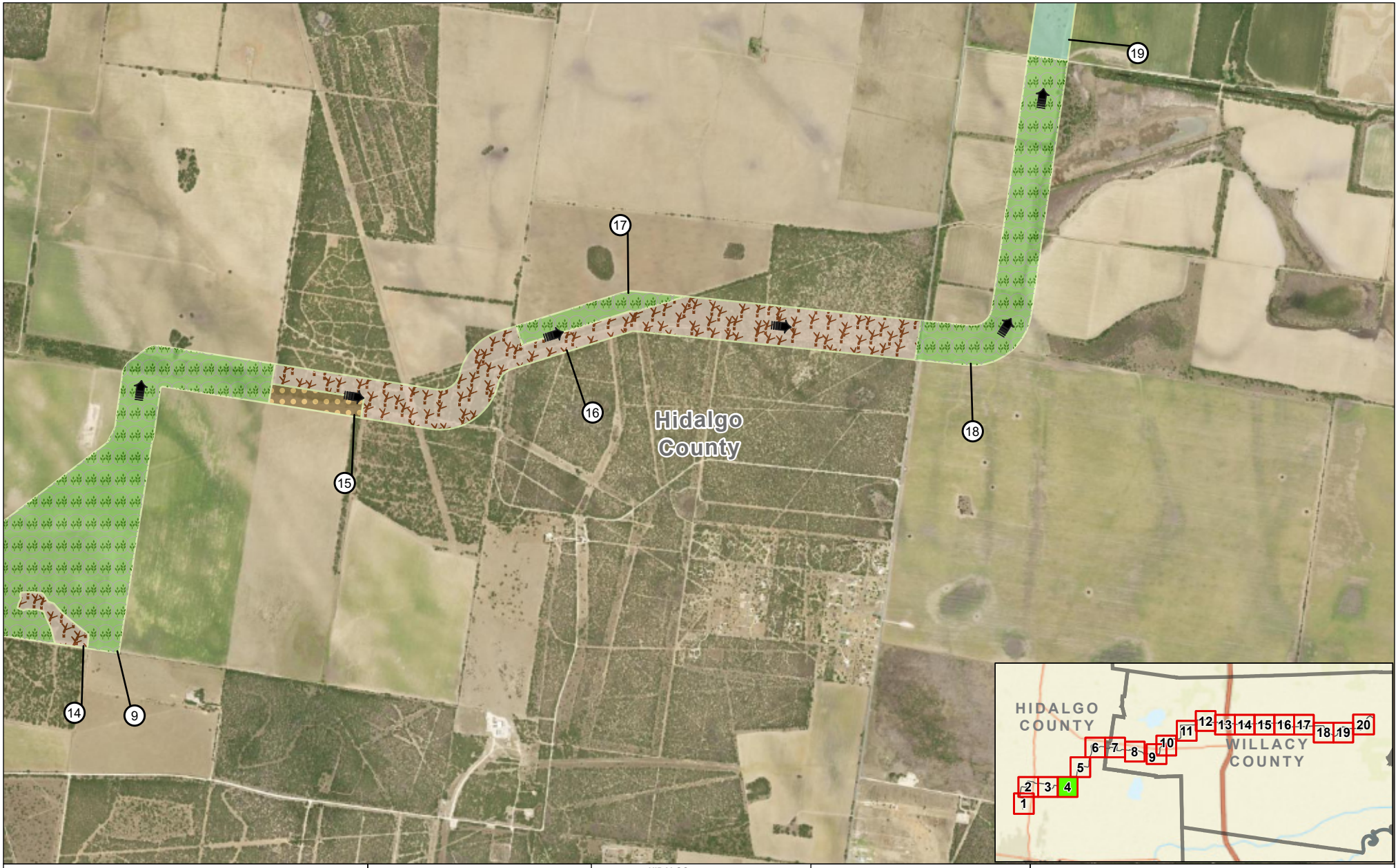
Sheet 3 of 20
Raymondville Drain Project

Author :	Joel F. Aguirre	Updated :	7/14/2023

DISCLAIMER: RRP makes no guarantees as to the accuracy of 3rd party data used in the construction of this map.

Data Provenance: ESRI World Imagery (2022)

Path: S:\projects\340\800_ProjectRepository\GIS\RDP_End-to-End_Series.aprx



Legend:

- Drain Flow
- Pasture
- Rangeland
- Row Crop
- Thornscrub

N

0 1,000 2,000

US Feet

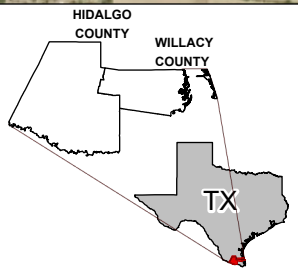


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Exhibit 5

Habitat Areas Map

Sheet 4 of 20
Raymondville Drain Project

Author :	Joel F. Aguirre	Updated :	7/14/2023

DISCLAIMER: RRP makes no guarantees as to the accuracy of 3rd party data used in the construction of this map.

Data Provenance: ESRI World Imagery (2022)

Path: S:\projects\340\800_ProjectRepository\GIS\RDP_End-to-End_Series.aprx

Legend:

- Drain Flow
- Barren
- Orchard
- Rangeland
- Row Crop
- Shrubland
- Washout
- Woodland-grassland

N

0 1,000 2,000

US Feet

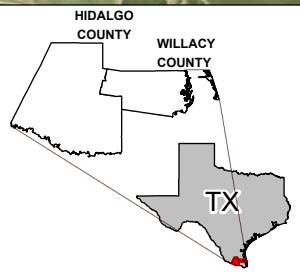

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Exhibit 5

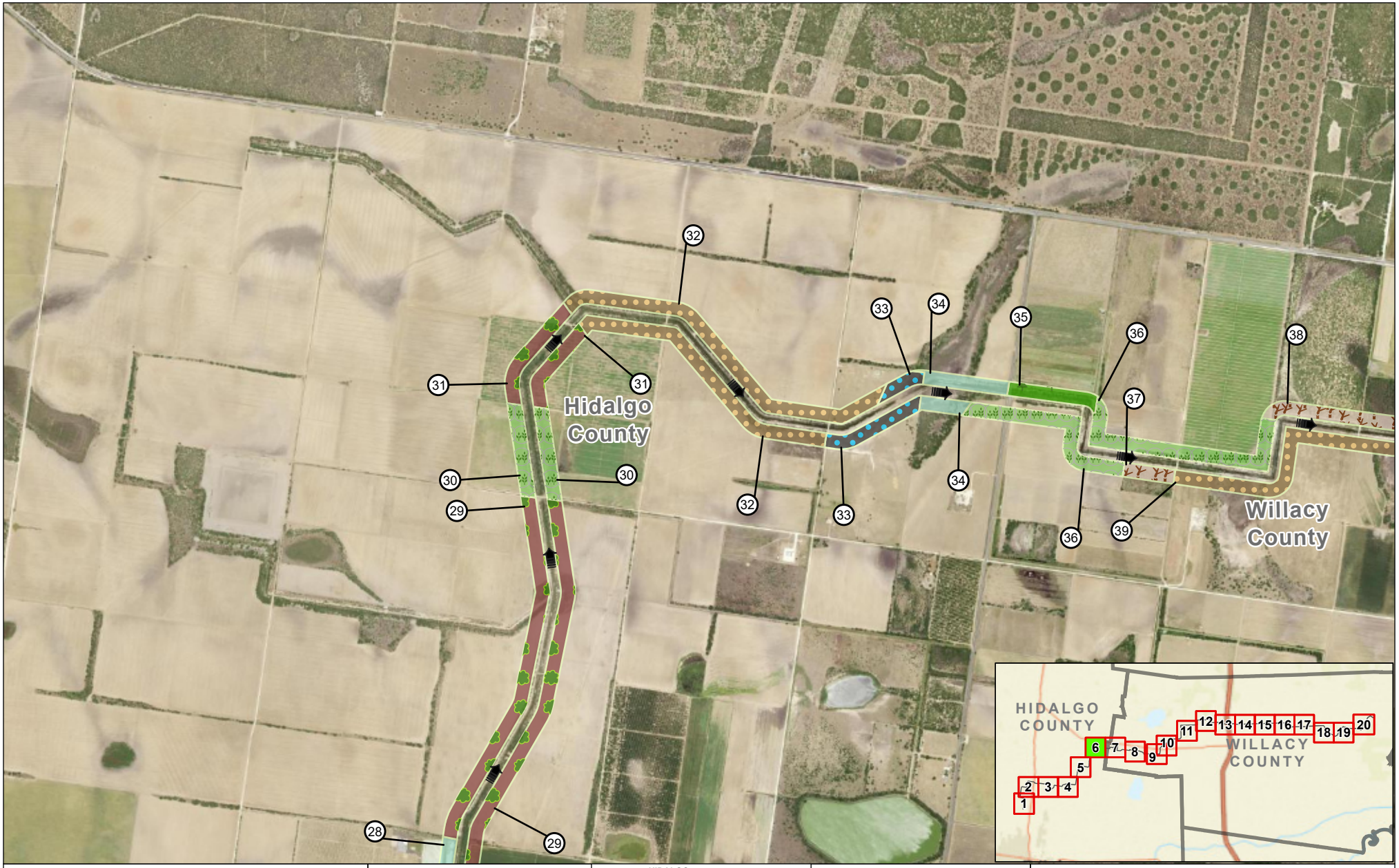
Habitat Areas Map

Sheet 5 of 20
Raymondville Drain Project

Author : Joel F. Aguirre **Updated :** 7/14/2023

DISCLAIMER: RRP makes no guarantees as to the accuracy of 3rd party data used in the construction of this map.

Data Provenance: ESRI World Imagery (2022)



Legend:

- Drain Flow
- Orchard
- Pasture
- Rangeland
- Row Crop
- Thornscrub
- Washout
- Woodland-grassland

N

0 1,000 2,000

US Feet

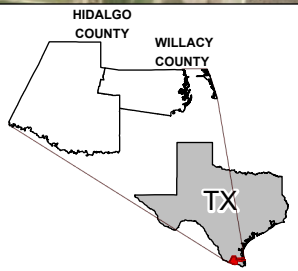


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Exhibit 5

Habitat Areas Map

Sheet 6 of 20

Raymondville Drain Project

Author : Joel F. Aguirre **Updated :** 7/14/2023

DISCLAIMER: RRP makes no guarantees as to the accuracy of 3rd party data used in the construction of this map.

Data Provenance: ESRI World Imagery (2022)

Legend:

- Drain Flow
- Lawn
- Pasture
- Rangeland
- Row Crop
- Shrubland
- Thornscrub
- Washout
- Woodland-grassland

N

0 1,000 2,000

US Feet

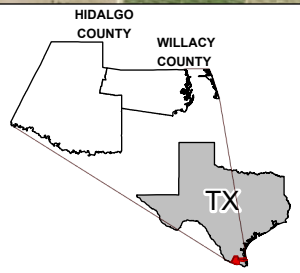

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Exhibit 5

Habitat Areas Map

Sheet 7 of 20

Raymondville Drain Project

Author :	Joel F. Aguirre	Updated :	7/14/2023

DISCLAIMER: RRP makes no guarantees as to the accuracy of 3rd party data used in the construction of this map.

Data Provenance: ESRI World Imagery (2022)

Path: S:\projects\340\800_ProjectRepository\GIS\RDP_End-to-End_Series.aprx

Legend:

- Drain Flow
- Lawn
- Pasture
- Rangeland
- Row Crop
- Shrubland
- Thornscrub

N

0 1,000 2,000

US Feet

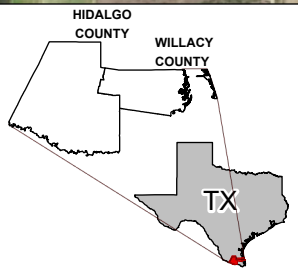

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Exhibit 5

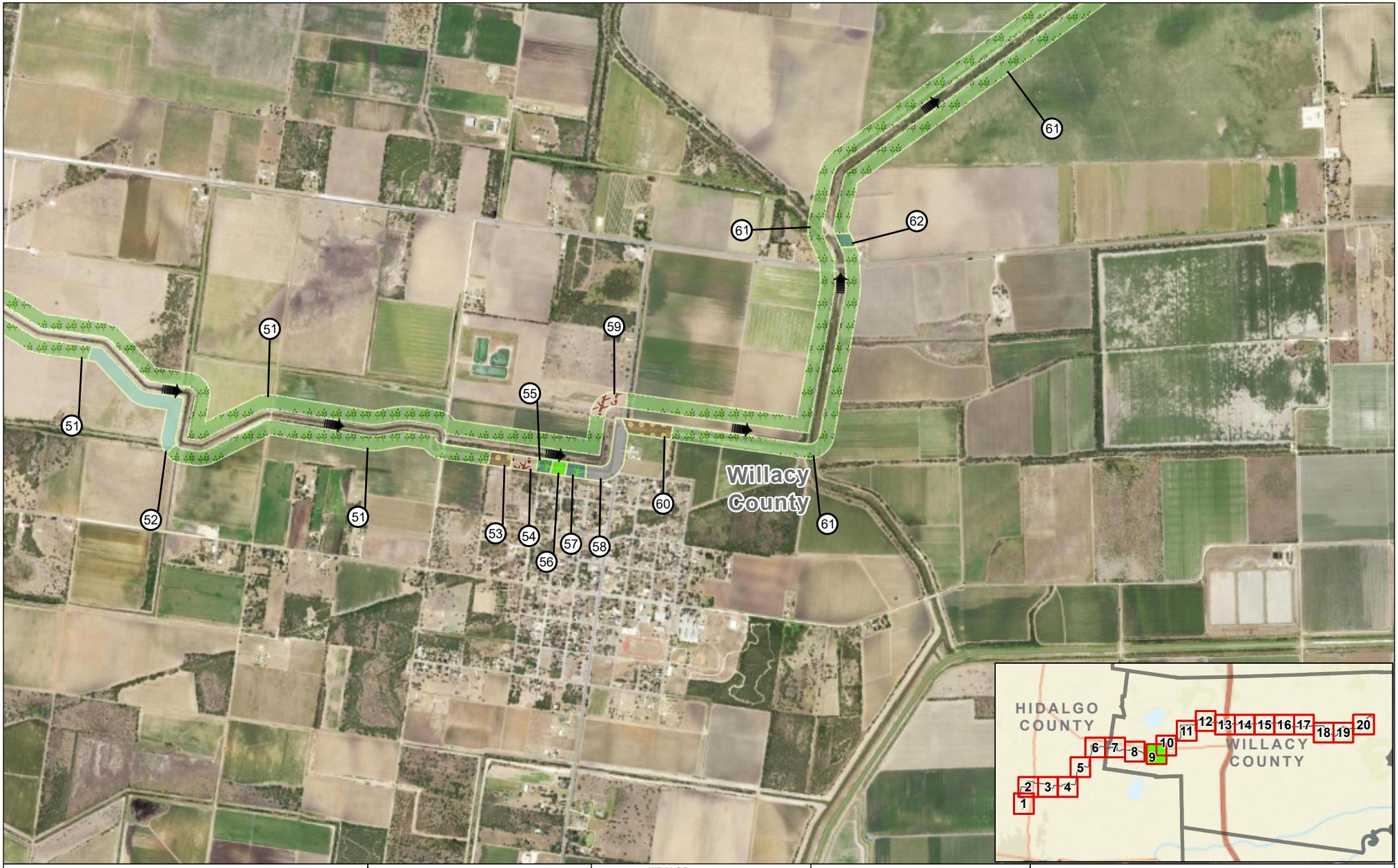
Habitat Areas Map

Sheet 8 of 20
Raymondville Drain Project

Author : Joel F. Aguirre | **Updated :** 7/14/2023

DISCLAIMER: RRP makes no guarantees as to the accuracy of 3rd party data used in the construction of this map.

Data Provenance: ESRI World Imagery (2022)



Legend:

- Drain Flow
- Developed
- Lawn
- Pasture
- Rangeland
- Row Crop
- Shrubland
- Thornscrub

N

0 1,000 2,000

US Feet

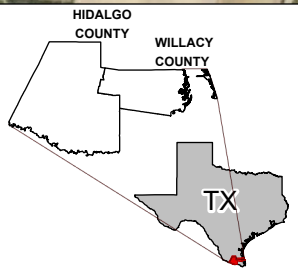


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Exhibit 5

Habitat Areas Map

Sheet 9 of 20
Raymondville Drain Project

Author :	Joel F. Aguirre	Updated :	7/14/2023

DISCLAIMER: RRP makes no guarantees as to the accuracy of 3rd party data used in the construction of this map.

Data Provenance: ESRI World Imagery (2022)

Path: S:\projects\340\800_ProjectRepository\GIS\RDP_End-to-End_Series.aprx

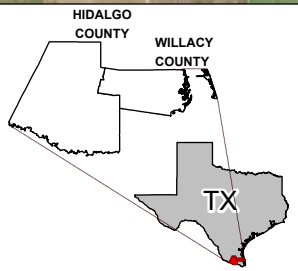
Legend:

- Drain Flow
- Developed
- Lawn
- Pasture
- Rangeland
- Row Crop
- Shrubland
- Thornscrub

N

0 1,000 2,000

US Feet



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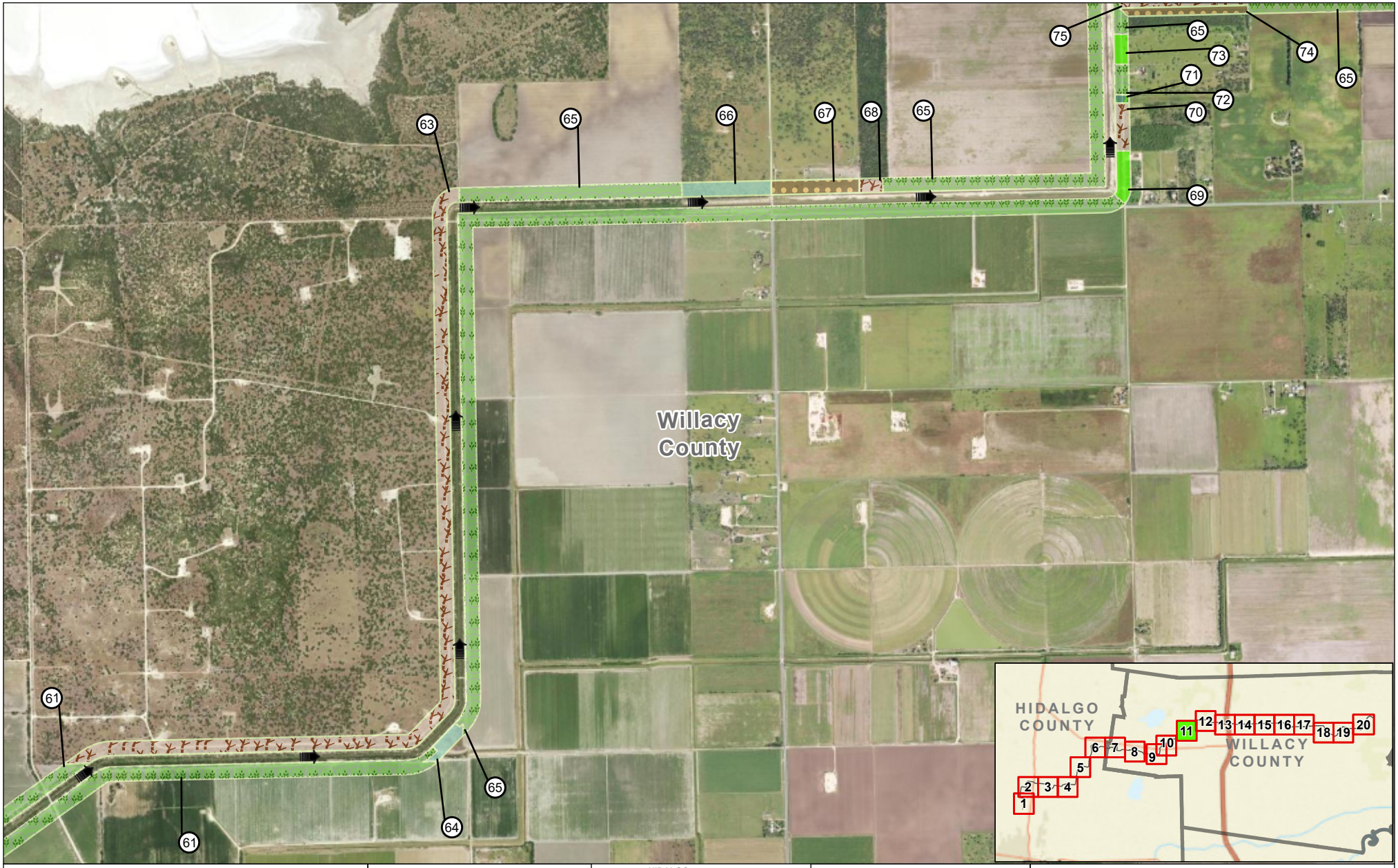
Habitat Areas Map

Sheet 10 of 20
Raymondville Drain Project

Author : Joel F. Aguirre **Updated :** 7/14/2023

DISCLAIMER: RRP makes no guarantees as to the accuracy of 3rd party data used in the construction of this map.

Data Provenance: ESRI World Imagery (2022)



Legend:

- Drain Flow
- Lawn
- Pasture
- Rangeland
- Row Crop
- Shrubland
- Thornscrub

N

0 1,000 2,000

US Feet

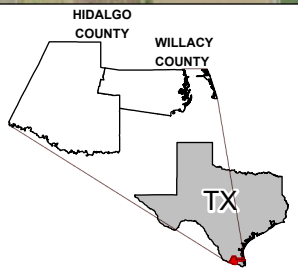


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Exhibit 5

Habitat Areas Map

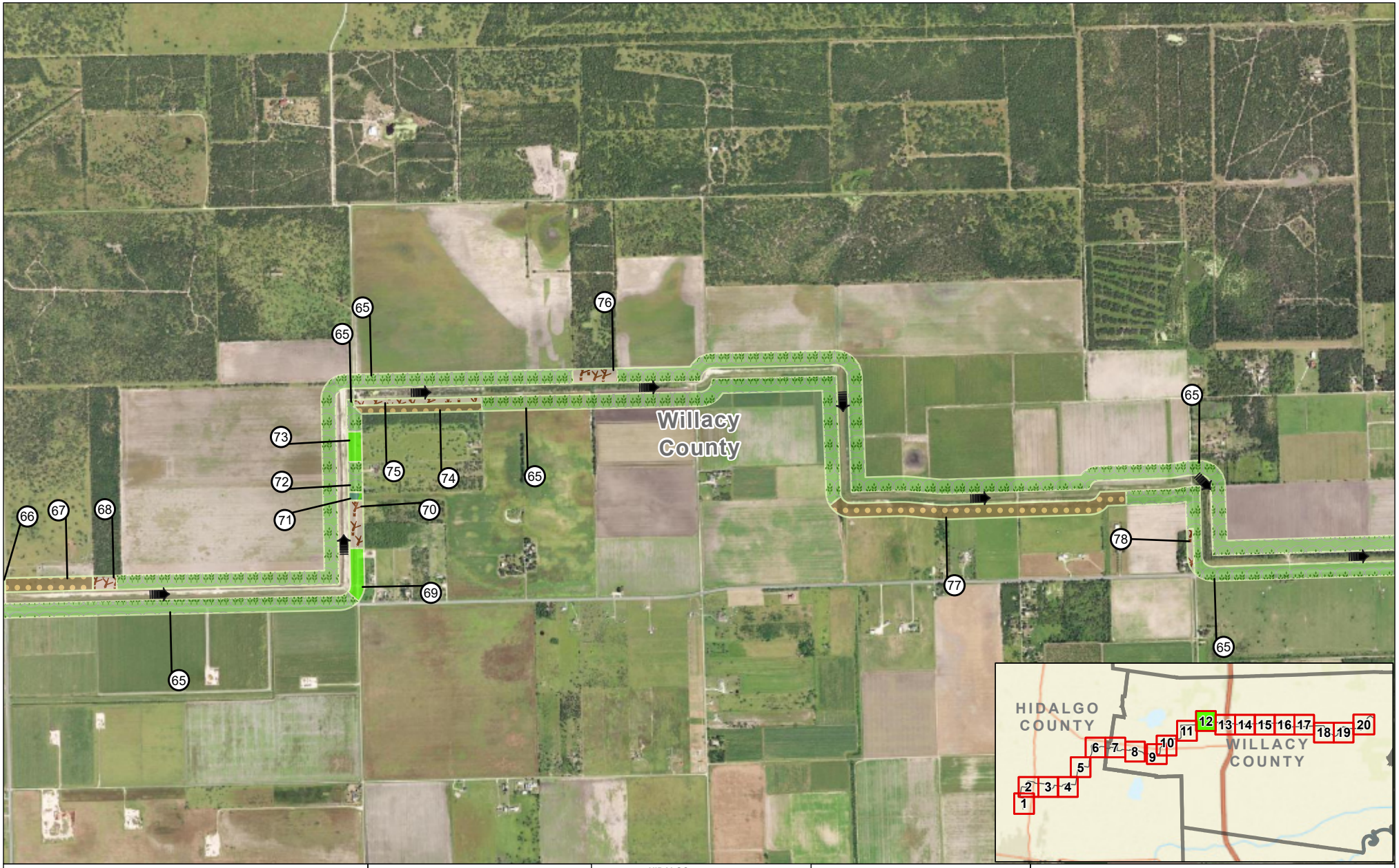
Sheet 11 of 20
Raymondville Drain Project

Author :	Joel F. Aguirre	Updated :	7/14/2023

DISCLAIMER: RRP makes no guarantees as to the accuracy of 3rd party data used in the construction of this map.

Data Provenance: ESRI World Imagery (2022)

Path: S:\projects\340\890\0_ProjectRepository\GIS\RDP_End-to-End_Series.aprx



Legend:

- Drain Flow
- Lawn
- Pasture
- Rangeland
- Row Crop
- Shrubland
- Thornscrub

N

0 1,000 2,000

US Feet

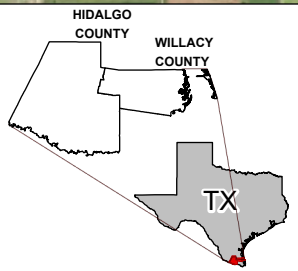


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Exhibit 5

Habitat Areas Map

Sheet 12 of 20
Raymondville Drain Project

Author : Joel F. Aguirre **Updated :** 7/14/2023

DISCLAIMER: RRP makes no guarantees as to the accuracy of 3rd party data used in the construction of this map.

Data Provenance: ESRI World Imagery (2022)

Legend:

- Drain Flow
- Drainageway
- Lawn
- Pasture
- Row Crop
- Thornscrub

N

0 1,000 2,000

US Feet

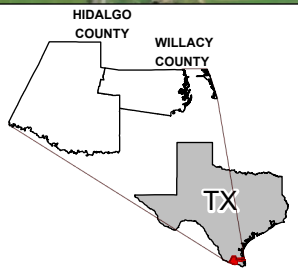

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Exhibit 5

Habitat Areas Map

Sheet 13 of 20
Raymondville Drain Project

Author : Joel F. Aguirre **Updated :** 7/14/2023

DISCLAIMER: RRP makes no guarantees as to the accuracy of 3rd party data used in the construction of this map.

Data Provenance: ESRI World Imagery (2022)

Legend:

- Drain Flow
- Drainageway
- Pasture
- Row Crop

N

0 1,000 2,000

US Feet

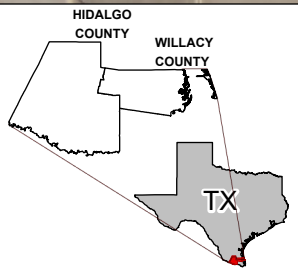

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Exhibit 5

Habitat Areas Map

Sheet 14 of 20

Raymondville Drain Project

Author : Joel F. Aguirre **Updated :** 7/14/2023

DISCLAIMER: RRP makes no guarantees as to the accuracy of 3rd party data used in the construction of this map.

Data Provenance: ESRI World Imagery (2022)

Path: S:\projects\340890\00_ProjectRepository\GIS\RDP_End-to-End_Series.aprx

Legend:

- Drain Flow
- Drainageway
- Row Crop

N

0 1,000 2,000

US Feet

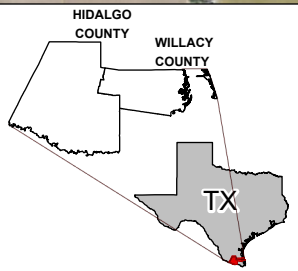

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Exhibit 5

Habitat Areas Map

Sheet 15 of 20
Raymondville Drain Project

Author : Joel F. Aguirre | **Updated :** 7/14/2023

DISCLAIMER: RRP makes no guarantees as to the accuracy of 3rd party data used in the construction of this map.

Data Provenance: ESRI World Imagery (2022)

Path: S:\projects\340\800_ProjectRepository\GIS\RDP_End-to-End_Series.aprx

Legend:

- Drain Flow
- Drainageway
- Row Crop

N

0 1,000 2,000

US Feet

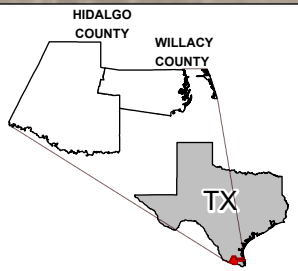

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Exhibit 5

Habitat Areas Map

Sheet 16 of 20
Raymondville Drain Project

Author : Joel F. Aguirre **Updated :** 7/14/2023

DISCLAIMER: RRP makes no guarantees as to the accuracy of 3rd party data used in the construction of this map.

Data Provenance: ESRI World Imagery (2022)

Path: S:\projects\340\800_ProjectRepository\GIS\RDP_End-to-End_Series.aprx

Legend:

- Drain Flow
- Rangeland
- Row Crop

N

0 1,000 2,000

US Feet

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Exhibit 5

Habitat Areas Map

Sheet 17 of 20
Raymondville Drain Project

Author :	Joel F. Aguirre	Updated :	7/14/2023

DISCLAIMER: RRP makes no guarantees as to the accuracy of 3rd party data used in the construction of this map.

Data Provenance: ESRI World Imagery (2022)

Path: S:\projects\340\8900_ProjectRepository\GIS\RDP_End-to-End_Series.aprx

Legend:

- Drain Flow
- Pasture
- Rangeland
- Row Crop
- Thornscrub

N

0 1,000 2,000

US Feet

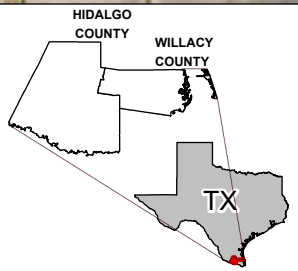

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Exhibit 5

Habitat Areas Map

Sheet 18 of 20

Raymondville Drain Project

Author :	Joel F. Aguirre	Updated :	7/14/2023

DISCLAIMER: RRP makes no guarantees as to the accuracy of 3rd party data used in the construction of this map.

Data Provenance: ESRI World Imagery (2022)

Path: S:\projects\340\800_ProjectRepository\GIS\RDP_End-to-End_Series.aprx

Legend:

- Drain Flow
- Pasture
- Row Crop
- Thornscrub
- Woodland-grassland

N

0 1,000 2,000

US Feet

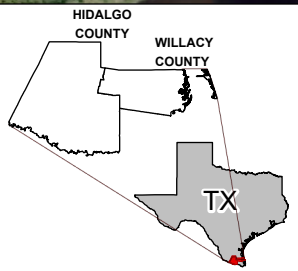

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Exhibit 5

Habitat Areas Map

Sheet 19 of 20

Raymondville Drain Project

Author : Joel F. Aguirre | **Updated :** 7/14/2023

DISCLAIMER: RRP makes no guarantees as to the accuracy of 3rd party data used in the construction of this map.

Data Provenance: ESRI World Imagery (2022)

Legend:

- Drain Flow
- Pasture
- Thornscrub
- Water Body
- Woodland-grassland

N

0 1,000 2,000

US Feet

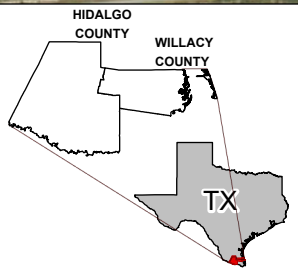

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Exhibit 5

Habitat Areas Map

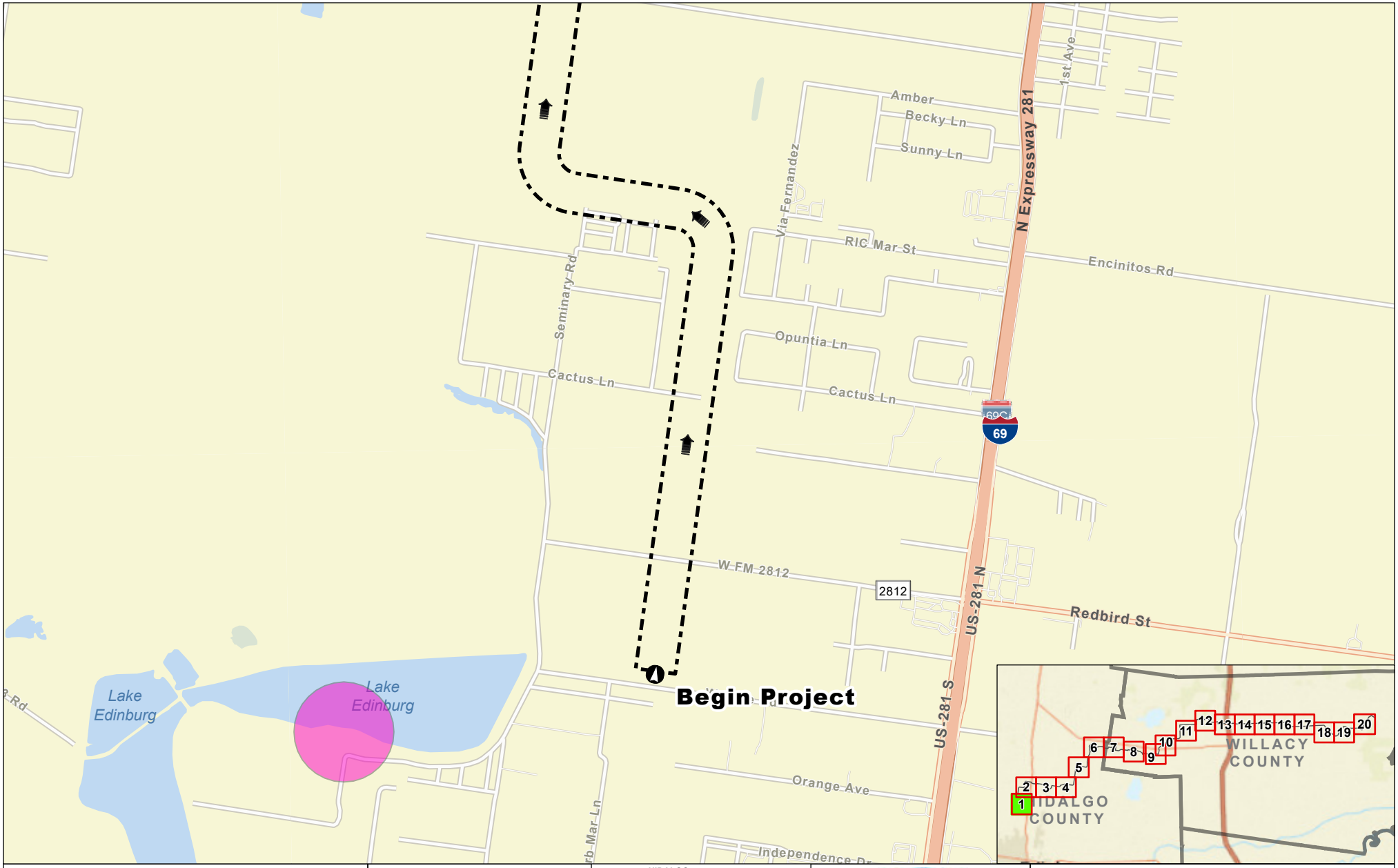
Sheet 20 of 20
Raymondville Drain Project

Author :	Joel F. Aguirre	Updated :	7/14/2023

DISCLAIMER: RRP makes no guarantees as to the accuracy of 3rd party data used in the construction of this map.

Data Provenance: ESRI World Imagery (2022)

Path: S:\projects\340\890\00_ProjectRepository\GIS\RDP_End-to-End_Series.aprx



Legend:

- Action Area
- Drain Flow
- Texas Indigo Snake

N

0 1,000 2,000

US Feet

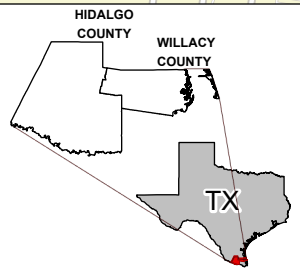


Exhibit 6

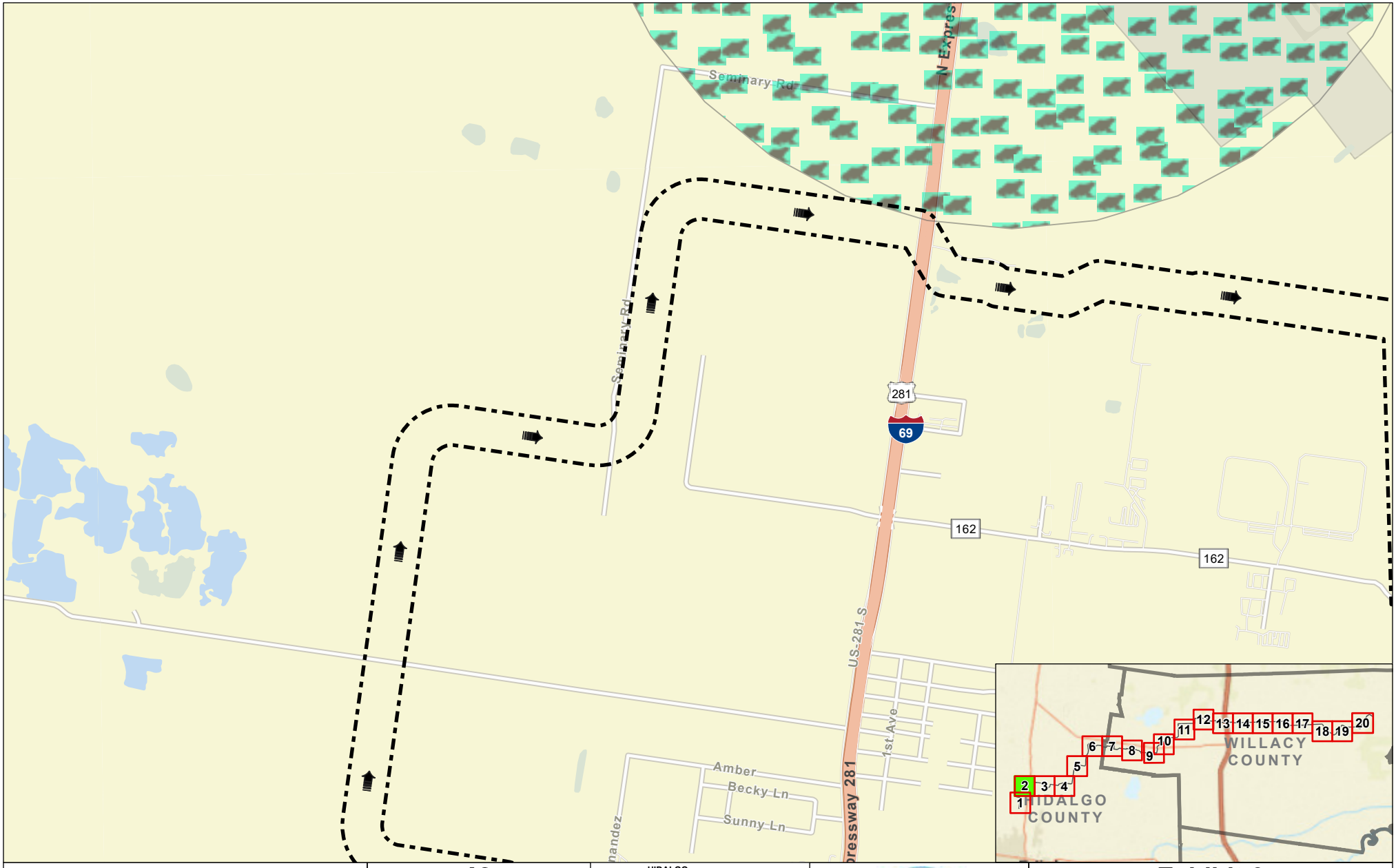
Alternative 1 NDD Map

Sheet 1 of 20
Raymondville Drain Project

Author : Joel F. Aguirre **Updated :** 7/20/2023

DISCLAIMER: RRP Engineering makes no guarantees as to the accuracy of 3rd party data used in the construction of this map.

Data Provenance: ESRI - NAIP Worldview Map (2022),TPWD - National Diversity Database (2022)



Legend:

- Action Area
- Drain Flow
- Sheep Frog

N

0 1,000 2,000

US Feet

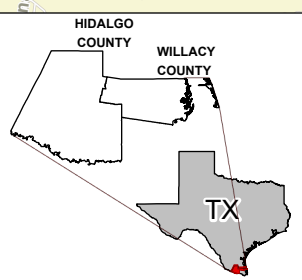


Exhibit 6

Alternative 1 NDD Map

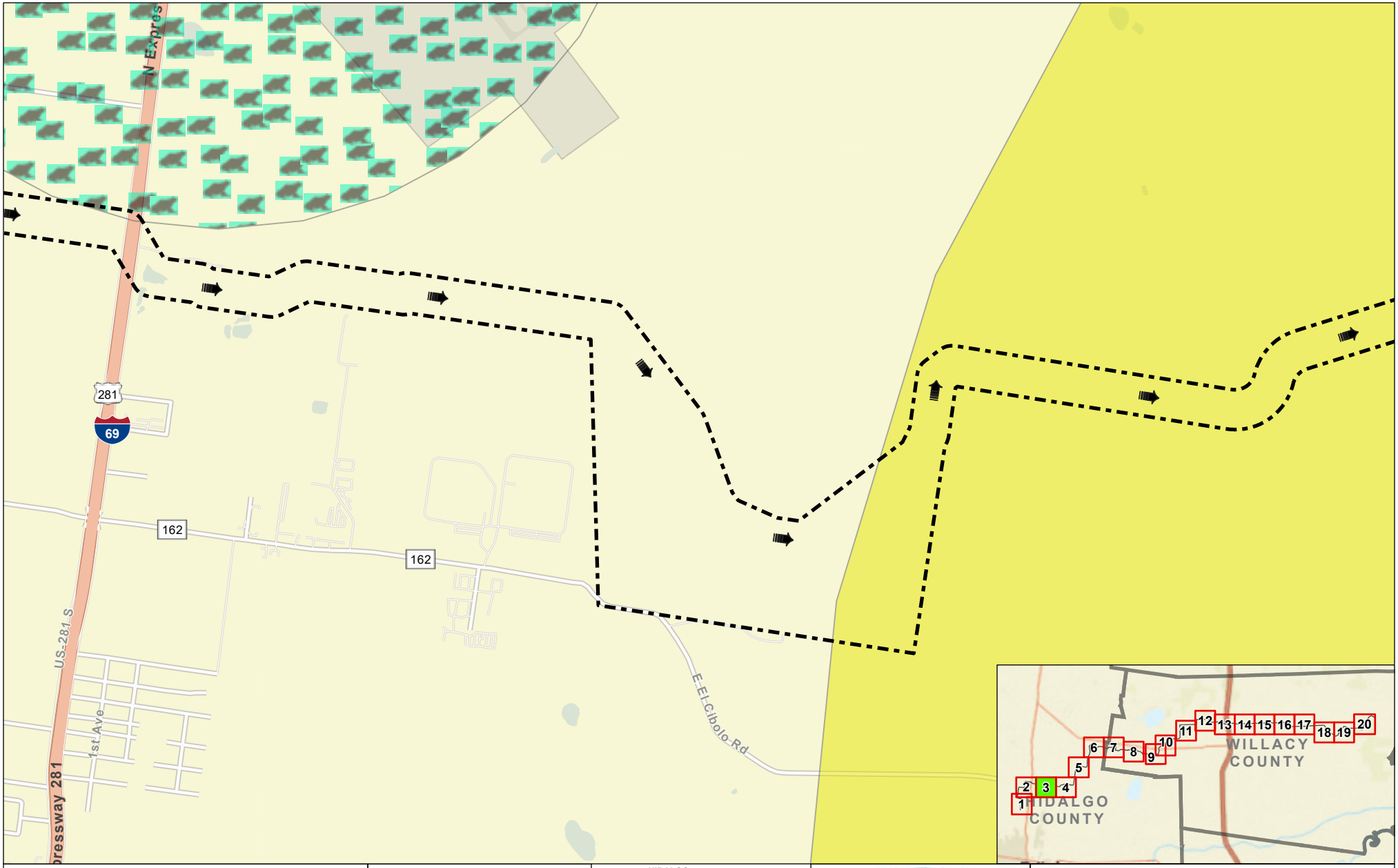
Sheet 2 of 20
Raymondville Drain Project

Author : Joel F. Aguirre **Updated :** 7/20/2023

DISCLAIMER: RRP Engineering makes no guarantees as to the accuracy of 3rd party data used in the construction of this map.

Data Provenance: ESRI - NAIP Worldview Map (2022),TPWD - National Diversity Database (2022)

Path: S:\projects\34080800_ProjectRepository\GIS\RDP_Exd-to-End_Series.aprx



Legend:

- Action Area
- Drain Flow
- Ocelot
- Sheep Frog

N

0 1,000 2,000

US Feet

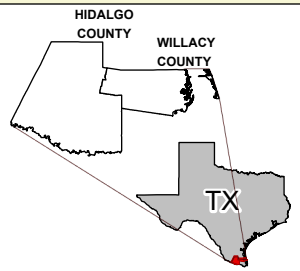


Exhibit 6

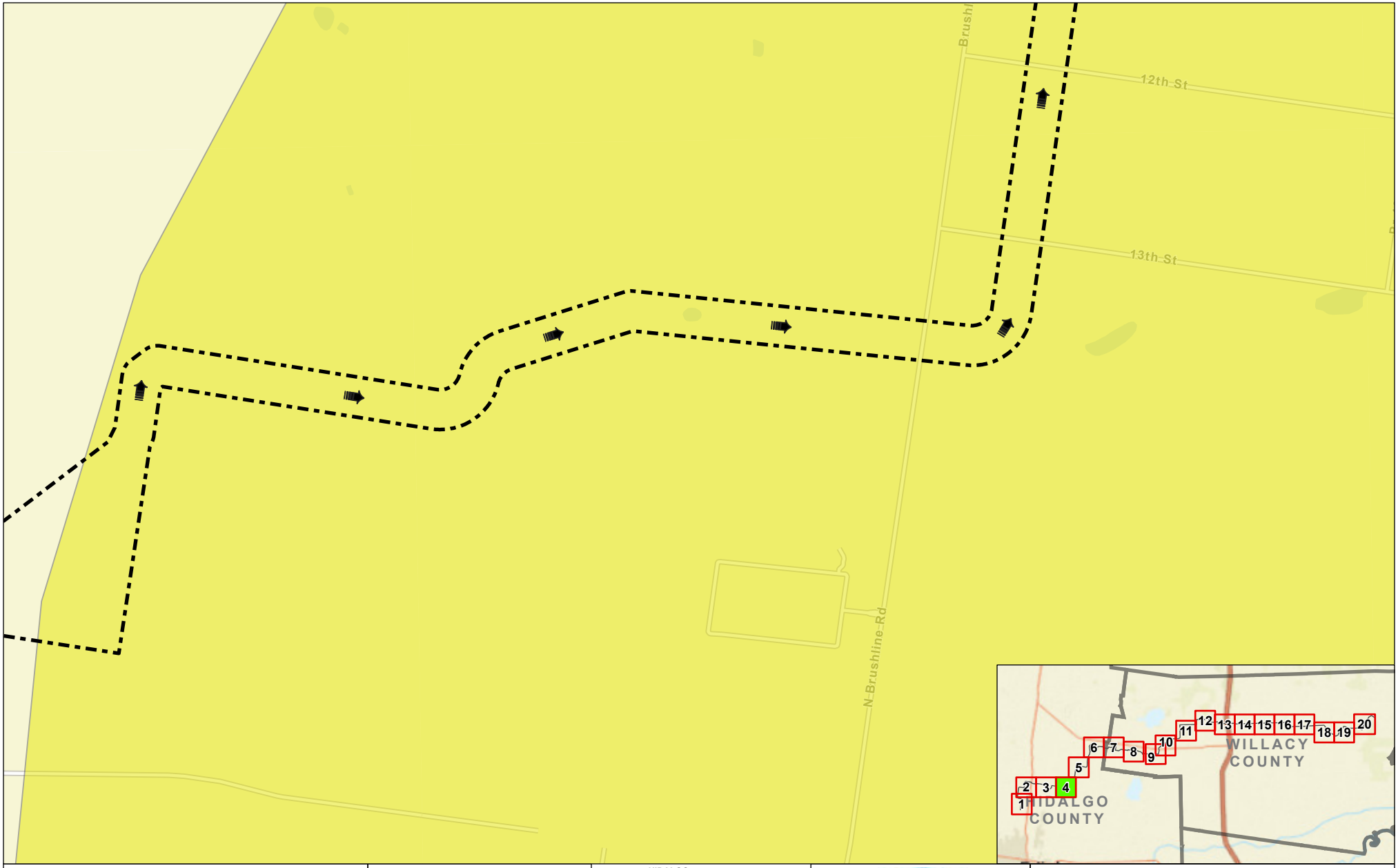
Alternative 1 NDD Map

Sheet 3 of 20
Raymondville Drain Project

Author : Joel F. Aguirre **Updated :** 7/20/2023

DISCLAIMER: RRP Engineering makes no guarantees as to the accuracy of 3rd party data used in the construction of this map.

Data Provenance: ESRI - NAIP Worldview Map (2022),TPWD - National Diversity Database (2022)



Legend:

- Action Area
- Drain Flow
- Ocelot

N

0 1,000 2,000

US Feet

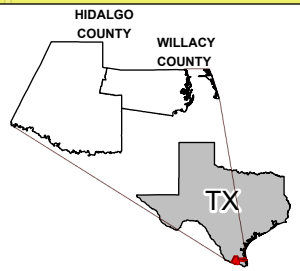


Exhibit 6

Alternative 1 NDD Map

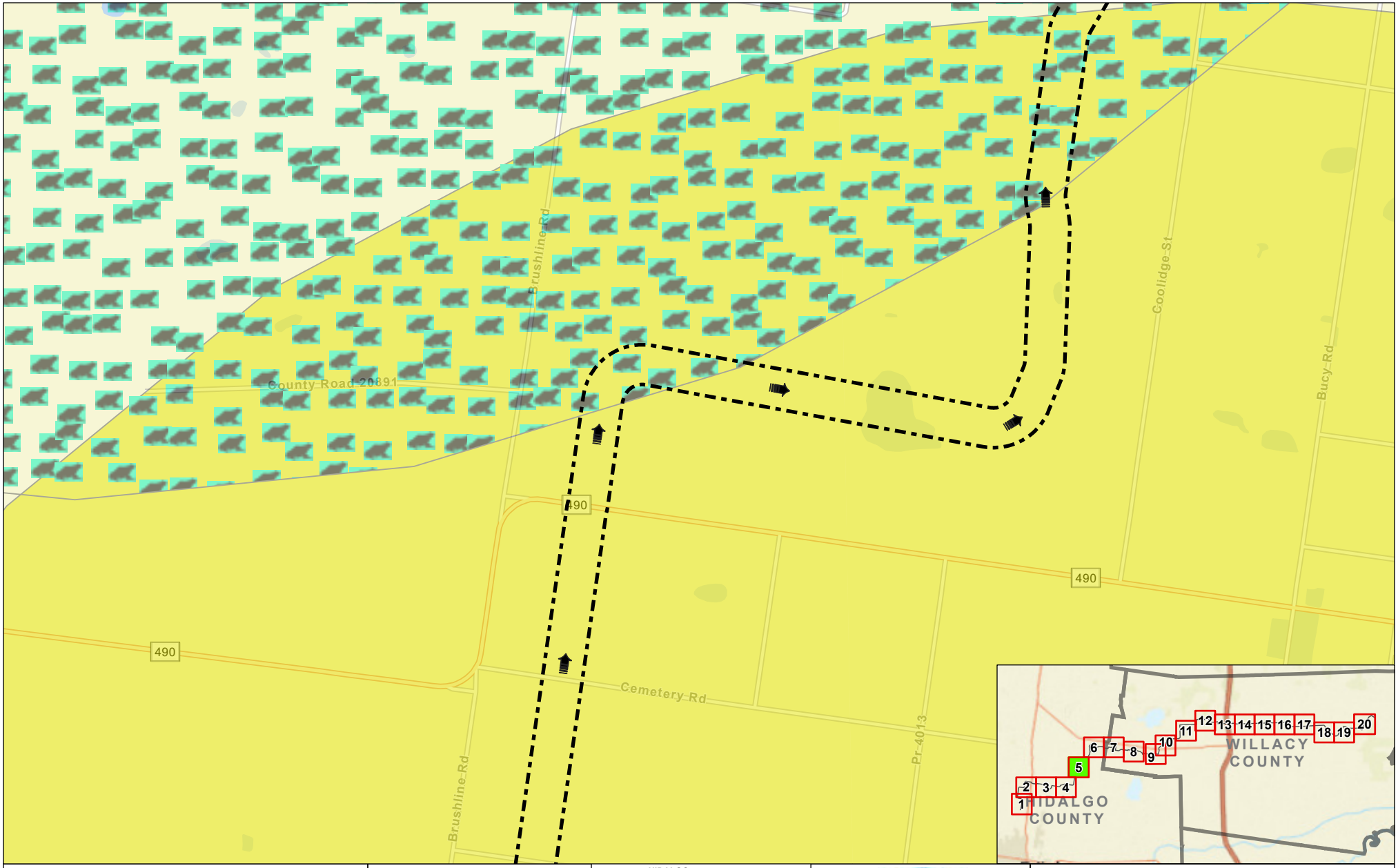
Sheet 4 of 20
Raymondville Drain Project

Author :	Joel F. Aguirre	Updated :	7/20/2023

DISCLAIMER: RRP Engineering makes no guarantees as to the accuracy of 3rd party data used in the construction of this map.

Data Provenance: ESRI - NAIP Worldview Map (2022),TPWD - National Diversity Database (2022)

Path: S:\projects\34080800_ProjectRepository\GIS\RDP_End-to-End_Series.aprx



Legend:

- Action Area
- Drain Flow
- Ocelot
- Sheep Frog

N

0 1,000 2,000

US Feet

HIDALGO COUNTY

WILLACY COUNTY

TX

Exhibit 6

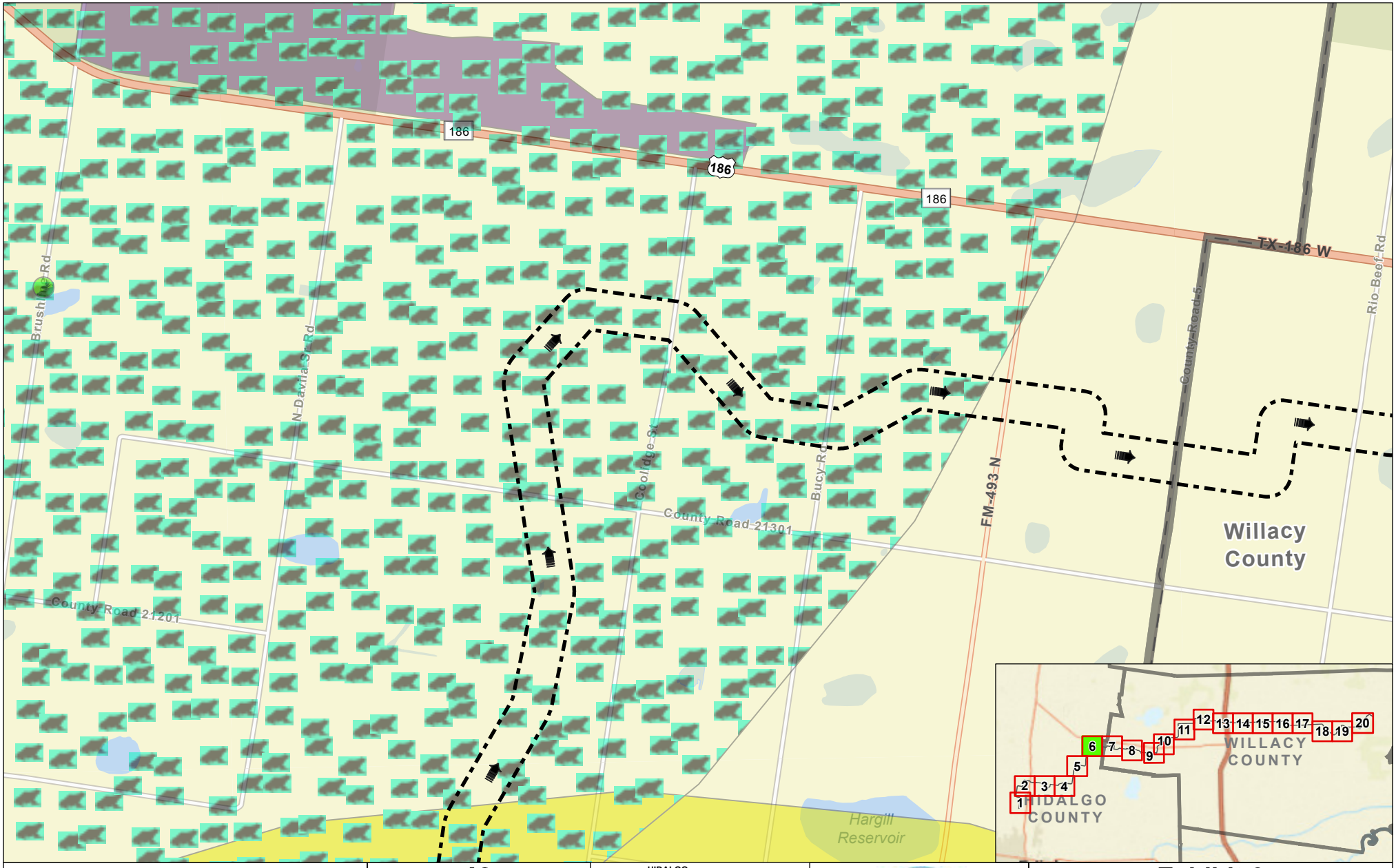
Alternative 1 NDD Map

Sheet 5 of 20
Raymondville Drain Project

Author : Joel F. Aguirre **Updated :** 7/20/2023

DISCLAIMER: RRP Engineering makes no guarantees as to the accuracy of 3rd party data used in the construction of this map.

Data Provenance: ESRI - NAIP Worldview Map (2022),TPWD - National Diversity Database (2022)



Legend:

- Action Area
- Drain Flow
- Ocelot
- Sheep Frog
- Texas Ebony-snake-eyes Shrubland
- Texas Horned Lizard

N

0 1,000 2,000

US Feet

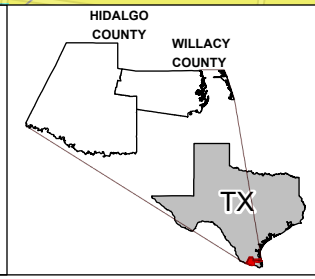


Exhibit 6

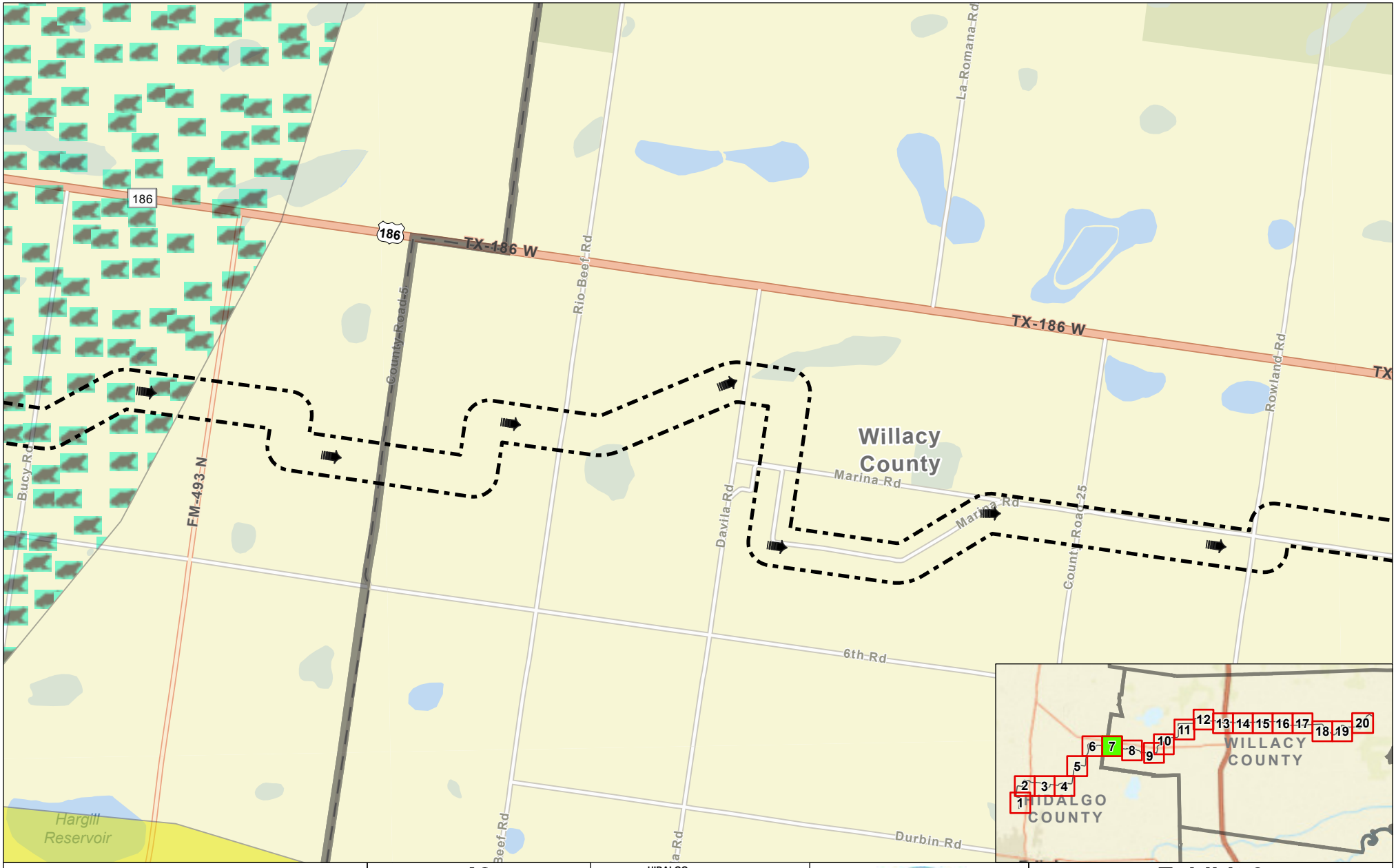
Alternative 1 NDD Map

Sheet 6 of 20
Raymondville Drain Project

Author : Joel F. Aguirre **Updated :** 7/20/2023

DISCLAIMER: RRP Engineering makes no guarantees as to the accuracy of 3rd party data used in the construction of this map.

Data Provenance: ESRI - NAIP Worldview Map (2022),TPWD - National Diversity Database (2022)



Legend:

- Action Area
- Drain Flow
- Ocelot
- Sheep Frog

N

0 1,000 2,000

US Feet

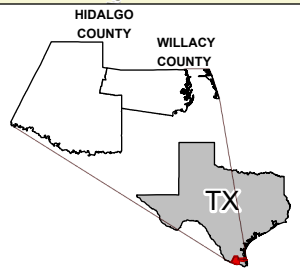


Exhibit 6

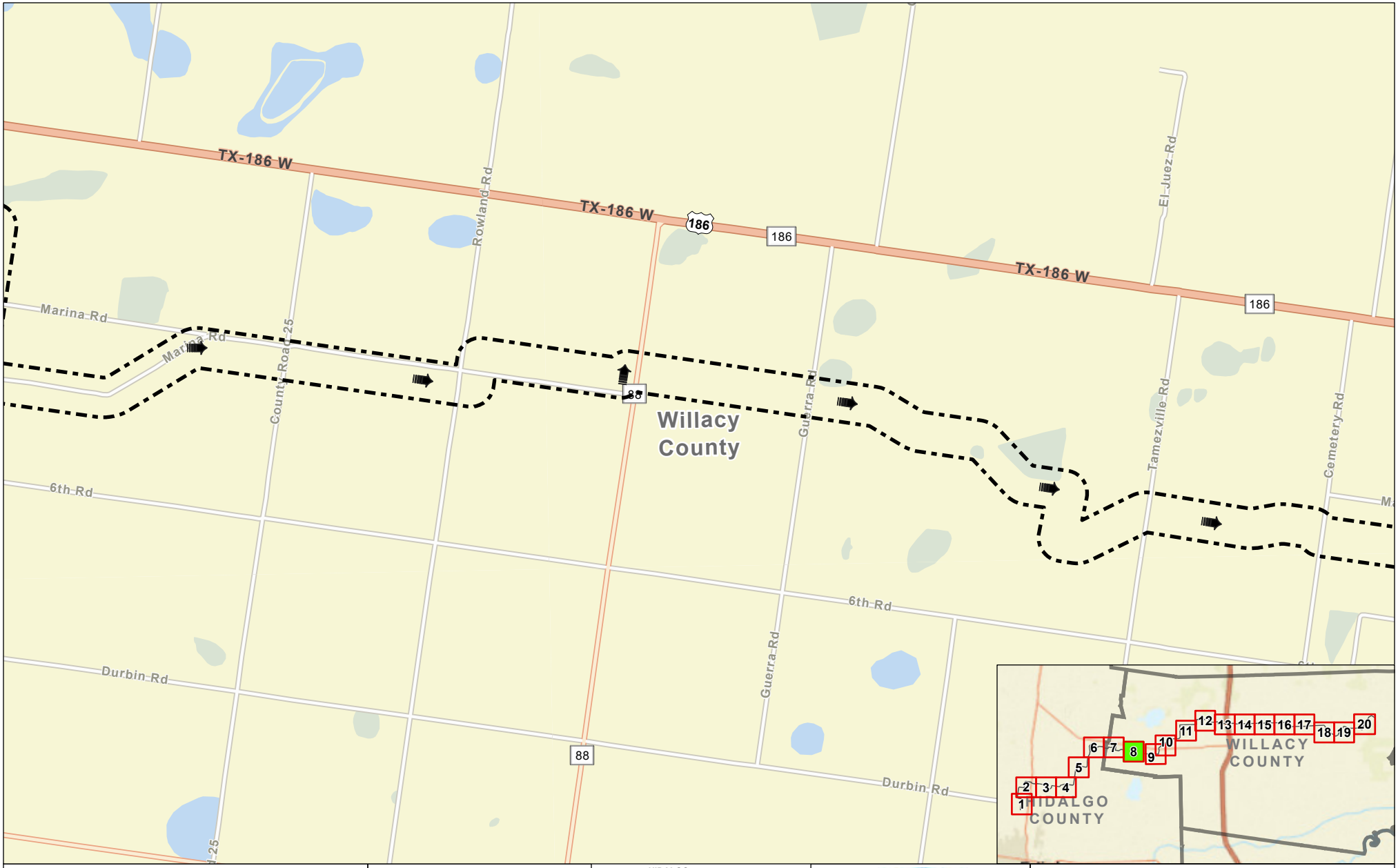
Alternative 1 NDD Map

Sheet 7 of 20
Raymondville Drain Project

Author : Joel F. Aguirre **Updated :** 7/20/2023

DISCLAIMER: RRP Engineering makes no guarantees as to the accuracy of 3rd party data used in the construction of this map.

Data Provenance: ESRI - NAIP Worldview Map (2022),TPWD - National Diversity Database (2022)



Legend:

- Action Area
- Drain Flow

N

0 1,000 2,000

US Feet

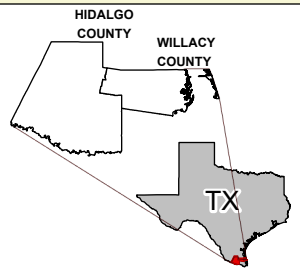


Exhibit 6

Alternative 1 NDD Map

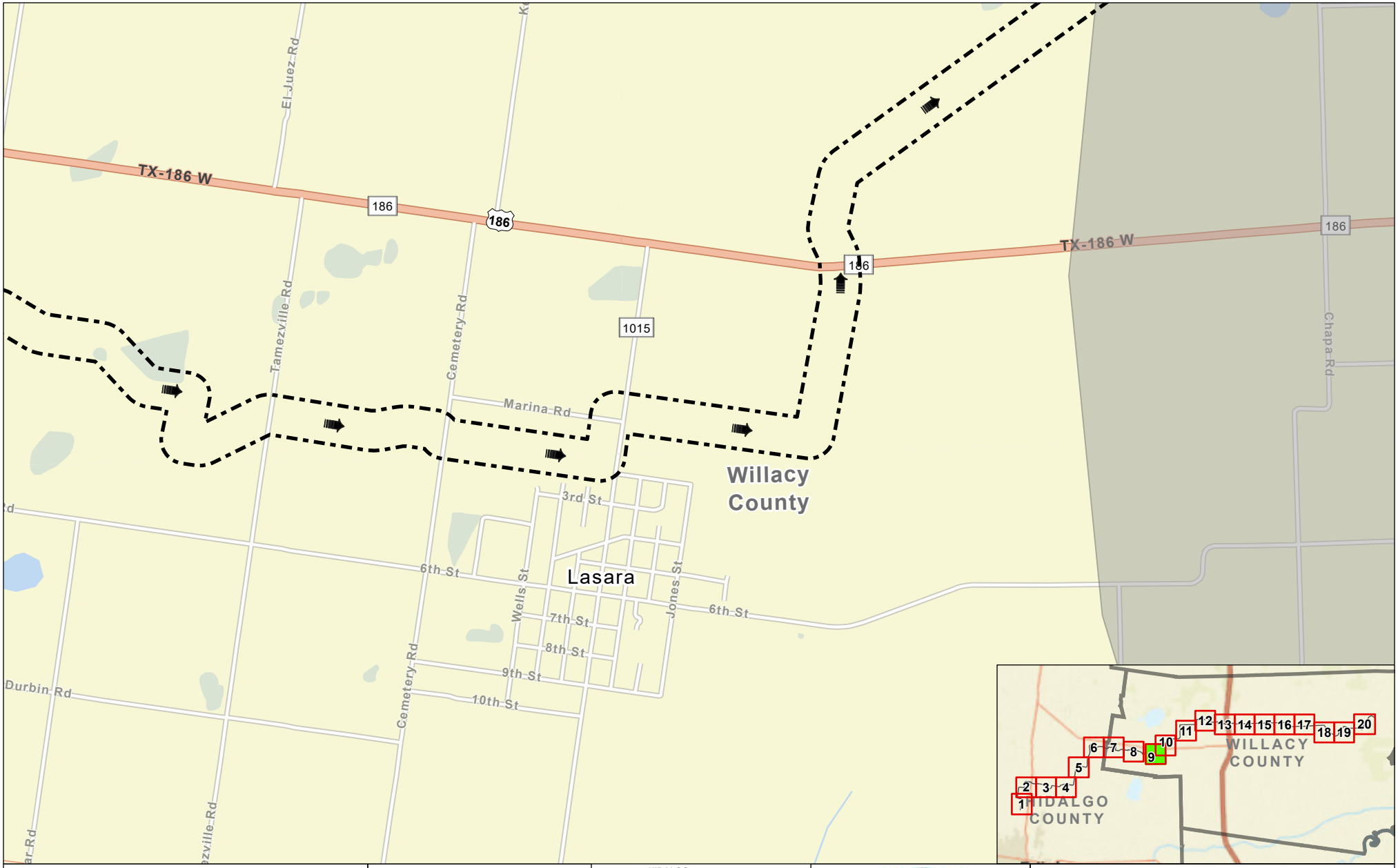
Sheet 8 of 20
Raymondville Drain Project

Author :	Joel F. Aguirre	Updated :	7/20/2023

DISCLAIMER: RRP Engineering makes no guarantees as to the accuracy of 3rd party data used in the construction of this map.

Data Provenance: ESRI - NAIP Worldview Map (2022),TPWD - National Diversity Database (2022)

Path: S:\projects\340B800_ProjectRepository\GIS\RDP_End-to-End_Series.aprx



Legend:

- Action Area
- Drain Flow
- Black-spotted Newt

N

0 1,000 2,000

US Feet

HIDALGO COUNTY

WILLACY COUNTY

TX

Exhibit 6

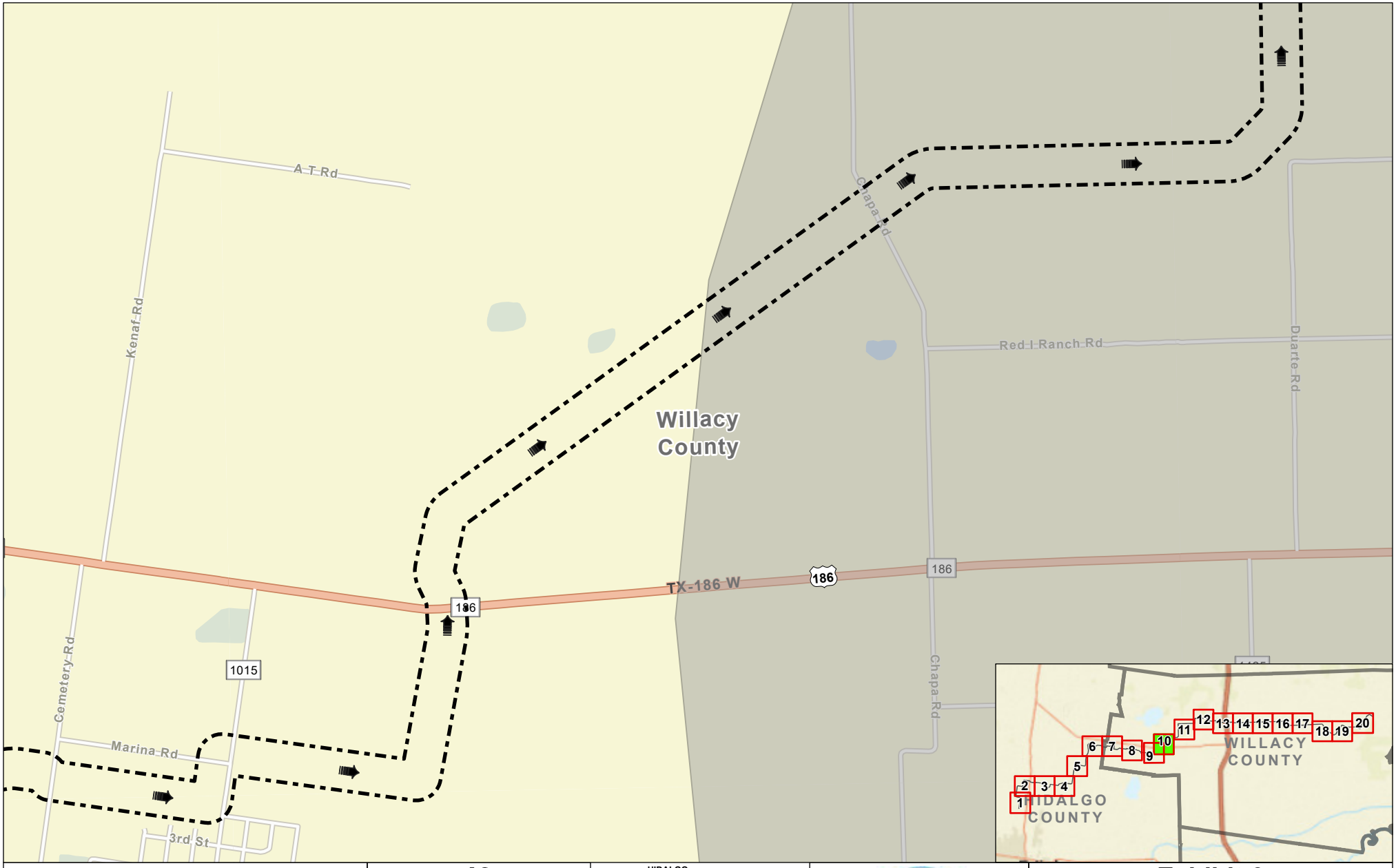
Alternative 1 NDD Map

Sheet 9 of 20
Raymondville Drain Project

Author : Joel F. Aguirre **Updated :** 7/20/2023

DISCLAIMER: RRP Engineering makes no guarantees as to the accuracy of 3rd party data used in the construction of this map.

Data Provenance: ESRI - NAIP Worldview Map (2022),TPWD - National Diversity Database (2022)



Legend:

- Action Area
- Drain Flow
- Black-spotted Newt

N

0 1,000 2,000

US Feet

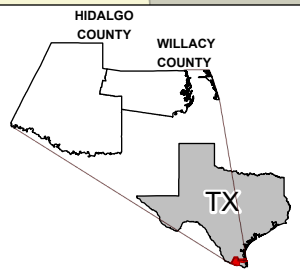


Exhibit 6

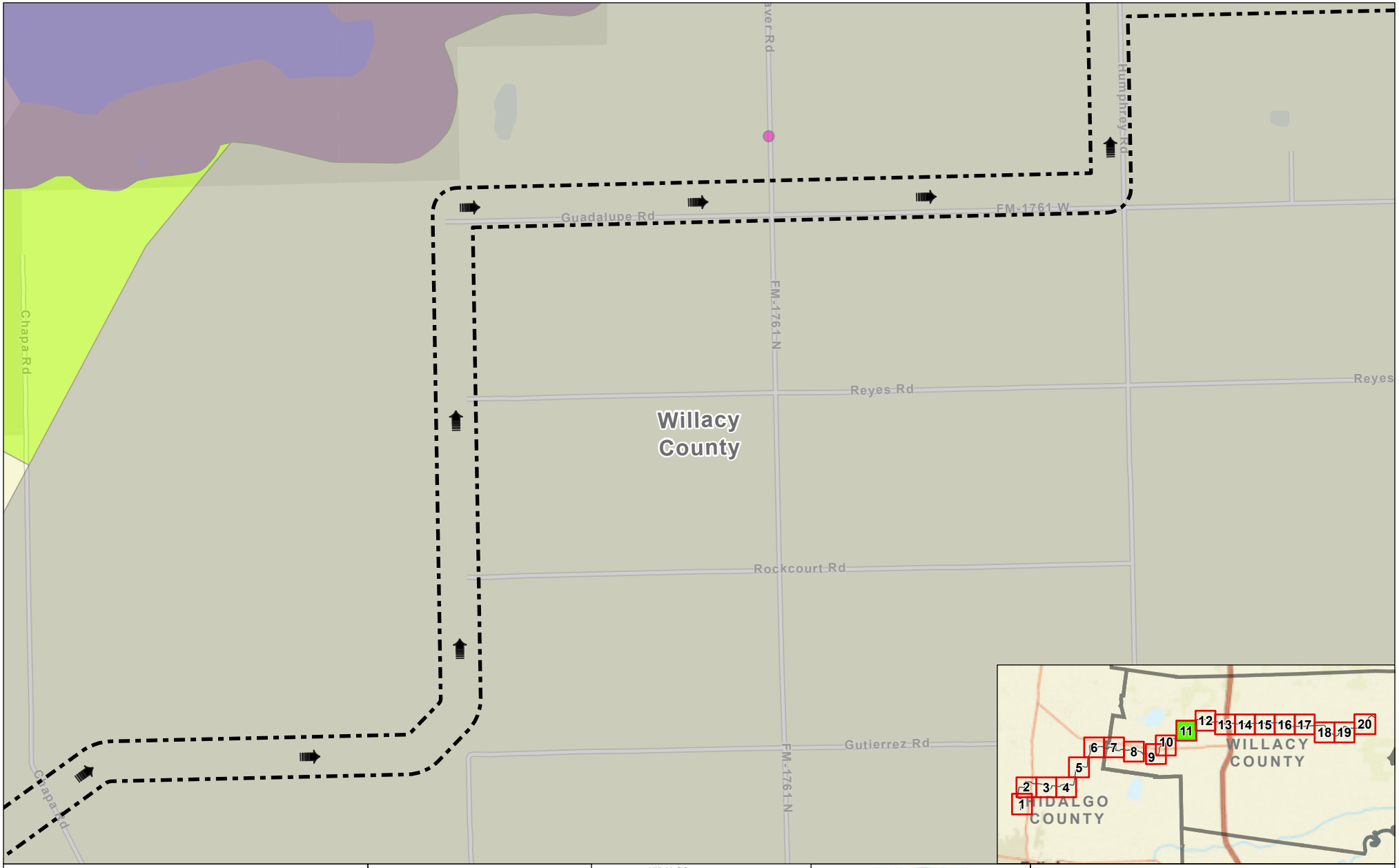
Alternative 1 NDD Map

Sheet 10 of 20
Raymondville Drain Project

Author : Joel F. Aguirre **Updated :** 7/20/2023

DISCLAIMER: RRP Engineering makes no guarantees as to the accuracy of 3rd party data used in the construction of this map.

Data Provenance: ESRI - NAIP Worldview Map (2022),TPWD - National Diversity Database (2022)



Legend:

- Action Area
- Drain Flow
- Black-spotted Newt
- South Texas Siren (large form)
- Texas Ebony-snake-eyes Shrubland
- Texas Indigo Snake

N

0 1,000 2,000

US Feet

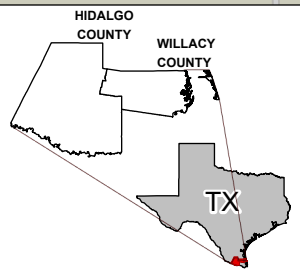


Exhibit 6

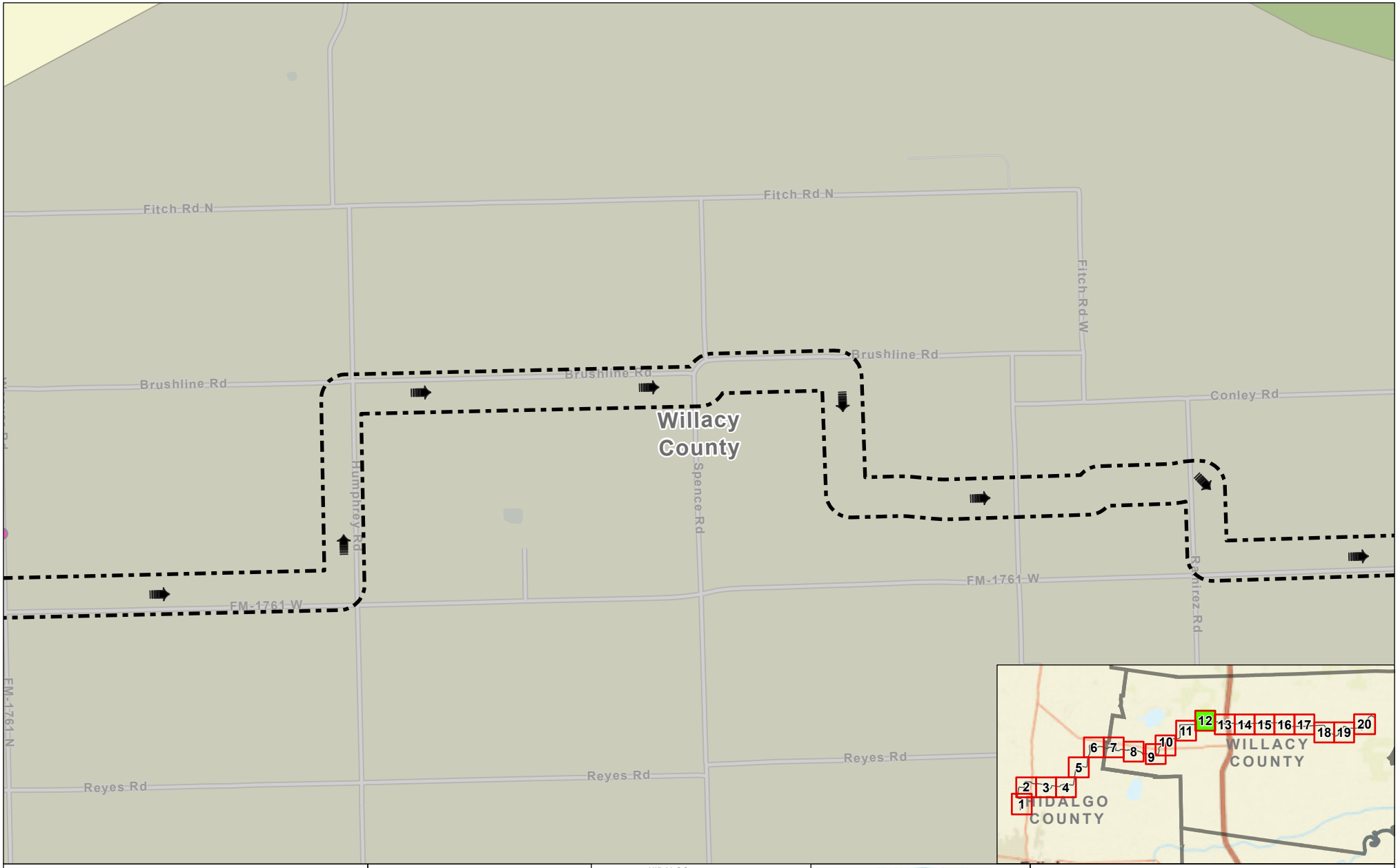
Alternative 1 NDD Map

Sheet 11 of 20
Raymondville Drain Project

Author :	Joel F. Aguirre	Updated :	7/20/2023

DISCLAIMER: RRP Engineering makes no guarantees as to the accuracy of 3rd party data used in the construction of this map.

Data Provenance: ESRI - NAIP Worldview Map (2022),TPWD - National Diversity Database (2022)



Legend:

- Action Area
- Drain Flow
- Black-spotted Newt
- Northern Cat-eyed Snake
- Texas Indigo Snake

N

0 1,000 2,000

US Feet

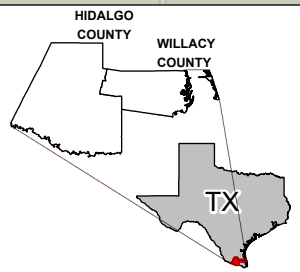


Exhibit 6

Alternative 1 NDD Map

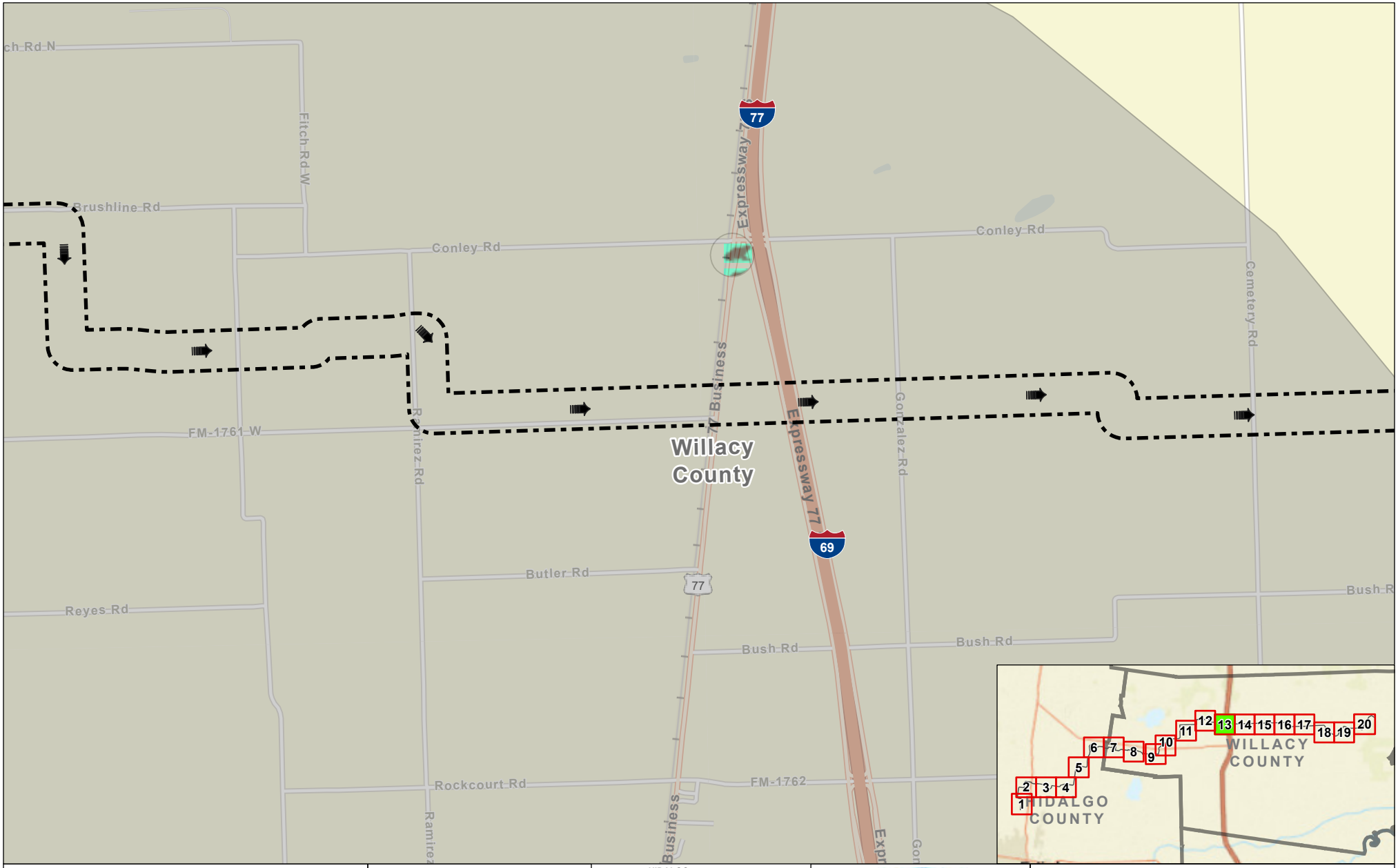
Sheet 12 of 20
Raymondville Drain Project

Author :	Joel F. Aguirre	Updated :	7/20/2023

DISCLAIMER: RRP Engineering makes no guarantees as to the accuracy of 3rd party data used in the construction of this map.

Data Provenance: ESRI - NAIP Worldview Map (2022),TPWD - National Diversity Database (2022)

Path: S:\projects\340\8600_ProjectRepository\GIS\RDP_End-to-End_Series.aprx



Legend:

- Action Area
- Drain Flow
- Black-spotted Newt
- Sheep Frog

N

0 1,000 2,000

US Feet

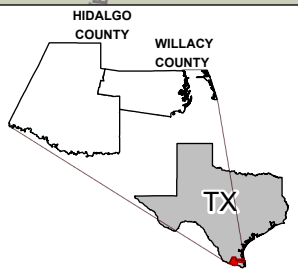


Exhibit 6

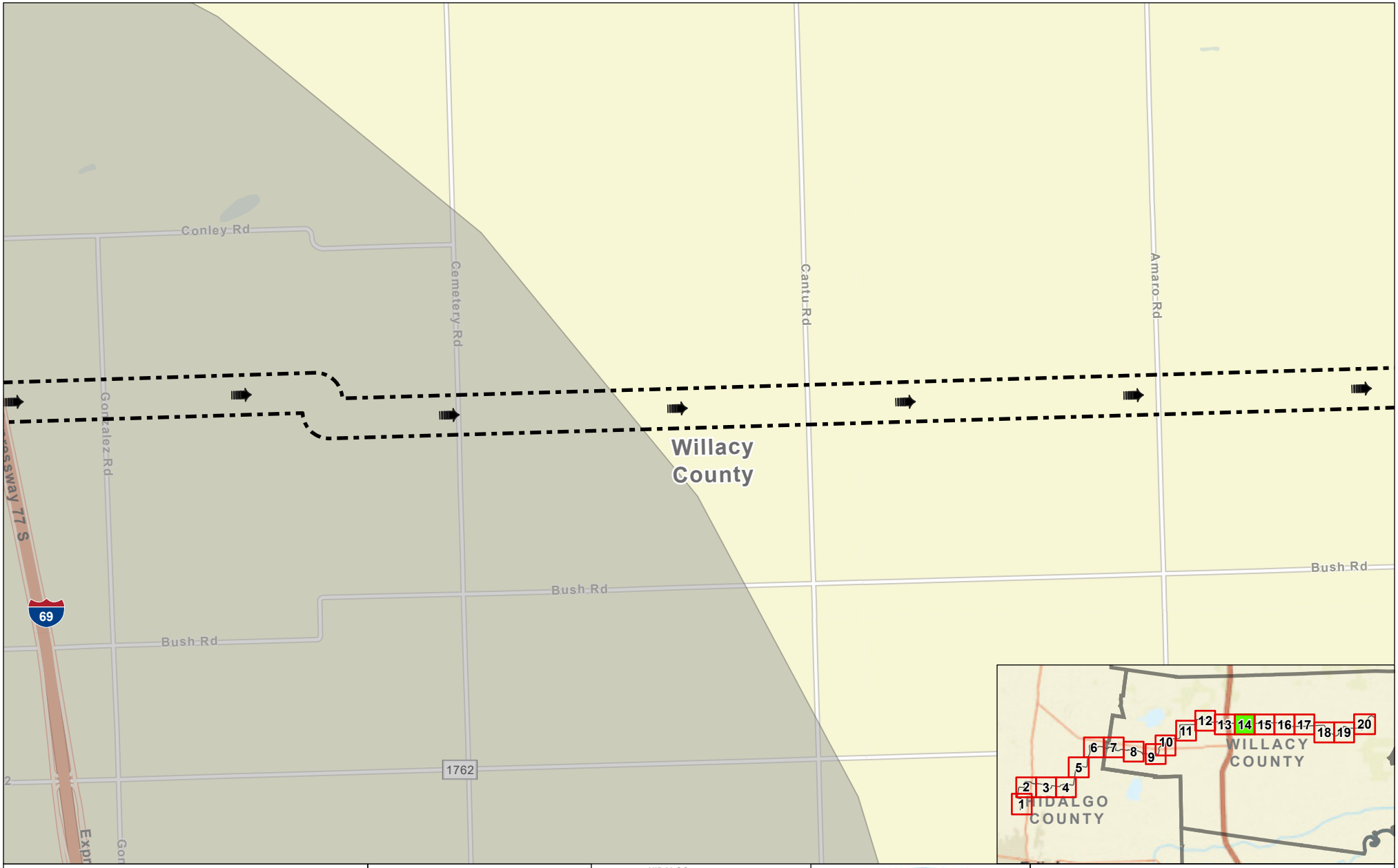
Alternative 1 NDD Map

Sheet 13 of 20
Raymondville Drain Project

Author :	Joel F. Aguirre	Updated :	7/20/2023

DISCLAIMER: RRP Engineering makes no guarantees as to the accuracy of 3rd party data used in the construction of this map.

Data Provenance: ESRI - NAIP Worldview Map (2022),TPWD - National Diversity Database (2022)



Legend:

- Action Area
- Drain Flow
- Black-spotted Newt

N

0 1,000 2,000

US Feet

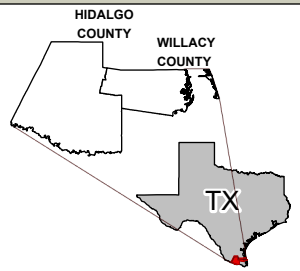


Exhibit 6

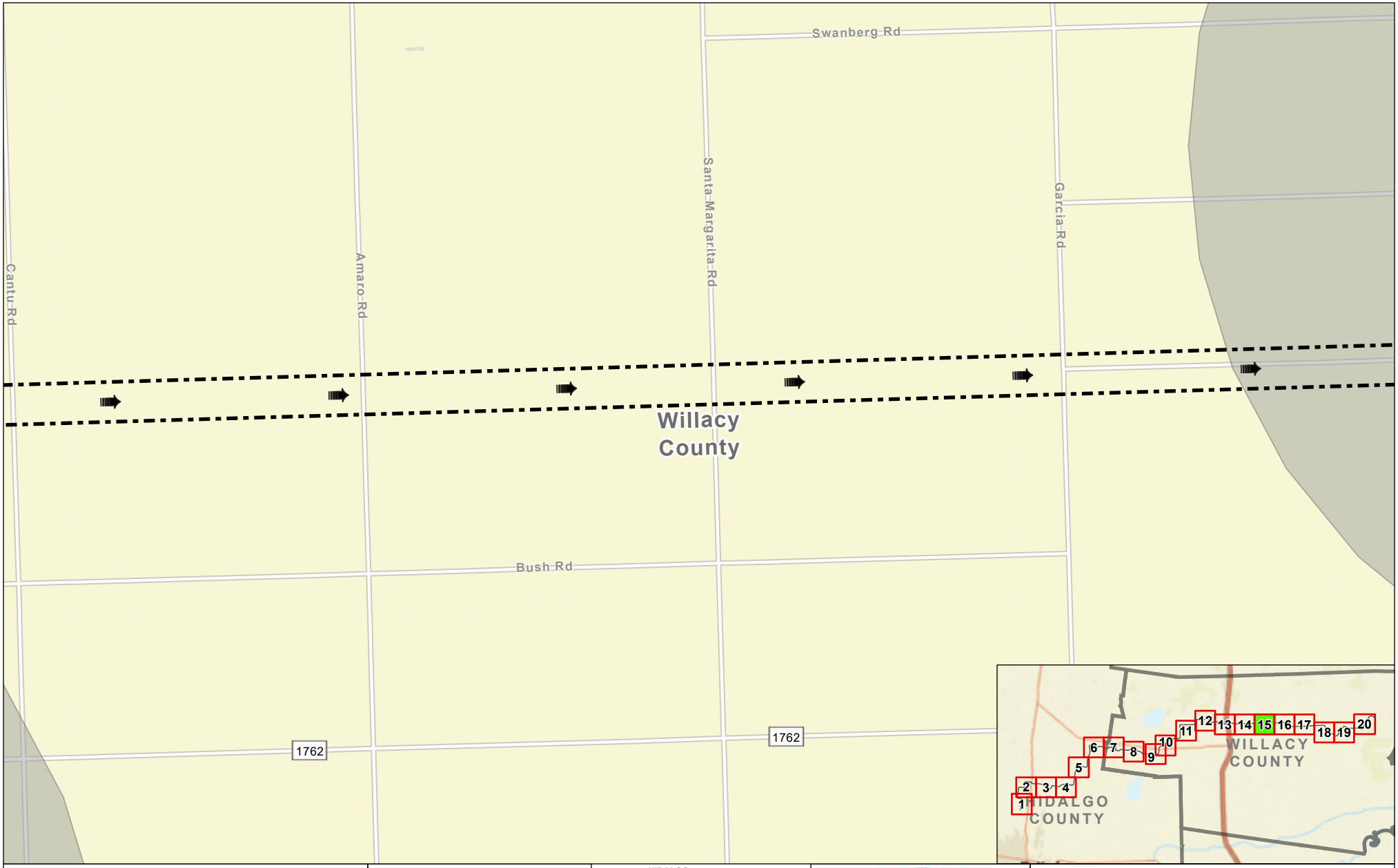
Alternative 1 NDD Map

Sheet 14 of 20
Raymondville Drain Project

Author : Joel F. Aguirre **Updated :** 7/20/2023

DISCLAIMER: RRP Engineering makes no guarantees as to the accuracy of 3rd party data used in the construction of this map.

Data Provenance: ESRI - NAIP Worldview Map (2022),TPWD - National Diversity Database (2022)



Legend:

- Action Area
- Drain Flow
- Black-spotted Newt

N

0 1,000 2,000

US Feet

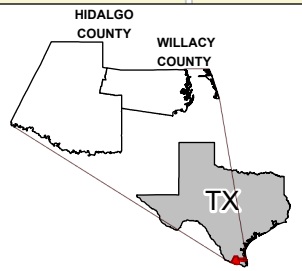


Exhibit 6

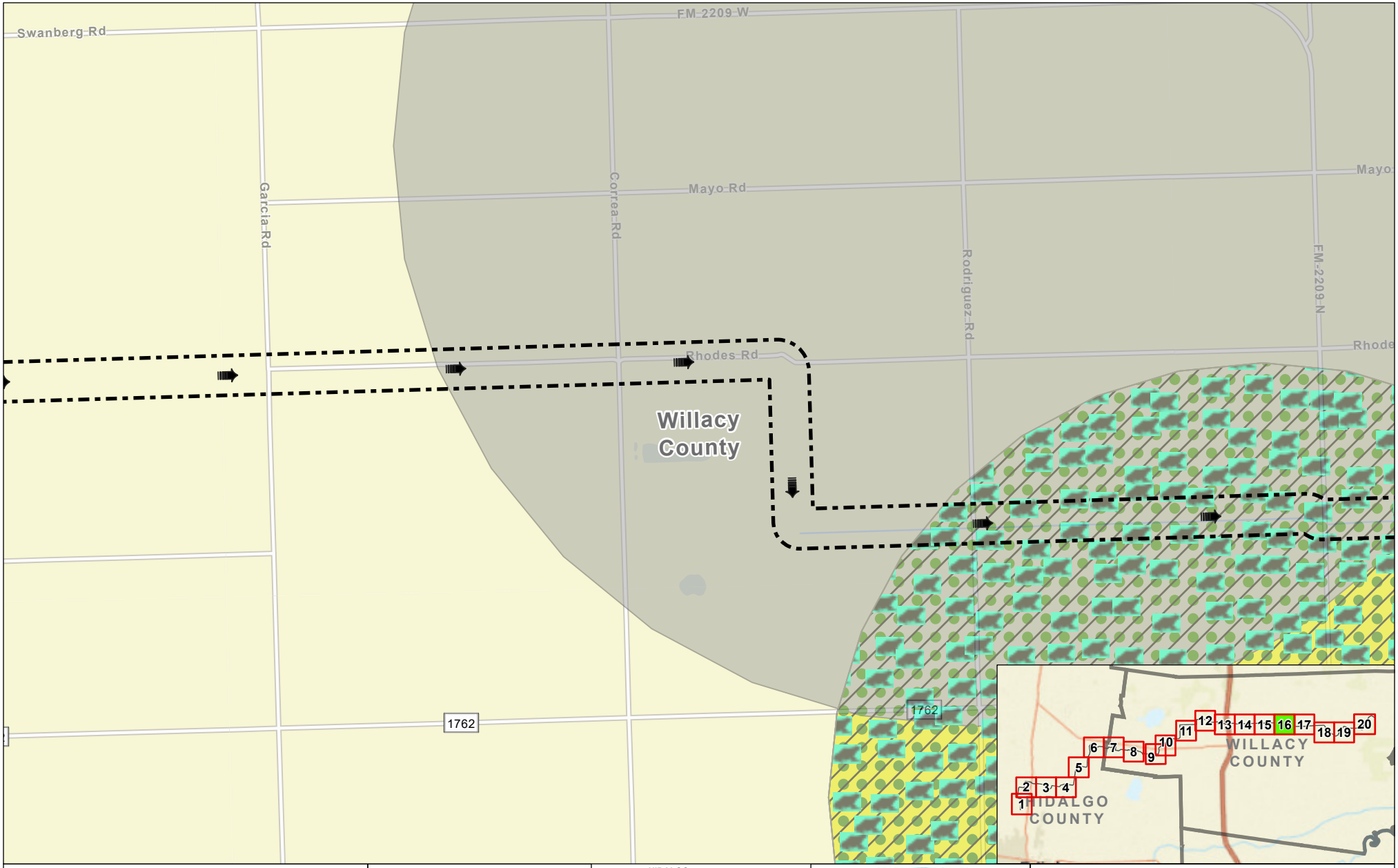
Alternative 1 NDD Map

Sheet 15 of 20
Raymondville Drain Project

Author :	Joel F. Aguirre	Updated :	7/20/2023

DISCLAIMER: RRP Engineering makes no guarantees as to the accuracy of 3rd party data used in the construction of this map.

Data Provenance: ESRI - NAIP Worldview Map (2022),TPWD - National Diversity Database (2022)



Legend:

- Action Area
- Drain Flow
- Berlandier's Tortoise
- Black-spotted Newt
- Ocelot
- Regal Black-striped Snake
- Sheep Frog

N

0 1,000 2,000

US Feet

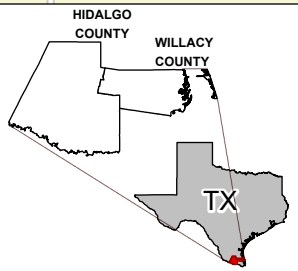


Exhibit 6

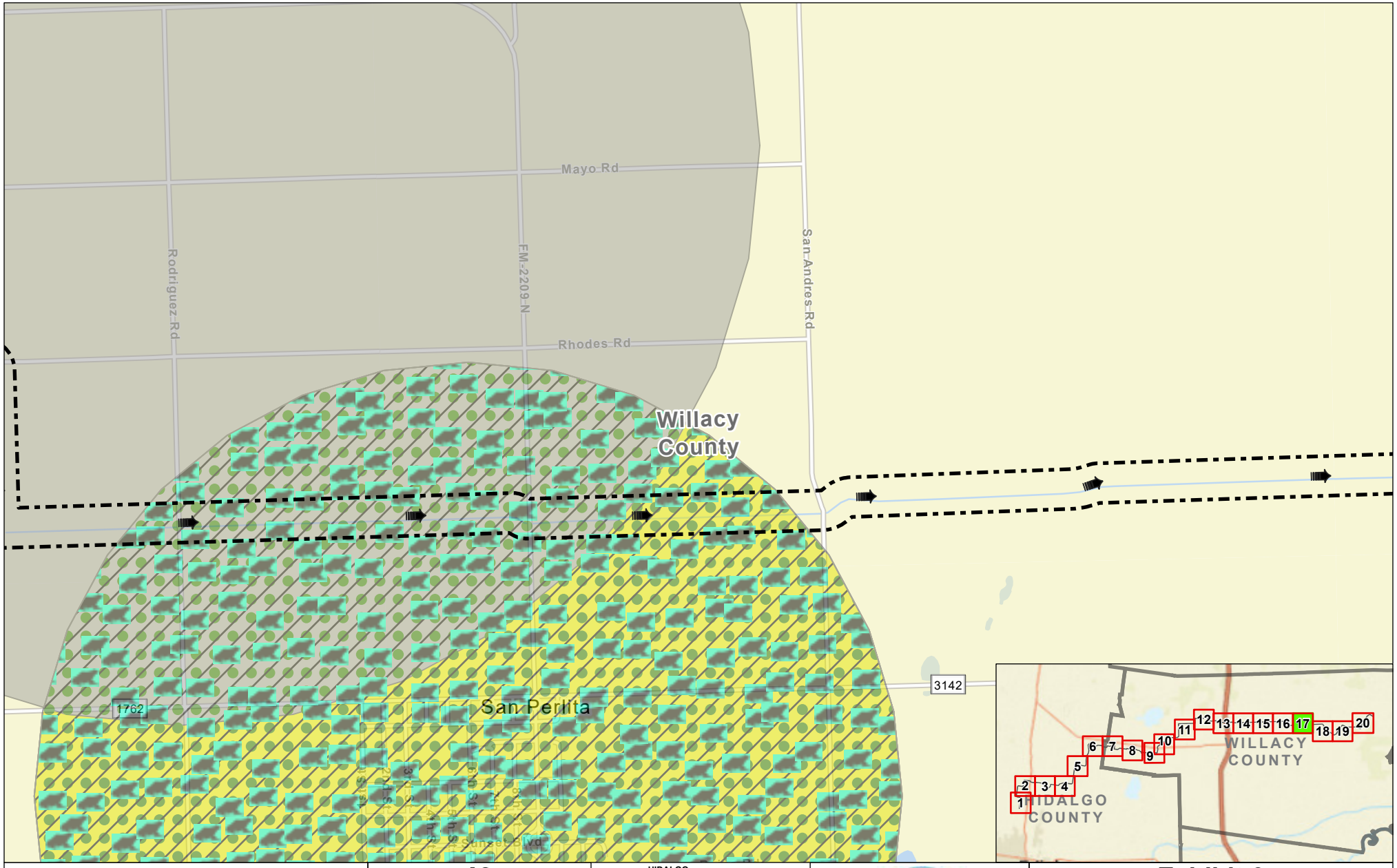
Alternative 1 NDD Map

Sheet 16 of 20
Raymondville Drain Project

Author : Joel F. Aguirre **Updated :** 7/20/2023

DISCLAIMER: RRP Engineering makes no guarantees as to the accuracy of 3rd party data used in the construction of this map.

Data Provenance: ESRI - NAIP Worldview Map (2022),TPWD - National Diversity Database (2022)



Legend:

- Action Area
- Drain Flow
- Berlandier's Tortoise
- Black-spotted Newt
- Ocelot
- Regal Black-striped Snake
- Sheep Frog

N

0 1,000 2,000

US Feet

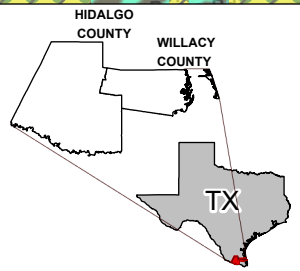


Exhibit 6

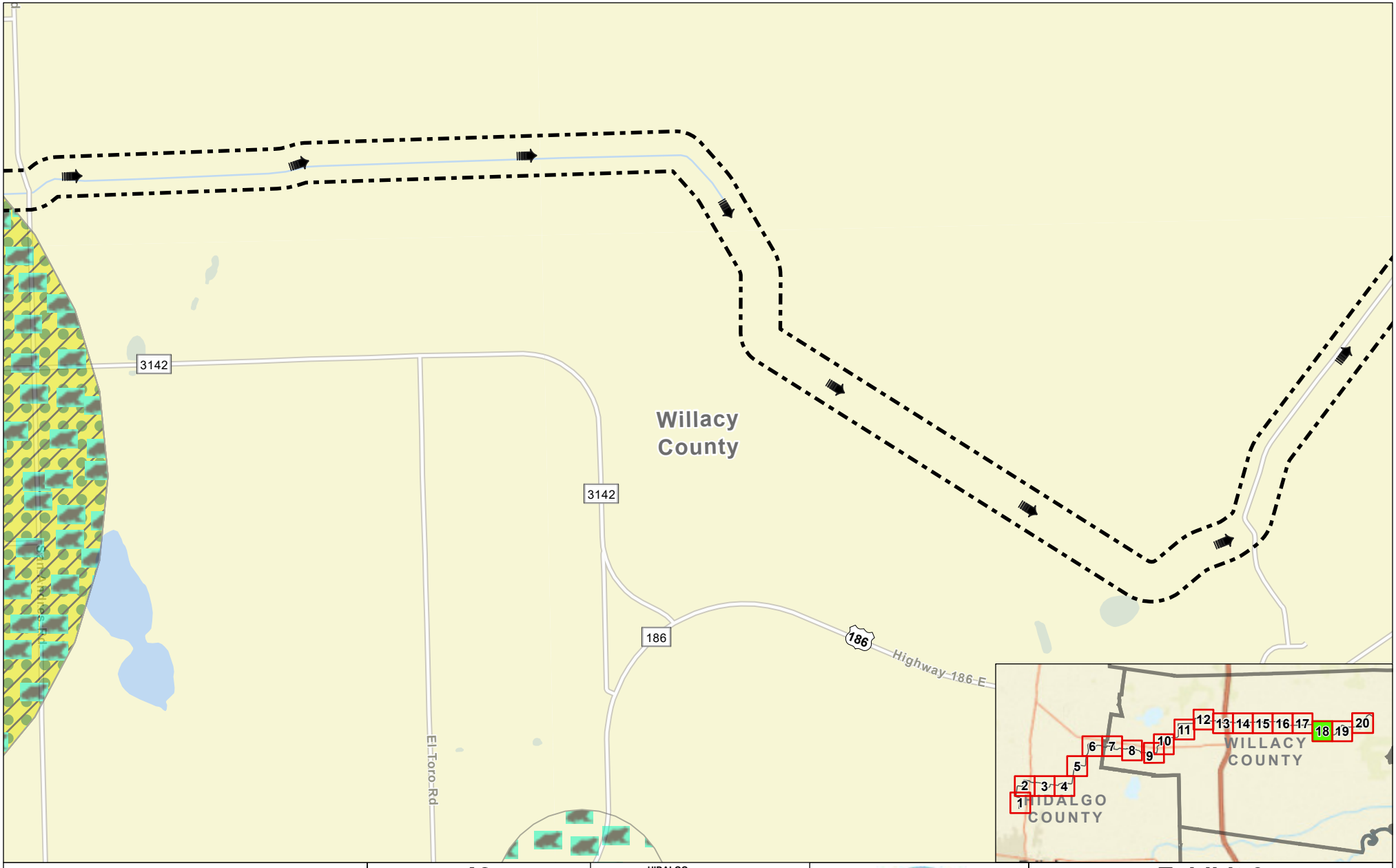
Alternative 1 NDD Map

Sheet 17 of 20
Raymondville Drain Project

Author :	Joel F. Aguirre	Updated :	7/20/2023

DISCLAIMER: RRP Engineering makes no guarantees as to the accuracy of 3rd party data used in the construction of this map.

Data Provenance: ESRI - NAIP Worldview Map (2022),TPWD - National Diversity Database (2022)



Legend:

- Action Area
- Drain Flow
- Berlandier's Tortoise
- Ocelot
- Regal Black-striped Snake
- Sheep Frog

N

0 1,000 2,000

US Feet

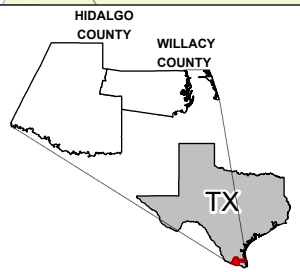


Exhibit 6

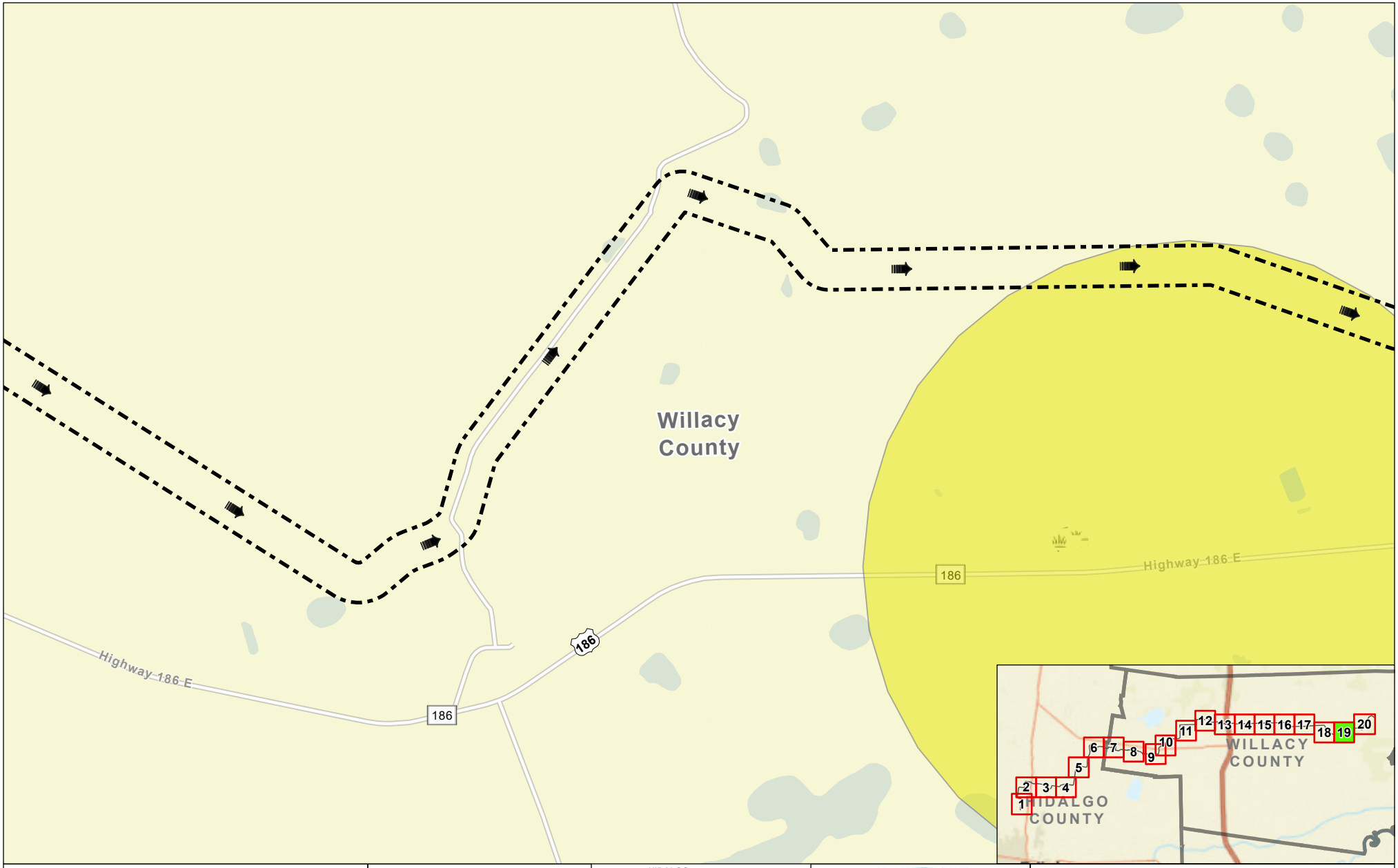
Alternative 1 NDD Map

Sheet 18 of 20
Raymondville Drain Project

Author : Joel F. Aguirre **Updated :** 7/20/2023

DISCLAIMER: RRP Engineering makes no guarantees as to the accuracy of 3rd party data used in the construction of this map.

Data Provenance: ESRI - NAIP Worldview Map (2022),TPWD - National Diversity Database (2022)



Legend:

- Action Area
- Drain Flow
- Ocelot

N

0 1,000 2,000

US Feet

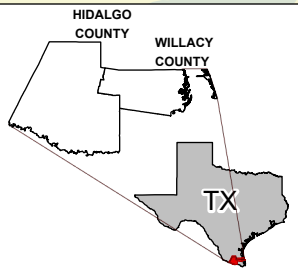


Exhibit 6

Alternative 1 NDD Map

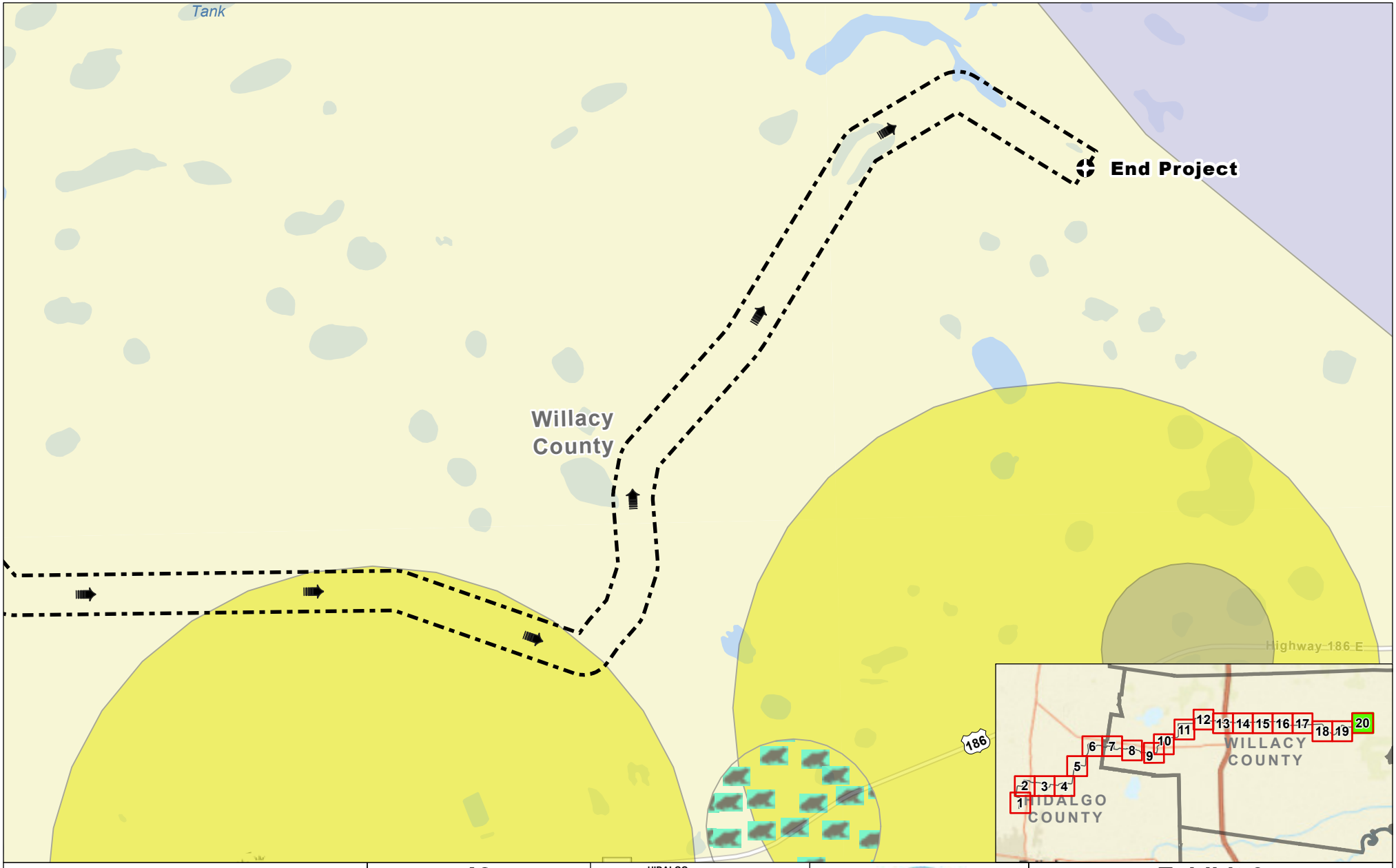
Sheet 19 of 20
Raymondville Drain Project

Author :	Joel F. Aguirre	Updated :	7/20/2023

DISCLAIMER: RRP Engineering makes no guarantees as to the accuracy of 3rd party data used in the construction of this map.

Data Provenance: ESRI - NAIP Worldview Map (2022),TPWD - National Diversity Database (2022)

Path: S:\projects\34080800_ProjectRepository\GIS\RDP_End-to-End_Series.aprx



Legend:

- Action Area
- Drain Flow
- Ocelot
- Sheep Frog
- Velvet Spurge
- Black-spotted Newt

N

0 1,000 2,000

US Feet

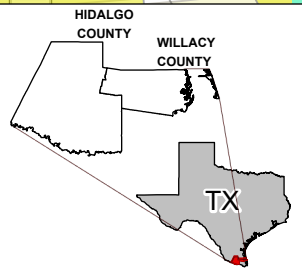


Exhibit 6

Alternative 1 NDD Map

Sheet 20 of 20
Raymondville Drain Project

Author :	Joel F. Aguirre	Updated :	7/20/2023

DISCLAIMER: RRP Engineering makes no guarantees as to the accuracy of 3rd party data used in the construction of this map.

Data Provenance: ESRI - NAIP Worldview Map (2022),TPWD - National Diversity Database (2022)

APPENDIX B

SITE PHOTOGRAPHS

The following site photographs of the proposed Raymondville Drain Project right-of-way were recorded during field investigations conducted in April and May 2023. Photographs were taken in areas in which right-of-entry was granted by the property owner and generally proceed from the western project terminus to the eastern project terminus.

Photograph 1 – View looking southwest at Lake Edinburg, west of the western project terminus.

Photograph 2 – View looking north (downstream) at Habitat Area (HA) 1 and the western project terminus; the proposed diversion channel is being constructed.

Photograph 3 – View looking east at an area of thornscrub located adjacent to HA 1.

Photograph 5 – View looking east at the northern edge of the thornscrub habitat.

Photograph 4 – View looking further north than Photograph 2.

Photograph 6 – View looking further north than the previous photograph.

Photograph 7 – View looking further north than the previous photograph.

Photograph 8 – View looking west at the location in HA 1 where the pilot channel of the Raymondville Drain Project (RDP) turns west.

Photograph 9 – View looking north at conditions in HA 2.

Photograph 10 – View looking northwest at conditions in HA 2.

Photograph 11 – View looking north at the location in HA 2 where the RDP would turn north.

Photograph 12 – View looking southeast at a drainage channel located in HA 2.

Photograph 13 – View looking west (upstream) at conditions in HA 3, which was inaccessible as right-of-entry was not granted to this area.

Photograph 14 – View looking north at conditions in HA 4, east of HA 3.

Photograph 15 – View looking further north than the previous photograph.

Photograph 16 – View looking northeast at a location in HA 4 where the RDP would turn east.

Photograph 17 – View looking east at Interstate Highway 69E/US Highway 281, the eastern extent of HA 4.

Photograph 18 – View looking southwest at a pond located within HA 5.

Photograph 19 – View looking east at an elevated area of concave relief in HA 5.

Photograph 20 – View looking south at the transition from HA 5 (rangeland) to HA 6 (thornscrub).

Photograph 21 – View looking east at conditions in HA 7.

Photograph 22 – View looking south at the transition from HA 7 (row crops) to HA 8 (rangeland).

Photograph 23 – View looking southwest at conditions in HA 8.

Photograph 24 – View looking southwest at conditions in another part of HA 8.

Photograph 25 – View looking southwest at a sparsely vegetated part of HA 8.

Photograph 26 – View looking southeast from the same location as the previous photograph, at conditions in HA 9.

Photograph 27 – View looking east at conditions in HA 9. This area was recently converted to row crops; historical aerial photographs depict this area as being vegetated by thornscrub.

Photograph 28 – View looking south at conditions in HA 10. This HA is surrounded by HA 9 and is located on a small rise.

Photograph 29 – View looking south at conditions in HA 11.

Photograph 30 – View looking east at conditions in HA 9, within the footprint of the proposed detention basin.

Photograph 31 – View looking west at conditions in HA 12.

Photograph 32 – View looking northeast at conditions in HA 13. This HA is surrounded by agricultural fields on three sides.

Photograph 33 – View looking west at conditions in HA 14.

Photograph 34 – View looking southwest at conditions in HA 15.

Photograph 35 – View looking north at the transition from HA 15 (pasture) to HA 16 (thornscrub).

Photograph 36 – View looking east at conditions in HA 16. HA 17, located to the north, was inaccessible due to a lack of right-of-entry.

Photograph 37 – View looking south at conditions in HA 18.

Photograph 38 – View looking north at conditions in HA 19.

Photograph 39 – View looking south at conditions in HA 20.

Photograph 40 – View looking south at conditions in HA 21.

Photograph 41 – View looking north at conditions in HA 22.

Photograph 42 – View looking further north than the previous photograph at conditions in HA 22 where the tree canopy is less dense.

Photograph 43 – View looking west at conditions in HA 23. An area of low-lying ground is visible in the background of this photograph.

Photograph 44 – View looking west at conditions in HA 24.

Photograph 45 – View looking east at conditions in HA 24.

Photograph 46 – View looking east at conditions in HA 25.

Photograph 47 – View looking east at conditions in HA 26.

Photograph 48 – View looking northeast (upstream) at the upstream extent of the existing Raymondville Drain, located in HA 26.

Photograph 49 – View looking southeast at conditions in HA 27, where flooding from the Raymondville Drain has washed out most vegetation.

Photograph 50 – View looking north (downstream) at conditions in HA 28.

Photograph 51 – View looking south at conditions in HA 29.

Photograph 52 – View looking north at waterfowl in the existing Raymondville Drain, north of Marcedonio Road.

Photograph 53 – View looking northwest at conditions in HA 30. HA 31, north of this location, was inaccessible due to lack of right-of-entry.

Photograph 54 – View looking northeast at conditions in HA 32.

Photograph 55 – View looking northwest at conditions in HA 32 near Bucy Road.

Photograph 56 – View looking northeast (downstream) at the existing RD as it flows through HA 33.

Photograph 57 – View looking northeast (downstream) at the existing Raymondville Drain as it flows into HA 34.

Photograph 58 – View looking west (upstream) at conditions in HA 34.

Photograph 59 – View looking east (downstream) at conditions in HA 35.

Photograph 60 – View looking southeast at conditions in HA 36.

Photograph 61 – View looking south
at conditions in HA 37.

Photograph 62 – View looking west
at conditions in HA 38.

Photograph 63 – Closer view of the dense thornscrub
vegetation depicted in the previous photograph.

Photograph 64 - View looking east (downstream)
at the existing Raymondville Drain
as it flows through HA 39.

Photograph 65 - View of a Swainson's hawk
(*Buteo swainsoni*) near the action area.

Photograph 66 - View looking east
at conditions in HA 40.

Photograph 67 - View looking east at conditions in HA 40 adjacent to the existing RD.

Photograph 70 – Another view of conditions in HA 44, looking north.

Photograph 68 – View looking west at conditions in HA 42.

Photograph 71 – View looking north at conditions in HA 45, visible in the background.

Photograph 69 - View looking north at conditions in HA 44.

Photograph 72 - View looking southwest at conditions in HA 46.

Photograph 73 - View looking north at conditions in HA 47.

Photograph 74 - View looking southeast at conditions in HA 48.

Photograph 75 – View looking southeast at conditions in HA 49.

Photograph 76 – View looking south at the transition from HA 49 (rangeland) to HA 50 (pasture).

Photograph 77 – View looking east (downstream) at the existing RD and HA 51.

Photograph 78 – View looking east at conditions in HA 52, which begins at the toe slope of the berm.

Photograph 79 - View looking southwest at conditions in HA 53.

Photograph 80 - View looking south at conditions in HA 54.

Photograph 81 - View looking south at conditions in HA 55.

Photograph 82 – View looking south at conditions in HA 56.

Photograph 83 - View looking south at conditions in HA 57.

Photograph 84 – View looking east at the existing Raymondville Drain as it flows by HA 58.

Photograph 85 – View looking east at the transition from HA 51 (row crops) to HA 59 (thornscrub).

Photograph 88 – View looking southwest at conditions in HA 60.

Photograph 86 – View looking north at conditions in HA 59.

Photograph 89 – View looking east (downstream) at the existing Raymondville Drain and conditions in HA 61.

Photograph 87 – View looking east (downstream) at the existing Raymondville Drain as it flows by HAs 60 (left side of the photograph) and 61 (right side).

Photograph 90 – View looking south from SH 186 at conditions in HA 61.

Photograph 91 – View looking north at conditions in HA 62.

Photograph 92 – View looking north at conditions in HA 61, north of SH 186.

Photograph 93 – View looking northwest at conditions in HA 63.

Photograph 94 – View looking west at conditions in HA 63. Much of this HA consists of private property and was assessed remotely.

Photograph 95 – View looking northwest at conditions in HA 63, within the Lower Rio Grande Valley National Wildlife Refuge.

Photograph 96 – View looking northeast at the transition from HA 65 (row crops) to HA 66 (rangeland).

Photograph 97 – View looking north from the existing RD ROW at conditions in HA 66.

Photograph 100 – View looking southeast conditions in HA 69.

Photograph 98 – View looking northwest at conditions in HA 67.

Photograph 101 – View looking east at a house in HA 69. HA 70 is visible in the background of this photograph.

Photograph 99 – View looking north at conditions in HA 65 (row crops in foreground) and HA 68 (dense thornscrub in background).

Photograph 102 – View looking east at conditions in HA 70.

Photograph 103 – View looking east at conditions in HA 71.

Photograph 104 – View looking east at conditions in HA 72.

Photograph 105 – View looking east at conditions in HA 73.

Photograph 106 – View looking east at a residential property located in HA 73.

Photograph 107 – View looking east at a portion of HA 73 located north of the property depicted in the previous photograph.

Photograph 108 – View looking west at conditions in HA 74 (left side of the photograph) and HA 75 (right side of the photograph).

Photograph 109 – View looking north at conditions in HA 76.

Photograph 110 – View looking north at the transition from HA 76 (thornscrub) to HA 65 (row crops).

Photograph 111 – View looking east at conditions in HA 77.

Photograph 112 – View looking west at conditions in HA 78.

Photograph 113 – View looking east (downstream) at the existing RD near US Highway 77. Work associated with the Raymondville Drain RESTORE Act Project was underway during field investigations.

Photograph 114 – View looking west at conditions in HA 79. HA 80, on the opposite side of the existing Raymondville Drain, was inaccessible.

Photograph 115 – View looking east at conditions in HA 81, north of the existing Raymondville Drain.

Photograph 116 – View looking east at conditions in HA 81, south of the existing Raymondville Drain.

Photograph 117 – View looking south at conditions in HA 82 near the existing Raymondville Drain (visible in the foreground).

Photograph 118 – View looking east at conditions in HA 82.

Photograph 119 – View looking south at conditions in HA 83.

Photograph 120 – View looking north at conditions in HA 84.

Photograph 121 – View looking north at the transition from HA 84 (light thornscrub) to HA 82 (row crops).

Photograph 122 – View looking east (downstream) at the existing RD in HA 82. Wind turbines were observed throughout HA 82.

Photograph 123 – View looking east at the confluence of HA 85 (drainageway) and the existing Raymondville Drain.

Photograph 124 – View looking southeast at HA 85.

Photograph 125 – Closer view of conditions in HA 85, looking south.

Photograph 126 – View of a Red-wing Blackbird (*Agelaius phoeniceus*) observed in the action area.

Photograph 127 – View looking southeast at conditions in HA 86. This property represents an effort by the property owner to restore pre-development prairie habitat.

Photograph 128 – View looking east (downstream) at the existing Raymondville Drain from County Road 445. East of this location, most of the action area was inaccessible due to a lack of right-of-entry permissions.

Photograph 129 – View looking east at conditions in HA 88, within the East Foundation property.

Photograph 130 – View looking south at conditions in HA 90, south of the existing Raymondville Drain.

Photograph 131 – View looking east at conditions in HA 91.

Photograph 132 – View looking east at fire damage to woody vegetation that was observed east of HA 91.

Photograph 133 – View looking north at an area within HA 88 where thornscrub vegetation coverage is less dense.

Photograph 134 – View looking northeast at conditions in another part of HA 88.

Photograph 135 – View looking south at conditions in HA 92.

Photograph 136 – View looking further southeast than the previous photograph at conditions in another part of HA 92.

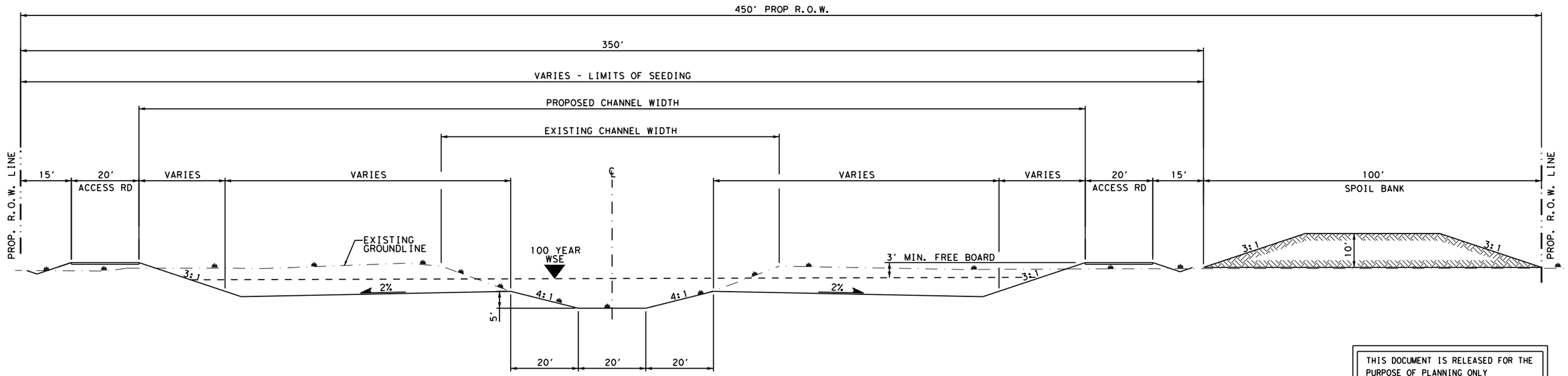
Photograph 137 – View looking northeast at a two-track vehicle trail in HA 88, near the eastern project terminus.

Photograph 138 – View looking east (downstream) from the eastern project terminus at the existing Raymondville Drain.

APPENDIX C

SUPPORTING DOCUMENTATION

- Raymondville Drain Project Proposed Typical Section
- Raymondville Drain Project Detention Pond Site Grading Layout
- U.S. Fish and Wildlife Service (USFWS), Texas Coastal Ecological Services Field Office, List of Threatened and Endangered Species, dated July 15, 2025
- Texas Parks and Wildlife Department (TPWD), Annotated County List of Rare Species for Hidalgo County, dated January 15, 2025
- TPWD, Annotated County List of Rare Species for Willacy County, dated January 15, 2025
- USFWS Identification Guide for Ocelots and Bobcats
- Vegetation and Wildlife Inventory for Raymondville Drain Project Action Area
- Natural Resources Conservation Service, Custom Soil Resource Report for Hidalgo County, Texas, and Willacy County, Texas; Raymondville Drain Project



PROPOSED TYPICAL SECTION

SCALE: 1" = 30'

THIS DOCUMENT IS RELEASED FOR THE PURPOSE OF PLANNING ONLY UNDER THE AUTHORITY OF:
JONATHAN T. PRUKOP, P.E.
TEXAS REGISTRATION 146702
DATE: 6/30/2023
IT IS NOT TO BE USED FOR BIDDING OR CONSTRUCTION PURPOSES.

HIDALGO COUNTY DRAINAGE DISTRICT No. 1

RRP
YOUR RELIABLE PARTNER
TEXAS BOARD OF PROFESSIONAL ENGINEERS # F-4440

RAYMONDVILLE DRAIN
TYPICAL SECTION

SHEET 1 OF 1

		SHEET NO.
STATE		COUNTY
TEXAS		

11:02:30 AM
6/30/2023
marinjr
E:\0944 Remote\Typical Section - Spoil Bank.dgn

DIV	CODE	DESCRIPTION	UNIT	EST	FINAL
02	02200	PREP R.O.W.	AC	272.0	
02	02315	EXCAVATION (DETENTION)	CY	5,963,544	
02	02330	EMBANKMENT (DETENTION)	CY	29,334	

X=1110513.7922
Y=16680315.6295
BEGIN DETENTION POND
STA 0+00.00

PROPOSED
FIELD DRAIN #1

STA 0+00.00
NATURAL GROUND
EL=76.40

EL=64.58

PROPOSED
FIELD DRAIN #2

STA 20+00.00
NATURAL GROUND
EL=83.41

PROPOSED
FIELD DRAIN #3

APPROXIMATELY 30'-0"
FROM PROPERTY LINE
TO DETENTION POND ALIGNMENT

POTENTIAL
PLUGGED GAS WELL
CONFLICT

PROPOSED
FIELD DRAIN #4

X=1110573.1266
Y=16676188.8983
DETENTION POND
STA 41+27.16

STA 41+27.16
NATURAL GROUND
EL=96.05

PROPOSED
FIELD DRAIN #5

PROPOSED
FIELD DRAIN #6

STA 66+00.00
NATURAL GROUND
EL=81.55

PROPOSED
FIELD DRAIN #7

STA 88+82.35
NATURAL GROUND
EL=74.00

PROPOSED
FIELD DRAIN #8

X=1115263.5232
Y=16675406.5866
DETENTION POND
STA 88+82.35

STA 110+00.00
NATURAL GROUND
EL=67.30

PROPOSED
FIELD DRAIN #9

PROPOSED
FIELD DRAIN #10

X=1115940.3016
Y=16679524.0719
END DETENTION POND
STA 130+55.08

STA 130+55.08
NATURAL GROUND
EL=74.79

PROPOSED
FIELD DRAIN #11

EL=63.34

EL=63.40

EL=63.18

EL=63.84

EL=63.76

FUTURE AIRPORT

RPROPOSED
DETENTION POND
OUTLET STRUCTURE

POTENTIAL
2" GAS LINE
CONFLICT
SEE SHEET 34

POTENTIAL
DRY HOLE
CONFLICT

POTENTIAL
2" GAS LINE
CONFLICT
SEE SHEET 31

DRAIN CHANNEL EXCAVATION LIMITS

APPROXIMATELY 30'-0"
FROM PROPERTY LINE
TO DETENTION POND ALIGNMENT

0.25%

SECTION A-A

DETENTION POND ACCESS ROAD
TYPICAL SECTION
SCALE: NOT TO SCALE

NOTES:
1. GAS WELLS WILL BE CAPPED AND CUT 2 FEET BELOW PROPOSED GRADE. IF PLUG IS ABOVE PROPOSED GRADE THEN IT WILL BE LEFT AS IS EXTRUDED TO AN ELEVATION THAT ABOVE 100 YEAR WATER SURFACE ELEVATION.
2. SEE DETENTION POND FIELD DRAIN DETAILS FOR ADDITIONAL INFORMATION.

SCALE: 1"=600'
0 300 600 Feet

HIDALGO COUNTY DRAINAGE DISTRICT No.1

RAYMONDVILLE DRAIN
PROJECT FOR FLOOD CONTROL
PHASE 1: SEGMENT 5
CONSTRUCTION OF DIVERSION DITCH

DETENTION POND
SITE GRADING
LAYOUT

DESIGNED BY:

INFRASTRUCTURE
TEXAS BOARD OF PROFESSIONAL ENGINEERS #: F-1582

S&BI PROJECT NO:	U9444	
DRAWN BY:	JM	
CHECKED BY:	DG	
APPROVED BY:	RA	

STATE OF TEXAS
REUBEN S. ABESAMIS
103397
LICENSED
PROFESSIONAL ENGINEER

08-06-2021

DATE:	SHEET NUMBER:
8/5/2021	87

United States Department of the Interior

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

In Reply Refer To: 07/15/2025 20:09:03 UTC
Project Code: 2025-0122066
Project Name: Raymondville Drain Project

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

To Whom It May Concern:

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

Project Leader; U.S. Fish and Wildlife Service; 17629 El Camino Real Ste. 211; Houston, Texas 77058
Angelina, *Austin*, *Brazoria*, *Brazos*, *Chambers, Colorado, Fayette, Fort Bend, Freestone, Galveston, Grimes, Hardin, Harris, Houston, Jasper, Jefferson, Leon, Liberty, Limestone, Madison, Matagorda, Montgomery, Newton, Orange, Polk, Robertson, Sabine, San Augustine, San Jacinto, Trinity, Tyler, Walker, Waller, and Wharton.*

Assistant Field Supervisor, U.S. Fish and Wildlife Service; 4444 Corona Drive, Ste 215; Corpus Christi, Texas 78411
Aransas, Atascosa, Bee, Brooks, Calhoun, De Witt, Dimmit, Duval, Frio, Goliad, Gonzales, Jackson, Jim Hogg, Jim Wells, Karnes, Kenedy, Kleberg, La Salle, Lavaca, Live Oak, Maverick, McMullen, Nueces, Refugio, San Patricio, Victoria, and Wilson.

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

For questions or coordination for projects occurring in counties not listed above, please contact arles@fws.gov.

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

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

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

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

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

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

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

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

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

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

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

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

Attachment(s):

- Official Species List

OFFICIAL SPECIES LIST

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

This species list is provided by:

Texas Coastal & Central Plains Esfo
17629 El Camino Real, Suite 211
Houston, TX 77058-3051
(281) 286-8282

PROJECT SUMMARY

Project Code: 2025-0122066
Project Name: Raymondville Drain Project
Project Type: Flooding
Project Description: Hidalgo County Drainage District No. 1 is developing a proposed project to improve the existing regional storm water drainage system in Hidalgo and Willacy Counties, Texas. This proposed drainage system improvement project, known as the Raymondville Drain Project, would expand the existing Raymondville Drain, in length and width, and potentially construct new drainage system elements (i.e., detention basins, alternative conveyance channels, etc.) to provide flood mitigation benefits within low-lying areas of Hidalgo and Willacy Counties.

Project Location:

The approximate location of the project can be viewed in Google Maps: https://www.google.com/maps/@26.4576996,-98.03251960941728,14z

Counties: Hidalgo and Willacy counties, Texas

ENDANGERED SPECIES ACT SPECIES

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

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

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

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

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

MAMMALS

NAME	STATUS
Gulf Coast Jaguarundi *Puma yagouaroundi cacomitli* No critical habitat has been designated for this species. Species profile: https://ecos.fws.gov/ecp/species/3945	Endangered
Ocelot *Leopardus (=Felis) pardalis* No critical habitat has been designated for this species. Species profile: https://ecos.fws.gov/ecp/species/4474	Endangered
Tricolored Bat *Perimyotis subflavus* No critical habitat has been designated for this species. Species profile: https://ecos.fws.gov/ecp/species/10515	Proposed Endangered

BIRDS

NAME	STATUS
Cactus Ferruginous Pygmy-owl *Glaucidium brasilianum cactorum* There is **final** critical habitat for this species. Species profile: https://ecos.fws.gov/ecp/species/1225	Threatened
Eastern Black Rail *Laterallus jamaicensis ssp. jamaicensis* No critical habitat has been designated for this species. Species profile: https://ecos.fws.gov/ecp/species/10477	Threatened
Northern Aplomado Falcon *Falco femoralis septentrionalis* Population: Wherever found, except where listed as an experimental population No critical habitat has been designated for this species. Species profile: https://ecos.fws.gov/ecp/species/1923	Endangered
Piping Plover *Charadrius melodus* Population: [Atlantic Coast and Northern Great Plains populations] - Wherever found, except those areas where listed as endangered. There is **final** critical habitat for this species. Your location does not overlap the critical habitat. Species profile: https://ecos.fws.gov/ecp/species/6039	Threatened
Rufa Red Knot *Calidris canutus rufa* There is **proposed** critical habitat for this species. Your location does not overlap the critical habitat. Species profile: https://ecos.fws.gov/ecp/species/1864	Threatened

REPTILES

NAME	STATUS
Green Sea Turtle *Chelonia mydas* Population: North Atlantic DPS There is **proposed** critical habitat for this species. Your location does not overlap the critical habitat. Species profile: https://ecos.fws.gov/ecp/species/6199	Threatened

NAME	STATUS
Hawksbill Sea Turtle *Eretmochelys imbricata* There is **final** critical habitat for this species. Your location does not overlap the critical habitat. Species profile: https://ecos.fws.gov/ecp/species/3656	Endangered
Kemp's Ridley Sea Turtle *Lepidochelys kempii* There is **proposed** critical habitat for this species. Species profile: https://ecos.fws.gov/ecp/species/5523	Endangered

CLAMS

NAME	STATUS
Salina Mucket *Potamilus metnecktayi* There is **proposed** critical habitat for this species. Your location does not overlap the critical habitat. Species profile: https://ecos.fws.gov/ecp/species/8753	Proposed Endangered

INSECTS

NAME	STATUS
Monarch Butterfly *Danaus plexippus* There is **proposed** critical habitat for this species. Your location does not overlap the critical habitat. Species profile: https://ecos.fws.gov/ecp/species/9743	Proposed Threatened

FLOWERING PLANTS

NAME	STATUS
Star Cactus *Astrophytum asterias* No critical habitat has been designated for this species. Species profile: https://ecos.fws.gov/ecp/species/7913	Endangered
Texas Ayenia *Ayenia limitaris* No critical habitat has been designated for this species. Species profile: https://ecos.fws.gov/ecp/species/4942	Endangered
Walker's Manioc *Manihot walkerae* No critical habitat has been designated for this species. Species profile: https://ecos.fws.gov/ecp/species/1892	Endangered

CRITICAL HABITATS

THERE ARE NO CRITICAL HABITATS WITHIN YOUR PROJECT AREA UNDER THIS OFFICE'S JURISDICTION.

YOU ARE STILL REQUIRED TO DETERMINE IF YOUR PROJECT(S) MAY HAVE EFFECTS ON ALL ABOVE LISTED SPECIES.

IPAC USER CONTACT INFORMATION

Agency:	Private Entity
Name:	Thomas Fitzgibbons
Address:	RRP Consulting Engineers, LLC
Address Line 2:	1400 Broadfield Blvd, Suite 400
City:	Houston
State:	TX
Zip:	77084
Email	tfitzgibbons@rrpeng.com
Phone:	2816274026

Last Update: 1/15/2025

HIDALGO COUNTY

AMPHIBIANS

black-spotted newt *Notophthalmus meridionalis*

Terrestrial and aquatic: Terrestrial habitats used by adults are typically poorly drained clay soils that allow for the formation of ephemeral wetlands. A wide variety of vegetation associations are known to be used, such as thorn scrub and pasture. Aquatic habitats used for reprodution are a variety of ephemeral and permanent water bodies.

Federal Status:	State Status: T	SGCN: Y
Endemic: N	Global Rank: G3	State Rank: S3

Mexican burrowing toad *Rhinophrynus dorsalis*

Terrestrial and aquatic: Low, rolling hills of sand, gravel or thin soil drained by ravines and gullies. Prefers moderate to dense vegetation cover of cactus and thornscrub. Roadside ditches, temporary ponds, arroyos, or wherever loose friable soils are present in which to burrow.

Federal Status:	State Status: T	SGCN: Y
Endemic: N	Global Rank: G5	State Rank: S3

Mexican treefrog *Smilisca baudinii*

Terrestrial and aquatic: Terrestrial habitas used include forested and brush around water bodies. Aquatic habitast used can any any body of water but preferred breeding sites are small, ephemeral wetlands.

Federal Status:	State Status: T	SGCN: Y
Endemic: N	Global Rank: G5	State Rank: S3

sheep frog *Hypopachus variolosus*

Terrestrial and aquatic: Predominantly grassland and savanna; largely fossorial in areas with moist microclimates.

Federal Status:	State Status: T	SGCN: N
Endemic: N	Global Rank: G5	State Rank: S4

South Texas siren (Large Form) *Siren sp. 1*

Aquatic: Mainly found in bodies of quiet water, permanent or temporary, with or without submergent vegetation. Wet or sometimes wet areas, such as arroyos, canals, ditches, or even shallow depressions; aestivates in the ground during dry periods, but does require some moisture to remain.

Federal Status:	State Status: T	SGCN: N
Endemic: N	Global Rank: GNRQ	State Rank: S1

white-lipped frog *Leptodactylus fragilis*

Terrestrial and aquatic: Lowlands, grasslands, cultivated fields, roadside ditches, and a wide variety of other habitats; often hides under rocks or in burrows under clumps of grass.

Federal Status:	State Status: T	SGCN: Y
Endemic: N	Global Rank: G5	State Rank: S3

HIDALGO COUNTY

AMPHIBIANS

Woodhouse's toad *Anaxyrus woodhousii*

Terrestrial and aquatic: A wide variety of terrestrial habitats are used by this species, including forests, grasslands, and barrier island sand dunes. Aquatic habitats are equally varied.

Federal Status:	State Status:	SGCN: Y
Endemic: N	Global Rank: G5	State Rank: S5

ARACHNIDS

No accepted common name *Diplocentrus diablo*

Like all species of Diplocentrus, D. diablo is an obligate burrower but may be found under large surface objects in rocky areas of the Rio Grande Valley (Stockwell & Nilsson 1987).

Federal Status:	State Status:	SGCN: Y
Endemic: N	Global Rank: GNR	State Rank: S2

BIRDS

Bank Swallow *Riparia riparia*

Bank Swallows live in low areas along rivers, streams, ocean coasts, and reservoirs. Their territories usually include vertical cliffs or banks where they nest in colonies of 10 to 2,000 nests. Though in the past Bank Swallows were most commonly found around natural bluffs or eroding streamside banks, they now often nest in human-made sites, such as sand and gravel quarries or road cuts. They forage in open areas and avoid places with tree cover.

Federal Status:	State Status:	SGCN: Y
Endemic: N	Global Rank: G5	State Rank: S2B,S4N

Brewer's Blackbird *Euphagus cyanocephalus*

Shrubby and bushy areas (especially near water), riparian woodland, aspen parklands, cultivated lands, marshes, and around human habitation; in migration and winter also in pastures and fields (AOU 1983).

Federal Status:	State Status:	SGCN: Y
Endemic: N	Global Rank: G5	State Rank: S5

Brown Pelican *Pelecanus occidentalis*

Largely coastal and near shore areas, where it roosts and nests on islands and spoil banks. Feeds in lagunas and shallow seaward waters.

Federal Status:	State Status:	SGCN: N
Endemic: N	Global Rank: G4	State Rank: S3B

cactus ferruginous pygmy-owl *Glaucidium brasilianum cactorum*

Riparian trees, brush, palm, and mesquite thickets; during day also roosts in small caves and recesses on slopes of low hills; breeding April to June

Federal Status: T	State Status: T	SGCN: N
Endemic: N	Global Rank: G5T2	State Rank: S2?

HIDALGO COUNTY

BIRDS

Cactus Wren *Campylorhynchus brunneicapillus*

Desert (especially with cholla cactus or yucca), mesquite, arid scrub, coastal sage scrub, and in trees in towns in arid regions (Tropical to Subtropical zones) (AOU 1983). Nests in OPUNTIA cactus, or in twiggy, thorny, trees and shrubs, sometimes in buildings. Nest may be relined and used as a winter roost.

Federal Status:	State Status:	SGCN: Y
Endemic: N	Global Rank: G5	State Rank: S4B

common black-hawk *Buteogallus anthracinus*

Cottonwood-lined rivers and streams; willow tree groves on the lower Rio Grande floodplain; formerly bred in south Texas

Federal Status:	State Status: T	SGCN: Y
Endemic: N	Global Rank: G4G5	State Rank: S2B

Common Nighthawk *Chordeiles minor*

Common Nighthawks nest in both rural and urban habitats including coastal sand dunes and beaches, logged forest, recently burned forest, woodland clearings, prairies, plains, sagebrush, grasslands, open forests, and rock outcrops. They also nest on flat gravel rooftops, though less often as gravel roofs are being replaced by smooth, rubberized roofs that provide an unsuitable surface.

Federal Status:	State Status:	SGCN: Y
Endemic: N	Global Rank: G5	State Rank: S4B

Elf Owl *Micrathene whitneyi*

In SW Texas and Coahuila, Mexico, nests in AGAVE-ACACIA-LEUCOPHYLLUM lowland desert, PROSOPIS-ACACIA-CELTIS-CHILOPSIS desert-wash woodland, POPULUS-SALIX-FRAXINUS-JUGLANS-ACER canyon riparian forest, and QUERCUS-PINUS-JUNIPERUS evergreen woodland; and in the lower Rio Grande valley of Texas and Tamaulipas and Nuevo Leon, Mexico, nests in ACACIA-PROSOPIS-CELTIS-DIOSPYRUS-BUMELIA subtropical thorn woodland and PITHECELLOBIUM-EHRETIA-ULMUS-LEUCAENA riparian woodland (Henry and Gehlbach 1999).

Federal Status:	State Status:	SGCN: Y
Endemic: N	Global Rank: G5	State Rank: S4B

ferruginous pygmy-owl *Glaucidium brasilianum*

Riparian trees, brush, palm, and mesquite thickets; during day also roosts in small caves and recesses on slopes of low hills; breeding April to June

Federal Status:	State Status: T	SGCN: Y
Endemic: N	Global Rank: G5	State Rank: S2?

Franklin's gull *Leucophaeus pipixcan*

The county distribution for this species includes geographic areas that the species may use during migration. Time of year should be factored into evaluations to determine potential presence of this species in a specific county. This species is only a spring and fall migrant throughout Texas. It does not breed in or near Texas. Winter records are unusual consisting of one or a few individuals at a given site (especially along the Gulf coastline). During migration, these gulls fly during daylight hours but often come down to wetlands, lake shore, or islands to roost for the night.

Federal Status:	State Status:	SGCN: Y
Endemic: N	Global Rank: G5	State Rank: S2N

HIDALGO COUNTY

BIRDS

gray hawk *Buteo plagiatus*

Locally and irregularly along U.S.-Mexico border; mature riparian woodlands and nearby semiarid mesquite and scrub grasslands; breeding range formerly extended north to southernmost Rio Grande floodplain of Texas

Federal Status: State Status: T SGCN: Y
Endemic: N Global Rank: G5 State Rank: S2B

interior least tern *Sternula antillarum athalassos*

Sand beaches, flats, bays, inlets, lagoons, islands. Subspecies is listed only when inland (more than 50 miles from a coastline); nests along sand and gravel bars within braided streams, rivers; also know to nest on man-made structures (inland beaches, wastewater treatment plants, gravel mines, etc); eats small fish and crustaceans, when breeding forages within a few hundred feet of colony

Federal Status: State Status: E SGCN: N
Endemic: N Global Rank: G4T3Q State Rank: S1B

lark bunting *Calamospiza melanocorys*

Overall, it's a generalist in most short grassland settings including ones with some brushy component plus certain agricultural lands that include grain sorghum. Short grasses include sideoats and blue gramas, sand dropseed, prairie junegrass (Koeleria), buffalograss also with patches of bluestem and other mid-grass species. This bunting will frequent smaller patches of grasses or disturbed patches of grasses including rural yards. It also uses weedy fields surrounding playas. This species avoids urban areas and cotton fields.

Federal Status: State Status: SGCN: Y
Endemic: N Global Rank: G5 State Rank: S4B

Least Tern *Sternula antillarum*

Sand beaches, flats, bays, inlets, lagoons, islands, river sandbars and flat gravel rooftops in urban areas.

Federal Status: State Status: SGCN: Y
Endemic: N Global Rank: G4 State Rank: S2B

Loggerhead Shrike *Lanius ludovicianus*

Loggerhead Shrikes inhabit open country with short vegetation and well-spaced shrubs or low trees, particularly those with spines or thorns. They frequent agricultural fields, pastures, old orchards, riparian areas, desert scrublands, savannas, prairies, golf courses, and cemeteries. Loggerhead Shrikes are often seen along mowed roadsides with access to fence lines and utility poles.

Federal Status: State Status: SGCN: Y
Endemic: N Global Rank: G4 State Rank: S4B

Mottled Duck *Anas fulvigula*

Estuaries, ponds, lakes, secondary bays.

Federal Status: State Status: SGCN: Y
Endemic: N Global Rank: G4 State Rank: S4B

HIDALGO COUNTY

BIRDS

mountain plover *Charadrius montanus*

The county distribution for this species includes geographic areas that the species may use during migration. Time of year should be factored into evaluations to determine potential presence of this species in a specific county. Breeding: nests on high plains or shortgrass prairie, on ground in shallow depression; nonbreeding: shortgrass plains and bare, dirt (plowed) fields; primarily insectivorous.

Federal Status:	State Status:	SGCN: Y
Endemic: N	Global Rank: G3	State Rank: S2

northern beardless-tyrannulet *Camptostoma imberbe*

Mesquite woodlands; also cottonwood, willow, elm, and tepeguaje near the Rio Grande. Breeding April to July

Federal Status:	State Status: T	SGCN: Y
Endemic: N	Global Rank: G5	State Rank: S1S2

Northern Bobwhite *Colinus virginianus*

Inhabits a wide variety of vegetation types, particularly early successional stages. Occurs in croplands, grasslands, pastures, fallow fields, grass-brush rangelands, open pinelands, open mixed pine-hardwood forests, and habitat mosaics (Brennan 1999).

Federal Status:	State Status:	SGCN: Y
Endemic: N	Global Rank: G4G5	State Rank: S4B

piping plover *Charadrius melodus*

The county distribution for this species includes geographic areas that the species may use during migration. Time of year should be factored into evaluations to determine potential presence of this species in a specific county. Beaches, sandflats, and dunes along Gulf Coast beaches and adjacent offshore islands. Also spoil islands in the Intracoastal Waterway. Based on the November 30, 1992 Section 6 Job No. 9.1, Piping Plover and Snowy Plover Winter Habitat Status Survey, algal flats appear to be the highest quality habitat. Some of the most important aspects of algal flats are their relative inaccessibility and their continuous availability throughout all tidal conditions. Sand flats often appear to be preferred over algal flats when both are available, but large portions of sand flats along the Texas coast are available only during low-very low tides and are often completely unavailable during extreme high tides or strong north winds. Beaches appear to serve as a secondary habitat to the flats associated with the primary bays, lagoons, and inter-island passes. Beaches are rarely used on the southern Texas coast, where bayside habitat is always available, and are abandoned as bayside habitats become available on the central and northern coast. However, beaches are probably a vital habitat along the central and northern coast (i.e. north of Padre Island) during periods of extreme high tides that cover the flats. Optimal site characteristics appear to be large in area, sparsely vegetated, continuously available or in close proximity to secondary habitat, and with limited human disturbance.

Federal Status: T	State Status: T	SGCN: Y
Endemic: N	Global Rank: G3	State Rank: S2N

Pyrrhuloxia *Cardinalis sinuatus*

Pyrrhuloxias live in upland deserts, mesquite savannas, riparian (streamside) woodlands, desert scrublands, farm fields with hedgerows, and residential areas with nearby mesquite. When not breeding, some Pyrrhuloxias wander into urban habitats, mesquite-hackberry habitats, and riparian habitats with Arizona sycamore and cottonwood.

Federal Status:	State Status:	SGCN: Y
Endemic: N	Global Rank: G5	State Rank: S4B

red-crowned parrot *Amazona viridigenalis*

HIDALGO COUNTY

BIRDS

Starting in the late 1980s to early 1990s, this species has increased in numbers in urban settings in Cameron and Hidalgo counties. This cavity-nesting species prefers dead palm trees, including non-native Washingtonian palms, with abandoned cavities excavated by Golden-fronted Woodpeckers. Grooming of palms (i.e., trimming the dead, drooping fronds) does not appear to directly impact this species; however removal of dead palms with or without cavities should be avoided.

Federal Status:	State Status: T	SGCN: Y
Endemic: N	Global Rank: G2	State Rank: S2

rose-throated becard *Pachyramphus aglaiae*

Riparian corridors; trees, woodlands, open forest, scrub, and mangroves; breeding April to July.

Federal Status:	State Status: T	SGCN: Y
Endemic: N	Global Rank: G4G5	State Rank: S1

Sanderling *Calidris alba*

Nonbreeding: primarily sandy beaches, less frequently on mud flats and shores of lakes or rivers (AOU 1983) also on exposed reefs (Pratt et al. 1987). Sleeps/loafs on upper beach or on salt pond dike.

Federal Status:	State Status:	SGCN: Y
Endemic: N	Global Rank: G5	State Rank: S5

Scaled Quail *Callipepla squamata*

In general, preferred habitat is arid-semiarid, mixed shrub-grassland. Common shrubs of preferred habitat include acacia (ACACIA spp.), sand sagebrush (ARTEMISIA FILIFOLIA), four-winged saltbush (ATRIPLEX CANESCENS), cacti (OPUNTIA spp.), honey mesquite (PROSOPIS GLANDULOSA), sumacs (RHUS AROMATICA, R. MICROPHYLLA, R. TRILOBATA), yucca (YUCCA spp.), and snakeweed (XANTHOCEPHALUM SAROTHRAE).

Federal Status:	State Status:	SGCN: Y
Endemic: N	Global Rank: G5	State Rank: S4B

Snowy Plover *Charadrius nivosus*

Algal flats appear to be the highest quality habitat. Some of the most important aspects of algal flats are their relative inaccessibility and their continuous availability throughout all tidal conditions. An optimal site characteristic would be large in size. The size of populations appear to be roughly proportional to the total area of suitable habitat used. Formerly an uncommon breeder in the Panhandle; potential migrant; winter along coast.

Federal Status:	State Status:	SGCN: Y
Endemic: N	Global Rank: G3	State Rank: S3B

Sprague's pipit *Anthus spragueii*

The county distribution for this species includes geographic areas that the species may use during migration. Time of year should be factored into evaluations to determine potential presence of this species in a specific county. Habitat during migration and in winter consists of pastures and weedy fields (AOU 1983), including grasslands with dense herbaceous vegetation or grassy agricultural fields.

Federal Status:	State Status:	SGCN: Y
Endemic: N	Global Rank: G3G4	State Rank: S3N

swallow-tailed kite *Elanoides forficatus*

HIDALGO COUNTY

BIRDS

The county distribution for this species includes geographic areas that the species may use during migration. Time of year should be factored into evaluations to determine potential presence of this species in a specific county. Lowland forested regions, especially swampy areas, ranging into open woodland; marshes, along rivers, lakes, and ponds; nests high in tall tree in clearing or on forest woodland edge, usually in pine, cypress, or various deciduous trees.

Federal Status:	State Status: T	SGCN: Y
Endemic: N	Global Rank: G5	State Rank: S2B

tropical parula *Setophaga pitiayumi*

Semi-tropical evergreen woodland along rivers and resacas. Texas ebony, anacua and other trees with epiphytic plants hanging from them. Dense or open woods, undergrowth, brush, and trees along edges of rivers and resacas; breeding April to July.

Federal Status:	State Status: T	SGCN: Y
Endemic: N	Global Rank: G5	State Rank: S3B

Varied Bunting *Passerina versicolor*

Arid thorn brush and thickets, dry washes and arid scrub (Tropical and Subtropical zones) (AOU 1983). Often near water. Often stays close to ground cover (Oberholser 1974). Nests usually low in tree, bush or vine, 0.5-1.5 m above ground (Terres 1980).

Federal Status:	State Status:	SGCN: Y
Endemic: N	Global Rank: G5	State Rank: S4B

western burrowing owl *Athene cunicularia hypugaea*

Open grasslands, especially prairie, plains, and savanna, sometimes in open areas such as vacant lots near human habitation or airports; nests and roosts in abandoned burrows

Federal Status:	State Status:	SGCN: N
Endemic: N	Global Rank: G4T4	State Rank: S2

white-faced ibis *Plegadis chihi*

The county distribution for this species includes geographic areas that the species may use during migration. Time of year should be factored into evaluations to determine potential presence of this species in a specific county. Prefers freshwater marshes, sloughs, and irrigated rice fields, but will attend brackish and saltwater habitats; currently confined to near-coastal rookeries in so-called hog-wallow prairies. Nests in marshes, in low trees, on the ground in bulrushes or reeds, or on floating mats.

Federal Status:	State Status: T	SGCN: N
Endemic: N	Global Rank: G5	State Rank: S4B

white-tailed hawk *Buteo albicaudatus*

Near coast on prairies, cordgrass flats, and scrub-live oak; further inland on prairies, mesquite and oak savannas, and mixed savanna-chaparral; breeding March-May

Federal Status:	State Status: T	SGCN: N
Endemic: N	Global Rank: G4G5	State Rank: S4B

HIDALGO COUNTY

BIRDS

Willet *Tringa semipalmata*

Marshes, tidal mudflats, beaches, lake margins, mangroves, tidal channels, river mouths, coastal lagoons, sandy or rocky shores, and, less frequently, open grassland (AOU 1983, Stiles and Skutch 1989).

Federal Status:	State Status:	SGCN: Y
Endemic: N	Global Rank: G5	State Rank: S5B

Wilson's Warbler *Cardellina pusilla*

Wilson’s warblers key in on forests and scrubby areas along streams to fatten up during migration. During the nonbreeding season they use many types of habitats from lowland thickets near streams to high-elevation cloud forests in Mexico and Central America.

Federal Status:	State Status:	SGCN: Y
Endemic: N	Global Rank: G5	State Rank: S4

wood stork *Mycteria americana*

The county distribution for this species includes geographic areas that the species may use during migration. Time of year should be factored into evaluations to determine potential presence of this species in a specific county. Prefers to nest in large tracts of baldcypress (Taxodium distichum) or red mangrove (Rhizophora mangle); forages in prairie ponds, flooded pastures or fields, ditches, and other shallow standing water, including salt-water; usually roosts communally in tall snags, sometimes in association with other wading birds (i.e. active heronries); breeds in Mexico and birds move into Gulf States in search of mud flats and other wetlands, even those associated with forested areas; formerly nested in Texas, but no breeding records since 1960.

Federal Status:	State Status: T	SGCN: Y
Endemic: N	Global Rank: G4	State Rank: SHB,S3N

yellow-billed cuckoo *Coccyzus americanus*

In Texas, the populations of concern are found breeding in riparian areas in the Trans Pecos (know as part of the Western Distinct Population Segment). It is the Western DPS that is on the U.S. ESA threatened list and includes the Texas counties Brewster, Culberson, El Paso, Hudspeth, Jeff Davis, and Presidio. Riparian woodlands below 6,000' in elevation consisting of cottonwoods and willows are prime habitat. This species is a long-distant migrant that summers in Texas, but winters mainly in South America. Breeding birds of the Trans Pecos populations typically arrive on their breeding grounds possibly in late April but the peak arrival time is in May. Threats to preferred habitat include hydrologic changes that don't promote the regeneration of cottonwoods and willows, plus livestock browsing and trampling of sapling trees in sensitive riparian areas.

Federal Status: T	State Status:	SGCN: Y
Endemic: N	Global Rank: G5	State Rank: S4S5B

zone-tailed hawk *Buteo albonotatus*

Arid open country, including open deciduous or pine-oak woodland, mesa or mountain county, often near watercourses, and wooded canyons and tree-lined rivers along middle-slopes of desert mountains; nests in various habitats and sites, ranging from small trees in lower desert, giant cottonwoods in riparian areas, to mature conifers in high mountain regions

Federal Status:	State Status: T	SGCN: Y
Endemic: N	Global Rank: G4	State Rank: S3B

HIDALGO COUNTY

CRUSTACEANS

acacia fairy shrimp *Dendrocephalus acacioidea*

Playa, roadside pools in Brooks, Hidalgo, Kleberg Cos., Texas (Jass and Klausmeier, 2000). Occurs in turbid, warm water temporary pools and playas.

Federal Status:	State Status:	SGCN: Y
Endemic: Y	Global Rank: G1	State Rank: S1

FISH

alligator gar *Atractosteus spatula*

From the Red River to the Rio Grande (Hubbs et al. 2008); occurs in the Trinity River upstream of Lake Livingston. Found in rivers, streams, lakes, swamps, bayous, bays and estuaries typically in pools and backwater habitats. Floodplains inundated with flood waters provide spawning and nursery habitats.

Federal Status:	State Status:	SGCN: Y
Endemic: N	Global Rank: G3G4	State Rank: S4

Rio Grande shiner *Notropis jemezanus*

Rio Grande drainage. Occurs over substrate of rubble, gravel and sand, often overlain with silt

Federal Status:	State Status: T	SGCN: Y
Endemic: N	Global Rank: G3	State Rank: S1

river goby *Awaous banana*

Formerly occupied the mainstream of the Rio Grande in Texas (northern most portion of their range). Generally occupies clear, well oxygenated streams and rivers with slow to moderate current (dependent on flowing water), sandy, muddy, or hard bottom, and little or no vegetation; also enters brackish and marine waters. Shaded areas of streams/rivers may be preferred. Spawning takes place in freshwater and eggs drift downstream to brackish or salt water where they hatch. Larvae migrate back into streams as they develop, but have a higher salinity tolerance than adults. Feeds mainly on filamentous algae.

Federal Status:	State Status: T	SGCN: N
Endemic: N	Global Rank: G5	State Rank: S1

speckled chub *Macrhybopsis aestivalis*

Found throughout the Rio Grande and lower Pecos River but occurs most frequently between the Río Conchos confluence and the Pecos River. Flowing water over coarse sand and fine gravel substrates in streams; typically found in raceways and runs.

Federal Status:	State Status: T	SGCN: Y
Endemic: N	Global Rank: G3G4	State Rank: S1S2

Tamaulipas shiner *Notropis braytoni*

Restricted to the Rio Grande basin in Texas including the lower Pecos River. Typically found in large rivers and creeks associated with a variety of flowng-water habitats such as runs and riffles over gravel, cobble, and sand.

Federal Status:	State Status: T	SGCN: Y
Endemic: N	Global Rank: G4	State Rank: S1S2

HIDALGO COUNTY

INSECTS

American bumblebee *Bombus pensylvanicus*

Habitat description is not available at this time.

Federal Status:	State Status:	SGCN: Y
Endemic:	Global Rank: G3G4	State Rank: SNR

Manfreda giant-skipper *Stallingsia maculosus*

Most skippers are small and stout-bodied; name derives from fast, erratic flight; at rest most skippers hold front and hind wings at different angles; skipper larvae are smooth, with the head and neck constricted; skipper larvae usually feed inside a leaf shelter and pupate in a cocoon made of leaves fastened together with silk

Federal Status:	State Status:	SGCN: Y
Endemic: N	Global Rank: G1	State Rank: S1

migratory monarch butterfly *Danaus plexippus plexippus*

Habitat description is not available at this time.

Federal Status: C	State Status:	SGCN: Y
Endemic:	Global Rank: G4T3	State Rank: SNR

neojuvenile tiger beetle *Cicindela obsoleta neojuvenilis*

Bare or sparsely vegetated, dry, hard-packed soil; typically in previously disturbed areas; peak adult activity in Jul

Federal Status:	State Status:	SGCN: Y
Endemic:	Global Rank: G5T1	State Rank: SH

No accepted common name *Pachyschelus fisheri*

Habitat description is not available at this time.

Federal Status:	State Status:	SGCN: Y
Endemic: Y	Global Rank: GNR	State Rank: S1

No accepted common name *Trichodesma pulchella*

Habitat description is not available at this time.

Federal Status:	State Status:	SGCN: Y
Endemic:	Global Rank: GNR	State Rank: S1

No accepted common name *Ormiscus albofasciatus*

Habitat description is not available at this time.

Federal Status:	State Status:	SGCN: Y
Endemic:	Global Rank: GNR	State Rank: S2

HIDALGO COUNTY

INSECTS

No accepted common name *Spectralia prosternalis*

Habitat description is not available at this time.

Federal Status:	State Status:	SGCN: Y
Endemic: Y	Global Rank: GNR	State Rank: S2

No accepted common name *Trigonogya reticulaticollis*

Habitat description is not available at this time.

Federal Status:	State Status:	SGCN: Y
Endemic: Y	Global Rank: GNR	State Rank: S1

No accepted common name *Heterobrenthus texanus*

Habitat description is not available at this time.

Federal Status:	State Status:	SGCN: Y
Endemic:	Global Rank: GNR	State Rank: S1

No accepted common name *Sphingicampa blanchardi*

Woodland - hardwood; Tamaulipan thornscrub with caterpillars host plant, Texas Ebony (Pitheocellobium flexicaule) an important element

Federal Status:	State Status:	SGCN: Y
Endemic: P	Global Rank: G1	State Rank: S1

No accepted common name *Bombus variabilis*

Habitat description is not available at this time.

Federal Status:	State Status:	SGCN: Y
Endemic:	Global Rank: G1G2	State Rank: SNR

subtropical black sky tiger beetle *Cicindela nigrocoerulea subtropica*

Most tiger beetles are active, usually brightly colored, and found in open, sunny areas; adult tiger beetles are predaceous and feed on a variety of small insects; larvae of tiger beetles are also predaceous and live in vertical burrows in soil of dry paths, fields, or sandy beaches

Federal Status:	State Status:	SGCN: Y
Endemic:	Global Rank: G5T2	State Rank: SH

Tamaulipan agapema *Agapema galbina*

Tamaulipan thornscrub with adequate densities of the caterpillar foodplant Condalia hookeri hookeri (= obovata); adults occur Sep - Oct; eggs hatch within two weeks and larvae mature rapidly

Federal Status:	State Status:	SGCN: Y
Endemic:	Global Rank: G1	State Rank: SH

HIDALGO COUNTY

INSECTS

Tamaulipan clubtail dragonfly *Gomphus gonzalezi*

Rivers, muddy to clear and rocky, should be watched for in substantial creeks as well. This species is considered rare and has a very restricted range in the Rio Grande Valley and southward in eastern Mexico. Abundance information is lacking (Ware et al 2016; Abbott 2005).

Federal Status:	State Status:	SGCN: Y
Endemic:	Global Rank: G2	State Rank: S2

MAMMALS

cave myotis bat *Myotis velifer*

Colonial and cave-dwelling; also roosts in rock crevices, old buildings, carports, under bridges, and even in abandoned Cliff Swallow (Hirundo pyrrhonota) nests; roosts in clusters of up to thousands of individuals; hibernates in limestone caves of Edwards Plateau and gypsum cave of Panhandle during winter; opportunistic insectivore.

Federal Status:	State Status:	SGCN: Y
Endemic: N	Global Rank: G4G5	State Rank: S2S3

Coues' rice rat *Oryzomys couesi*

Cattail-bulrush marsh with shallower zone of aquatic grasses (Echinochloa, Panicum, Paspalidium) near the shoreline; shade trees around the shoreline are important features. Freshwater marshes.

Federal Status:	State Status: T	SGCN: Y
Endemic: N	Global Rank: G5	State Rank: S2

Coues' rice rat *Oryzomys couesi aquaticus*

Cattail-bulrush marsh with shallower zone of aquatic grasses near the shoreline; shade trees around the shoreline are important features; prefers salt and freshwater, as well as grassy areas near water; breeds April-August

Federal Status:	State Status: T	SGCN: Y
Endemic: N	Global Rank: G5T2T4	State Rank: S2

eastern spotted skunk *Spilogale putorius*

Generalist; open fields prairies, croplands, fence rows, farmyards, forest edges & woodlands. Prefer wooded, brushy areas & tallgrass prairies. S.p. ssp. interrupta found in wooded areas and tallgrass prairies, preferring rocky canyons and outcrops when such sites are available.

Federal Status:	State Status:	SGCN: Y
Endemic: N	Global Rank: G4	State Rank: S1S3

ghost-faced bat *Mormoops megalophylla*

Winter roosts are in large limestone caves. Buildings and rock crevasses provide roosts, as well.

Federal Status:	State Status:	SGCN: Y
Endemic: N	Global Rank: G5	State Rank: S2

HIDALGO COUNTY

MAMMALS

hoary bat *Lasiurus cinereus*

Hoary bats are highly migratory, high-flying bats that have been noted throughout the state. Females are known to migrate to Mexico in the winter, males tend to remain further north and may stay in Texas year-round. Commonly associated with forests (foliage roosting species) but are found in unforested parts of the state and lowland deserts. Tend to be captured over water and large, open flyways.

Federal Status: State Status: SGCN: Y
Endemic: N Global Rank: G3G4 State Rank: S3

Mexican spiny pocket mouse *Liomys irroratus*

Lives in dense brush on ridges forming the old Rio Grande river bed. Usually closely associated with prickly pear thickets. Nests are in underground burrows.

Federal Status: State Status: SGCN: Y
Endemic: N Global Rank: G5 State Rank: S3

mountain lion *Puma concolor*

Generalist; found in a wide range of habitats statewide. Found most frequently in rugged mountains & riparian zones.

Federal Status: State Status: SGCN: Y
Endemic: N Global Rank: G5 State Rank: S2S3

ocelot *Leopardus pardalis*

Restricted to mesquite-thorn scrub and live-oak mottes; avoids open areas. Dense mixed brush below four feet; thorny shrublands; dense chaparral thickets; breeds and raises young June-November.

Federal Status: E State Status: E SGCN: Y
Endemic: N Global Rank: G4 State Rank: S1

plains spotted skunk *Spilogale interrupta*

Generalist; open fields, prairies, croplands, fence rows, farmyards, forest edges, and woodlands; prefers wooded, brushy areas and tallgrass prairie

Federal Status: State Status: SGCN: Y
Endemic: N Global Rank: G3 State Rank: S1S3

southern yellow bat *Lasiurus ega*

Relict palm grove is only known Texas habitat. Neotropical species roosting in palms, forages over water; insectivorous; breeding in late winter. Roosts in dead palm fronds in ornamental palms in urban areas.

Federal Status: State Status: SGCN: Y
Endemic: N Global Rank: G5 State Rank: S3S4

tricolored bat *Perimyotis subflavus*

Forest, woodland and riparian areas are important. Caves are very important to this species.

Federal Status: PE State Status: SGCN: Y
Endemic: N Global Rank: G3G4 State Rank: S2

HIDALGO COUNTY

MAMMALS

white-nosed coati *Nasua narica*

Woodlands, riparian corridors and canyons.Most individuals in Texas probably transients from Mexico; diurnal and crepuscular; very sociable; forages on ground and in trees; omnivorous; may be susceptible to hunting, trapping, and pet trade

Federal Status:	State Status: T	SGCN: Y
Endemic: N	Global Rank: G5	State Rank: S1

Yuma myotis *Myotis yumanensis*

Caves, mines, tunnels and buildings in Trans-Pecos.

Federal Status:	State Status:	SGCN: Y
Endemic: N	Global Rank: G5	State Rank: S3?

MOLLUSKS

Glossy Wolfsnail *Euglandina texasiana*

Habitat description is not available at this time.

Federal Status:	State Status:	SGCN: Y
Endemic:	Global Rank: G1G2	State Rank: S3

Mexican fawnsfoot *Truncilla cognata*

Occurs in large rivers but may also be found in medium-sized streams. Is commonly found in habitats with some flowing water, often in protected near shore areas such as banks and backwaters but also at the head of riffles; the latter more often supporting both sub-adults and adults. Typically occurs in substrates of mixed sand and gravel as well as soft unconsolidated sediments. Considered intolerant of reservoirs (Randklev et al. 2017b; Randklev et al. forthcoming). [Mussels of Texas 2019]

Federal Status: PE	State Status: T	SGCN: Y
Endemic: N	Global Rank: G1	State Rank: S1

No accepted common name *Praticolella trimatris*

Habitat description is not available at this time.

Federal Status:	State Status:	SGCN: Y
Endemic: Y	Global Rank: G2	State Rank: S3

Salina mucket *Potamilus metnecktayi*

Occurs in medium to large rivers, where it may be found in substrates composed of various combinations of mud, sand, gravel, and cobble, as well as under rocks. It occurs in areas with slow to moderate current, most often in stable littoral habitats dominated by boulder or bedrock habitat; not known from reservoirs (Randklev et al. 2017b; Randklev et al. forthcoming). [Mussels of Texas 2019]

Federal Status:	State Status: T	SGCN: Y
Endemic: N	Global Rank: G1	State Rank: S1

HIDALGO COUNTY

MOLLUSKS

Texas hornshell *Popenaias popeii*

Occurs in small streams to large rivers in slow to moderate current, often residing in rock crevices, travertine shelves, and under large boulders, where small-grained material, such as clay, silt, or sand gathers. Can also occur in riffles that are clean swept of soft silt; not known from reservoirs (Carman 2007; Inoue et al. 2014; Randklev et al. 2017b; Randklev et al. forthcoming). [Mussels of Texas 2019]

Federal Status: E	State Status: E	SGCN: Y
Endemic: N	Global Rank: G1	State Rank: S1

REPTILES

American alligator *Alligator mississippiensis*

Aquatic: Coastal marshes; inland natural rivers, swamps and marshes; manmade impoundments.

Federal Status: SAT	State Status:	SGCN: N
Endemic: N	Global Rank: G5	State Rank: S4

black-striped snake *Coniophanes imperialis*

Terrestrial: Occurs in native thorn scrub and woodlands a well as modfied urban areas. Prefers warm, moist microhabitats, and sandy soils.

Federal Status:	State Status: T	SGCN: Y
Endemic: N	Global Rank: G4G5	State Rank: S2S3

eastern box turtle *Terrapene carolina*

Terrestrial: Eastern box turtles inhabit forests, fields, forest-brush, and forest-field ecotones. In some areas they move seasonally from fields in spring to forest in summer. They commonly enters pools of shallow water in summer. For shelter, they burrow into loose soil, debris, mud, old stump holes, or under leaf litter. They can successfully hibernate in sites that may experience subfreezing temperatures.

Federal Status:	State Status:	SGCN: Y
Endemic: N	Global Rank: G5	State Rank: S3

keeled earless lizard *Holbrookia propinqua*

Terrestrial: Habitats include coastal dunes, barrier islands, and other sandy areas (Axtell 1983). Although it occurs well inland, this species is most abundant on coastal dunes, were it seeks shelter in the burrows of small mammals or crabs (Bartlett and Bartlett 1999).

Federal Status:	State Status:	SGCN: Y
Endemic: N	Global Rank: G4	State Rank: S3

Mexican Hooknose Snake *Ficimia streckeri*

Habitats include thorn brush woodland (e.g., cactus, mesquite, acacia, paloverde; especially near water or along the edges of agricultural fields) and lower Rio Grande floodplain in lowland southern Texas. Thi ssanke burrows into soft soil.

Federal Status:	State Status:	SGCN: Y
Endemic: N	Global Rank: G4	State Rank: S3

HIDALGO COUNTY

REPTILES

northern cat-eyed snake *Leptodeira septentrionalis*

Terrestrial: Thorn scrub and decidious woodland; dense thickets bordering ponds and streams.

Federal Status:	State Status: T	SGCN: Y
Endemic: N	Global Rank: G5	State Rank: S3

Rio Grande river cooter *Pseudemys gorzugi*

Aquatic: Habitat includes rivers and their more permanent spring-fed tributary streams, beaver ponds, and stock tanks (Garrett and Barker 1987). Occupied waters may have a muddy, sandy, or rocky bottom, and may or may not contain aquatic vegetation (Degenhardt et al. 1996).

Federal Status:	State Status:	SGCN: Y
Endemic: N	Global Rank: G3G4	State Rank: S2

slender glass lizard *Ophisaurus attenuatus*

Terrestrial: Habitats include open grassland, prairie, woodland edge, open woodland, oak savannas, longleaf pine flatwoods, scrubby areas, fallow fields, and areas near streams and ponds, often in habitats with sandy soil.

Federal Status:	State Status:	SGCN: Y
Endemic: N	Global Rank: G5	State Rank: S3

speckled racer *Drymobius margaritiferus*

Terrestrial: Dense thickets near water, palm groves, riparian woodlands; often in areas with much vegetation litter on ground.

Federal Status:	State Status: T	SGCN: Y
Endemic: N	Global Rank: G5	State Rank: S1

Texas horned lizard *Phrynosoma cornutum*

Terrestrial: Open habitats with sparse vegetation, including grass, prairie, cactus, scattered brush or scrubby trees; soil may vary in texture from sandy to rocky; burrows into soil, enters rodent burrows, or hides under rock when inactive. Occurs to 6000 feet, but largely limited below the pinyon-juniper zone on mountains in the Big Bend area.

Federal Status:	State Status: T	SGCN: Y
Endemic: N	Global Rank: G4G5	State Rank: S3

Texas tortoise *Gopherus berlandieri*

Terrestrial: Open scrub woods, arid brush, lomas, grass-cactus association; often in areas with sandy well-drained soils. When inactive occupies shallow depressions dug at base of bush or cactus; sometimes in underground burrow or under object. Eggs are laid in nests dug in soil near or under bushes.

Federal Status:	State Status: T	SGCN: Y
Endemic: N	Global Rank: G4	State Rank: S2

HIDALGO COUNTY

REPTILES

western box turtle *Terrapene ornata*

Terrestrial: Ornate or western box trutles inhabit prairie grassland, pasture, fields, sandhills, and open woodland. They are essentially terrestrial but sometimes enter slow, shallow streams and creek pools. For shelter, they burrow into soil (e.g., under plants such as yucca) (Converse et al. 2002) or enter burrows made by other species.

Federal Status:	State Status:	SGCN: Y
Endemic: N	Global Rank: G4G5	State Rank: S3

western massasauga *Sistrurus tergeminus*

Terrestrial: Shortgrass or mixed grass prairie, with gravel or sandy soils. Often found associated with draws, floodplains, and more mesic habitats within the arid landscape. Frequently occurs in shrub encroached grasslands.

Federal Status:	State Status:	SGCN: Y
Endemic: N	Global Rank: G3	State Rank: S3

PLANTS

Amelia's sand-verbena *Abronia ameliae*

Endemic to South Texas; Occurs on deep, well-drained sandy soils of the South Texas Sand Sheet in grassy and/or herbaceous dominated openings within coastal live oak woodlands or mesquite-coastal live oak woodlands. Perennial; Flowering Mar-June

Federal Status:	State Status:	SGCN: Y
Endemic: Y	Global Rank: G3	State Rank: S3

arrowleaf milkvine *Matelea sagittifolia*

Most consistently encountered in thornscrub in South Texas; Perennial; Flowering March-July; Fruiting April-July and Dec?

Federal Status:	State Status:	SGCN: Y
Endemic: N	Global Rank: G3	State Rank: S3

Bailey's ballmoss *Tillandsia baileyi*

Epiphytic on various trees and tall shrubs, perhaps most common in mottes of Live oak on vegtated dunes and flats in coastal portions of the South Texas Sand Sheet, but also on evergreen sub-tropical woodlands along resacas in the Lower Rio Grande Valley; flowering (February-)April-May, but conspicuous throughout the year

Federal Status:	State Status:	SGCN: Y
Endemic: N	Global Rank: G2G3	State Rank: S2

Buckley's spiderwort *Tradescantia buckleyi*

Occurs on sandy loam or clay soils in grasslands or shrublands underlain by the Beaumount Formation.

Federal Status:	State Status:	SGCN: Y
Endemic: N	Global Rank: G3	State Rank: S3

HIDALGO COUNTY

PLANTS

Chihuahua balloon-vine *Cardiospermum dissectum*

Thorn shrublands or low woodlands on well to excessively well drained, calcareous, sandy to gravelly soils in drier uplands of the Lower Rio Grande Valley, in areas underlain by the Goliad formation, Catahoula and Frio formations undivided, Jackson Group, and other Eocene formations; during drought conditions the normally inconspicuous slender twining vine turns a more conspicuous deep reddish-purple; flowering (April-) July-September, probably throughout the growing season in response to rainfall.

Federal Status:	State Status:	SGCN: Y
Endemic: N	Global Rank: G3	State Rank: S3

Cory's croton *Croton coryi*

Grasslands and woodland openings on barrier islands and coastal sands of South Texas, inland on South Texas Sand Sheet; Annual; Flowering July-Oct; Fruiting July-Nov

Federal Status:	State Status:	SGCN: Y
Endemic: Y	Global Rank: G3	State Rank: S3

Croft's bluet *Houstonia croftiae*

Occurs in sparsely vegetated areas in grasslands or among shrubs (Carr 2015).

Federal Status:	State Status:	SGCN: Y
Endemic: Y	Global Rank: G3	State Rank: S3

Falfurrias milkvine *Matelea radiata*

Uncertain, only two known specimens; one from clay soil on dry gravel hills at altitude of approximately 45 m (150 ft); other from Falfurrias, no habitat description; probably flowering May-June

Federal Status:	State Status:	SGCN: Y
Endemic: Y	Global Rank: G1	State Rank: S1

Gregg's wild-buckwheat *Eriogonum greggii*

Sparingly vegetated openings in thorn shrublands in shallow soils on xeric ridges along the Rio Grande; also on excessively drained, sandy soil over caliche and calcareous sandstone of the Goliad Formation and over sandstone or fossiliferous layers of the Jackson Group; flowering February-July, probably opportunistically during the growing season

Federal Status:	State Status:	SGCN: Y
Endemic: N	Global Rank: G2	State Rank: S1

Jones' nailwort *Paronychia jonesii*

Occurs in early successional open areas on deep well-drained sand; Biennial Annual; Flowering March-Nov; Fruiting April-Nov

Federal Status:	State Status:	SGCN: Y
Endemic: Y	Global Rank: G3G4	State Rank: S3S4

HIDALGO COUNTY

PLANTS

large selenia *Selenia grandis*

Occurs in seasonally wet clayey soils in open areas; Annual; Flowering Jan-April; Fruiting Feb-April

Federal Status: State Status: SGCN: Y
Endemic: Y Global Rank: G3 State Rank: S3

Mexican mud-plantain *Heteranthera mexicana*

Wet clayey soils of resacas and ephemeral wetlands in South Texas and along margins of playas in the Panhandle; flowering June-December, only after sufficient rainfall

Federal Status: State Status: SGCN: Y
Endemic: N Global Rank: G2G3 State Rank: S1

Runyon's cory cactus *Coryphantha macromeris var. runyonii*

Gravelly to sandy or clayey, calcareous, sometimes gypsiferous or saline soils, often over the Catahoula and Frio formations, on gentle hills and slopes to the flats between, at elevations ranging from 10 to 150 m (30 to 500 ft); ?late spring or early summer, November, fruit has been collected in August

Federal Status: State Status: SGCN: Y
Endemic: N Global Rank: G5T2T3 State Rank: S2S3

Runyon's water-willow *Justicia runyonii*

Margins of and openings within subtropical woodlands or thorn shrublands on calcareous, alluvial, silty or clayey soils derived from Holocene silt and sand floodplain deposits of the Rio Grande Delta; can be common in narow openings such as those provided by trails through dense ebony woodlands and is sometimes restricted to microdepressions; flowering (July-) September-November

Federal Status: State Status: SGCN: Y
Endemic: N Global Rank: G3 State Rank: S2

sand Brazos mint *Brazoria arenaria*

Sandy areas in South Texas; Annual; Flowering/Fruiting March-April

Federal Status: State Status: SGCN: Y
Endemic: Y Global Rank: G3 State Rank: S3

sand sheet leaf-flower *Phyllanthus abnormis var. riograndensis*

Semi-desert scrub of deep South Texas; Annual; Flowering Feb-July; Fruiting Oct-March

Federal Status: State Status: SGCN: Y
Endemic: Y Global Rank: G5T3 State Rank: S3

shortcrown milkvine *Matelea brevicoronata*

Primarily in grasslands on tight sandy or silty substrates; Perennial; Flowering March-Sept; Fruiting May-Sept

Federal Status: State Status: SGCN: Y
Endemic: Y Global Rank: G3 State Rank: S3

HIDALGO COUNTY

PLANTS

Siler's huaco *Manfreda sileri*

Rare in a variety of grasslands and shrublands on dry sites; Perennial; Flowering April-July; Fruiting June-July

Federal Status:	State Status:	SGCN: Y
Endemic: N	Global Rank: G3	State Rank: S3

small-leaved yellow velvet-leaf *Wissadula parvifolia*

Occurs on sandy loams or clays in shrublands or woodlands on gently undulating terrain of the Holocene sand sheet over the Goliad Formation.

Federal Status:	State Status:	SGCN: Y
Endemic: Y	Global Rank: G1	State Rank: S1

South Texas false cudweed *Pseudognaphalium austrotexanum*

In sandy grasslands on eroded area above saline flats; along edge of sendero through mesquite woodland and shrub mottes on sandy loam; on gravel and silt bars and flats in scour plain of streams (TEX-LL specimens Carr 23682, 29264, 22647, 27206). Oct-Jan, sometimes in spring.

Federal Status:	State Status:	SGCN: Y
Endemic: N	Global Rank: G3	State Rank: S3

South Texas yellow clammyweed *Polanisia erosa ssp. breviglandulosa*

Sand plains of south Texas (Iltis 1958). Flowering early spring-mid fall.

Federal Status:	State Status:	SGCN: Y
Endemic: Y	Global Rank: G5T3T4	State Rank: S3S4

St. Joseph's staff *Manfreda longiflora*

Thorn shrublands on clays and loams with various concentrations of salt, caliche, sand, and gravel; rossettes are often obscured by low shrubs; flowering September-October

Federal Status:	State Status:	SGCN: Y
Endemic: N	Global Rank: G2	State Rank: S2

star cactus *Astrophytum asterias*

Gravelly clays or loams, possibly of the Catarina Series (deep, droughty, saline clays), over the Catahoula and Frio formations, on gentle slopes and flats in sparsely vegetated openings between shrub thickets within mesquite grasslands or mesquite-blackbrush thorn shrublands; plants sink into or below ground during dry periods; flowering from mid March-May, may also flower in warmer months after sufficient rainfall, flowers most reliably in early April; fruiting mid April-June

Federal Status: E	State Status: E	SGCN: Y
Endemic: N	Global Rank: G1G2	State Rank: S1

stinking rushpea *Pomaria austrotexana*

In open areas on deep well drained sands; Perennial; Flowering Feb-Oct; Fruiting April-Oct

Federal Status:	State Status:	SGCN: Y
Endemic: N	Global Rank: G3	State Rank: S3

HIDALGO COUNTY

PLANTS

Texas ayenia *Ayenia limitaris*

Subtropical thorn woodland or tall shrubland on loamy soils of the Rio Grande Delta; known site soils include well-drained, calcareous, sandy clay loam (Hidalgo Series) and neutral to moderately alkaline, fine sandy loam (Willacy Series); also under or among taller shrubs in thorn woodland/thorn shrubland; flowering throughout the year with sufficient rainfall

Federal Status: E	State Status: E	SGCN: Y
Endemic: N	Global Rank: G2	State Rank: S1

Texas peachbush *Prunus texana*

Occurs at scattered sites in various well drained sandy situations; deep sand, plains and sand hills, grasslands, oak woods, 0-200 m elevation; Perennial; Flowering Feb-Mar; Fruiting Apr-Jun

Federal Status:	State Status:	SGCN: Y
Endemic: Y	Global Rank: G3G4	State Rank: S3S4

Texas stonecrop *Lenophyllum texanum*

Found in shrublands on clay dunes (lomas) at the mouth of the Rio Grande and on xeric calcareous rock outcrops at scattered inland sites; Perennial; Flowering/Fruiting Nov-Feb

Federal Status:	State Status:	SGCN: Y
Endemic: N	Global Rank: G3	State Rank: S3

Vasey's adelia *Adelia vaseyi*

Mostly subtropical evergreen/deciduous woodlands on loamy soils of Rio Grande Delta, but occassionally in shrublands on more xeric sandy to gravelly upland sites; Perennial; Flowering January-June

Federal Status:	State Status:	SGCN: Y
Endemic: N	Global Rank: G3	State Rank: S3

Walker's manioc *Manihot walkerae*

Periphery of native brush in sandy loam; also on caliche cuestas?; flowering April-September (following rains?)

Federal Status: E	State Status: E	SGCN: Y
Endemic: N	Global Rank: G2	State Rank: S1

Wright's trichocoronis *Trichocoronis wrightii var. wrightii*

Most records from Texas are historical, perhaps indicating a decline as a result of alteration of wetland habitats; Annual; Flowering Feb-Oct; Fruiting Feb-Sept

Federal Status:	State Status:	SGCN: Y
Endemic: N	Global Rank: G4T3	State Rank: S2

yellow-flowered alicoche *Echinocereus papillosus*

Under shrubs or in open areas on various substrates; Perennial; Flowering Jan-April.

Federal Status:	State Status:	SGCN: Y
Endemic: N	Global Rank: G3	State Rank: S3

Last Update: 1/15/2025

WILLACY COUNTY

AMPHIBIANS

black-spotted newt *Notophthalmus meridionalis*

Terrestrial and aquatic: Terrestrial habitats used by adults are typically poorly drained clay soils that allow for the formation of ephemeral wetlands. A wide variety of vegetation associations are known to be used, such as thorn scrub and pasture. Aquatic habitats used for reprodution are a variety of ephemeral and permanent water bodies.

Federal Status:	State Status: T	SGCN: Y
Endemic: N	Global Rank: G3	State Rank: S3

Mexican treefrog *Smilisca baudinii*

Terrestrial and aquatic: Terrestrial habitas used include forested and brush around water bodies. Aquatic habitast used can any any body of water but preferred breeding sites are small, ephemeral wetlands.

Federal Status:	State Status: T	SGCN: Y
Endemic: N	Global Rank: G5	State Rank: S3

sheep frog *Hypopachus variolosus*

Terrestrial and aquatic: Predominantly grassland and savanna; largely fossorial in areas with moist microclimates.

Federal Status:	State Status: T	SGCN: N
Endemic: N	Global Rank: G5	State Rank: S4

South Texas siren (Large Form) *Siren sp. 1*

Aquatic: Mainly found in bodies of quiet water, permanent or temporary, with or without submergent vegetation. Wet or sometimes wet areas, such as arroyos, canals, ditches, or even shallow depressions; aestivates in the ground during dry periods, but does require some moisture to remain.

Federal Status:	State Status: T	SGCN: N
Endemic: N	Global Rank: GNRQ	State Rank: S1

Strecker's chorus frog *Pseudacris streckeri*

Terrestrial and aquatic: Wooded floodplains and flats, prairies, cultivated fields and marshes. Likes sandy substrates.

Federal Status:	State Status:	SGCN: Y
Endemic: N	Global Rank: G5	State Rank: S3

Woodhouse's toad *Anaxyrus woodhousii*

Terrestrial and aquatic: A wide variety of terrestrial habitats are used by this species, including forests, grasslands, and barrier island sand dunes. Aquatic habitats are equally varied.

Federal Status:	State Status:	SGCN: Y
Endemic: N	Global Rank: G5	State Rank: S5

WILLACY COUNTY

BIRDS

Bank Swallow *Riparia riparia*

Bank Swallows live in low areas along rivers, streams, ocean coasts, and reservoirs. Their territories usually include vertical cliffs or banks where they nest in colonies of 10 to 2,000 nests. Though in the past Bank Swallows were most commonly found around natural bluffs or eroding streamside banks, they now often nest in human-made sites, such as sand and gravel quarries or road cuts. They forage in open areas and avoid places with tree cover.

Federal Status: State Status: SGCN: Y
Endemic: N Global Rank: G5 State Rank: S2B,S4N

black skimmer *Rynchops niger*

Primarily coastal waters, including bays, estuaries, lagoons and mudflats in migration and winter (AOU 1983); also quiet waters of rivers and lakes (Stiles and Skutch 1989). Rest on mudflats, sandbars, beaches.

Federal Status: State Status: SGCN: Y
Endemic: N Global Rank: G5 State Rank: S2B

Botteri's sparrow *Peucaea botterii*

Two allopatric subspecies occur in Texas. The arizonae subspecies found in the Trans Pecos is considered to be a vagrant because there is just one record from Presidio County in 1997. The other subspecies, texana, can be found regularly in sacahuista habitat (or cordgrass flats) in counties that along the lower coastline like Kenedy, Willacy, and Cameron counties, but also rarely in Kleberg and Brooks counties. This migratory species does not overwinter in Texas. Breeding birds return in spring and sit fairly visibly on (low) commanding perches like fence posts or mesquite limbs where males sing vigorously throughout summer.

Federal Status: State Status: SGCN: Y
Endemic: N Global Rank: G4G5 State Rank: S2B

Brewer's Blackbird *Euphagus cyanocephalus*

Shrubby and bushy areas (especially near water), riparian woodland, aspen parklands, cultivated lands, marshes, and around human habitation; in migration and winter also in pastures and fields (AOU 1983).

Federal Status: State Status: SGCN: Y
Endemic: N Global Rank: G5 State Rank: S5

Brown Pelican *Pelecanus occidentalis*

Largely coastal and near shore areas, where it roosts and nests on islands and spoil banks. Feeds in lagunas and shallow seaward waters.

Federal Status: State Status: SGCN: N
Endemic: N Global Rank: G4 State Rank: S3B

cactus ferruginous pygmy-owl *Glaucidium brasilianum cactorum*

Riparian trees, brush, palm, and mesquite thickets; during day also roosts in small caves and recesses on slopes of low hills; breeding April to June

Federal Status: T State Status: T SGCN: N
Endemic: N Global Rank: G5T2 State Rank: S2?

Cactus Wren *Campylorhynchus brunneicapillus*

WILLACY COUNTY

BIRDS

Desert (especially with cholla cactus or yucca), mesquite, arid scrub, coastal sage scrub, and in trees in towns in arid regions (Tropical to Subtropical zones) (AOU 1983). Nests in OPUNTIA cactus, or in twiggy, thorny, trees and shrubs, sometimes in buildings. Nest may be relined and used as a winter roost.

Federal Status:	State Status:	SGCN: Y
Endemic: N	Global Rank: G5	State Rank: S4B

Common Nighthawk *Chordeiles minor*

Common Nighthawks nest in both rural and urban habitats including coastal sand dunes and beaches, logged forest, recently burned forest, woodland clearings, prairies, plains, sagebrush, grasslands, open forests, and rock outcrops. They also nest on flat gravel rooftops, though less often as gravel roofs are being replaced by smooth, rubberized roofs that provide an unsuitable surface.

Federal Status:	State Status:	SGCN: Y
Endemic: N	Global Rank: G5	State Rank: S4B

ferruginous pygmy-owl *Glaucidium brasilianum*

Riparian trees, brush, palm, and mesquite thickets; during day also roosts in small caves and recesses on slopes of low hills; breeding April to June

Federal Status:	State Status: T	SGCN: Y
Endemic: N	Global Rank: G5	State Rank: S2?

Franklin's gull *Leucophaeus pipixcan*

The county distribution for this species includes geographic areas that the species may use during migration. Time of year should be factored into evaluations to determine potential presence of this species in a specific county. This species is only a spring and fall migrant throughout Texas. It does not breed in or near Texas. Winter records are unusual consisting of one or a few individuals at a given site (especially along the Gulf coastline). During migration, these gulls fly during daylight hours but often come down to wetlands, lake shore, or islands to roost for the night.

Federal Status:	State Status:	SGCN: Y
Endemic: N	Global Rank: G5	State Rank: S2N

gray hawk *Buteo plagiatus*

Locally and irregularly along U.S.-Mexico border; mature riparian woodlands and nearby semiarid mesquite and scrub grasslands; breeding range formerly extended north to southernmost Rio Grande floodplain of Texas

Federal Status:	State Status: T	SGCN: Y
Endemic: N	Global Rank: G5	State Rank: S2B

lark bunting *Calamospiza melanocorys*

Overall, it's a generalist in most short grassland settings including ones with some brushy component plus certain agricultural lands that include grain sorghum. Short grasses include sideoats and blue gramas, sand dropseed, prairie junegrass (Koeleria), buffalograss also with patches of bluestem and other mid-grass species. This bunting will frequent smaller patches of grasses or disturbed patches of grasses including rural yards. It also uses weedy fields surrounding playas. This species avoids urban areas and cotton fields.

Federal Status:	State Status:	SGCN: Y
Endemic: N	Global Rank: G5	State Rank: S4B

WILLACY COUNTY

BIRDS

Least Tern *Sternula antillarum*

Sand beaches, flats, bays, inlets, lagoons, islands, river sandbars and flat gravel rooftops in urban areas.

Federal Status: State Status: SGCN: Y
Endemic: N Global Rank: G4 State Rank: S2B

Loggerhead Shrike *Lanius ludovicianus*

Loggerhead Shrikes inhabit open country with short vegetation and well-spaced shrubs or low trees, particularly those with spines or thorns. They frequent agricultural fields, pastures, old orchards, riparian areas, desert scrublands, savannas, prairies, golf courses, and cemeteries. Loggerhead Shrikes are often seen along mowed roadsides with access to fence lines and utility poles.

Federal Status: State Status: SGCN: Y
Endemic: N Global Rank: G4 State Rank: S4B

Mottled Duck *Anas fulvigula*

Estuaries, ponds, lakes, secondary bays.

Federal Status: State Status: SGCN: Y
Endemic: N Global Rank: G4 State Rank: S4B

mountain plover *Charadrius montanus*

The county distribution for this species includes geographic areas that the species may use during migration. Time of year should be factored into evaluations to determine potential presence of this species in a specific county. Breeding: nests on high plains or shortgrass prairie, on ground in shallow depression; nonbreeding: shortgrass plains and bare, dirt (plowed) fields; primarily insectivorous.

Federal Status: State Status: SGCN: Y
Endemic: N Global Rank: G3 State Rank: S2

northern aplomado falcon *Falco femoralis septentrionalis*

Open country, especially savanna and open woodland, and sometimes in very barren areas; grassy plains and valleys with scattered mesquite, yucca, and cactus; nests in old stick nests of other bird species

Federal Status: E State Status: E SGCN: Y
Endemic: N Global Rank: G4T2T3 State Rank: S1

northern beardless-tyrannulet *Camptostoma imberbe*

Mesquite woodlands; also cottonwood, willow, elm, and tepeguaje near the Rio Grande. Breeding April to July

Federal Status: State Status: T SGCN: Y
Endemic: N Global Rank: G5 State Rank: S1S2

Northern Bobwhite *Colinus virginianus*

Inhabits a wide variety of vegetation types, particularly early successional stages. Occurs in croplands, grasslands, pastures, fallow fields, grass-brush rangelands, open pinelands, open mixed pine-hardwood forests, and habitat mosaics (Brennan 1999).

Federal Status: State Status: SGCN: Y
Endemic: N Global Rank: G4G5 State Rank: S4B

WILLACY COUNTY

BIRDS

piping plover *Charadrius melodus*

The county distribution for this species includes geographic areas that the species may use during migration. Time of year should be factored into evaluations to determine potential presence of this species in a specific county. Beaches, sandflats, and dunes along Gulf Coast beaches and adjacent offshore islands. Also spoil islands in the Intracoastal Waterway. Based on the November 30, 1992 Section 6 Job No. 9.1, Piping Plover and Snowy Plover Winter Habitat Status Survey, algal flats appear to be the highest quality habitat. Some of the most important aspects of algal flats are their relative inaccessibility and their continuous availability throughout all tidal conditions. Sand flats often appear to be preferred over algal flats when both are available, but large portions of sand flats along the Texas coast are available only during low-very low tides and are often completely unavailable during extreme high tides or strong north winds. Beaches appear to serve as a secondary habitat to the flats associated with the primary bays, lagoons, and inter-island passes. Beaches are rarely used on the southern Texas coast, where bayside habitat is always available, and are abandoned as bayside habitats become available on the central and northern coast. However, beaches are probably a vital habitat along the central and northern coast (i.e. north of Padre Island) during periods of extreme high tides that cover the flats. Optimal site characteristics appear to be large in area, sparsely vegetated, continuously available or in close proximity to secondary habitat, and with limited human disturbance.

Federal Status: T	State Status: T	SGCN: Y
Endemic: N	Global Rank: G3	State Rank: S2N

Pyrrhuloxia *Cardinalis sinuatus*

Pyrrhuloxias live in upland deserts, mesquite savannas, riparian (streamside) woodlands, desert scrublands, farm fields with hedgerows, and residential areas with nearby mesquite. When not breeding, some Pyrrhuloxias wander into urban habitats, mesquite-hackberry habitats, and riparian habitats with Arizona sycamore and cottonwood.

Federal Status:	State Status:	SGCN: Y
Endemic: N	Global Rank: G5	State Rank: S4B

reddish egret *Egretta rufescens*

Resident of the Texas Gulf Coast; brackish marshes and shallow salt ponds and tidal flats; nests on ground or in trees or bushes, on dry coastal islands in brushy thickets of yucca and prickly pear

Federal Status:	State Status: T	SGCN: Y
Endemic: N	Global Rank: G4	State Rank: S2B

rufa red knot *Calidris canutus rufa*

The county distribution for this species includes geographic areas that the species may use during migration. Time of year should be factored into evaluations to determine potential presence of this species in a specific county. Habitat: Primarily seacoasts on tidal flats and beaches, herbaceous wetland, and Tidal flat/shore. Bolivar Flats in Galveston County, sandy beaches Mustang Island, few on outer coastal and barrier beaches, tidal mudflats and salt marshes.

Federal Status: T	State Status: T	SGCN: Y
Endemic: N	Global Rank: G4T2	State Rank: S2N

Sanderling *Calidris alba*

Nonbreeding: primarily sandy beaches, less frequently on mud flats and shores of lakes or rivers (AOU 1983) also on exposed reefs (Pratt et al. 1987). Sleeps/loafs on upper beach or on salt pond dike.

Federal Status:	State Status:	SGCN: Y
Endemic: N	Global Rank: G5	State Rank: S5

Snowy Plover *Charadrius nivosus*

WILLACY COUNTY

BIRDS

Algal flats appear to be the highest quality habitat. Some of the most important aspects of algal flats are their relative inaccessibility and their continuous availability throughout all tidal conditions. An optimal site characteristic would be large in size. The size of populations appear to be roughly proportional to the total area of suitable habitat used. Formerly an uncommon breeder in the Panhandle; potential migrant; winter along coast.

Federal Status:	State Status:	SGCN: Y
Endemic: N	Global Rank: G3	State Rank: S3B

sooty tern *Onychoprion fuscatus*

Primarily an offshore bird; does nest on sandy beaches and islands, breeding April-July.

Federal Status:	State Status: T	SGCN: Y
Endemic: N	Global Rank: G5	State Rank: S1B

Sprague's pipit *Anthus spragueii*

The county distribution for this species includes geographic areas that the species may use during migration. Time of year should be factored into evaluations to determine potential presence of this species in a specific county. Habitat during migration and in winter consists of pastures and weedy fields (AOU 1983), including grasslands with dense herbaceous vegetation or grassy agricultural fields.

Federal Status:	State Status:	SGCN: Y
Endemic: N	Global Rank: G3G4	State Rank: S3N

swallow-tailed kite *Elanoides forficatus*

The county distribution for this species includes geographic areas that the species may use during migration. Time of year should be factored into evaluations to determine potential presence of this species in a specific county. Lowland forested regions, especially swampy areas, ranging into open woodland; marshes, along rivers, lakes, and ponds; nests high in tall tree in clearing or on forest woodland edge, usually in pine, cypress, or various deciduous trees.

Federal Status:	State Status: T	SGCN: Y
Endemic: N	Global Rank: G5	State Rank: S2B

Texas Botteri's sparrow *Peucaea botterii texana*

Grassland and short-grass plains with scattered bushes or shrubs, sagebrush, mesquite, or yucca; nests on ground of low clump of grasses

Federal Status:	State Status: T	SGCN: N
Endemic: N	Global Rank: G4G5T4	State Rank: S2B

tropical parula *Setophaga pitiayumi*

Semi-tropical evergreen woodland along rivers and resacas. Texas ebony, anacua and other trees with epiphytic plants hanging from them. Dense or open woods, undergrowth, brush, and trees along edges of rivers and resacas; breeding April to July.

Federal Status:	State Status: T	SGCN: Y
Endemic: N	Global Rank: G5	State Rank: S3B

WILLACY COUNTY

BIRDS

western burrowing owl *Athene cunicularia hypugaea*

Open grasslands, especially prairie, plains, and savanna, sometimes in open areas such as vacant lots near human habitation or airports; nests and roosts in abandoned burrows

Federal Status:	State Status:	SGCN: N
Endemic: N	Global Rank: G4T4	State Rank: S2

white-faced ibis *Plegadis chihi*

The county distribution for this species includes geographic areas that the species may use during migration. Time of year should be factored into evaluations to determine potential presence of this species in a specific county. Prefers freshwater marshes, sloughs, and irrigated rice fields, but will attend brackish and saltwater habitats; currently confined to near-coastal rookeries in so-called hog-wallow prairies. Nests in marshes, in low trees, on the ground in bulrushes or reeds, or on floating mats.

Federal Status:	State Status: T	SGCN: N
Endemic: N	Global Rank: G5	State Rank: S4B

white-tailed hawk *Buteo albicaudatus*

Near coast on prairies, cordgrass flats, and scrub-live oak; further inland on prairies, mesquite and oak savannas, and mixed savanna-chaparral; breeding March-May

Federal Status:	State Status: T	SGCN: N
Endemic: N	Global Rank: G4G5	State Rank: S4B

Willet *Tringa semipalmata*

Marshes, tidal mudflats, beaches, lake margins, mangroves, tidal channels, river mouths, coastal lagoons, sandy or rocky shores, and, less frequently, open grassland (AOU 1983, Stiles and Skutch 1989).

Federal Status:	State Status:	SGCN: Y
Endemic: N	Global Rank: G5	State Rank: S5B

Wilson's Warbler *Cardellina pusilla*

Wilson’s warblers key in on forests and scrubby areas along streams to fatten up during migration. During the nonbreeding season they use many types of habitats from lowland thickets near streams to high-elevation cloud forests in Mexico and Central America.

Federal Status:	State Status:	SGCN: Y
Endemic: N	Global Rank: G5	State Rank: S4

wood stork *Mycteria americana*

The county distribution for this species includes geographic areas that the species may use during migration. Time of year should be factored into evaluations to determine potential presence of this species in a specific county. Prefers to nest in large tracts of baldcypress (Taxodium distichum) or red mangrove (Rhizophora mangle); forages in prairie ponds, flooded pastures or fields, ditches, and other shallow standing water, including salt-water; usually roosts communally in tall snags, sometimes in association with other wading birds (i.e. active heronries); breeds in Mexico and birds move into Gulf States in search of mud flats and other wetlands, even those associated with forested areas; formerly nested in Texas, but no breeding records since 1960.

Federal Status:	State Status: T	SGCN: Y
Endemic: N	Global Rank: G4	State Rank: SHB,S3N

WILLACY COUNTY

BIRDS

yellow-billed cuckoo *Coccyzus americanus*

In Texas, the populations of concern are found breeding in riparian areas in the Trans Pecos (know as part of the Western Distinct Population Segment). It is the Western DPS that is on the U.S. ESA threatened list and includes the Texas counties Brewster, Culberson, El Paso, Hudspeth, Jeff Davis, and Presidio. Riparian woodlands below 6,000' in elevation consisting of cottonwoods and willows are prime habitat. This species is a long-distant migrant that summers in Texas, but winters mainly in South America. Breeding birds of the Trans Pecos populations typically arrive on their breeding grounds possibly in late April but the peak arrival time is in May. Threats to preferred habitat include hydrologic changes that don't promote the regeneration of cottonwoods and willows, plus livestock browsing and trampling of sapling trees in sensitive riparian areas.

Federal Status: T	State Status:	SGCN: Y
Endemic: N	Global Rank: G5	State Rank: S4S5B

zone-tailed hawk *Buteo albonotatus*

Arid open country, including open deciduous or pine-oak woodland, mesa or mountain county, often near watercourses, and wooded canyons and tree-lined rivers along middle-slopes of desert mountains; nests in various habitats and sites, ranging from small trees in lower desert, giant cottonwoods in riparian areas, to mature conifers in high mountain regions

Federal Status:	State Status: T	SGCN: Y
Endemic: N	Global Rank: G4	State Rank: S3B

FISH

Atlantic guitarfish *Rhinobatos lentiginosus*

Habitat description is not available at this time.

Federal Status:	State Status:	SGCN: Y
Endemic: N	Global Rank: GNR	State Rank: S2S3

Atlantic tarpon *Megalops atlanticus*

Habitat description is not available at this time.

Federal Status:	State Status:	SGCN: Y
Endemic: N	Global Rank: G5	State Rank: S2S3

black grouper *Mycteroperca bonaci*

Habitat description is not available at this time.

Federal Status:	State Status:	SGCN: Y
Endemic: N	Global Rank: GNR	State Rank: S3S4

blacknose shark *Carcharhinus acronotus*

Habitat description is not available at this time.

Federal Status:	State Status:	SGCN: Y
Endemic: N	Global Rank: GNR	State Rank: S3

WILLACY COUNTY

FISH

blue marlin *Makaira nigricans*
Habitat description is not available at this time.
Federal Status: State Status: SGCN: Y
Endemic: N Global Rank: GNR State Rank: SNR

Bull Shark *Carcharhinus leucas*
Habitat description is not available at this time.
Federal Status: State Status: SGCN: Y
Endemic: N Global Rank: G5 State Rank: S5

Caribbean sharpnose shark *Rhizoprionodon porosus*
Habitat description is not available at this time.
Federal Status: State Status: SGCN: Y
Endemic: N Global Rank: GNR State Rank: S3

cobia *Rachycentron canadum*
Habitat description is not available at this time.
Federal Status: State Status: SGCN: Y
Endemic: N Global Rank: GNR State Rank: S3S4

dusky shark *Carcharhinus obscurus*
Habitat description is not available at this time.
Federal Status: State Status: SGCN: Y
Endemic: N Global Rank: G3 State Rank: S3

Finetooth Shark *Carcharhinus isodon*
Habitat description is not available at this time.
Federal Status: State Status: SGCN: Y
Endemic: N Global Rank: GNR State Rank: SNR

giant manta ray *Manta birostris*
Habitat description is not available at this time.
Federal Status: T State Status: SGCN: Y
Endemic: N Global Rank: G3G4 State Rank: SNR

WILLACY COUNTY

FISH

great hammerhead *Sphyrna mokarran*

Habitat description is not available at this time.

Federal Status:	State Status: T	SGCN: Y
Endemic: N	Global Rank: G3G4	State Rank: S2

greater amberjack *Seriola dumerili*

Habitat description is not available at this time.

Federal Status:	State Status:	SGCN: Y
Endemic: N	Global Rank: GNR	State Rank: S3

lemon shark *Negaprion brevirostris*

Habitat description is not available at this time.

Federal Status:	State Status:	SGCN: Y
Endemic: N	Global Rank: G3G4	State Rank: S1S3

oceanic whitetip shark *Carcharhinus longimanus*

Habitat description is not available at this time.

Federal Status: T	State Status: T	SGCN: Y
Endemic: N	Global Rank: GNR	State Rank: S2

opossum pipefish *Microphis brachyurus*

Adults are only found in low salinity waters of estuaries or freshwater tributaries within 30 miles of the coast (Gilmore 1992), where they also give birth. Young move or are carried into more saline waters off the coast after birth. Newly released larvae must have conditions near 18 ppt salinity for at least two weeks after birth to survive, indicating a physiology adapted for downstream transport to estuarine and marine environments (Frias-Torres 2002). Juvenile migration toward the ocean depends on water flow regimes, salinity, and vegetation for cover and capturing prey (Frias-Torres 2002). Seawalls, docks, and riprap construction destroy habitat and poor water quality and alteration of flow regimes may prevent migration (NMFS 2009).

Federal Status:	State Status:	SGCN: Y
Endemic: N	Global Rank: G4G5	State Rank: S3N

sailfish *Istiophorus platypterus*

Habitat description is not available at this time.

Federal Status:	State Status:	SGCN: Y
Endemic: N	Global Rank: GNR	State Rank: S3

sandbar shark *Carcharhinus plumbeus*

Habitat description is not available at this time.

Federal Status:	State Status:	SGCN: Y
Endemic: N	Global Rank: G4	State Rank: S3S4

WILLACY COUNTY

FISH

scalloped hammerhead shark *Sphyrna lewini*

Habitat description is not available at this time.

Federal Status:	State Status:	SGCN: Y
Endemic: N	Global Rank: G4	State Rank: SNR

scamp *Mycteroperca phenax*

Habitat description is not available at this time.

Federal Status:	State Status:	SGCN: Y
Endemic: N	Global Rank: GNR	State Rank: SNR

shortfin mako shark *Isurus oxyrinchus*

Habitat description is not available at this time.

Federal Status:	State Status: T	SGCN: Y
Endemic: N	Global Rank: GNR	State Rank: S2

silky shark *Carcharhinus falciformis*

Habitat description is not available at this time.

Federal Status:	State Status:	SGCN: Y
Endemic: N	Global Rank: G3	State Rank: S3

smalltail shark *Carcharhinus porosus*

Habitat description is not available at this time.

Federal Status:	State Status:	SGCN: Y
Endemic: N	Global Rank: GNR	State Rank: S3

southern flounder *Paralichthys lethostigma*

This is an estuarine-dependent species that inhabits riverine, estuarine and coastal waters, and prefers muddy, sandy, or silty substrates (Reagan and Wingo 1985). Individuals can tolerate wide temperature (~5-35°C) and salinity ranges (0-60 ppt). Southern Flounder spawn in offshore waters of the Gulf of Mexico from October to February (Reagan and Wingo 1985). The oceanic larval stage is pelagic and lasts 30–60 days. Metamorphosing individuals enter estuaries and migrate towards low-salinity headwaters, where settlement occurs (Burke et al. 1991, Walsh et al. 1999). The young fish enter the bays during late winter and early spring, occupying seagrass; some may move further into coastal rivers and bayous. Juveniles remain in estuaries until the onset of sexual maturation (approximately two years), at which time they migrate out of estuaries to join adults on the inner continental shelf. Adult southern flounder leave the bays during the fall for spawning in the Gulf of Mexico. They spawn for the first time when two years old at depths of 50 to 100 feet. Although most of the adults leave the bays and enter the Gulf for spawning during the winter, some remain behind and spend winter in the bays. Those in the Gulf will reenter the bays in the spring. The spring influx is gradual and does not occur with large concentrations that characterize the fall emigration.

Federal Status:	State Status:	SGCN: Y
Endemic: N	Global Rank: G5	State Rank: S5

WILLACY COUNTY

FISH

speckled hind *Epinephelus drummondhayi*

Habitat description is not available at this time.

Federal Status:	State Status:	SGCN: Y
Endemic: N	Global Rank: G3	State Rank: S3

spinner shark *Carcharhinus brevipinna*

Habitat description is not available at this time.

Federal Status:	State Status:	SGCN: Y
Endemic: N	Global Rank: GNR	State Rank: S3

swordfish *Xiphias gladius*

Habitat description is not available at this time.

Federal Status:	State Status:	SGCN: Y
Endemic: N	Global Rank: G5	State Rank: S3

white marlin *Kajikia albida*

Habitat description is not available at this time.

Federal Status:	State Status:	SGCN: Y
Endemic: N	Global Rank: GNR	State Rank: S3

INSECTS

Los Olmos tiger beetle *Cicindela nevadica olmosa*

Most tiger beetles are active, usually brightly colored, and found in open, sunny areas; adult tiger beetles are predaceous and feed on a variety of small insects; larvae of tiger beetles are also predaceous and live in vertical burrows in soil of dry paths, fields, or sandy beaches

Federal Status:	State Status:	SGCN: Y
Endemic:	Global Rank: G5T2	State Rank: S2

migratory monarch butterfly *Danaus plexippus plexippus*

Habitat description is not available at this time.

Federal Status: C	State Status:	SGCN: Y
Endemic:	Global Rank: G4T3	State Rank: SNR

MAMMALS

Atlantic spotted dolphin *Stenella frontalis*

Inhabits warm tropical, subtropical, and temperate waters throughout the Atlantic Ocean, including the Gulf of Mexico. Commonly found along the continental shelf and coastal waters that are 65-820 feet deep, usually inside or near 185 m contour (within 250-350 km of coast); occassionally found in deeper waters. Often dive to 30-200 feet preying upon fish, invertebrates, and cephalopods.

Federal Status:	State Status: T	SGCN: Y
Endemic: N	Global Rank: G5	State Rank: S1

WILLACY COUNTY

MAMMALS

Blainville's beaked whale *Mesoplodon densirostris*

Not applicable.

Federal Status: State Status: SGCN: Y
Endemic: N Global Rank: G4 State Rank: S1

blue whale *Balaenoptera musculus*

Inhabits tropical, subtropical, temperate, and subpolar waters worldwide, but are infrequently sighted in the Gulf of Mexico. They migrate seasonally between summer feeding grounds and winter breeeding grounds, but specifics vary. Commonly observed at the surface in open ocean.

Federal Status: E State Status: E SGCN: Y
Endemic: N Global Rank: G3G4 State Rank: SH

bottlenosed dolphin *Tursiops truncatus*

Habitat description is not available at this time.

Federal Status: State Status: SGCN: Y
Endemic: N Global Rank: G5 State Rank: S2

Bryde's whale *Balaenoptera edeni brydei*

Habitat description is not available at this time.

Federal Status: State Status: E SGCN: Y
Endemic: N Global Rank: GNR State Rank: SNR

cave myotis bat *Myotis velifer*

Colonial and cave-dwelling; also roosts in rock crevices, old buildings, carports, under bridges, and even in abandoned Cliff Swallow (Hirundo pyrrhonota) nests; roosts in clusters of up to thousands of individuals; hibernates in limestone caves of Edwards Plateau and gypsum cave of Panhandle during winter; opportunistic insectivore.

Federal Status: State Status: SGCN: Y
Endemic: N Global Rank: G4G5 State Rank: S2S3

clymene dolphin *Stenella clymene*

Habitat description is not available at this time.

Federal Status: State Status: SGCN: Y
Endemic: N Global Rank: G4 State Rank: S1

Coues' rice rat *Oryzomys couesi*

Cattail-bulrush marsh with shallower zone of aquatic grasses (Echinochloa, Panicum, Paspalidium) near the shoreline; shade trees around the shoreline are important features. Freshwater marshes.

Federal Status: State Status: T SGCN: Y
Endemic: N Global Rank: G5 State Rank: S2

Coues' rice rat *Oryzomys couesi aquaticus*

WILLACY COUNTY

MAMMALS

Cattail-bulrush marsh with shallower zone of aquatic grasses near the shoreline; shade trees around the shoreline are important features; prefers salt and freshwater, as well as grassy areas near water; breeds April-August

Federal Status:	State Status: T	SGCN: Y
Endemic: N	Global Rank: G5T2T4	State Rank: S2

Cuvier's beaked whale *Ziphius cavirostris*

Inhabits tropical, subtropical, and temperate waters world wide, including the Gulf of Mexico. Commonly found in water over 3,300 feet deep near the continetal shelf near steep slopes or canyons, avoiding coastal areas. Mostly pelagic apparently confined by the 1,00 meter bthymetric contour. frequenly make deep dives to capture prey (squids and fishes).

Federal Status:	State Status: T	SGCN: Y
Endemic: N	Global Rank: G4	State Rank: S1

dwarf sperm whale *Kogia simus*

Inhabits tropical and temperate waters world wide, Commonly found in deep waters near the continental shelf and rarely seen at the surface, but may be more coastal than the pygmy sperm whale (Kogia breviceps). Dives to great depths (1,000 feet) to hunt for squid, fish, and crustaceans. Migration patterns are unknown.

Federal Status:	State Status: T	SGCN: Y
Endemic: N	Global Rank: G4	State Rank: S1

eastern spotted skunk *Spilogale putorius*

Generalist; open fields prairies, croplands, fence rows, farmyards, forest edges & woodlands. Prefer wooded, brushy areas & tallgrass prairies. S.p. ssp. interrupta found in wooded areas and tallgrass prairies, preferring rocky canyons and outcrops when such sites are available.

Federal Status:	State Status:	SGCN: Y
Endemic: N	Global Rank: G4	State Rank: S1S3

false killer whale *Pseudorca crassidens*

Inhabits tropical, subtropical, and temperate waters world wide, including the Gulf of Mexico. Commonly found in deep, offshore waters deeper than 3,300 feet, making dives of up to 2,000 meters to catch their prey (fishes and squids). Gulf of Mexico distinct population segment is not well studied.

Federal Status:	State Status: T	SGCN: Y
Endemic: N	Global Rank: G4	State Rank: S1

finback whale *Balaenoptera physalus*

Inhabits tropical, subtropical, temperate, and subpolar waters worldwide, but are less common in the tropics preferring cooler water. Commonly found in deep, offshore waters and migrate in the open ocean from the poles (feeding grounds) to warmer waters in the winter to give birth. They feed on krill, squid, and small schooling fish sometimes with other baleen whale species. They are very rare in the Gulf of Mexico and reported sightings are likely vagrants (Witt et al. 2011).

Federal Status: E	State Status: E	SGCN: Y
Endemic: N	Global Rank: G3G4	State Rank: S1

Gervais's beaked whale *Mesoplodon europaeus*

WILLACY COUNTY

MAMMALS

Inhabits tropical, subtropical, and temperate waters of the northern Atlantic Ocean, Gulf of Mexico, and Caribbean. Commonly found in deep water and open ocean where they prey upon squids. They are difficult to distinguish from others in their family (Mesoplodon) and are cryptic and skittish, but the most commonly stranded species on the US southeastern coast. Migration patterns are unknown.

Federal Status:	State Status: T	SGCN: Y
Endemic: N	Global Rank: G4	State Rank: S1

ghost-faced bat *Mormoops megalophylla*

Winter roosts are in large limestone caves. Buildings and rock crevasses provide roosts, as well.

Federal Status:	State Status:	SGCN: Y
Endemic: N	Global Rank: G5	State Rank: S2

hoary bat *Lasiurus cinereus*

Hoary bats are highly migratory, high-flying bats that have been noted throughout the state. Females are known to migrate to Mexico in the winter, males tend to remain further north and may stay in Texas year-round. Commonly associated with forests (foliage roosting species) but are found in unforested parts of the state and lowland deserts. Tend to be captured over water and large, open flyways.

Federal Status:	State Status:	SGCN: Y
Endemic: N	Global Rank: G3G4	State Rank: S3

humpback whale *Megaptera novaeangliae*

Inhabits tropical, subtropical, temperate, and subpolar waters world wide. Migrate up to 5,000 miles between colder water (feeding grounds) and warmer water (calving grounds) each year. They will use both open ocean and coastal waters, sometimes including inshore areas such as bays, and are often found near the surface; however, this species is rare in the Gulf of Mexico. The northwest Atlantic/Gulf of Mexico distinct population segment is not considered at risk of extinction and is not listed as Endangered on the Endangered Species Act.

Federal Status: E	State Status:	SGCN: Y
Endemic: N	Global Rank: G4	State Rank: SNR

killer whale *Orcinus orca*

Inhabits tropical, subtropical, temperate, and polar waters world wide. In the Gulf of Mexico, they are commonly found in oceanic waters ranging from 256-2,652 meters deep beyond the 1,000 meter isobath and a very rarely found over the continental shelf and may be entirely absent from nearshore waters. May come in contact with pelagic longline fisheries targeting tunas and billfishes.

Federal Status:	State Status: T	SGCN: Y
Endemic: N	Global Rank: G4G5	State Rank: S1

Mexican spiny pocket mouse *Liomys irroratus*

Lives in dense brush on ridges forming the old Rio Grande river bed. Usually closely associated with prickly pear thickets. Nests are in underground burrows.

Federal Status:	State Status:	SGCN: Y
Endemic: N	Global Rank: G5	State Rank: S3

WILLACY COUNTY

MAMMALS

minke whale *Balaenoptera acutorostrata*

Habitat description is not available at this time.

Federal Status:	State Status:	SGCN: Y
Endemic: N	Global Rank: G5	State Rank: S1

mountain lion *Puma concolor*

Generalist; found in a wide range of habitats statewide. Found most frequently in rugged mountains & riparian zones.

Federal Status:	State Status:	SGCN: Y
Endemic: N	Global Rank: G5	State Rank: S2S3

North Atlantic right whale *Eubalaena glacialis*

Inhabits subtropical and temperate waters in the northern Atlantic. Commonly found in coastal waters or clsoe to the continental shelf near the surface. They migrate from feeding grounds in cooler waters (Canada and New England) to warmer waters of the southeast US (South Carolina, Georgia, and Florida) to give birth in the fall/winter - both areas are identified as critical habitat by NOAA-NMFS. Nursery areas are in shallow, coastal waters. This species is very rare in the Gulf of Mexico and the few reported sightings are likely vagrants (Ward-Geiger etal 2011).

Federal Status: E	State Status: E	SGCN: Y
Endemic: N	Global Rank: G1	State Rank: S1

ocelot *Leopardus pardalis*

Restricted to mesquite-thorn scrub and live-oak mottes; avoids open areas. Dense mixed brush below four feet; thorny shrublands; dense chaparral thickets; breeds and raises young June-November.

Federal Status: E	State Status: E	SGCN: Y
Endemic: N	Global Rank: G4	State Rank: S1

plains spotted skunk *Spilogale interrupta*

Generalist; open fields, prairies, croplands, fence rows, farmyards, forest edges, and woodlands; prefers wooded, brushy areas and tallgrass prairie

Federal Status:	State Status:	SGCN: Y
Endemic: N	Global Rank: G3	State Rank: S1S3

pygmy killer whale *Feresa attenuata*

Inhabits tropical and subtropical waters worldwide, including the Gulf of Mexico. Commonly found in deeper, offshore waters where they dive for their prey (squids and fishes), but may occassionally occur close to shore. They are very rare and migration patterns are unknown.

Federal Status:	State Status: T	SGCN: Y
Endemic: N	Global Rank: G4	State Rank: S1

WILLACY COUNTY

MAMMALS

pygmy sperm whale *Kogia breviceps*

Inhabits tropical, subtropical, and temperate waters world wide. Commonly found in deep water over the continental slope and rarely seen at the surface. Dives to great depths (over 1,000 feet) to hunt for squid, fish, and crustaceans.Migration patterns are unknown.

Federal Status:	State Status: T	SGCN: Y
Endemic: N	Global Rank: G4	State Rank: S1

Rice's whale *Balaenoptera ricei*

Habitat description is not available at this time.

Federal Status: E	State Status: E	SGCN: Y
Endemic: N	Global Rank: G1	State Rank: SNR

roughtoothed dolphin *Steno bredanensis*

Inhabits tropical, subtropical, and temperate waters worldwide, including the Gulf of Mexico. Records in Texas are only known from strandings. Commonly found in deep, oceanic water over 1,500-2,000 meters deep and ranging in temperature from 17-25 degrees Celsius. May associate with other cetaceans. Prey on squids and fish. No known migration patterns.

Federal Status:	State Status: T	SGCN: Y
Endemic: N	Global Rank: G4	State Rank: S1

sei whale *Balaenoptera borealis*

Habitat description is not available at this time.

Federal Status: E	State Status: E	SGCN: Y
Endemic: N	Global Rank: G5?	State Rank: SNR

short-finned pilot whale *Globicephala macrorhynchus*

Inhabits tropical, subtropical, and temperate waters worldwide, including the Gulf of Mexico. Commonly found in deeper waters (>1,000 feet) and continental shelf where they make deep dives to capture squid, but may come closer to shore. Migration patterns unknown.

Federal Status:	State Status: T	SGCN: Y
Endemic: N	Global Rank: G5	State Rank: S1

southern yellow bat *Lasiurus ega*

Relict palm grove is only known Texas habitat. Neotropical species roosting in palms, forages over water; insectivorous; breeding in late winter. Roosts in dead palm fronds in ornamental palms in urban areas.

Federal Status:	State Status:	SGCN: Y
Endemic: N	Global Rank: G5	State Rank: S3S4

WILLACY COUNTY

MAMMALS

sperm whale *Physeter macrocephalus*

Inhabits tropical, subtropical, and temperate waters world wide, avoiding icey waters. Distribution is highly dependent on their food source (squids, sharks, skates, and fish), breeding, and composition of the pod. In general, this species migrates from north to south in the winter and south to north in the summer; however, individuals in tropical and temperate waters don't seem to migrate at all. Routinely dive to catch their prey (2,000-10,000 feet) and generally occupies water at least 3,300 feet deep near ocean trenches.

Federal Status: E | State Status: E | SGCN: Y
Endemic: N | Global Rank: G3G4 | State Rank: S1

spinner dolphin *Stenella longirostris*

Habitat description is not available at this time.

Federal Status: | State Status: | SGCN: Y
Endemic: N | Global Rank: G5 | State Rank: S1

tricolored bat *Perimyotis subflavus*

Forest, woodland and riparian areas are important. Caves are very important to this species.

Federal Status: PE | State Status: | SGCN: Y
Endemic: N | Global Rank: G3G4 | State Rank: S2

West Indian manatee *Trichechus manatus*

Large rivers, brackish water bays, coastal waters. Warm waters of the tropics, in rivers and brackish bays but may also survive in salt water habitats. Very sensitive to cold water temperatures. Rarely occurring as far north as Texas. Gulf and bay system; opportunistic, aquatic herbivore.

Federal Status: T | State Status: T | SGCN: Y
Endemic: N | Global Rank: G2G3 | State Rank: S1

white-nosed coati *Nasua narica*

Woodlands, riparian corridors and canyons.Most individuals in Texas probably transients from Mexico; diurnal and crepuscular; very sociable; forages on ground and in trees; omnivorous; may be susceptible to hunting, trapping, and pet trade

Federal Status: | State Status: T | SGCN: Y
Endemic: N | Global Rank: G5 | State Rank: S1

MOLLUSKS

Glossy Wolfsnail *Euglandina texasiana*

Habitat description is not available at this time.

Federal Status: | State Status: | SGCN: Y
Endemic: | Global Rank: G1G2 | State Rank: S3

REPTILES

American alligator *Alligator mississippiensis*

Aquatic: Coastal marshes; inland natural rivers, swamps and marshes; manmade impoundments.

WILLACY COUNTY

REPTILES

Federal Status: SAT | State Status: | SGCN: N
Endemic: N | Global Rank: G5 | State Rank: S4

Atlantic hawksbill sea turtle *Eretmochelys imbricata*

Inhabits tropical and subtropical waters worldwide, in the Gulf of Mexico, especially Texas. Hatchling and juveniles are found in open, pelagic ocean and closely associated with floating lgae/seagrass mats. Juveniles then migrate to shallower, coastal areas, mainly coral reefs and rocky areas, but also in bays and estuaries near mangroves when reefs are absent; seldom in water lmore than 65 feet deep. They feed on sponges, jellyfish, sea urchins, molluscs, and crustaceans. Nesting occurs from April to November high up on the beach where there is vegetation for cover and little or no sand. Some migrate, but others stay close to foraging areas - females are philopatric.

Federal Status: E | State Status: E | SGCN: Y
Endemic: N | Global Rank: G3 | State Rank: S2

black-striped snake *Coniophanes imperialis*

Terrestrial: Occurs in native thorn scrub and woodlands a well as modfied urban areas. Prefers warm, moist microhabitats, and sandy soils.

Federal Status: | State Status: T | SGCN: Y
Endemic: N | Global Rank: G4G5 | State Rank: S2S3

green sea turtle *Chelonia mydas*

Inhabits tropical, subtropical, and temperate waters worldwide, including the Gulf of Mexico. Adults and juveniles occupy inshore and nearshore areas, including bays and lagoons with reefs and seagrass. They migrate from feeding grounds (open ocean) to nesting grounds (beaches/barrier islands) and some nesting does occur in Texas (April to September). Adults are herbivorous feeding on sea grass and seaweed; juveniles are omnivorous feeding initially on marine invertebrates, then increasingly on sea grasses and seaweeds.

Federal Status: T | State Status: T | SGCN: Y
Endemic: N | Global Rank: G3 | State Rank: S3B,S3N

keeled earless lizard *Holbrookia propinqua*

Terrestrial: Habitats include coastal dunes, barrier islands, and other sandy areas (Axtell 1983). Although it occurs well inland, this species is most abundant on coastal dunes, were it seeks shelter in the burrows of small mammals or crabs (Bartlett and Bartlett 1999).

Federal Status: | State Status: | SGCN: Y
Endemic: N | Global Rank: G4 | State Rank: S3

Kemp's Ridley sea turtle *Lepidochelys kempii*

Inhabits tropical, subtropical, and temperate waters of the northwestern Atlantic Ocean and Gulf of Mexico. Adults are found in coastal waters with muddy or sandy bottoms. Some males migrate between feeding grounds and breeeding grounds, but some don't. Females migrate between feeding and nesting areas, often returning to the same destinations. Nesting in Texas occurs on a smaller scale compared to other areas (i.e. Mexico). Hatchlings are quickly swept out to open water and are rarely found nearshore. Similarly, juveniles often congregate near floating algae/seagrass mats offshore, and move into nearshore, coastal, neritic areas after 1-2 years and remain until they reach maturity. They feed primarily on crabs, but also snails, clams, other crustaceans and plants, juveniles feed on sargassum and its associated fauna; nests April through August.

Federal Status: E | State Status: E | SGCN: Y
Endemic: N | Global Rank: G1 | State Rank: S3

leatherback sea turtle *Dermochelys coriacea*

WILLACY COUNTY

REPTILES

Inhabits tropical, subtropical, and temperate waters worldwide, including the Gulf of Mexico. Nesting is not common in Texas (March to July). Most pelagic of the seaturtles with the longest migration (>10,000 miles) between nesting and foraging sites. Are able to dive to depths of 4,000 feet. They are omnivorous, showing a preference for jellyfish.

Federal Status: E	State Status: E	SGCN: Y
Endemic: N	Global Rank: G2	State Rank: S1S2

loggerhead sea turtle *Caretta caretta*

Inhabits tropical, subtropical, and temperate waters worldwide, including the Gulf of Mexico. They migrate from feeding grounds to nesting beaches/barrier islands and some nesting does occur in Texas (April to September). Beaches that are narrow, steeply sloped, with coarse-grain sand are preffered for nesting. Newly hatched individuals depend on floating alage/seaweed for protection and foraging, which eventually transport them offshore and into open ocean. Juveniles and young adults spend their lives in open ocean, offshore before migrating to coastal areas to breed and nest. Foraging areas for adults include shallow continental shelf waters.

Federal Status: T	State Status: T	SGCN: Y
Endemic: N	Global Rank: G2G4	State Rank: S4

Mexican Hooknose Snake *Ficimia streckeri*

Habitats include thorn brush woodland (e.g., cactus, mesquite, acacia, paloverde; especially near water or along the edges of agricultural fields) and lower Rio Grande floodplain in lowland southern Texas. Thi ssanke burrows into soft soil.

Federal Status:	State Status:	SGCN: Y
Endemic: N	Global Rank: G4	State Rank: S3

northern cat-eyed snake *Leptodeira septentrionalis*

Terrestrial: Thorn scrub and decidious woodland; dense thickets bordering ponds and streams.

Federal Status:	State Status: T	SGCN: Y
Endemic: N	Global Rank: G5	State Rank: S3

slender glass lizard *Ophisaurus attenuatus*

Terrestrial: Habitats include open grassland, prairie, woodland edge, open woodland, oak savannas, longleaf pine flatwoods, scrubby areas, fallow fields, and areas near streams and ponds, often in habitats with sandy soil.

Federal Status:	State Status:	SGCN: Y
Endemic: N	Global Rank: G5	State Rank: S3

Texas horned lizard *Phrynosoma cornutum*

Terrestrial: Open habitats with sparse vegetation, including grass, prairie, cactus, scattered brush or scrubby trees; soil may vary in texture from sandy to rocky; burrows into soil, enters rodent burrows, or hides under rock when inactive. Occurs to 6000 feet, but largely limited below the pinyon-juniper zone on mountains in the Big Bend area.

Federal Status:	State Status: T	SGCN: Y
Endemic: N	Global Rank: G4G5	State Rank: S3

WILLACY COUNTY

REPTILES

Texas tortoise *Gopherus berlandieri*

Terrestrial: Open scrub woods, arid brush, lomas, grass-cactus association; often in areas with sandy well-drained soils. When inactive occupies shallow depressions dug at base of bush or cactus; sometimes in underground burrow or under object. Eggs are laid in nests dug in soil near or under bushes.

Federal Status:	State Status: T	SGCN: Y
Endemic: N	Global Rank: G4	State Rank: S2

western box turtle *Terrapene ornata*

Terrestrial: Ornate or western box trutles inhabit prairie grassland, pasture, fields, sandhills, and open woodland. They are essentially terrestrial but sometimes enter slow, shallow streams and creek pools. For shelter, they burrow into soil (e.g., under plants such as yucca) (Converse et al. 2002) or enter burrows made by other species.

Federal Status:	State Status:	SGCN: Y
Endemic: N	Global Rank: G4G5	State Rank: S3

PLANTS

Bailey's ballmoss *Tillandsia baileyi*

Epiphytic on various trees and tall shrubs, perhaps most common in mottes of Live oak on vegtated dunes and flats in coastal portions of the South Texas Sand Sheet, but also on evergreen sub-tropical woodlands along resacas in the Lower Rio Grande Valley; flowering (February-)April-May, but conspicuous throughout the year

Federal Status:	State Status:	SGCN: Y
Endemic: N	Global Rank: G2G3	State Rank: S2

bristle nailwort *Paronychia setacea*

Flowering vascular plant endemic to eastern southcentral Texas, occurring in sandy soils

Federal Status:	State Status:	SGCN: Y
Endemic: Y	Global Rank: G3	State Rank: S2

Cory's croton *Croton coryi*

Grasslands and woodland openings on barrier islands and coastal sands of South Texas, inland on South Texas Sand Sheet; Annual; Flowering July-Oct; Fruiting July-Nov

Federal Status:	State Status:	SGCN: Y
Endemic: Y	Global Rank: G3	State Rank: S3

Elmendorf's onion *Allium elmendorfii*

Grassland openings in oak woodlands on deep, loose, well-drained sands; in Coastal Bend, on Pleistocene barrier island ridges and Holocene Sand Sheet that support live oak woodlands; to the north it occurs in post oak-black hickory-live oak woodlands over Queen City and similar Eocene formations; one anomalous specimen found on Llano Uplift in wet pockets of granitic loam; Perennial; Flowering March-April, May

Federal Status:	State Status:	SGCN: Y
Endemic: Y	Global Rank: G2	State Rank: S2

WILLACY COUNTY

PLANTS

lila de los Llanos *Echeandia chandleri*

Most commonly encountered among shrubs or in grassy openings in subtropical thorn shrublands on somewhat saline clays of lomas along Gulf Coast near mouth of Rio Grande; also observed in a few upland coastal prairie remnants on clay soils over the Beaumont Formation at inland sites well to the north and along railroad right-of-ways and cemeteries; flowering (May-) September-December, fruiting October-December

Federal Status:	State Status:	SGCN: Y
Endemic: N	Global Rank: G2G3	State Rank: S2S3

Runyon's water-willow *Justicia runyonii*

Margins of and openings within subtropical woodlands or thorn shrublands on calcareous, alluvial, silty or clayey soils derived from Holocene silt and sand floodplain deposits of the Rio Grande Delta; can be common in narow openings such as those provided by trails through dense ebony woodlands and is sometimes restricted to microdepressions; flowering (July-) September-November

Federal Status:	State Status:	SGCN: Y
Endemic: N	Global Rank: G3	State Rank: S2

small-leaved yellow velvet-leaf *Wissadula parvifolia*

Occurs on sandy loams or clays in shrublands or woodlands on gently undulating terrain of the Holocene sand sheet over the Goliad Formation.

Federal Status:	State Status:	SGCN: Y
Endemic: Y	Global Rank: G1	State Rank: S1

South Texas false cudweed *Pseudognaphalium austrotexanum*

In sandy grasslands on eroded area above saline flats; along edge of sendero through mesquite woodland and shrub mottes on sandy loam; on gravel and silt bars and flats in scour plain of streams (TEX-LL specimens Carr 23682, 29264, 22647, 27206). Oct-Jan, sometimes in spring.

Federal Status:	State Status:	SGCN: Y
Endemic: N	Global Rank: G3	State Rank: S3

South Texas yellow clammyweed *Polanisia erosa ssp. breviglandulosa*

Sand plains of south Texas (Iltis 1958). Flowering early spring-mid fall.

Federal Status:	State Status:	SGCN: Y
Endemic: Y	Global Rank: G5T3T4	State Rank: S3S4

Texas ayenia *Ayenia limitaris*

Subtropical thorn woodland or tall shrubland on loamy soils of the Rio Grande Delta; known site soils include well-drained, calcareous, sandy clay loam (Hidalgo Series) and neutral to moderately alkaline, fine sandy loam (Willacy Series); also under or among taller shrubs in thorn woodland/thorn shrubland; flowering throughout the year with sufficient rainfall

Federal Status: E	State Status: E	SGCN: Y
Endemic: N	Global Rank: G2	State Rank: S1

WILLACY COUNTY

PLANTS

Vasey's adelia *Adelia vaseyi*

Mostly subtropical evergreen/deciduous woodlands on loamy soils of Rio Grande Delta, but occassionally in shrublands on more xeric sandy to gravelly upland sites; Perennial; Flowering January-June

Federal Status:	State Status:	SGCN: Y
Endemic: N	Global Rank: G3	State Rank: S3

velvet spurge *Euphorbia innocua*

Open or brushy areas on coastal sands and the South Texas Sand Sheet; Perennial; Flowering Sept-April; Fruiting Nov-July

Federal Status:	State Status:	SGCN: Y
Endemic: Y	Global Rank: G3	State Rank: S3

Wright's trichocoronis *Trichocoronis wrightii var. wrightii*

Most records from Texas are historical, perhaps indicating a decline as a result of alteration of wetland habitats; Annual; Flowering Feb-Oct; Fruiting Feb-Sept

Federal Status:	State Status:	SGCN: Y
Endemic: N	Global Rank: G4T3	State Rank: S2

Ocelots:

Distinguishing characteristics:

- Small cat-like animal with distinct spots
- Long, ringed tail that is nearly one-third the length of its body
- Slightly rounded ears
- Prefers dense brush, where it hunts for birds, snakes and rodents
- Endangered: ocelots used to be found from South Texas up into Arkansas and Louisiana. Today, there are less than 50 ocelots left in the U.S. and all are found in the lower Rio Grande Valley

What to do if you see an ocelot (alive OR dead):

Immediately contact the U.S. Fish & Wildlife Service
(956)784-7520 ~ (956)784-7608 ~ (956)748-3607 ~ (956)784-7500
After Hours (956) 874-4664

Provide important information, including:

Your name and a phone number where you can be reached; location, time and type of sighting (alive or dead); identifying marks that confirm it was an ocelot and not a bobcat; directions on how to get to the location; and a detailed description of the area.

If you find a dead ocelot:

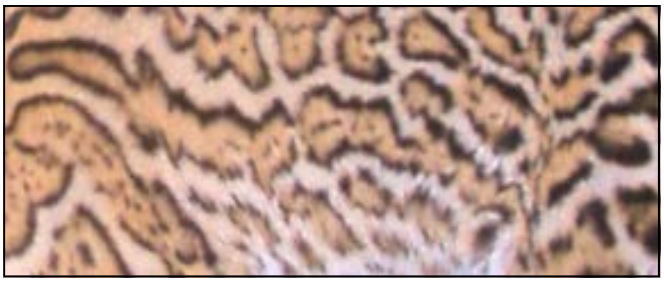
If you can, please stay with the carcass until FWS staff arrive. If you are not able to stay, please move the carcass so that it is not visible to passersby and FWS can retrieve. Be sure to let FWS know exactly where to find the carcass so they can retrieve it and collect important information such as internal tags and genetics.

Bobcats

Distinguishing characteristics:

- Light brown to gray coat. Might have spots on coat but they are more subtle
- Short tail
- Tufted ears. More pointed than ocelot with tuft of hair
- Larger than an ocelot
- Found in various habitat types, including forest, coastal, wetlands, as well as near urban areas
- Common throughout the U.S.

How to tell an ocelot from a bobcat:



Typical coat pattern of an ocelot

Typical coat pattern of a bobcat

Rounded ears on ocelot

Pointed and tufted ears on bobcat

Long, ringed tail on ocelot

Short, bobbed tail on bobcat

What to do if you see an ocelot (alive OR dead):

Immediately contact the U.S. Fish & Wildlife Service

(956)784-7520 ~ (956)784-7608 ~ (956)748-3607 ~ (956)784-7500

After Hours (956) 874-4664

VEGETATION AND WILDLIFE INVENTORY FOR THE ACTION AREA

The following plant species were observed to be the dominant species (at least 40% absolute cover in at least one Habitat Area) at various points within the action area of the Raymondville Drain Project.

Stratum/Strata	Common Name	Scientific Name
Tree	Loblolly Pine	*Pinus taeda*
Tree & Shrub	Honey Mesquite	*Prosopis glandulosa*
Tree& Shrub	Huisache	*Vachellia farnesiana*
Shrub	Broom Snakeweed	*Gutierrezia sarothrae*
Shrub	Granjeno	*Celtis pallida*
Shrub	Rooseveltweed	*Baccharis neglecta*
Shrub	Prickly Pear	*Opuntia stricta*
Herb	Annual Sunflower	*Helianthus annuus*
Herb	Bermudagrass	*Cynodon dactylon*
Herb	Buffelgrass	*Pennisetum ciliare*
Herb	Cuman Ragweed	*Ambrosia psilostachya*
Herb	Curly Dock	*Rumex crispus*
Herb	Dwarf Saltwort	*Salicornia bigelovii*
Herb	Johnsongrass	*Sorghum halepense*
Herb	King Ranch Bluestem	*Bothriochloa ischaemum*
Herb	Peppervine	*Ampelopsis arborea*
Herb	Prairie Coneflower	*Ratibida columnifera*
Herb	Saw Greenbriar	*Smilax bona-nox*
Herb	Silverleaf Nightshade	*Solanum eleagnifolium*
Herb	Sixweeks Threeawn	*Aristida adscensionis*
Herb	Shoregrass	*Monanthochloe littoralis*
Herb	Smartweed	*Polygonum pensylvanicum*
Herb	Southern Cattail	*Typha domingensis*
Herb	Texas Thistle	*Cirsium texanum*

Continued on the following page.

The following animal species were observed at various points within the action area of the Raymondville Drain Project.

Taxon	Common Name	Scientific Name
Birds	Black Vulture	*Coragyps atratus*
Birds	Bluewing Teal	*Spatula discors*
Birds	Cattle Egrets	*Bubulcus ibis*
Birds	Chipping Sparrow	*Spizella passerina*
Birds	Common Grackle	*Quiscalus quiscula*
Birds	Cormorants	Family Phalacrocoracidae
Birds	Cowbirds	Family Molothrus
Birds	Great Blue Heron	*Ardea herodias*
Birds	Gull	Family Larinae
Birds	House Sparrow	*Passer domesticus*
Birds	Killdeer	*Charadrius vociferus*
Birds	Mockingbird	*Mimus polyglottos*
Birds	Mottled Duck	*Anas fulvigula*
Birds	Mourning Dove	*Zenaida macroura*
Birds	Northern Cardinal	*Cardinalis cardinalis*
Birds	Northern Crested Caracara	*Caracara plancus cheriway*
Birds	Northern Shovelers	*Spatula clypeata*
Birds	Orchard Orioles	*Icterus spurius*
Birds	Pied-Billed Grebe	*Podilymbus podiceps*
Birds	Red-tailed Hawk	*Buteo jamaicensis*
Birds	Red-wing Blackbird	*Agelaius phoeniceus*
Birds	Roadrunner	*Geococcyx* spp.
Birds	Roseate Spoonbill	*Platalea ajaja*
Birds	Snowy Egret	*Egretta thula*
Birds	Spotted Sandpiper	*Actitis macularius*
Birds	Swallows	Family Hirundinidae
Birds	Turkey Vulture	*Cathartes aura*
Birds	Wild Turkey	*Meleagris gallopavo*
Fish	Alligator Gar	*Atractosteus spatula*
Insects	American Bumblebee	*Bombus pennsylvanicus*
Insects	Carpenter Bee	*Xylocopa* spp.

Continued on the following page.

Taxon	Common Name	Scientific Name
Mammals	Collard Peccary (a.k.a. Javelina)	*Tayassu tajacu*
Mammals	Coyote	*Canis latrans*
Mammals	Feral Hog	*Sus scrofa*
Mammals	Mule Deer	*Odocoileus hemionus*
Mammals	Nilgai	*Boselaphus tragocamelus*
Mammals	Nine-banded Armadillo	*Dasypodius novemcinctus*
Mammals	White Tail Deer	*Odocoileus virginiana*
Reptiles	Common Watersnake	*Nerodia sipedon*
Reptiles	Diamondback Rattlesnake	*Crotalus atrox*
Reptiles	Red-eared Slider	*Trachemys scripta elegans*
Reptiles	Ribbon Snake	*Thamnophis sauritus*
Reptiles	Texas Tortoise	*Gopherus berlandieri*

United States Department of Agriculture

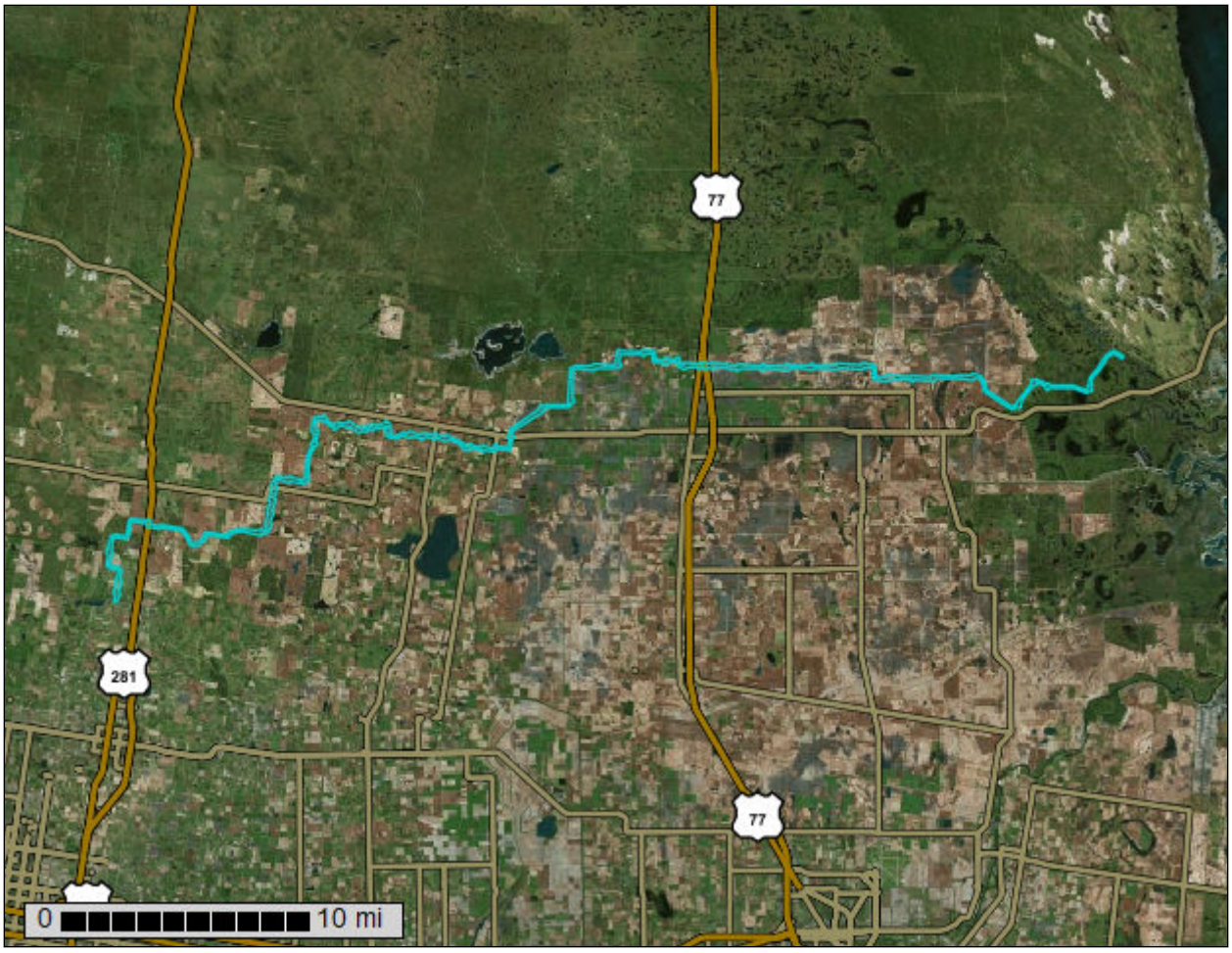
NRCS

Natural Resources Conservation Service

A product of the National Cooperative Soil Survey, a joint effort of the United States Department of Agriculture and other Federal agencies, State agencies including the Agricultural Experiment Stations, and local participants

Custom Soil Resource Report for Hidalgo County, Texas, and Willacy County, Texas

Raymondville Drain Project



July 16, 2025

Preface

Soil surveys contain information that affects land use planning in survey areas. They highlight soil limitations that affect various land uses and provide information about the properties of the soils in the survey areas. Soil surveys are designed for many different users, including farmers, ranchers, foresters, agronomists, urban planners, community officials, engineers, developers, builders, and home buyers. Also, conservationists, teachers, students, and specialists in recreation, waste disposal, and pollution control can use the surveys to help them understand, protect, or enhance the environment.

Various land use regulations of Federal, State, and local governments may impose special restrictions on land use or land treatment. Soil surveys identify soil properties that are used in making various land use or land treatment decisions. The information is intended to help the land users identify and reduce the effects of soil limitations on various land uses. The landowner or user is responsible for identifying and complying with existing laws and regulations.

Although soil survey information can be used for general farm, local, and wider area planning, onsite investigation is needed to supplement this information in some cases. Examples include soil quality assessments (http://www.nrcs.usda.gov/wps/portal/nrcs/main/soils/health/) and certain conservation and engineering applications. For more detailed information, contact your local USDA Service Center (https://offices.sc.egov.usda.gov/locator/app?agency=nrcs) or your NRCS State Soil Scientist (http://www.nrcs.usda.gov/wps/portal/nrcs/detail/soils/contactus/?cid=nrcs142p2_053951).

Great differences in soil properties can occur within short distances. Some soils are seasonally wet or subject to flooding. Some are too unstable to be used as a foundation for buildings or roads. Clayey or wet soils are poorly suited to use as septic tank absorption fields. A high water table makes a soil poorly suited to basements or underground installations.

The National Cooperative Soil Survey is a joint effort of the United States Department of Agriculture and other Federal agencies, State agencies including the Agricultural Experiment Stations, and local agencies. The Natural Resources Conservation Service (NRCS) has leadership for the Federal part of the National Cooperative Soil Survey.

Information about soils is updated periodically. Updated information is available through the NRCS Web Soil Survey, the site for official soil survey information.

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Contents

How Soil Surveys Are Made

Soil surveys are made to provide information about the soils and miscellaneous areas in a specific area. They include a description of the soils and miscellaneous areas and their location on the landscape and tables that show soil properties and limitations affecting various uses. Soil scientists observed the steepness, length, and shape of the slopes; the general pattern of drainage; the kinds of crops and native plants; and the kinds of bedrock. They observed and described many soil profiles. A soil profile is the sequence of natural layers, or horizons, in a soil. The profile extends from the surface down into the unconsolidated material in which the soil formed or from the surface down to bedrock. The unconsolidated material is devoid of roots and other living organisms and has not been changed by other biological activity.

Currently, soils are mapped according to the boundaries of major land resource areas (MLRAs). MLRAs are geographically associated land resource units that share common characteristics related to physiography, geology, climate, water resources, soils, biological resources, and land uses (USDA, 2006). Soil survey areas typically consist of parts of one or more MLRA.

The soils and miscellaneous areas in a survey area occur in an orderly pattern that is related to the geology, landforms, relief, climate, and natural vegetation of the area. Each kind of soil and miscellaneous area is associated with a particular kind of landform or with a segment of the landform. By observing the soils and miscellaneous areas in the survey area and relating their position to specific segments of the landform, a soil scientist develops a concept, or model, of how they were formed. Thus, during mapping, this model enables the soil scientist to predict with a considerable degree of accuracy the kind of soil or miscellaneous area at a specific location on the landscape.

Commonly, individual soils on the landscape merge into one another as their characteristics gradually change. To construct an accurate soil map, however, soil scientists must determine the boundaries between the soils. They can observe only a limited number of soil profiles. Nevertheless, these observations, supplemented by an understanding of the soil-vegetation-landscape relationship, are sufficient to verify predictions of the kinds of soil in an area and to determine the boundaries.

Soil scientists recorded the characteristics of the soil profiles that they studied. They noted soil color, texture, size and shape of soil aggregates, kind and amount of rock fragments, distribution of plant roots, reaction, and other features that enable them to identify soils. After describing the soils in the survey area and determining their properties, the soil scientists assigned the soils to taxonomic classes (units). Taxonomic classes are concepts. Each taxonomic class has a set of soil characteristics with precisely defined limits. The classes are used as a basis for comparison to classify soils systematically. Soil taxonomy, the system of taxonomic classification used in the United States, is based mainly on the kind and character of soil properties and the arrangement of horizons within the profile. After the soil

scientists classified and named the soils in the survey area, they compared the individual soils with similar soils in the same taxonomic class in other areas so that they could confirm data and assemble additional data based on experience and research.

The objective of soil mapping is not to delineate pure map unit components; the objective is to separate the landscape into landforms or landform segments that have similar use and management requirements. Each map unit is defined by a unique combination of soil components and/or miscellaneous areas in predictable proportions. Some components may be highly contrasting to the other components of the map unit. The presence of minor components in a map unit in no way diminishes the usefulness or accuracy of the data. The delineation of such landforms and landform segments on the map provides sufficient information for the development of resource plans. If intensive use of small areas is planned, onsite investigation is needed to define and locate the soils and miscellaneous areas.

Soil scientists make many field observations in the process of producing a soil map. The frequency of observation is dependent upon several factors, including scale of mapping, intensity of mapping, design of map units, complexity of the landscape, and experience of the soil scientist. Observations are made to test and refine the soil-landscape model and predictions and to verify the classification of the soils at specific locations. Once the soil-landscape model is refined, a significantly smaller number of measurements of individual soil properties are made and recorded. These measurements may include field measurements, such as those for color, depth to bedrock, and texture, and laboratory measurements, such as those for content of sand, silt, clay, salt, and other components. Properties of each soil typically vary from one point to another across the landscape.

Observations for map unit components are aggregated to develop ranges of characteristics for the components. The aggregated values are presented. Direct measurements do not exist for every property presented for every map unit component. Values for some properties are estimated from combinations of other properties.

While a soil survey is in progress, samples of some of the soils in the area generally are collected for laboratory analyses and for engineering tests. Soil scientists interpret the data from these analyses and tests as well as the field-observed characteristics and the soil properties to determine the expected behavior of the soils under different uses. Interpretations for all of the soils are field tested through observation of the soils in different uses and under different levels of management. Some interpretations are modified to fit local conditions, and some new interpretations are developed to meet local needs. Data are assembled from other sources, such as research information, production records, and field experience of specialists. For example, data on crop yields under defined levels of management are assembled from farm records and from field or plot experiments on the same kinds of soil.

Predictions about soil behavior are based not only on soil properties but also on such variables as climate and biological activity. Soil conditions are predictable over long periods of time, but they are not predictable from year to year. For example, soil scientists can predict with a fairly high degree of accuracy that a given soil will have a high water table within certain depths in most years, but they cannot predict that a high water table will always be at a specific level in the soil on a specific date.

After soil scientists located and identified the significant natural bodies of soil in the survey area, they drew the boundaries of these bodies on aerial photographs and

identified each as a specific map unit. Aerial photographs show trees, buildings, fields, roads, and rivers, all of which help in locating boundaries accurately.

Soil Map

The soil map section includes the soil map for the defined area of interest, a list of soil map units on the map and extent of each map unit, and cartographic symbols displayed on the map. Also presented are various metadata about data used to produce the map, and a description of each soil map unit.

Custom Soil Resource Report
Soil Map

Map Scale: 1:362,000 if printed on A landscape (11" x 8.5") sheet.

N

Meters
0 5000 10000 20000 30000

Feet
0 15000 30000 60000 90000

Map projection: Web Mercator Corner coordinates: WGS84 Edge tics: UTM Zone 14N WGS84

MAP LEGEND

Area of Interest (AOI)
- Area of Interest (AOI)

Soils
- Soil Map Unit Polygons
- Soil Map Unit Lines
- Soil Map Unit Points

Special Point Features
- Blowout
- Borrow Pit
- Clay Spot
- Closed Depression
- Gravel Pit
- Gravelly Spot
- Landfill
- Lava Flow
- Marsh or swamp
- Mine or Quarry
- Miscellaneous Water
- Perennial Water
- Rock Outcrop
- Saline Spot
- Sandy Spot
- Severely Eroded Spot
- Sinkhole
- Slide or Slip
- Sodic Spot
- Spoil Area
- Stony Spot
- Very Stony Spot
- Wet Spot
- Other
- Special Line Features

Water Features
- Streams and Canals

Transportation
- Rails
- Interstate Highways
- US Routes
- Major Roads
- Local Roads

Background
- Aerial Photography

MAP INFORMATION

The soil surveys that comprise your AOI were mapped at scales ranging from 1:20,000 to 1:24,000.

Please rely on the bar scale on each map sheet for map measurements.

Source of Map: Natural Resources Conservation Service
Web Soil Survey URL:
Coordinate System: Web Mercator (EPSG:3857)

Maps from the Web Soil Survey are based on the Web Mercator projection, which preserves direction and shape but distorts distance and area. A projection that preserves area, such as the Albers equal-area conic projection, should be used if more accurate calculations of distance or area are required.

This product is generated from the USDA-NRCS certified data as of the version date(s) listed below.

Soil Survey Area: Hidalgo County, Texas
Survey Area Data: Version 23, Aug 30, 2024

Soil Survey Area: Willacy County, Texas
Survey Area Data: Version 22, Aug 30, 2024

Your area of interest (AOI) includes more than one soil survey area. These survey areas may have been mapped at different scales, with a different land use in mind, at different times, or at different levels of detail. This may result in map unit symbols, soil properties, and interpretations that do not completely agree across soil survey area boundaries.

Soil map units are labeled (as space allows) for map scales 1:50,000 or larger.

Date(s) aerial images were photographed: Jan 1, 1999—Dec 31, 2003

The orthophoto or other base map on which the soil lines were compiled and digitized probably differs from the background

MAP LEGEND

MAP INFORMATION

imagery displayed on these maps. As a result, some minor shifting of map unit boundaries may be evident.

Map Unit Legend

Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI
3	Brennan fine sandy loam, 0 to 1 percent slopes	105.5	2.2%
4	Brennan fine sandy loam, 0 to 3 percent slopes	15.7	0.3%
8	Comitas loamy fine sand, 0 to 3 percent slopes	53.3	1.1%
9	Delfina loamy fine sand, warm, 0 to 2 percent slopes	57.9	1.2%
10	Delfina fine sandy loam, warm, 0 to 2 percent slopes	61.2	1.3%
11	Delfina fine sandy loam, warm, 1 to 3 percent slopes	47.6	1.0%
16	Hargill fine sandy loam, 0 to 1 percent slopes	82.4	1.7%
17	Hargill fine sandy loam, 1 to 3 percent slopes	64.3	1.3%
22	Hebbronville sandy loam, 0 to 1 percent slopes	19.5	0.4%
23	Hebbronville fine sandy loam, 1 to 3 percent slopes	27.7	0.6%
25	Hidalgo fine sandy loam, 0 to 1 percent slopes	165.7	3.5%
26	Hidalgo fine sandy loam, 1 to 3 percent slopes	15.7	0.3%
28	Hidalgo sandy clay loam, 0 to 1 percent slopes	118.2	2.5%
42	Nueces fine sand, 0 to 3 percent slopes	10.8	0.2%
45	Pits, borrow	2.6	0.1%
48	Racombes sandy clay loam, 0 to 1 percent slopes	83.8	1.8%
49	Racombes sandy clay loam, saline, 0 to 1 percent slopes	12.2	0.3%
59	Rio fine sandy loam, saline, ponded	137.7	2.9%
60	Rio clay loam, ponded	26.8	0.6%
61	Rio clay loam, saline, ponded	4.2	0.1%
67	Tiocano clay, 0 to 1 percent slopes, occasionally ponded	64.4	1.4%
70	Willacy fine sandy loam, 0 to 1 percent slopes	212.8	4.5%
71	Willacy fine sandy loam, 1 to 3 percent slopes	170.0	3.6%
Subtotals for Soil Survey Area		**1,560.5**	**32.7%**

Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI
Totals for Area of Interest		**4,770.2**	**100.0%**

Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI
An	Arents, loamy	1.2	0.0%
Ar	Arrada sandy clay loam, 0 to 1 percent slopes, very frequently flooded, frequently ponded	29.6	0.6%
DfA	Delfina fine sandy loam, warm, 0 to 2 percent slopes	198.9	4.2%
DfB	Delfina fine sandy loam, warm, 1 to 3 percent slopes	49.6	1.0%
HaA	Hargill fine sandy loam, 0 to 1 percent slopes	57.7	1.2%
HaB	Hargill fine sandy loam, 1 to 3 percent slopes	78.1	1.6%
HoA	Hidalgo sandy clay loam, 0 to 1 percent slopes	219.9	4.6%
Ic	Incell clay, 0 to 1 percent slopes, occasionally ponded	19.2	0.4%
Ja	Jarron sandy clay loam	23.3	0.5%
Le	Latina sandy clay loam, 0 to 1 percent slopes, occasionally ponded, rarely flooded	32.1	0.7%
Lm	Lomalta clay, 0 to 1 percent slopes, occasionally ponded	23.2	0.5%
Ln	Lozano fine sandy loam	188.7	4.0%
Ly	Lyford sandy clay loam	443.5	9.3%
Me	Mercedes clay	20.4	0.4%
Mp	Mercedes clay, ponded	2.4	0.0%
Nu	Nueces fine sand, 0 to 3 percent slopes	26.8	0.6%
Ra	Racombes sandy clay loam, 0 to 1 percent slopes	422.0	8.8%
Rc	Racombes sandy clay loam, saline, 0 to 1 percent slopes	92.1	1.9%
Rd	Raymondville clay loam	870.8	18.3%
Rg	Rio sandy clay loam, ponded	44.0	0.9%
Rs	Rio sandy clay loam, saline, ponded	42.1	0.9%
Tc	Tiocano clay, 0 to 1 percent slopes, occasionally ponded	17.0	0.4%
Uf	Ustorthents, loamy	2.1	0.0%
W	Water	5.4	0.1%
WaA	Willacy fine sandy loam, 0 to 1 percent slopes	66.6	1.4%

Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI
WaB	Willacy fine sandy loam, 1 to 3 percent slopes	4.1	0.1%
Wf	Willamar fine sandy loam, 0 to 1 percent slopes	211.4	4.4%
Ws	Willamar fine sandy loam, strongly saline, 0 to 1 percent slopes, occasionally ponded	17.2	0.4%
Subtotals for Soil Survey Area		**3,209.6**	**67.3%**
Totals for Area of Interest		**4,770.2**	**100.0%**

Map Unit Descriptions

The map units delineated on the detailed soil maps in a soil survey represent the soils or miscellaneous areas in the survey area. The map unit descriptions, along with the maps, can be used to determine the composition and properties of a unit.

A map unit delineation on a soil map represents an area dominated by one or more major kinds of soil or miscellaneous areas. A map unit is identified and named according to the taxonomic classification of the dominant soils. Within a taxonomic class there are precisely defined limits for the properties of the soils. On the landscape, however, the soils are natural phenomena, and they have the characteristic variability of all natural phenomena. Thus, the range of some observed properties may extend beyond the limits defined for a taxonomic class. Areas of soils of a single taxonomic class rarely, if ever, can be mapped without including areas of other taxonomic classes. Consequently, every map unit is made up of the soils or miscellaneous areas for which it is named and some minor components that belong to taxonomic classes other than those of the major soils.

Most minor soils have properties similar to those of the dominant soil or soils in the map unit, and thus they do not affect use and management. These are called noncontrasting, or similar, components. They may or may not be mentioned in a particular map unit description. Other minor components, however, have properties and behavioral characteristics divergent enough to affect use or to require different management. These are called contrasting, or dissimilar, components. They generally are in small areas and could not be mapped separately because of the scale used. Some small areas of strongly contrasting soils or miscellaneous areas are identified by a special symbol on the maps. If included in the database for a given area, the contrasting minor components are identified in the map unit descriptions along with some characteristics of each. A few areas of minor components may not have been observed, and consequently they are not mentioned in the descriptions, especially where the pattern was so complex that it was impractical to make enough observations to identify all the soils and miscellaneous areas on the landscape.

The presence of minor components in a map unit in no way diminishes the usefulness or accuracy of the data. The objective of mapping is not to delineate pure taxonomic classes but rather to separate the landscape into landforms or landform segments that have similar use and management requirements. The delineation of such segments on the map provides sufficient information for the development of resource plans. If intensive use of small areas is planned, however,

onsite investigation is needed to define and locate the soils and miscellaneous areas.

An identifying symbol precedes the map unit name in the map unit descriptions. Each description includes general facts about the unit and gives important soil properties and qualities.

Soils that have profiles that are almost alike make up a *soil series*. Except for differences in texture of the surface layer, all the soils of a series have major horizons that are similar in composition, thickness, and arrangement.

Soils of one series can differ in texture of the surface layer, slope, stoniness, salinity, degree of erosion, and other characteristics that affect their use. On the basis of such differences, a soil series is divided into *soil phases*. Most of the areas shown on the detailed soil maps are phases of soil series. The name of a soil phase commonly indicates a feature that affects use or management. For example, Alpha silt loam, 0 to 2 percent slopes, is a phase of the Alpha series.

Some map units are made up of two or more major soils or miscellaneous areas. These map units are complexes, associations, or undifferentiated groups.

A *complex* consists of two or more soils or miscellaneous areas in such an intricate pattern or in such small areas that they cannot be shown separately on the maps. The pattern and proportion of the soils or miscellaneous areas are somewhat similar in all areas. Alpha-Beta complex, 0 to 6 percent slopes, is an example.

An *association* is made up of two or more geographically associated soils or miscellaneous areas that are shown as one unit on the maps. Because of present or anticipated uses of the map units in the survey area, it was not considered practical or necessary to map the soils or miscellaneous areas separately. The pattern and relative proportion of the soils or miscellaneous areas are somewhat similar. Alpha-Beta association, 0 to 2 percent slopes, is an example.

An *undifferentiated group* is made up of two or more soils or miscellaneous areas that could be mapped individually but are mapped as one unit because similar interpretations can be made for use and management. The pattern and proportion of the soils or miscellaneous areas in a mapped area are not uniform. An area can be made up of only one of the major soils or miscellaneous areas, or it can be made up of all of them. Alpha and Beta soils, 0 to 2 percent slopes, is an example.

Some surveys include *miscellaneous areas*. Such areas have little or no soil material and support little or no vegetation. Rock outcrop is an example.

Hidalgo County, Texas

3—Brennan fine sandy loam, 0 to 1 percent slopes

Map Unit Setting

National map unit symbol: 2t8bl
Elevation: 70 to 600 feet
Mean annual precipitation: 19 to 24 inches
Mean annual air temperature: 72 to 74 degrees F
Frost-free period: 295 to 330 days
Farmland classification: Prime farmland if irrigated

Map Unit Composition

Brennan and similar soils: 85 percent
Minor components: 15 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Brennan

Setting

Landform: Sand sheets
Landform position (three-dimensional): Talf
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Eolian sands and/or calcareous loamy alluvium

Typical profile

A - 0 to 12 inches: fine sandy loam
Bt - 12 to 26 inches: sandy clay loam
Bk - 26 to 40 inches: sandy clay loam
BCk - 40 to 80 inches: sandy clay loam

Properties and qualities

Slope: 0 to 1 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Well drained
Runoff class: Negligible
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.57 to 1.98 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 30 percent
Gypsum, maximum content: 2 percent
Maximum salinity: Nonsaline to slightly saline (1.0 to 4.0 mmhos/cm)
Sodium adsorption ratio, maximum: 2.0
Available water supply, 0 to 60 inches: Moderate (about 8.5 inches)

Interpretive groups

Land capability classification (irrigated): 1
Land capability classification (nonirrigated): 3c
Hydrologic Soil Group: B
Ecological site: R083EY023TX - Sandy Loam
Hydric soil rating: No

Minor Components

Delmita
Percent of map unit: 5 percent
Ecological site: R083EY022TX - Loamy Sand
Hydric soil rating: No

Mcallen
Percent of map unit: 5 percent
Ecological site: R083BY019TX - Gray Sandy Loam
Hydric soil rating: No

Ramadero
Percent of map unit: 3 percent
Ecological site: R083DY012TX - Ramadero
Hydric soil rating: No

Zapata
Percent of map unit: 2 percent
Ecological site: R083CY002TX - Shallow Ridge
Hydric soil rating: No

4—Brennan fine sandy loam, 0 to 3 percent slopes

Map Unit Setting
National map unit symbol: 2t8bn
Elevation: 70 to 600 feet
Mean annual precipitation: 17 to 24 inches
Mean annual air temperature: 72 to 74 degrees F
Frost-free period: 295 to 330 days
Farmland classification: Prime farmland if irrigated

Map Unit Composition
Brennan and similar soils: 85 percent
Minor components: 15 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Brennan

Setting
Landform: Sand sheets
Landform position (three-dimensional): Talf
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Eolian sands and/or calcareous loamy alluvium

Typical profile
A - 0 to 10 inches: fine sandy loam
Btk - 10 to 35 inches: sandy clay loam
Bk - 35 to 50 inches: sandy clay loam
BCk - 50 to 80 inches: sandy clay loam

Properties and qualities

Slope: 0 to 3 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Well drained
Runoff class: Low
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.57 to 1.98 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 20 percent
Gypsum, maximum content: 2 percent
Maximum salinity: Nonsaline to slightly saline (1.0 to 4.0 mmhos/cm)
Sodium adsorption ratio, maximum: 2.0
Available water supply, 0 to 60 inches: Moderate (about 8.7 inches)

Interpretive groups

Land capability classification (irrigated): 2e
Land capability classification (nonirrigated): 3c
Hydrologic Soil Group: B
Ecological site: R083EY023TX - Sandy Loam
Hydric soil rating: No

Minor Components

Copita

Percent of map unit: 10 percent
Ecological site: R083BY019TX - Gray Sandy Loam
Hydric soil rating: No

Hebbronville

Percent of map unit: 3 percent
Ecological site: R083EY023TX - Sandy Loam
Hydric soil rating: No

Tela

Percent of map unit: 2 percent
Ecological site: R083CY012TX - Ramadero
Hydric soil rating: No

8—Comitas loamy fine sand, 0 to 3 percent slopes

Map Unit Setting

National map unit symbol: 2sxvh
Elevation: 30 to 750 feet
Mean annual precipitation: 19 to 25 inches
Mean annual air temperature: 70 to 74 degrees F
Frost-free period: 270 to 365 days
Farmland classification: Farmland of statewide importance, if irrigated

Map Unit Composition

Comitas and similar soils: 83 percent
Minor components: 17 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Comitas

Setting

Landform: Sand sheets
Landform position (two-dimensional): Footslope
Landform position (three-dimensional): Tread
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Eolian sands over alluvium and/or eolian deposits

Typical profile

A - 0 to 31 inches: loamy fine sand
Bt - 31 to 59 inches: fine sandy loam
Btk - 59 to 80 inches: fine sandy loam

Properties and qualities

Slope: 0 to 3 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Well drained
Runoff class: Negligible
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.57 to 5.95 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 15 percent
Maximum salinity: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)
Available water supply, 0 to 60 inches: Low (about 5.9 inches)

Interpretive groups

Land capability classification (irrigated): 3e
Land capability classification (nonirrigated): 3e
Hydrologic Soil Group: A
Ecological site: R083EY022TX - Loamy Sand
Hydric soil rating: No

Minor Components

Nueces

Percent of map unit: 4 percent
Landform: Sand sheets
Landform position (two-dimensional): Footslope
Landform position (three-dimensional): Tread
Down-slope shape: Convex
Across-slope shape: Linear
Ecological site: R083EY021TX - Sandy
Hydric soil rating: No

Sarita

Percent of map unit: 4 percent
Landform: Dunes on sand sheets

Landform position (two-dimensional): Summit, shoulder
Landform position (three-dimensional): Tread
Down-slope shape: Convex
Across-slope shape: Convex
Ecological site: R083EY021TX - Sandy
Hydric soil rating: No

Brennan

Percent of map unit: 3 percent
Landform: Sand sheets
Landform position (two-dimensional): Toeslope, footslope
Landform position (three-dimensional): Tread
Down-slope shape: Linear
Across-slope shape: Linear
Ecological site: R083EY023TX - Sandy Loam
Hydric soil rating: No

Falfurrias

Percent of map unit: 3 percent
Landform: Dunes on sand sheets
Landform position (two-dimensional): Summit, shoulder, footslope
Landform position (three-dimensional): Tread
Down-slope shape: Convex
Across-slope shape: Convex, linear
Ecological site: R083EY020TX - Sand Hills
Hydric soil rating: No

Delmita

Percent of map unit: 3 percent
Landform: Sand sheets
Landform position (two-dimensional): Toeslope
Landform position (three-dimensional): Tread
Down-slope shape: Linear
Across-slope shape: Linear
Ecological site: R083EY022TX - Loamy Sand
Hydric soil rating: No

9—Delfina loamy fine sand, warm, 0 to 2 percent slopes

Map Unit Setting

National map unit symbol: 2t12p
Elevation: 30 to 330 feet
Mean annual precipitation: 21 to 29 inches
Mean annual air temperature: 73 to 75 degrees F
Frost-free period: 300 to 365 days
Farmland classification: Prime farmland if irrigated and the product of I (soil erodibility) x C (climate factor) does not exceed 60

Map Unit Composition

Delfina, warm, and similar soils: 85 percent

Minor components: 15 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Delfina, Warm

Setting

Landform: Sand sheets on terraces
Landform position (three-dimensional): Tread
Down-slope shape: Convex, linear
Across-slope shape: Linear
Parent material: Sandy and loamy eolian deposits over calcareous loamy alluvium

Typical profile

Ap - 0 to 15 inches: loamy fine sand
2Bt - 15 to 47 inches: sandy clay loam
2Btk - 47 to 80 inches: sandy clay loam

Properties and qualities

Slope: 0 to 2 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Moderately well drained
Runoff class: Low
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.20 to 1.98 in/hr)
Depth to water table: About 30 to 60 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 15 percent
Maximum salinity: Nonsaline to slightly saline (0.0 to 7.0 mmhos/cm)
Sodium adsorption ratio, maximum: 8.0
Available water supply, 0 to 60 inches: Moderate (about 6.2 inches)

Interpretive groups

Land capability classification (irrigated): 3e
Land capability classification (nonirrigated): 3e
Hydrologic Soil Group: C
Ecological site: R083EY022TX - Loamy Sand
Hydric soil rating: No

Minor Components

Nueces

Percent of map unit: 8 percent
Landform: Sand sheets on terraces
Landform position (three-dimensional): Tread
Down-slope shape: Convex, linear
Across-slope shape: Convex, linear
Ecological site: R083EY021TX - Sandy
Hydric soil rating: No

Willacy

Percent of map unit: 5 percent
Landform: Terraces
Landform position (three-dimensional): Tread
Down-slope shape: Linear
Across-slope shape: Linear
Ecological site: R083DY023TX - Sandy Loam

Hydric soil rating: No

Racombes

Percent of map unit: 2 percent
Landform: Terraces
Landform position (three-dimensional): Tread
Down-slope shape: Linear
Across-slope shape: Linear
Ecological site: R083DY015TX - Saline Clay
Hydric soil rating: No

10—Delfina fine sandy loam, warm, 0 to 2 percent slopes

Map Unit Setting

National map unit symbol: 2t12k
Elevation: 20 to 220 feet
Mean annual precipitation: 21 to 29 inches
Mean annual air temperature: 73 to 75 degrees F
Frost-free period: 300 to 365 days
Farmland classification: Prime farmland if irrigated

Map Unit Composition

Delfina, warm, and similar soils: 90 percent
Minor components: 10 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Delfina, Warm

Setting

Landform: Stream terraces
Landform position (three-dimensional): Tread
Down-slope shape: Linear
Across-slope shape: Convex
Parent material: Loamy eolian deposits over calcareous loamy alluvium

Typical profile

Ap - 0 to 15 inches: fine sandy loam
2Bt - 15 to 47 inches: sandy clay loam
2Btk - 47 to 80 inches: sandy clay loam

Properties and qualities

Slope: 0 to 2 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Moderately well drained
Runoff class: Low
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.20 to 1.98 in/hr)
Depth to water table: About 30 to 60 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 15 percent

Maximum salinity: Nonsaline to slightly saline (0.0 to 7.0 mmhos/cm)
Sodium adsorption ratio, maximum: 8.0
Available water supply, 0 to 60 inches: Moderate (about 6.8 inches)

Interpretive groups

Land capability classification (irrigated): 3e
Land capability classification (nonirrigated): 3e
Hydrologic Soil Group: C
Ecological site: R083DY024TX - Tight Sandy Loam
Hydric soil rating: No

Minor Components

Willacy

Percent of map unit: 5 percent
Landform: Terraces
Landform position (three-dimensional): Tread
Down-slope shape: Linear
Across-slope shape: Linear
Ecological site: R083DY023TX - Sandy Loam
Hydric soil rating: No

Racombes

Percent of map unit: 4 percent
Landform: Terraces
Landform position (three-dimensional): Tread
Down-slope shape: Linear
Across-slope shape: Linear
Ecological site: R083DY025TX - Clay Loam
Hydric soil rating: No

Lozano

Percent of map unit: 1 percent
Landform: Terraces
Landform position (three-dimensional): Tread
Down-slope shape: Linear
Across-slope shape: Linear
Ecological site: R083DY024TX - Tight Sandy Loam
Hydric soil rating: No

11—Delfina fine sandy loam, warm, 1 to 3 percent slopes

Map Unit Setting

National map unit symbol: 2t12n
Elevation: 30 to 220 feet
Mean annual precipitation: 21 to 29 inches
Mean annual air temperature: 73 to 75 degrees F
Frost-free period: 300 to 365 days
Farmland classification: Prime farmland if irrigated

Map Unit Composition

Delfina, warm, and similar soils: 90 percent
Minor components: 10 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Delfina, Warm

Setting

Landform: Stream terraces
Landform position (three-dimensional): Tread
Down-slope shape: Convex
Across-slope shape: Convex
Parent material: Loamy eolian deposits over calcareous loamy alluvium

Typical profile

Ap - 0 to 15 inches: fine sandy loam
2Bt - 15 to 47 inches: sandy clay loam
2Btk - 47 to 80 inches: sandy clay loam

Properties and qualities

Slope: 1 to 3 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Moderately well drained
Runoff class: Low
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.20 to 1.98 in/hr)
Depth to water table: About 30 to 60 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 15 percent
Maximum salinity: Nonsaline to slightly saline (0.0 to 7.0 mmhos/cm)
Sodium adsorption ratio, maximum: 8.0
Available water supply, 0 to 60 inches: Moderate (about 6.8 inches)

Interpretive groups

Land capability classification (irrigated): 3e
Land capability classification (nonirrigated): 3e
Hydrologic Soil Group: C
Ecological site: R083DY024TX - Tight Sandy Loam
Hydric soil rating: No

Minor Components

Willacy

Percent of map unit: 5 percent
Landform: Terraces
Landform position (three-dimensional): Tread
Down-slope shape: Linear
Across-slope shape: Linear
Ecological site: R083DY023TX - Sandy Loam
Hydric soil rating: No

Racombes

Percent of map unit: 4 percent
Landform: Terraces
Landform position (three-dimensional): Tread

Down-slope shape: Concave
Across-slope shape: Linear
Ecological site: R083DY015TX - Saline Clay
Hydric soil rating: No

Lozano

Percent of map unit: 1 percent
Landform: Terraces
Landform position (three-dimensional): Tread
Down-slope shape: Linear
Across-slope shape: Linear
Ecological site: R083DY024TX - Tight Sandy Loam
Hydric soil rating: No

16—Hargill fine sandy loam, 0 to 1 percent slopes

Map Unit Setting

National map unit symbol: dbkr
Elevation: 30 to 150 feet
Mean annual precipitation: 26 to 34 inches
Mean annual air temperature: 72 to 73 degrees F
Frost-free period: 310 to 340 days
Farmland classification: Prime farmland if irrigated

Map Unit Composition

Hargill and similar soils: 75 percent
Minor components: 25 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Hargill

Setting

Landform: Delta plains
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Loamy alluvium

Typical profile

H1 - 0 to 18 inches: fine sandy loam
H2 - 18 to 63 inches: sandy clay loam
H3 - 63 to 80 inches: sandy clay loam

Properties and qualities

Slope: 0 to 1 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Well drained
Runoff class: Negligible
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.57 to 1.98 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None

Frequency of ponding: None
Calcium carbonate, maximum content: 10 percent
Maximum salinity: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)
Available water supply, 0 to 60 inches: Moderate (about 8.6 inches)

Interpretive groups

Land capability classification (irrigated): 1
Land capability classification (nonirrigated): 2c
Hydrologic Soil Group: B
Ecological site: R083DY023TX - Sandy Loam
Hydric soil rating: No

Minor Components

Unnamed

Percent of map unit: 25 percent
Hydric soil rating: No

17—Hargill fine sandy loam, 1 to 3 percent slopes

Map Unit Setting

National map unit symbol: dbks
Elevation: 30 to 150 feet
Mean annual precipitation: 26 to 34 inches
Mean annual air temperature: 72 to 73 degrees F
Frost-free period: 310 to 340 days
Farmland classification: Prime farmland if irrigated

Map Unit Composition

Hargill and similar soils: 80 percent
Minor components: 20 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Hargill

Setting

Landform: Delta plains
Down-slope shape: Linear
Across-slope shape: Convex
Parent material: Loamy alluvium

Typical profile

H1 - 0 to 18 inches: fine sandy loam
H2 - 18 to 63 inches: sandy clay loam
H3 - 63 to 80 inches: sandy clay loam

Properties and qualities

Slope: 1 to 3 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Well drained
Runoff class: Low

Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.57 to 1.98 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 10 percent
Maximum salinity: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)
Available water supply, 0 to 60 inches: Moderate (about 8.6 inches)

Interpretive groups

Land capability classification (irrigated): 2e
Land capability classification (nonirrigated): 2e
Hydrologic Soil Group: B
Ecological site: R083DY023TX - Sandy Loam
Hydric soil rating: No

Minor Components

Unnamed

Percent of map unit: 20 percent
Hydric soil rating: No

22—Hebbronville sandy loam, 0 to 1 percent slopes

Map Unit Setting

National map unit symbol: dbkz
Elevation: 100 to 400 feet
Mean annual precipitation: 18 to 28 inches
Mean annual air temperature: 70 to 73 degrees F
Frost-free period: 300 to 330 days
Farmland classification: Prime farmland if irrigated

Map Unit Composition

Hebbronville and similar soils: 80 percent
Minor components: 20 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Hebbronville

Setting

Landform: Sand sheets
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Eolian sands over calcareous loamy alluvium

Typical profile

H1 - 0 to 17 inches: sandy loam
H2 - 17 to 58 inches: fine sandy loam
H3 - 58 to 65 inches: fine sandy loam

Properties and qualities

Slope: 0 to 1 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Well drained
Runoff class: Negligible
Capacity of the most limiting layer to transmit water (Ksat): High (1.98 to 5.95 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 5 percent
Maximum salinity: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)
Sodium adsorption ratio, maximum: 4.0
Available water supply, 0 to 60 inches: Moderate (about 7.9 inches)

Interpretive groups

Land capability classification (irrigated): 1
Land capability classification (nonirrigated): 3c
Hydrologic Soil Group: A
Ecological site: R083EY023TX - Sandy Loam
Hydric soil rating: No

Minor Components

Unnamed

Percent of map unit: 20 percent
Hydric soil rating: No

23—Hebbronville fine sandy loam, 1 to 3 percent slopes

Map Unit Setting

National map unit symbol: 30fm4
Elevation: 100 to 400 feet
Mean annual precipitation: 18 to 28 inches
Mean annual air temperature: 70 to 74 degrees F
Frost-free period: 270 to 365 days
Farmland classification: Prime farmland if irrigated

Map Unit Composition

Hebbronville and similar soils: 85 percent
Minor components: 15 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Hebbronville

Setting

Landform: Sand sheets
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Eolian sands over calcareous loamy alluvium

Typical profile

A - 0 to 15 inches: fine sandy loam
Bt - 15 to 60 inches: fine sandy loam
Bk - 60 to 80 inches: fine sandy loam

Properties and qualities

Slope: 1 to 3 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Well drained
Runoff class: Very low
Capacity of the most limiting layer to transmit water (Ksat): High (1.98 to 5.95 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 5 percent
Maximum salinity: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)
Sodium adsorption ratio, maximum: 4.0
Available water supply, 0 to 60 inches: Moderate (about 7.8 inches)

Interpretive groups

Land capability classification (irrigated): 2e
Land capability classification (nonirrigated): 3e
Hydrologic Soil Group: A
Ecological site: R083EY023TX - Sandy Loam
Hydric soil rating: No

Minor Components

Brennan

Percent of map unit: 5 percent
Landform: Sand sheets
Landform position (two-dimensional): Toeslope, footslope
Landform position (three-dimensional): Tread
Down-slope shape: Linear
Across-slope shape: Linear
Ecological site: R083EY023TX - Sandy Loam
Hydric soil rating: No

Comitas

Percent of map unit: 5 percent
Landform: Sand sheets
Landform position (three-dimensional): Tread
Down-slope shape: Linear
Across-slope shape: Convex
Ecological site: R083EY022TX - Loamy Sand
Hydric soil rating: No

Delmita

Percent of map unit: 5 percent
Landform: Sand sheets
Landform position (two-dimensional): Toeslope
Landform position (three-dimensional): Tread
Down-slope shape: Linear
Across-slope shape: Linear
Ecological site: R083EY022TX - Loamy Sand

Hydric soil rating: No

25—Hidalgo fine sandy loam, 0 to 1 percent slopes

Map Unit Setting

National map unit symbol: 2sxvn
Elevation: 20 to 500 feet
Mean annual precipitation: 20 to 27 inches
Mean annual air temperature: 72 to 74 degrees F
Frost-free period: 300 to 365 days
Farmland classification: Prime farmland if irrigated

Map Unit Composition

Hidalgo and similar soils: 85 percent
Minor components: 15 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Hidalgo

Setting

Landform: Terraces
Landform position (three-dimensional): Tread
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Calcareous loamy alluvium

Typical profile

Ap - 0 to 17 inches: fine sandy loam
Bk1 - 17 to 28 inches: sandy clay loam
Bk2 - 28 to 38 inches: clay loam
Ck - 38 to 80 inches: clay loam

Properties and qualities

Slope: 0 to 1 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Well drained
Runoff class: Negligible
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.57 to 1.98 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 35 percent
Maximum salinity: Nonsaline to slightly saline (0.0 to 4.0 mmhos/cm)
Sodium adsorption ratio, maximum: 10.0
Available water supply, 0 to 60 inches: Moderate (about 7.8 inches)

Interpretive groups

Land capability classification (irrigated): 2s
Land capability classification (nonirrigated): 2s
Hydrologic Soil Group: B

Ecological site: R083DY019TX - Gray Sandy Loam
Hydric soil rating: No

Minor Components

Willacy
Percent of map unit: 10 percent
Landform: Terraces
Landform position (three-dimensional): Tread
Down-slope shape: Linear
Across-slope shape: Linear
Ecological site: R083DY023TX - Sandy Loam
Hydric soil rating: No

Brennan
Percent of map unit: 5 percent
Landform: Terraces
Landform position (three-dimensional): Tread
Down-slope shape: Linear
Across-slope shape: Linear
Ecological site: R083EY023TX - Sandy Loam
Hydric soil rating: No

26—Hidalgo fine sandy loam, 1 to 3 percent slopes

Map Unit Setting
National map unit symbol: 2sxvp
Elevation: 20 to 500 feet
Mean annual precipitation: 20 to 27 inches
Mean annual air temperature: 72 to 74 degrees F
Frost-free period: 300 to 365 days
Farmland classification: Prime farmland if irrigated

Map Unit Composition
Hidalgo and similar soils: 85 percent
Minor components: 15 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Hidalgo

Setting
Landform: Terraces
Landform position (three-dimensional): Tread
Down-slope shape: Convex
Across-slope shape: Linear
Parent material: Calcareous loamy alluvium

Typical profile
Ap - 0 to 17 inches: fine sandy loam
Bk1 - 17 to 28 inches: sandy clay loam
Bk2 - 28 to 38 inches: clay loam

Ck - 38 to 80 inches: clay loam

Properties and qualities

Slope: 1 to 3 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Well drained
Runoff class: Low
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.57 to 1.98 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 35 percent
Maximum salinity: Nonsaline to slightly saline (0.0 to 4.0 mmhos/cm)
Sodium adsorption ratio, maximum: 10.0
Available water supply, 0 to 60 inches: Moderate (about 7.8 inches)

Interpretive groups

Land capability classification (irrigated): 2e
Land capability classification (nonirrigated): 2e
Hydrologic Soil Group: B
Ecological site: R083DY019TX - Gray Sandy Loam
Hydric soil rating: No

Minor Components

Willacy

Percent of map unit: 10 percent
Landform: Terraces
Landform position (three-dimensional): Tread
Down-slope shape: Convex
Across-slope shape: Linear
Ecological site: R083DY023TX - Sandy Loam
Hydric soil rating: No

Brennan

Percent of map unit: 5 percent
Landform: Terraces
Landform position (three-dimensional): Tread
Down-slope shape: Convex
Across-slope shape: Linear
Ecological site: R083EY023TX - Sandy Loam
Hydric soil rating: No

28—Hidalgo sandy clay loam, 0 to 1 percent slopes

Map Unit Setting

National map unit symbol: 2sxvl
Elevation: 20 to 500 feet
Mean annual precipitation: 20 to 27 inches
Mean annual air temperature: 72 to 74 degrees F

Frost-free period: 300 to 365 days
Farmland classification: All areas are prime farmland

Map Unit Composition

Hidalgo and similar soils: 85 percent
Minor components: 15 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Hidalgo

Setting

Landform: Terraces
Landform position (three-dimensional): Tread
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Calcareous loamy alluvium

Typical profile

Ap - 0 to 17 inches: sandy clay loam
Bk1 - 17 to 28 inches: sandy clay loam
Bk2 - 28 to 38 inches: clay loam
Ck - 38 to 80 inches: clay loam

Properties and qualities

Slope: 0 to 1 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Well drained
Runoff class: Negligible
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.57 to 1.98 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 35 percent
Maximum salinity: Nonsaline to slightly saline (0.0 to 4.0 mmhos/cm)
Sodium adsorption ratio, maximum: 10.0
Available water supply, 0 to 60 inches: Moderate (about 7.8 inches)

Interpretive groups

Land capability classification (irrigated): 1
Land capability classification (nonirrigated): 2c
Hydrologic Soil Group: B
Ecological site: R083DY019TX - Gray Sandy Loam
Hydric soil rating: No

Minor Components

Raymondville

Percent of map unit: 7 percent
Landform: Terraces
Landform position (three-dimensional): Tread
Down-slope shape: Linear
Across-slope shape: Linear
Ecological site: R083DY025TX - Clay Loam
Hydric soil rating: No

Racombes

Percent of map unit: 6 percent
Landform: Terraces
Landform position (three-dimensional): Tread
Down-slope shape: Linear
Across-slope shape: Linear
Ecological site: R083DY025TX - Clay Loam
Hydric soil rating: No

Willacy

Percent of map unit: 2 percent
Landform: Terraces
Landform position (three-dimensional): Tread
Down-slope shape: Linear
Across-slope shape: Linear
Ecological site: R083DY023TX - Sandy Loam
Hydric soil rating: No

42—Nueces fine sand, 0 to 3 percent slopes

Map Unit Setting

National map unit symbol: 2sxvd
Elevation: 20 to 500 feet
Mean annual precipitation: 21 to 27 inches
Mean annual air temperature: 71 to 74 degrees F
Frost-free period: 300 to 365 days
Farmland classification: Farmland of statewide importance

Map Unit Composition

Nueces and similar soils: 85 percent
Minor components: 15 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Nueces

Setting

Landform: Sand sheets
Landform position (three-dimensional): Tread
Down-slope shape: Linear
Across-slope shape: Convex
Parent material: Sandy eolian deposits over loamy alluvium

Typical profile

A - 0 to 10 inches: fine sand
E - 10 to 32 inches: fine sand
2Bt1 - 32 to 48 inches: sandy clay loam
2Bt2 - 48 to 80 inches: sandy clay loam

Properties and qualities

Slope: 0 to 3 percent

Depth to restrictive feature: More than 80 inches
Drainage class: Moderately well drained
Runoff class: Very low
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.57 to 1.98 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 2 percent
Gypsum, maximum content: 1 percent
Maximum salinity: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)
Sodium adsorption ratio, maximum: 20.0
Available water supply, 0 to 60 inches: Moderate (about 6.7 inches)

Interpretive groups

Land capability classification (irrigated): 3e
Land capability classification (nonirrigated): 3e
Hydrologic Soil Group: B
Ecological site: R083EY021TX - Sandy
Hydric soil rating: No

Minor Components

Sarita

Percent of map unit: 8 percent
Landform: Dunes on sand sheets
Landform position (two-dimensional): Summit, shoulder
Landform position (three-dimensional): Tread
Down-slope shape: Convex
Across-slope shape: Convex
Ecological site: R083EY021TX - Sandy
Hydric soil rating: No

Delfina

Percent of map unit: 3 percent
Landform: Sand sheets
Landform position (two-dimensional): Footslope, toeslope
Landform position (three-dimensional): Tread
Down-slope shape: Linear
Across-slope shape: Linear
Ecological site: R083EY023TX - Sandy Loam
Hydric soil rating: No

Comitas

Percent of map unit: 3 percent
Landform: Sand sheets
Landform position (two-dimensional): Footslope
Landform position (three-dimensional): Tread
Down-slope shape: Linear
Across-slope shape: Convex
Ecological site: R083EY022TX - Loamy Sand
Hydric soil rating: No

Sauz

Percent of map unit: 1 percent
Landform: Sand sheets
Landform position (two-dimensional): Toeslope

Landform position (three-dimensional): Tread
Down-slope shape: Concave
Across-slope shape: Concave
Ecological site: R150BY708TX - Sandy Flat
Hydric soil rating: Yes

45—Pits, borrow

Map Unit Setting

National map unit symbol: dbls
Elevation: 50 to 850 feet
Mean annual precipitation: 20 to 41 inches
Mean annual air temperature: 64 to 73 degrees F
Frost-free period: 225 to 325 days
Farmland classification: Not prime farmland

Map Unit Composition

Pits: 100 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Pits

Typical profile

H1 - 0 to 80 inches: variable

Properties and qualities

Slope: 1 to 30 percent
Drainage class: Well drained
Runoff class: Very low
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to very high (0.57 to 19.98 in/hr)
Frequency of flooding: Occasional

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 7e
Hydrologic Soil Group: B
Hydric soil rating: No

48—Racombes sandy clay loam, 0 to 1 percent slopes

Map Unit Setting

National map unit symbol: 2yndc
Elevation: 30 to 330 feet
Mean annual precipitation: 23 to 27 inches
Mean annual air temperature: 72 to 74 degrees F

Frost-free period: 280 to 365 days
Farmland classification: All areas are prime farmland

Map Unit Composition

Racombes and similar soils: 85 percent
Minor components: 15 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Racombes

Setting

Landform: Terraces
Landform position (three-dimensional): Tread
Down-slope shape: Linear
Across-slope shape: Concave
Parent material: Calcareous loamy alluvium

Typical profile

Ap - 0 to 13 inches: sandy clay loam
Bt - 13 to 25 inches: sandy clay loam
Btk - 25 to 49 inches: sandy clay loam
Bk - 49 to 80 inches: sandy clay loam

Properties and qualities

Slope: 0 to 1 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Well drained
Runoff class: Negligible
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.57 to 1.98 in/hr)
Depth to water table: About 42 to 72 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 20 percent
Gypsum, maximum content: 2 percent
Maximum salinity: Nonsaline to slightly saline (0.0 to 4.0 mmhos/cm)
Sodium adsorption ratio, maximum: 6.0
Available water supply, 0 to 60 inches: Moderate (about 9.0 inches)

Interpretive groups

Land capability classification (irrigated): 1
Land capability classification (nonirrigated): 1
Hydrologic Soil Group: B
Ecological site: R083DY025TX - Clay Loam
Hydric soil rating: No

Minor Components

Willacy

Percent of map unit: 6 percent
Landform: Terraces
Landform position (three-dimensional): Tread
Down-slope shape: Linear
Across-slope shape: Linear
Ecological site: R083DY023TX - Sandy Loam
Hydric soil rating: No

Hidalgo

Percent of map unit: 4 percent
Landform: Terraces
Landform position (three-dimensional): Tread
Down-slope shape: Convex
Across-slope shape: Linear
Ecological site: R083DY019TX - Gray Sandy Loam
Hydric soil rating: No

Raymondville

Percent of map unit: 4 percent
Landform: Terraces
Landform position (three-dimensional): Tread
Down-slope shape: Linear
Across-slope shape: Linear
Ecological site: R083DY025TX - Clay Loam
Hydric soil rating: No

Rio

Percent of map unit: 1 percent
Landform: Closed depressions
Landform position (three-dimensional): Tread
Down-slope shape: Concave
Across-slope shape: Concave
Ecological site: R083DY007TX - Lakebed
Hydric soil rating: Yes

49—Racombes sandy clay loam, saline, 0 to 1 percent slopes

Map Unit Setting

National map unit symbol: 2yndf
Elevation: 30 to 330 feet
Mean annual precipitation: 23 to 27 inches
Mean annual air temperature: 72 to 74 degrees F
Frost-free period: 280 to 365 days
Farmland classification: Not prime farmland

Map Unit Composition

Racombes, saline, and similar soils: 85 percent
Minor components: 15 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Racombes, Saline

Setting

Landform: Drainageways on terraces
Landform position (three-dimensional): Tread
Down-slope shape: Linear
Across-slope shape: Concave
Parent material: Calcareous loamy alluvium

Typical profile

Ap - 0 to 13 inches: sandy clay loam
Bt - 13 to 25 inches: sandy clay loam
Btk - 25 to 49 inches: sandy clay loam
Bk - 49 to 80 inches: sandy clay loam

Properties and qualities

Slope: 0 to 1 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Well drained
Runoff class: Negligible
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.57 to 1.98 in/hr)
Depth to water table: About 18 to 48 inches
Frequency of flooding: Rare
Frequency of ponding: None
Calcium carbonate, maximum content: 20 percent
Gypsum, maximum content: 2 percent
Maximum salinity: Slightly saline to strongly saline (4.0 to 16.0 mmhos/cm)
Sodium adsorption ratio, maximum: 10.0
Available water supply, 0 to 60 inches: Low (about 5.3 inches)

Interpretive groups

Land capability classification (irrigated): 4s
Land capability classification (nonirrigated): 4s
Hydrologic Soil Group: C
Ecological site: R083DY015TX - Saline Clay
Hydric soil rating: No

Minor Components

Raymondville

Percent of map unit: 8 percent
Landform: Terraces
Landform position (three-dimensional): Tread
Down-slope shape: Linear
Across-slope shape: Linear
Ecological site: R083DY025TX - Clay Loam
Hydric soil rating: No

Hidalgo

Percent of map unit: 3 percent
Landform: Terraces
Landform position (three-dimensional): Tread
Down-slope shape: Convex
Across-slope shape: Linear
Ecological site: R083DY019TX - Gray Sandy Loam
Hydric soil rating: No

Willamar

Percent of map unit: 3 percent
Landform: Terraces
Landform position (three-dimensional): Tread
Down-slope shape: Linear
Across-slope shape: Concave
Ecological site: R150BY708TX - Sandy Flat

Hydric soil rating: No

Rio

Percent of map unit: 1 percent
Landform: Closed depressions
Landform position (three-dimensional): Tread
Down-slope shape: Concave
Across-slope shape: Concave
Ecological site: R083DY007TX - Lakebed
Hydric soil rating: Yes

59—Rio fine sandy loam, saline, ponded

Map Unit Setting

National map unit symbol: dbm8
Elevation: 10 to 100 feet
Mean annual precipitation: 18 to 34 inches
Mean annual air temperature: 72 to 75 degrees F
Frost-free period: 310 to 350 days
Farmland classification: Not prime farmland

Map Unit Composition

Rio and similar soils: 85 percent
Minor components: 15 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Rio

Setting

Landform: Closed depressions
Down-slope shape: Concave
Across-slope shape: Concave
Parent material: Clayey alluvium

Typical profile

H1 - 0 to 12 inches: fine sandy loam
H2 - 12 to 38 inches: clay loam
H3 - 38 to 63 inches: sandy clay loam

Properties and qualities

Slope: 0 to 1 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Somewhat poorly drained
Runoff class: Negligible
Capacity of the most limiting layer to transmit water (Ksat): Moderately low to moderately high (0.06 to 0.20 in/hr)
Depth to water table: About 0 inches
Frequency of flooding: None
Frequency of ponding: Frequent
Calcium carbonate, maximum content: 5 percent
Maximum salinity: Slightly saline to strongly saline (4.0 to 16.0 mmhos/cm)

Sodium adsorption ratio, maximum: 10.0
Available water supply, 0 to 60 inches: Low (about 4.6 inches)

Interpretive groups
Land capability classification (irrigated): 4s
Land capability classification (nonirrigated): 4s
Hydrologic Soil Group: C/D
Ecological site: R083DY007TX - Lakebed
Hydric soil rating: Yes

Minor Components

Unnamed
Percent of map unit: 15 percent
Hydric soil rating: No

60—Rio clay loam, ponded

Map Unit Setting
National map unit symbol: dbmb
Elevation: 10 to 500 feet
Mean annual precipitation: 18 to 34 inches
Mean annual air temperature: 72 to 75 degrees F
Frost-free period: 310 to 350 days
Farmland classification: Prime farmland if drained

Map Unit Composition
Rio and similar soils: 87 percent
Minor components: 13 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Rio

Setting
Landform: Closed depressions
Down-slope shape: Concave
Across-slope shape: Concave
Parent material: Clayey alluvium

Typical profile
H1 - 0 to 12 inches: clay loam
H2 - 12 to 38 inches: clay
H3 - 38 to 63 inches: clay loam

Properties and qualities
Slope: 0 to 1 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Somewhat poorly drained
Runoff class: Negligible
Capacity of the most limiting layer to transmit water (Ksat): Moderately low to moderately high (0.06 to 0.20 in/hr)

Depth to water table: About 0 inches
Frequency of flooding: None
Frequency of ponding: Frequent
Calcium carbonate, maximum content: 10 percent
Maximum salinity: Very slightly saline to slightly saline (2.0 to 4.0 mmhos/cm)
Available water supply, 0 to 60 inches: High (about 9.4 inches)

Interpretive groups

Land capability classification (irrigated): 3w
Land capability classification (nonirrigated): 3w
Hydrologic Soil Group: C/D
Ecological site: R083DY007TX - Lakebed
Hydric soil rating: Yes

Minor Components

Tiocano

Percent of map unit: 8 percent
Landform: Depressions
Ecological site: R083AY007TX - Lakebed
Hydric soil rating: Yes

Unnamed

Percent of map unit: 5 percent
Hydric soil rating: No

61—Rio clay loam, saline, ponded

Map Unit Setting

National map unit symbol: dbmc
Elevation: 10 to 100 feet
Mean annual precipitation: 18 to 34 inches
Mean annual air temperature: 72 to 75 degrees F
Frost-free period: 310 to 350 days
Farmland classification: Not prime farmland

Map Unit Composition

Rio and similar soils: 85 percent
Minor components: 15 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Rio

Setting

Landform: Closed depressions
Down-slope shape: Concave
Across-slope shape: Concave
Parent material: Clayey alluvium

Typical profile

H1 - 0 to 12 inches: clay loam

H2 - 12 to 38 inches: clay
H3 - 38 to 63 inches: clay loam

Properties and qualities

Slope: 0 to 1 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Somewhat poorly drained
Runoff class: Negligible
Capacity of the most limiting layer to transmit water (Ksat): Moderately low to moderately high (0.06 to 0.20 in/hr)
Depth to water table: About 0 inches
Frequency of flooding: None
Frequency of ponding: Frequent
Calcium carbonate, maximum content: 5 percent
Maximum salinity: Slightly saline to strongly saline (4.0 to 16.0 mmhos/cm)
Sodium adsorption ratio, maximum: 10.0
Available water supply, 0 to 60 inches: Low (about 4.6 inches)

Interpretive groups

Land capability classification (irrigated): 4s
Land capability classification (nonirrigated): 4s
Hydrologic Soil Group: C/D
Ecological site: R083DY007TX - Lakebed
Hydric soil rating: Yes

Minor Components

Unnamed

Percent of map unit: 10 percent
Hydric soil rating: No

Tiocano

Percent of map unit: 5 percent
Landform: Depressions
Ecological site: R083AY007TX - Lakebed
Hydric soil rating: Yes

67—Tiocano clay, 0 to 1 percent slopes, occasionally ponded

Map Unit Setting

National map unit symbol: 2t8br
Elevation: 20 to 350 feet
Mean annual precipitation: 21 to 29 inches
Mean annual air temperature: 72 to 74 degrees F
Frost-free period: 301 to 365 days
Farmland classification: Not prime farmland

Map Unit Composition

Tiocano and similar soils: 85 percent
Minor components: 15 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Tiocano

Setting

Landform: Closed depressions
Landform position (three-dimensional): Dip
Down-slope shape: Concave
Across-slope shape: Concave
Parent material: Clayey alluvium

Typical profile

A - 0 to 10 inches: clay
Bss - 10 to 50 inches: clay
BCk - 50 to 80 inches: clay

Properties and qualities

Slope: 0 to 1 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Somewhat poorly drained
Runoff class: Negligible
Capacity of the most limiting layer to transmit water (Ksat): Very low to moderately low (0.00 to 0.06 in/hr)
Depth to water table: About 0 inches
Frequency of flooding: None
Frequency of ponding: Occasional
Calcium carbonate, maximum content: 40 percent
Maximum salinity: Nonsaline to slightly saline (0.5 to 4.0 mmhos/cm)
Sodium adsorption ratio, maximum: 2.0
Available water supply, 0 to 60 inches: Moderate (about 8.6 inches)

Interpretive groups

Land capability classification (irrigated): 6w
Land capability classification (nonirrigated): 6w
Hydrologic Soil Group: D
Ecological site: R083DY007TX - Lakebed
Hydric soil rating: No

Minor Components

Rio

Percent of map unit: 10 percent
Landform: Closed depressions
Landform position (three-dimensional): Dip
Down-slope shape: Concave
Across-slope shape: Concave
Ecological site: R083DY007TX - Lakebed
Hydric soil rating: Yes

Racombes

Percent of map unit: 5 percent
Ecological site: R083DY025TX - Clay Loam
Hydric soil rating: No

70—Willacy fine sandy loam, 0 to 1 percent slopes

Map Unit Setting

National map unit symbol: dbmp
Elevation: 30 to 750 feet
Mean annual precipitation: 26 to 34 inches
Mean annual air temperature: 72 to 73 degrees F
Frost-free period: 270 to 365 days
Farmland classification: All areas are prime farmland

Map Unit Composition

Willacy and similar soils: 85 percent
Minor components: 15 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Willacy

Setting

Landform: Delta plains
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Loamy alluvium

Typical profile

H1 - 0 to 14 inches: fine sandy loam
H2 - 14 to 72 inches: sandy clay loam

Properties and qualities

Slope: 0 to 1 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Well drained
Runoff class: Negligible
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.57 to 1.98 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 10 percent
Maximum salinity: Nonsaline to slightly saline (0.0 to 4.0 mmhos/cm)
Sodium adsorption ratio, maximum: 4.0
Available water supply, 0 to 60 inches: High (about 9.6 inches)

Interpretive groups

Land capability classification (irrigated): 1
Land capability classification (nonirrigated): 2c
Hydrologic Soil Group: B
Ecological site: R083DY023TX - Sandy Loam
Hydric soil rating: No

Minor Components

Unnamed

Percent of map unit: 15 percent
Hydric soil rating: No

71—Willacy fine sandy loam, 1 to 3 percent slopes

Map Unit Setting

National map unit symbol: dbmq
Elevation: 30 to 750 feet
Mean annual precipitation: 26 to 34 inches
Mean annual air temperature: 72 to 73 degrees F
Frost-free period: 270 to 365 days
Farmland classification: All areas are prime farmland

Map Unit Composition

Willacy and similar soils: 85 percent
Minor components: 15 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Willacy

Setting

Landform: Delta plains
Down-slope shape: Linear
Across-slope shape: Convex
Parent material: Loamy alluvium

Typical profile

H1 - 0 to 14 inches: fine sandy loam
H2 - 14 to 72 inches: sandy clay loam

Properties and qualities

Slope: 1 to 3 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Well drained
Runoff class: Low
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.57 to 1.98 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 10 percent
Maximum salinity: Nonsaline to slightly saline (0.0 to 4.0 mmhos/cm)
Sodium adsorption ratio, maximum: 4.0
Available water supply, 0 to 60 inches: High (about 9.6 inches)

Interpretive groups

Land capability classification (irrigated): 2e

Land capability classification (nonirrigated): 2e
Hydrologic Soil Group: B
Ecological site: R083DY023TX - Sandy Loam
Hydric soil rating: No

Minor Components

Unnamed
Percent of map unit: 15 percent
Hydric soil rating: No

Willacy County, Texas

An—Arents, loamy

Map Unit Setting

National map unit symbol: djm2
Elevation: 20 to 850 feet
Mean annual precipitation: 20 to 41 inches
Mean annual air temperature: 64 to 73 degrees F
Frost-free period: 230 to 330 days
Farmland classification: Not prime farmland

Map Unit Composition

Arents and similar soils: 85 percent
Minor components: 15 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Arents

Setting

Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Loamy alluvium

Typical profile

H1 - 0 to 60 inches: sandy clay loam

Properties and qualities

Slope: 0 to 1 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Well drained
Runoff class: Negligible
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.57 to 1.98 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Maximum salinity: Nonsaline to slightly saline (0.0 to 4.0 mmhos/cm)
Available water supply, 0 to 60 inches: Moderate (about 8.4 inches)

Interpretive groups

Land capability classification (irrigated): 1
Land capability classification (nonirrigated): 2c
Hydrologic Soil Group: B
Hydric soil rating: No

Minor Components

Unnamed

Percent of map unit: 15 percent
Hydric soil rating: No

Ar—Arrada sandy clay loam, 0 to 1 percent slopes, very frequently flooded, frequently ponded

Map Unit Setting

National map unit symbol: 2v3d1
Elevation: 0 to 20 feet
Mean annual precipitation: 25 to 29 inches
Mean annual air temperature: 72 to 75 degrees F
Frost-free period: 310 to 350 days
Farmland classification: Not prime farmland

Map Unit Composition

Arrada and similar soils: 85 percent
Minor components: 15 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Arrada

Setting

Landform: Wind-tidal flats
Landform position (three-dimensional): Talf
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Loamy eolian deposits derived from igneous, metamorphic and sedimentary rock

Typical profile

Anzg - 0 to 5 inches: sandy clay loam
Bnzg - 5 to 32 inches: sandy clay loam
BCnzg - 32 to 80 inches: sandy clay loam

Properties and qualities

Slope: 0 to 1 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Poorly drained
Runoff class: Negligible
Capacity of the most limiting layer to transmit water (Ksat): Moderately high (0.20 to 0.57 in/hr)
Depth to water table: About 0 to 36 inches
Frequency of flooding: Very frequent
Frequency of ponding: Frequent
Calcium carbonate, maximum content: 10 percent
Maximum salinity: Strongly saline (30.0 to 99.0 mmhos/cm)
Sodium adsorption ratio, maximum: 99.0
Available water supply, 0 to 60 inches: Very low (about 0.6 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 8
Hydrologic Soil Group: C/D

Ecological site: R150BY716TX - Wind Tidal Flat
Hydric soil rating: Yes

Minor Components

Barrada
Percent of map unit: 5 percent
Landform: Tidal flats
Landform position (three-dimensional): Talf
Down-slope shape: Linear
Across-slope shape: Linear
Ecological site: R150BY716TX - Wind Tidal Flat
Hydric soil rating: Yes

Saucel
Percent of map unit: 5 percent
Landform: Tidal flats
Landform position (three-dimensional): Talf
Down-slope shape: Linear
Across-slope shape: Linear
Ecological site: R150BY651TX - Salt Flat
Hydric soil rating: Yes

Lalinda
Percent of map unit: 5 percent
Landform: Dunes on blowouts
Landform position (three-dimensional): Rise
Down-slope shape: Linear, convex
Across-slope shape: Convex
Ecological site: R150BY647TX - Coastal Ridge
Hydric soil rating: No

DfA—Delfina fine sandy loam, warm, 0 to 2 percent slopes

Map Unit Setting
National map unit symbol: 2t12k
Elevation: 20 to 220 feet
Mean annual precipitation: 21 to 29 inches
Mean annual air temperature: 73 to 75 degrees F
Frost-free period: 300 to 365 days
Farmland classification: Prime farmland if irrigated

Map Unit Composition
Delfina, warm, and similar soils: 90 percent
Minor components: 10 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Delfina, Warm

Setting
Landform: Stream terraces

Landform position (three-dimensional): Tread
Down-slope shape: Linear
Across-slope shape: Convex
Parent material: Loamy eolian deposits over calcareous loamy alluvium

Typical profile

Ap - 0 to 15 inches: fine sandy loam
2Bt - 15 to 47 inches: sandy clay loam
2Btk - 47 to 80 inches: sandy clay loam

Properties and qualities

Slope: 0 to 2 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Moderately well drained
Runoff class: Low
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.20 to 1.98 in/hr)
Depth to water table: About 30 to 60 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 15 percent
Maximum salinity: Nonsaline to slightly saline (0.0 to 7.0 mmhos/cm)
Sodium adsorption ratio, maximum: 8.0
Available water supply, 0 to 60 inches: Moderate (about 6.8 inches)

Interpretive groups

Land capability classification (irrigated): 3e
Land capability classification (nonirrigated): 3e
Hydrologic Soil Group: C
Ecological site: R083DY024TX - Tight Sandy Loam
Hydric soil rating: No

Minor Components

Willacy

Percent of map unit: 5 percent
Landform: Terraces
Landform position (three-dimensional): Tread
Down-slope shape: Linear
Across-slope shape: Linear
Ecological site: R083DY023TX - Sandy Loam
Hydric soil rating: No

Racombes

Percent of map unit: 4 percent
Landform: Terraces
Landform position (three-dimensional): Tread
Down-slope shape: Linear
Across-slope shape: Linear
Ecological site: R083DY025TX - Clay Loam
Hydric soil rating: No

Lozano

Percent of map unit: 1 percent
Landform: Terraces
Landform position (three-dimensional): Tread
Down-slope shape: Linear

Across-slope shape: Linear
Ecological site: R083DY024TX - Tight Sandy Loam
Hydric soil rating: No

DfB—Delfina fine sandy loam, warm, 1 to 3 percent slopes

Map Unit Setting

National map unit symbol: 2t12n
Elevation: 30 to 220 feet
Mean annual precipitation: 21 to 29 inches
Mean annual air temperature: 73 to 75 degrees F
Frost-free period: 300 to 365 days
Farmland classification: Prime farmland if irrigated

Map Unit Composition

Delfina, warm, and similar soils: 90 percent
Minor components: 10 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Delfina, Warm

Setting

Landform: Stream terraces
Landform position (three-dimensional): Tread
Down-slope shape: Convex
Across-slope shape: Convex
Parent material: Loamy eolian deposits over calcareous loamy alluvium

Typical profile

Ap - 0 to 15 inches: fine sandy loam
2Bt - 15 to 47 inches: sandy clay loam
2Btk - 47 to 80 inches: sandy clay loam

Properties and qualities

Slope: 1 to 3 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Moderately well drained
Runoff class: Low
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.20 to 1.98 in/hr)
Depth to water table: About 30 to 60 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 15 percent
Maximum salinity: Nonsaline to slightly saline (0.0 to 7.0 mmhos/cm)
Sodium adsorption ratio, maximum: 8.0
Available water supply, 0 to 60 inches: Moderate (about 6.8 inches)

Interpretive groups

Land capability classification (irrigated): 3e
Land capability classification (nonirrigated): 3e

Hydrologic Soil Group: C
Ecological site: R083DY024TX - Tight Sandy Loam
Hydric soil rating: No

Minor Components

Willacy
Percent of map unit: 5 percent
Landform: Terraces
Landform position (three-dimensional): Tread
Down-slope shape: Linear
Across-slope shape: Linear
Ecological site: R083DY023TX - Sandy Loam
Hydric soil rating: No

Racombes
Percent of map unit: 4 percent
Landform: Terraces
Landform position (three-dimensional): Tread
Down-slope shape: Concave
Across-slope shape: Linear
Ecological site: R083DY015TX - Saline Clay
Hydric soil rating: No

Lozano
Percent of map unit: 1 percent
Landform: Terraces
Landform position (three-dimensional): Tread
Down-slope shape: Linear
Across-slope shape: Linear
Ecological site: R083DY024TX - Tight Sandy Loam
Hydric soil rating: No

HaA—Hargill fine sandy loam, 0 to 1 percent slopes

Map Unit Setting
National map unit symbol: djmj
Elevation: 30 to 150 feet
Mean annual precipitation: 26 to 34 inches
Mean annual air temperature: 72 to 73 degrees F
Frost-free period: 310 to 340 days
Farmland classification: Prime farmland if irrigated

Map Unit Composition
Hargill and similar soils: 85 percent
Minor components: 15 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Hargill

Setting

Landform: Delta plains
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Loamy alluvium

Typical profile

H1 - 0 to 14 inches: fine sandy loam
H2 - 14 to 42 inches: sandy clay loam
H3 - 42 to 65 inches: sandy clay loam

Properties and qualities

Slope: 0 to 1 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Well drained
Runoff class: Negligible
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.57 to 1.98 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 10 percent
Maximum salinity: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)
Available water supply, 0 to 60 inches: Moderate (about 8.7 inches)

Interpretive groups

Land capability classification (irrigated): 1
Land capability classification (nonirrigated): 2c
Hydrologic Soil Group: B
Ecological site: R083DY023TX - Sandy Loam
Hydric soil rating: No

Minor Components

Unnamed

Percent of map unit: 15 percent
Hydric soil rating: No

HaB—Hargill fine sandy loam, 1 to 3 percent slopes

Map Unit Setting

National map unit symbol: djmk
Elevation: 30 to 150 feet
Mean annual precipitation: 26 to 34 inches
Mean annual air temperature: 72 to 73 degrees F
Frost-free period: 310 to 340 days
Farmland classification: Prime farmland if irrigated

Map Unit Composition

Hargill and similar soils: 85 percent
Minor components: 15 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Hargill

Setting

Landform: Delta plains
Down-slope shape: Linear
Across-slope shape: Convex
Parent material: Loamy alluvium

Typical profile

H1 - 0 to 14 inches: fine sandy loam
H2 - 14 to 42 inches: sandy clay loam
H3 - 42 to 65 inches: sandy clay loam

Properties and qualities

Slope: 1 to 3 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Well drained
Runoff class: Low
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.57 to 1.98 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 10 percent
Maximum salinity: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)
Available water supply, 0 to 60 inches: Moderate (about 8.7 inches)

Interpretive groups

Land capability classification (irrigated): 2e
Land capability classification (nonirrigated): 2e
Hydrologic Soil Group: B
Ecological site: R083DY023TX - Sandy Loam
Hydric soil rating: No

Minor Components

Unnamed

Percent of map unit: 15 percent
Hydric soil rating: No

HoA—Hidalgo sandy clay loam, 0 to 1 percent slopes

Map Unit Setting

National map unit symbol: 2sxvl
Elevation: 20 to 500 feet

Mean annual precipitation: 20 to 27 inches
Mean annual air temperature: 72 to 74 degrees F
Frost-free period: 300 to 365 days
Farmland classification: Prime farmland if irrigated

Map Unit Composition

Hidalgo and similar soils: 85 percent
Minor components: 15 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Hidalgo

Setting

Landform: Terraces
Landform position (three-dimensional): Tread
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Calcareous loamy alluvium

Typical profile

Ap - 0 to 17 inches: sandy clay loam
Bk1 - 17 to 28 inches: sandy clay loam
Bk2 - 28 to 38 inches: clay loam
Ck - 38 to 80 inches: clay loam

Properties and qualities

Slope: 0 to 1 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Well drained
Runoff class: Negligible
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.57 to 1.98 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 35 percent
Maximum salinity: Nonsaline to slightly saline (0.0 to 4.0 mmhos/cm)
Sodium adsorption ratio, maximum: 10.0
Available water supply, 0 to 60 inches: Moderate (about 7.8 inches)

Interpretive groups

Land capability classification (irrigated): 1
Land capability classification (nonirrigated): 2c
Hydrologic Soil Group: B
Ecological site: R083DY019TX - Gray Sandy Loam
Hydric soil rating: No

Minor Components

Raymondville

Percent of map unit: 7 percent
Landform: Terraces
Landform position (three-dimensional): Tread
Down-slope shape: Linear
Across-slope shape: Linear
Ecological site: R083DY025TX - Clay Loam
Hydric soil rating: No

Racombes

Percent of map unit: 6 percent
Landform: Terraces
Landform position (three-dimensional): Tread
Down-slope shape: Linear
Across-slope shape: Linear
Ecological site: R083DY025TX - Clay Loam
Hydric soil rating: No

Willacy

Percent of map unit: 2 percent
Landform: Terraces
Landform position (three-dimensional): Tread
Down-slope shape: Linear
Across-slope shape: Linear
Ecological site: R083DY023TX - Sandy Loam
Hydric soil rating: No

lc—Lncell clay, 0 to 1 percent slopes, occasionally ponded

Map Unit Setting

National map unit symbol: djmn
Elevation: 10 to 50 feet
Mean annual precipitation: 26 to 28 inches
Mean annual air temperature: 72 to 73 degrees F
Frost-free period: 300 to 340 days
Farmland classification: Not prime farmland

Map Unit Composition

Lncell and similar soils: 85 percent
Minor components: 15 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Lncell

Setting

Landform: Closed depressions
Landform position (three-dimensional): Dip
Down-slope shape: Concave
Across-slope shape: Concave
Parent material: Loamy alluvium of quaternary age

Typical profile

H1 - 0 to 25 inches: clay
H2 - 25 to 60 inches: sandy clay loam

Properties and qualities

Slope: 0 to 1 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Very poorly drained

Runoff class: Negligible
Capacity of the most limiting layer to transmit water (Ksat): Very low to moderately low (0.00 to 0.06 in/hr)
Depth to water table: About 0 inches
Frequency of flooding: None
Frequency of ponding: Occasional
Calcium carbonate, maximum content: 10 percent
Maximum salinity: Nonsaline to slightly saline (0.0 to 4.0 mmhos/cm)
Sodium adsorption ratio, maximum: 10.0
Available water supply, 0 to 60 inches: High (about 10.8 inches)

Interpretive groups
Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 6w
Hydrologic Soil Group: D
Ecological site: R083DY006TX - Fresh Marsh
Hydric soil rating: Yes

Minor Components

Jarron
Percent of map unit: 5 percent
Landform: Marine terraces
Ecological site: R083DY007TX - Lakebed
Hydric soil rating: Yes

Rio
Percent of map unit: 5 percent
Landform: Depressions
Ecological site: R083DY007TX - Lakebed
Hydric soil rating: Yes

Tiocano
Percent of map unit: 5 percent
Landform: Depressions
Ecological site: R083AY007TX - Lakebed
Hydric soil rating: Yes

Ja—Jarron sandy clay loam

Map Unit Setting
National map unit symbol: djmp
Elevation: 10 to 50 feet
Mean annual precipitation: 25 to 28 inches
Mean annual air temperature: 72 to 73 degrees F
Frost-free period: 300 to 340 days
Farmland classification: Not prime farmland

Map Unit Composition
Jarron and similar soils: 85 percent
Minor components: 15 percent

Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Jarron

Setting

Landform: Closed depressions
Down-slope shape: Concave
Across-slope shape: Concave
Parent material: Loamy alluvium

Typical profile

H1 - 0 to 8 inches: sandy clay loam
H2 - 8 to 36 inches: sandy clay
H3 - 36 to 65 inches: clay loam

Properties and qualities

Slope: 0 to 1 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Poorly drained
Runoff class: Negligible
Capacity of the most limiting layer to transmit water (Ksat): Moderately low to moderately high (0.06 to 0.20 in/hr)
Depth to water table: About 0 inches
Frequency of flooding: None
Frequency of ponding: Occasional
Calcium carbonate, maximum content: 20 percent
Maximum salinity: Moderately saline to strongly saline (8.0 to 32.0 mmhos/cm)
Sodium adsorption ratio, maximum: 60.0
Available water supply, 0 to 60 inches: Low (about 5.6 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 4w
Hydrologic Soil Group: C/D
Ecological site: R083DY007TX - Lakebed
Hydric soil rating: Yes

Minor Components

Unnamed

Percent of map unit: 5 percent
Hydric soil rating: No

Rio

Percent of map unit: 5 percent
Landform: Depressions
Ecological site: R083DY007TX - Lakebed
Hydric soil rating: Yes

Tiocano

Percent of map unit: 5 percent
Landform: Depressions
Ecological site: R083AY007TX - Lakebed
Hydric soil rating: Yes

Le—Latina sandy clay loam, 0 to 1 percent slopes, occasionally ponded, rarely flooded

Map Unit Setting

National map unit symbol: 2vv2y
Elevation: 0 to 20 feet
Mean annual precipitation: 27 to 29 inches
Mean annual air temperature: 72 to 74 degrees F
Frost-free period: 330 to 365 days
Farmland classification: Not prime farmland

Map Unit Composition

Latina and similar soils: 85 percent
Minor components: 15 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Latina

Setting

Landform: Depressions
Landform position (three-dimensional): Dip
Down-slope shape: Concave
Across-slope shape: Concave
Parent material: Saline loamy fluviomarine deposits derived from igneous, metamorphic and sedimentary rock

Typical profile

A - 0 to 4 inches: sandy clay loam
Bnz - 4 to 16 inches: sandy clay loam
Bknz - 16 to 30 inches: sandy clay loam
BCknz - 30 to 80 inches: sandy clay loam

Properties and qualities

Slope: 0 to 1 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Somewhat poorly drained
Runoff class: Negligible
Capacity of the most limiting layer to transmit water (Ksat): Moderately low to moderately high (0.06 to 0.20 in/hr)
Depth to water table: About 0 inches
Frequency of flooding: Rare
Frequency of ponding: Occasional
Calcium carbonate, maximum content: 35 percent
Maximum salinity: Strongly saline (40.0 to 99.0 mmhos/cm)
Sodium adsorption ratio, maximum: 30.0
Available water supply, 0 to 60 inches: Very low (about 1.8 inches)

Interpretive groups

Land capability classification (irrigated): 6s
Land capability classification (nonirrigated): 6s

Hydrologic Soil Group: C/D
Ecological site: R150BY651TX - Salt Flat
Hydric soil rating: Yes

Minor Components

Willamar
Percent of map unit: 5 percent
Landform: Delta plains
Landform position (three-dimensional): Talf
Down-slope shape: Linear
Across-slope shape: Concave
Ecological site: R150BY551TX - Salty Prairie
Hydric soil rating: No

Lomalta
Percent of map unit: 5 percent
Landform: Delta plains
Landform position (three-dimensional): Talf
Down-slope shape: Linear
Across-slope shape: Concave, linear
Ecological site: R150BY652TX - Southern Salt Marsh
Hydric soil rating: Yes

Saucel
Percent of map unit: 2 percent
Landform: Blowouts on sand sheets
Landform position (three-dimensional): Talf
Down-slope shape: Linear
Across-slope shape: Linear
Ecological site: R150BY651TX - Salt Flat
Hydric soil rating: Yes

Porfirio
Percent of map unit: 2 percent
Landform: Flats
Landform position (three-dimensional): Talf
Down-slope shape: Linear
Across-slope shape: Linear
Ecological site: R150BY551TX - Salty Prairie
Hydric soil rating: Yes

Sejita
Percent of map unit: 1 percent
Landform: Flats
Landform position (three-dimensional): Talf
Down-slope shape: Linear
Across-slope shape: Linear
Ecological site: R150BY651TX - Salt Flat
Hydric soil rating: Yes

Lm—Lomalta clay, 0 to 1 percent slopes, occasionally ponded

Map Unit Setting

National map unit symbol: djms
Elevation: 0 to 20 feet
Mean annual precipitation: 25 to 36 inches
Mean annual air temperature: 72 to 73 degrees F
Frost-free period: 330 to 350 days
Farmland classification: Not prime farmland

Map Unit Composition

Lomalta and similar soils: 85 percent
Minor components: 15 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Lomalta

Setting

Landform: Depressions
Landform position (three-dimensional): Dip
Down-slope shape: Concave
Across-slope shape: Concave
Parent material: Clayey alluvium

Typical profile

H1 - 0 to 44 inches: clay
H2 - 44 to 65 inches: stratified silt loam to silty clay loam to clay

Properties and qualities

Slope: 0 to 1 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Poorly drained
Runoff class: Negligible
Capacity of the most limiting layer to transmit water (Ksat): Very low to moderately low (0.00 to 0.06 in/hr)
Depth to water table: About 0 inches
Frequency of flooding: None
Frequency of ponding: Occasional
Calcium carbonate, maximum content: 10 percent
Gypsum, maximum content: 1 percent
Maximum salinity: Strongly saline (16.0 to 32.0 mmhos/cm)
Sodium adsorption ratio, maximum: 30.0
Available water supply, 0 to 60 inches: Very low (about 2.5 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 7s
Hydrologic Soil Group: D
Ecological site: R150BY652TX - Southern Salt Marsh
Hydric soil rating: Yes

Minor Components

Latina

Percent of map unit: 10 percent
Landform: Marine terraces
Ecological site: R150BY651TX - Salt Flat
Hydric soil rating: Yes

Tiocano

Percent of map unit: 5 percent
Landform: Depressions
Ecological site: R083DY007TX - Lakebed
Hydric soil rating: Yes

Ln—Lozano fine sandy loam

Map Unit Setting

National map unit symbol: djmt
Elevation: 10 to 30 feet
Mean annual precipitation: 24 to 28 inches
Mean annual air temperature: 73 degrees F
Frost-free period: 320 to 350 days
Farmland classification: Not prime farmland

Map Unit Composition

Lozano and similar soils: 75 percent
Minor components: 25 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Lozano

Setting

Landform: Delta plains
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Calcareous loamy alluvium

Typical profile

H1 - 0 to 16 inches: fine sandy loam
H2 - 16 to 34 inches: sandy clay loam
H3 - 34 to 65 inches: sandy clay loam

Properties and qualities

Slope: 0 to 1 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Somewhat poorly drained
Runoff class: Low
Capacity of the most limiting layer to transmit water (Ksat): Moderately high (0.20 to 0.57 in/hr)
Depth to water table: About 12 to 60 inches

Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 15 percent
Maximum salinity: Very slightly saline to moderately saline (2.0 to 8.0 mmhos/cm)
Sodium adsorption ratio, maximum: 20.0
Available water supply, 0 to 60 inches: Moderate (about 8.4 inches)

Interpretive groups

Land capability classification (irrigated): 2w
Land capability classification (nonirrigated): 2w
Hydrologic Soil Group: C
Ecological site: R083DY024TX - Tight Sandy Loam
Hydric soil rating: No

Minor Components

Unnamed

Percent of map unit: 25 percent
Hydric soil rating: No

Ly—Lyford sandy clay loam

Map Unit Setting

National map unit symbol: djmv
Elevation: 0 to 50 feet
Mean annual precipitation: 25 to 26 inches
Mean annual air temperature: 73 degrees F
Frost-free period: 331 to 341 days
Farmland classification: Not prime farmland

Map Unit Composition

Lyford and similar soils: 85 percent
Minor components: 15 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Lyford

Setting

Landform: Delta plains
Down-slope shape: Linear
Across-slope shape: Concave
Parent material: Calcareous loamy alluvium

Typical profile

H1 - 0 to 12 inches: sandy clay loam
H2 - 12 to 20 inches: sandy clay loam
H3 - 20 to 60 inches: clay loam

Properties and qualities

Slope: 0 to 1 percent
Depth to restrictive feature: More than 80 inches

Drainage class: Moderately well drained
Runoff class: Negligible
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.57 to 1.98 in/hr)
Depth to water table: About 36 to 60 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 15 percent
Maximum salinity: Nonsaline to moderately saline (0.0 to 8.0 mmhos/cm)
Available water supply, 0 to 60 inches: High (about 9.4 inches)

Interpretive groups

Land capability classification (irrigated): 2w
Land capability classification (nonirrigated): 2w
Hydrologic Soil Group: B
Ecological site: R083DY025TX - Clay Loam
Hydric soil rating: No

Minor Components

Unnamed

Percent of map unit: 15 percent
Hydric soil rating: No

Me—Mercedes clay

Map Unit Setting

National map unit symbol: djmw
Elevation: 10 to 150 feet
Mean annual precipitation: 24 to 34 inches
Mean annual air temperature: 73 to 75 degrees F
Frost-free period: 300 to 365 days
Farmland classification: Not prime farmland

Map Unit Composition

Mercedes and similar soils: 85 percent
Minor components: 15 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Mercedes

Setting

Landform: Delta plains
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Calcareous loamy alluvium

Typical profile

H1 - 0 to 12 inches: clay
H2 - 12 to 60 inches: clay
H3 - 60 to 90 inches: clay

Properties and qualities

Slope: 0 to 1 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Moderately well drained
Runoff class: High
Capacity of the most limiting layer to transmit water (Ksat): Very low to moderately low (0.00 to 0.06 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 5 percent
Gypsum, maximum content: 10 percent
Maximum salinity: Slightly saline to strongly saline (4.0 to 16.0 mmhos/cm)
Sodium adsorption ratio, maximum: 12.0
Available water supply, 0 to 60 inches: Moderate (about 7.5 inches)

Interpretive groups

Land capability classification (irrigated): 3s
Land capability classification (nonirrigated): 3s
Hydrologic Soil Group: D
Ecological site: R083DY015TX - Saline Clay
Hydric soil rating: No

Minor Components

Unnamed

Percent of map unit: 10 percent
Hydric soil rating: No

Tiocano

Percent of map unit: 5 percent
Landform: Depressions
Ecological site: R083AY007TX - Lakebed
Hydric soil rating: Yes

Mp—Mercedes clay, ponded

Map Unit Setting

National map unit symbol: djmx
Elevation: 10 to 150 feet
Mean annual precipitation: 24 to 34 inches
Mean annual air temperature: 73 to 75 degrees F
Frost-free period: 300 to 365 days
Farmland classification: Not prime farmland

Map Unit Composition

Mercedes and similar soils: 85 percent
Minor components: 15 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Mercedes

Setting

Landform: Depressions
Down-slope shape: Concave
Across-slope shape: Concave
Parent material: Calcareous loamy alluvium

Typical profile

H1 - 0 to 12 inches: clay
H2 - 12 to 60 inches: clay
H3 - 60 to 90 inches: clay

Properties and qualities

Slope: 0 to 1 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Moderately well drained
Runoff class: Negligible
Capacity of the most limiting layer to transmit water (Ksat): Very low to moderately low (0.00 to 0.06 in/hr)
Depth to water table: About 0 inches
Frequency of flooding: None
Frequency of ponding: Frequent
Calcium carbonate, maximum content: 5 percent
Gypsum, maximum content: 10 percent
Maximum salinity: Moderately saline to strongly saline (8.0 to 16.0 mmhos/cm)
Sodium adsorption ratio, maximum: 20.0
Available water supply, 0 to 60 inches: Moderate (about 7.5 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 4w
Hydrologic Soil Group: D
Ecological site: R083DY015TX - Saline Clay
Hydric soil rating: Yes

Minor Components

Lomalta

Percent of map unit: 5 percent
Landform: Tidal flats
Ecological site: R150BY652TX - Southern Salt Marsh
Hydric soil rating: Yes

Jarron

Percent of map unit: 5 percent
Landform: Marine terraces
Ecological site: R083DY007TX - Lakebed
Hydric soil rating: Yes

Tiocano

Percent of map unit: 3 percent
Landform: Depressions
Ecological site: R083AY007TX - Lakebed
Hydric soil rating: Yes

Latina

Percent of map unit: 2 percent
Landform: Marine terraces
Ecological site: R150BY651TX - Salt Flat
Hydric soil rating: Yes

Nu—Nueces fine sand, 0 to 3 percent slopes

Map Unit Setting

National map unit symbol: 2sxvd
Elevation: 20 to 500 feet
Mean annual precipitation: 21 to 27 inches
Mean annual air temperature: 71 to 74 degrees F
Frost-free period: 300 to 365 days
Farmland classification: Farmland of statewide importance, if irrigated

Map Unit Composition

Nueces and similar soils: 85 percent
Minor components: 15 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Nueces

Setting

Landform: Sand sheets
Landform position (three-dimensional): Tread
Down-slope shape: Linear
Across-slope shape: Convex
Parent material: Sandy eolian deposits over loamy alluvium

Typical profile

A - 0 to 10 inches: fine sand
E - 10 to 32 inches: fine sand
2Bt1 - 32 to 48 inches: sandy clay loam
2Bt2 - 48 to 80 inches: sandy clay loam

Properties and qualities

Slope: 0 to 3 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Moderately well drained
Runoff class: Very low
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.57 to 1.98 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 2 percent
Gypsum, maximum content: 1 percent
Maximum salinity: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)
Sodium adsorption ratio, maximum: 20.0

Available water supply, 0 to 60 inches: Moderate (about 6.7 inches)

Interpretive groups

Land capability classification (irrigated): 3e
Land capability classification (nonirrigated): 3e
Hydrologic Soil Group: B
Ecological site: R083EY021TX - Sandy
Hydric soil rating: No

Minor Components

Sarita

Percent of map unit: 8 percent
Landform: Dunes on sand sheets
Landform position (two-dimensional): Summit, shoulder
Landform position (three-dimensional): Tread
Down-slope shape: Convex
Across-slope shape: Convex
Ecological site: R083EY021TX - Sandy
Hydric soil rating: No

Delfina

Percent of map unit: 3 percent
Landform: Sand sheets
Landform position (two-dimensional): Footslope, toeslope
Landform position (three-dimensional): Tread
Down-slope shape: Linear
Across-slope shape: Linear
Ecological site: R083EY023TX - Sandy Loam
Hydric soil rating: No

Comitas

Percent of map unit: 3 percent
Landform: Sand sheets
Landform position (two-dimensional): Footslope
Landform position (three-dimensional): Tread
Down-slope shape: Linear
Across-slope shape: Convex
Ecological site: R083EY022TX - Loamy Sand
Hydric soil rating: No

Sauz

Percent of map unit: 1 percent
Landform: Sand sheets
Landform position (two-dimensional): Toeslope
Landform position (three-dimensional): Tread
Down-slope shape: Concave
Across-slope shape: Concave
Ecological site: R150BY708TX - Sandy Flat
Hydric soil rating: Yes

Ra—Racombes sandy clay loam, 0 to 1 percent slopes

Map Unit Setting

National map unit symbol: 2yndc
Elevation: 30 to 330 feet
Mean annual precipitation: 23 to 27 inches
Mean annual air temperature: 72 to 74 degrees F
Frost-free period: 280 to 365 days
Farmland classification: All areas are prime farmland

Map Unit Composition

Racombes and similar soils: 85 percent
Minor components: 15 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Racombes

Setting

Landform: Terraces
Landform position (three-dimensional): Tread
Down-slope shape: Linear
Across-slope shape: Concave
Parent material: Calcareous loamy alluvium

Typical profile

Ap - 0 to 13 inches: sandy clay loam
Bt - 13 to 25 inches: sandy clay loam
Btk - 25 to 49 inches: sandy clay loam
Bk - 49 to 80 inches: sandy clay loam

Properties and qualities

Slope: 0 to 1 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Well drained
Runoff class: Negligible
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.57 to 1.98 in/hr)
Depth to water table: About 42 to 72 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 20 percent
Gypsum, maximum content: 2 percent
Maximum salinity: Nonsaline to slightly saline (0.0 to 4.0 mmhos/cm)
Sodium adsorption ratio, maximum: 6.0
Available water supply, 0 to 60 inches: Moderate (about 9.0 inches)

Interpretive groups

Land capability classification (irrigated): 1
Land capability classification (nonirrigated): 1
Hydrologic Soil Group: B

Ecological site: R083DY025TX - Clay Loam
Hydric soil rating: No

Minor Components

Willacy
Percent of map unit: 6 percent
Landform: Terraces
Landform position (three-dimensional): Tread
Down-slope shape: Linear
Across-slope shape: Linear
Ecological site: R083DY023TX - Sandy Loam
Hydric soil rating: No

Hidalgo
Percent of map unit: 4 percent
Landform: Terraces
Landform position (three-dimensional): Tread
Down-slope shape: Convex
Across-slope shape: Linear
Ecological site: R083DY019TX - Gray Sandy Loam
Hydric soil rating: No

Raymondville
Percent of map unit: 4 percent
Landform: Terraces
Landform position (three-dimensional): Tread
Down-slope shape: Linear
Across-slope shape: Linear
Ecological site: R083DY025TX - Clay Loam
Hydric soil rating: No

Rio
Percent of map unit: 1 percent
Landform: Closed depressions
Landform position (three-dimensional): Tread
Down-slope shape: Concave
Across-slope shape: Concave
Ecological site: R083DY007TX - Lakebed
Hydric soil rating: Yes

Rc—Racombes sandy clay loam, saline, 0 to 1 percent slopes

Map Unit Setting
National map unit symbol: 2yndf
Elevation: 30 to 330 feet
Mean annual precipitation: 23 to 27 inches
Mean annual air temperature: 72 to 74 degrees F
Frost-free period: 280 to 365 days
Farmland classification: Not prime farmland

Map Unit Composition

Racombes, saline, and similar soils: 85 percent
Minor components: 15 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Racombes, Saline

Setting

Landform: Drainageways on terraces
Landform position (three-dimensional): Tread
Down-slope shape: Linear
Across-slope shape: Concave
Parent material: Calcareous loamy alluvium

Typical profile

Ap - 0 to 13 inches: sandy clay loam
Bt - 13 to 25 inches: sandy clay loam
Btk - 25 to 49 inches: sandy clay loam
Bk - 49 to 80 inches: sandy clay loam

Properties and qualities

Slope: 0 to 1 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Well drained
Runoff class: Negligible
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.57 to 1.98 in/hr)
Depth to water table: About 18 to 48 inches
Frequency of flooding: Rare
Frequency of ponding: None
Calcium carbonate, maximum content: 20 percent
Gypsum, maximum content: 2 percent
Maximum salinity: Slightly saline to strongly saline (4.0 to 16.0 mmhos/cm)
Sodium adsorption ratio, maximum: 10.0
Available water supply, 0 to 60 inches: Low (about 5.3 inches)

Interpretive groups

Land capability classification (irrigated): 4s
Land capability classification (nonirrigated): 4s
Hydrologic Soil Group: C
Ecological site: R083DY015TX - Saline Clay
Hydric soil rating: No

Minor Components

Raymondville

Percent of map unit: 8 percent
Landform: Terraces
Landform position (three-dimensional): Tread
Down-slope shape: Linear
Across-slope shape: Linear
Ecological site: R083DY025TX - Clay Loam
Hydric soil rating: No

Hidalgo

Percent of map unit: 3 percent

Landform: Terraces
Landform position (three-dimensional): Tread
Down-slope shape: Convex
Across-slope shape: Linear
Ecological site: R083DY019TX - Gray Sandy Loam
Hydric soil rating: No

Willamar

Percent of map unit: 3 percent
Landform: Terraces
Landform position (three-dimensional): Tread
Down-slope shape: Linear
Across-slope shape: Concave
Ecological site: R150BY708TX - Sandy Flat
Hydric soil rating: No

Rio

Percent of map unit: 1 percent
Landform: Closed depressions
Landform position (three-dimensional): Tread
Down-slope shape: Concave
Across-slope shape: Concave
Ecological site: R083DY007TX - Lakebed
Hydric soil rating: Yes

Rd—Raymondville clay loam

Map Unit Setting

National map unit symbol: djn3
Elevation: 20 to 200 feet
Mean annual precipitation: 23 to 33 inches
Mean annual air temperature: 72 to 73 degrees F
Frost-free period: 300 to 340 days
Farmland classification: All areas are prime farmland

Map Unit Composition

Raymondville and similar soils: 85 percent
Minor components: 15 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Raymondville

Setting

Landform: Delta plains
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Calcareous loamy alluvium

Typical profile

H1 - 0 to 16 inches: clay loam
H2 - 16 to 46 inches: clay

H3 - 46 to 60 inches: clay

Properties and qualities

Slope: 0 to 1 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Moderately well drained
Runoff class: Medium
Capacity of the most limiting layer to transmit water (Ksat): Moderately low to moderately high (0.06 to 0.20 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 10 percent
Maximum salinity: Nonsaline to slightly saline (0.0 to 4.0 mmhos/cm)
Sodium adsorption ratio, maximum: 8.0
Available water supply, 0 to 60 inches: Moderate (about 9.0 inches)

Interpretive groups

Land capability classification (irrigated): 2s
Land capability classification (nonirrigated): 2s
Hydrologic Soil Group: C
Ecological site: R083DY025TX - Clay Loam
Hydric soil rating: No

Minor Components

Unnamed

Percent of map unit: 15 percent
Hydric soil rating: No

Rg—Rio sandy clay loam, ponded

Map Unit Setting

National map unit symbol: djn6
Elevation: 10 to 500 feet
Mean annual precipitation: 18 to 34 inches
Mean annual air temperature: 72 to 75 degrees F
Frost-free period: 310 to 350 days
Farmland classification: Prime farmland if drained

Map Unit Composition

Rio and similar soils: 85 percent
Minor components: 15 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Rio

Setting

Landform: Delta plains
Down-slope shape: Concave
Across-slope shape: Concave

Parent material: Clayey alluvium

Typical profile

H1 - 0 to 10 inches: sandy clay loam
H2 - 10 to 44 inches: clay
H3 - 44 to 65 inches: clay loam

Properties and qualities

Slope: 0 to 1 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Somewhat poorly drained
Runoff class: Negligible
Capacity of the most limiting layer to transmit water (Ksat): Moderately low to moderately high (0.06 to 0.20 in/hr)
Depth to water table: About 0 inches
Frequency of flooding: None
Frequency of ponding: Frequent
Calcium carbonate, maximum content: 10 percent
Maximum salinity: Very slightly saline to slightly saline (2.0 to 4.0 mmhos/cm)
Available water supply, 0 to 60 inches: High (about 9.4 inches)

Interpretive groups

Land capability classification (irrigated): 3w
Land capability classification (nonirrigated): 3w
Hydrologic Soil Group: C/D
Ecological site: R083DY007TX - Lakebed
Hydric soil rating: Yes

Minor Components

Unnamed

Percent of map unit: 15 percent
Hydric soil rating: No

Rs—Rio sandy clay loam, saline, ponded

Map Unit Setting

National map unit symbol: djn7
Elevation: 10 to 100 feet
Mean annual precipitation: 18 to 34 inches
Mean annual air temperature: 72 to 75 degrees F
Frost-free period: 310 to 350 days
Farmland classification: Not prime farmland

Map Unit Composition

Rio and similar soils: 85 percent
Minor components: 15 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Rio

Setting

Landform: Closed depressions
Down-slope shape: Concave
Across-slope shape: Concave
Parent material: Clayey alluvium

Typical profile

H1 - 0 to 10 inches: sandy clay loam
H2 - 10 to 44 inches: clay
H3 - 44 to 65 inches: clay loam

Properties and qualities

Slope: 0 to 1 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Somewhat poorly drained
Runoff class: Negligible
Capacity of the most limiting layer to transmit water (Ksat): Moderately low to moderately high (0.06 to 0.20 in/hr)
Depth to water table: About 0 inches
Frequency of flooding: None
Frequency of ponding: Frequent
Calcium carbonate, maximum content: 5 percent
Maximum salinity: Slightly saline to strongly saline (4.0 to 16.0 mmhos/cm)
Sodium adsorption ratio, maximum: 10.0
Available water supply, 0 to 60 inches: Low (about 4.6 inches)

Interpretive groups

Land capability classification (irrigated): 4s
Land capability classification (nonirrigated): 4s
Hydrologic Soil Group: C/D
Ecological site: R083DY007TX - Lakebed
Hydric soil rating: Yes

Minor Components

Unnamed

Percent of map unit: 10 percent
Hydric soil rating: No

Tiocano

Percent of map unit: 5 percent
Landform: Depressions
Ecological site: R083AY007TX - Lakebed
Hydric soil rating: Yes

Tc—Tiocano clay, 0 to 1 percent slopes, occasionally ponded

Map Unit Setting

National map unit symbol: 2t8br

Elevation: 20 to 350 feet
Mean annual precipitation: 21 to 29 inches
Mean annual air temperature: 72 to 74 degrees F
Frost-free period: 301 to 365 days
Farmland classification: Not prime farmland

Map Unit Composition

Tiocano and similar soils: 85 percent
Minor components: 15 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Tiocano

Setting

Landform: Closed depressions
Landform position (three-dimensional): Dip
Down-slope shape: Concave
Across-slope shape: Concave
Parent material: Clayey alluvium

Typical profile

A - 0 to 10 inches: clay
Bss - 10 to 50 inches: clay
BCk - 50 to 80 inches: clay

Properties and qualities

Slope: 0 to 1 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Somewhat poorly drained
Runoff class: Negligible
Capacity of the most limiting layer to transmit water (Ksat): Very low to moderately low (0.00 to 0.06 in/hr)
Depth to water table: About 0 inches
Frequency of flooding: None
Frequency of ponding: Occasional
Calcium carbonate, maximum content: 40 percent
Maximum salinity: Nonsaline to slightly saline (0.5 to 4.0 mmhos/cm)
Sodium adsorption ratio, maximum: 2.0
Available water supply, 0 to 60 inches: Moderate (about 8.6 inches)

Interpretive groups

Land capability classification (irrigated): 6w
Land capability classification (nonirrigated): 6w
Hydrologic Soil Group: D
Ecological site: R083DY007TX - Lakebed
Hydric soil rating: No

Minor Components

Rio

Percent of map unit: 10 percent
Landform: Closed depressions
Landform position (three-dimensional): Dip
Down-slope shape: Concave
Across-slope shape: Concave
Ecological site: R083DY007TX - Lakebed
Hydric soil rating: Yes

Racombes

Percent of map unit: 5 percent
Ecological site: R083DY025TX - Clay Loam
Hydric soil rating: No

Uf—Ustorthents, loamy

Map Unit Setting

National map unit symbol: djnk
Elevation: 10 to 700 feet
Mean annual precipitation: 26 to 48 inches
Mean annual air temperature: 64 to 73 degrees F
Frost-free period: 230 to 330 days
Farmland classification: Not prime farmland

Map Unit Composition

Ustorthents and similar soils: 75 percent
Minor components: 25 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Ustorthents

Setting

Landform position (three-dimensional): Talf
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Leveled loamy alluvium of quaternary age

Typical profile

H1 - 0 to 80 inches: sandy clay loam

Properties and qualities

Slope: 0 to 1 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Well drained
Runoff class: Negligible
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.57 to 1.98 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Maximum salinity: Nonsaline to slightly saline (0.0 to 4.0 mmhos/cm)
Sodium adsorption ratio, maximum: 4.0
Available water supply, 0 to 60 inches: Moderate (about 8.4 inches)

Interpretive groups

Land capability classification (irrigated): 1
Land capability classification (nonirrigated): 2c
Hydrologic Soil Group: B
Hydric soil rating: No

Minor Components

Unnamed

Percent of map unit: 25 percent
Hydric soil rating: No

W—Water

Map Unit Composition

Water: 100 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Water

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 8
Hydrologic Soil Group: D
Hydric soil rating: No

WaA—Willacy fine sandy loam, 0 to 1 percent slopes

Map Unit Setting

National map unit symbol: djnm
Elevation: 30 to 750 feet
Mean annual precipitation: 26 to 34 inches
Mean annual air temperature: 72 to 73 degrees F
Frost-free period: 270 to 365 days
Farmland classification: All areas are prime farmland

Map Unit Composition

Willacy and similar soils: 75 percent
Minor components: 25 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Willacy

Setting

Landform: Delta plains
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Loamy alluvium

Typical profile

H1 - 0 to 14 inches: fine sandy loam
H2 - 14 to 65 inches: sandy clay loam

Properties and qualities

Slope: 0 to 1 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Well drained
Runoff class: Negligible
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.57 to 1.98 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 10 percent
Maximum salinity: Nonsaline to slightly saline (0.0 to 4.0 mmhos/cm)
Sodium adsorption ratio, maximum: 4.0
Available water supply, 0 to 60 inches: High (about 9.6 inches)

Interpretive groups

Land capability classification (irrigated): 1
Land capability classification (nonirrigated): 2c
Hydrologic Soil Group: B
Ecological site: R083DY023TX - Sandy Loam
Hydric soil rating: No

Minor Components

Unnamed

Percent of map unit: 25 percent
Hydric soil rating: No

WaB—Willacy fine sandy loam, 1 to 3 percent slopes

Map Unit Setting

National map unit symbol: djnn
Elevation: 30 to 750 feet
Mean annual precipitation: 26 to 34 inches
Mean annual air temperature: 72 to 73 degrees F
Frost-free period: 270 to 365 days
Farmland classification: All areas are prime farmland

Map Unit Composition

Willacy and similar soils: 75 percent
Minor components: 25 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Willacy

Setting

Landform: Delta plains
Down-slope shape: Linear
Across-slope shape: Convex
Parent material: Loamy alluvium

Typical profile

H1 - 0 to 14 inches: fine sandy loam
H2 - 14 to 65 inches: sandy clay loam

Properties and qualities

Slope: 1 to 3 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Well drained
Runoff class: Low
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.57 to 1.98 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 10 percent
Maximum salinity: Nonsaline to slightly saline (0.0 to 4.0 mmhos/cm)
Sodium adsorption ratio, maximum: 4.0
Available water supply, 0 to 60 inches: High (about 9.6 inches)

Interpretive groups

Land capability classification (irrigated): 2e
Land capability classification (nonirrigated): 2e
Hydrologic Soil Group: B
Ecological site: R083DY023TX - Sandy Loam
Hydric soil rating: No

Minor Components

Unnamed

Percent of map unit: 25 percent
Hydric soil rating: No

Wf—Willamar fine sandy loam, 0 to 1 percent slopes

Map Unit Setting

National map unit symbol: 2vv3x
Elevation: 10 to 50 feet
Mean annual precipitation: 20 to 29 inches
Mean annual air temperature: 73 to 76 degrees F
Frost-free period: 301 to 365 days
Farmland classification: Not prime farmland

Map Unit Composition

Willamar and similar soils: 85 percent
Minor components: 15 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Willamar

Setting

Landform: Flats
Landform position (three-dimensional): Talf
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Loamy fluviomarine deposits derived from igneous, metamorphic and sedimentary rock

Typical profile

A - 0 to 3 inches: fine sandy loam
E - 3 to 5 inches: fine sandy loam
Btnz - 5 to 18 inches: clay loam
Btknz - 18 to 30 inches: clay loam
Cknz - 30 to 80 inches: sandy clay loam

Properties and qualities

Slope: 0 to 1 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Somewhat poorly drained
Runoff class: High
Capacity of the most limiting layer to transmit water (Ksat): Very low to moderately low (0.00 to 0.06 in/hr)
Depth to water table: About 36 to 72 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 35 percent
Gypsum, maximum content: 5 percent
Maximum salinity: Strongly saline (16.0 to 30.0 mmhos/cm)
Sodium adsorption ratio, maximum: 40.0
Available water supply, 0 to 60 inches: Very low (about 2.8 inches)

Interpretive groups

Land capability classification (irrigated): 4s
Land capability classification (nonirrigated): 4s
Hydrologic Soil Group: D
Ecological site: R150BY551TX - Salty Prairie
Hydric soil rating: No

Minor Components

Latina

Percent of map unit: 5 percent
Landform: Depressions
Landform position (three-dimensional): Dip
Down-slope shape: Concave
Across-slope shape: Concave
Ecological site: R150BY651TX - Salt Flat
Hydric soil rating: Yes

Lyford

Percent of map unit: 5 percent
Landform: Delta plains
Down-slope shape: Linear
Across-slope shape: Concave

Ecological site: R083DY025TX - Clay Loam
Hydric soil rating: No

Lozano

Percent of map unit: 5 percent
Landform: Terraces
Landform position (three-dimensional): Tread
Down-slope shape: Linear
Across-slope shape: Linear
Ecological site: R083DY024TX - Tight Sandy Loam
Hydric soil rating: No

Ws—Willamar fine sandy loam, strongly saline, 0 to 1 percent slopes, occasionally ponded

Map Unit Setting

National map unit symbol: djnq
Elevation: 10 to 50 feet
Mean annual precipitation: 25 to 28 inches
Mean annual air temperature: 72 to 73 degrees F
Frost-free period: 310 to 335 days
Farmland classification: Not prime farmland

Map Unit Composition

Willamar and similar soils: 75 percent
Minor components: 25 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Willamar

Setting

Landform: Flats
Landform position (three-dimensional): Dip
Down-slope shape: Linear
Across-slope shape: Concave
Parent material: Loamy fluviomarine deposits of quaternary age

Typical profile

H1 - 0 to 6 inches: sandy clay loam
H2 - 6 to 28 inches: sandy clay loam
H3 - 28 to 65 inches: sandy clay loam

Properties and qualities

Slope: 0 to 1 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Somewhat poorly drained
Runoff class: Negligible
Capacity of the most limiting layer to transmit water (Ksat): Very low to moderately low (0.00 to 0.06 in/hr)
Depth to water table: About 0 inches
Frequency of flooding: None

Frequency of ponding: Occasional
Calcium carbonate, maximum content: 25 percent
Maximum salinity: Strongly saline (16.0 to 32.0 mmhos/cm)
Sodium adsorption ratio, maximum: 99.0
Available water supply, 0 to 60 inches: Very low (about 0.9 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 6s
Hydrologic Soil Group: D
Ecological site: R150BY551TX - Salty Prairie
Hydric soil rating: Yes

Minor Components

Unnamed

Percent of map unit: 20 percent
Hydric soil rating: No

Rio

Percent of map unit: 5 percent
Landform: Depressions
Ecological site: R083DY007TX - Lakebed
Hydric soil rating: Yes

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APPENDIX D

DATA FORMS FOR HABITAT AREAS

Habitat Areas Overview Table				
Habitat Area	Habitat Type	Acres	Considered Species that May Occur	Notes
1	Barren	92.92		
2	Row Crops	75.95		
3	Thornscrub	99.47	Ocelot, Gulf Coast Jaguarundi	No right-of-entry (ROE)
4	Row Crops	88.42		
5	Rangeland	21.13		
6	Thornscrub	12.75	Ocelot, Gulf Coast Jaguarundi	
7	Row Crops	5.30		
8	Rangeland	19.99		
9	Row Crops	361.69		
10	Rangeland	3.01		
11	Thornscrub	7.13		Insufficient canopy cover for Ocelot
12	Shrubland	38.06		
13	Herbaceous wetland	5.38		
14	Thornscrub	8.01	Ocelot, Gulf Coast Jaguarundi, Cactus Ferruginous Pygmy-owl	
15	Pasture	9.69		
16	Thornscrub	117.25	Tricolored Bat	Insufficient canopy cover for Ocelot
17	Row Crops	15.23		Inaccessible
18	Row Crops	76.28		
19	Rangeland	17.88		
20	Row Crops	44.53		
21	Shrubland	10.11		
22	Woodland-grassland	17.29	Tricolored Bat	
23	Row Crops	26.98		
24	Rangeland	33.89		
25	Barren	24.22		
26	Woodland-grassland	20.26	Tricolored Bat	
27	Washout	21.12		
28	Rangeland	13.93		
29	Orchard	66.73		
30	Row Crops	13.90		
31	Orchard	15.72		Inaccessible
32	Pasture	49.05		
33	Washout	11.10		
34	Rangeland	9.90		
35	Woodland-grassland	6.76	Tricolored Bat	
36	Row Crops	64.29		
37	Thornscrub	3.82		Insufficient canopy cover for Ocelot
38	Thornscrub	14.53	Ocelot, Gulf Coast Jaguarundi	Texas Tortoise
39	Pasture	31.29		
40	Row Crops	39.88		
41	Shrubland	7.32		
42	Rangeland	6.88		
43	Shrubland	12.95	Tricolored Bat	
44	Thornscrub	2.98	Ocelot, Gulf Coast Jaguarundi	

Habitat Areas Overview Table				
Habitat Area	Habitat Type	Acres	Considered Species that May Occur	Notes
45	Lawn	3.13	Tricolored Bat	
46	Thornscrub	11.71		Insufficient canopy cover for Ocelot
47	Rangeland	18.53		
48	Row Crops	17.13		
49	Rangeland	6.55		
50	Pasture	26.81		
51	Row Crops	108.32		
52	Rangeland	11.25		
53	Pasture	1.67		
54	Thornscrub	1.91		Proximity to a residential area
55	Shrubland	1.10		
56	Lawn	1.08		
57	Shrubland	1.48		
58	Developed	5.60		
59	Thornscrub	2.90		Dense canopy only adjacent to road
60	Pasture	3.57		
61	Row Crops	173.94		
62	Shrubland	1.15		
63	Thornscrub	67.77		Insufficient canopy cover for Ocelot
64	Rangeland	3.00		
65	Row Crops	298.48		
66	Rangeland	6.60		
67	Pasture	6.50		
68	Thornscrub	1.77	Ocelot, Gulf Coast Jaguarundi	
69	Lawn	3.69		
70	Thornscrub	3.55		Proximity to a residential area
71	Shrubland	0.62		
72	Row Crops	2.25		
73	Lawn	2.26		
74	Pasture	5.39		
75	Thornscrub	3.99		Insufficient canopy cover for Ocelot
76	Thornscrub	3.34	Ocelot, Gulf Coast Jaguarundi	
77	Pasture	22.13		
78	Thornscrub	1.27	Cactus Ferruginous Pygmy-owl	
79	Row Crops	4.47		
80	Lawn	5.05		Inaccessible
81	Pasture	15.00		
82	Row Crops	494.99		
83	Drainageway	0.26		
84	Pasture	6.48		
85	Drainageway	0.82		
86	Rangeland	26.86		

Habitat Areas Overview Table				
Habitat Area	Habitat Type	Acres	Considered Species that May Occur	Notes
87	Row Crops	126.75		
88	Thornscrub	294.48	Ocelot, Tricolored Bat, Gulf Coast Jaguarundi, Cactus Ferruginous Pygmy-owl	
89	Pasture	25.64	Northern Aplomado Falcon	Inaccessible
90	Woodland-grassland	13.27		
91	Water Body	0.44		
92	Pasture	12.85		
Total		**3,502.77**		

DATA FORM FOR BIOLOGICAL ASSESSMENT

Habitat Area Number: 1 Location: Western project terminus

Description/General Character: Sparsely vegetated drainageway, heavily vegetated in areas adjacent to the center of the channel. No culverts observed to allow northward flow under roadways which traverse this area. Concrete culvert components scattered along the perimeter near the western project terminus.

Vegetation Present:

Species	% Cover
Cynodon dactylon	10
Solanum eleagnifolium	2
Bare ground	88

Environmental Stressors Observed: Bare ground covers more than 80% of the ground surface. Construction activities are ongoing near the northern extent of this Habitat Area; construction equipment and signs of recent vehicle traffic were observed during field investigations.

Listed Species that this Habitat Area may support: none

DATA FORM FOR BIOLOGICAL ASSESSMENT

Habitat Area Number: 2 Location: Northwest of Habitat Area 1

Description/General Character: Row crops plus adjoining grassy areas and drainage ditch. Crop species not identified.

Vegetation Present:

Species	% Cover
Bothriochloa ischaemum	10
Baccharis neglecta	2
Helianthus angustifolia	2
Cynodon dactylon	5
Row crops	90

Environmental Stressors Observed: Farm equipment traffic.

Listed Species that this Habitat Area may support: none

DATA FORM FOR BIOLOGICAL ASSESSMENT

Habitat Area Number: 3

Location: North of Habitat Area 2, west of US 281 and Habitat Area 4

Description/General Character: Thornscrub vegetation; species coverage and density varies. This area was inaccessible during the field investigation due to a lack of right-of-entry authorization from the property owner.

Vegetation Present:

Species	% Cover
Prosopis glandulosa	85
Sorghum halepense	50
Ampelopsis arborea	10
Condalia hookeri	15

Environmental Stressors Observed: Vehicle trails and regularly-shaped gaps in the tree canopy observed on aerial imagery.

Listed Species that this Habitat Area may support: Ocelot, Gulf Coast Jaguarundi

DATA FORM FOR BIOLOGICAL ASSESSMENT

Habitat Area Number: 4 Location: West of and adjacent to US 281

Description/General Character: Row crops. Crop species not identified.

Vegetation Present:

Species	% Cover
Row crops	70
Bare ground	30

Environmental Stressors Observed: Farm equipment traffic. Unpaved caliche road along the southern edge of the action area.

Listed Species that this Habitat Area may support: none

DATA FORM FOR BIOLOGICAL ASSESSMENT

Habitat Area Number: 5 Location: East of and adjacent to US 281

Description/General Character: Rangeland vegetation adjacent to a residential area with crater-like berms and a small pond.

Vegetation Present:

Species	% Cover
Bothriochloa ischaemum	20
Pennisetum ciliare	70
Cynodon dactylon	10
Solanum eleagnifolium	5
Ambrosia psilostachya	30
Helianthus annuus	5
Rumex crispus (only observed by pond)	2
Salix exigua (only observed by US 281)	1
The following species were only observed inside the crater-like berms:	
Ampelopsis arborea	10
Baccharis neglecta	10
Pinus taeda	2
Vachellia farnesiana	5

Environmental Stressors Observed: adjacent to a residential area and a major highway (US 281)

Listed Species that this Habitat Area may support: none

DATA FORM FOR BIOLOGICAL ASSESSMENT

Habitat Area Number: 6 Location: East of Habitat Area 5

Description/General Character: Dense thornscrub with an open understory.

Vegetation Present:

Species	% Cover
Prosopis glandulosa	90
Sorghum halepense	90

Environmental Stressors Observed:

Listed Species that this Habitat Area may support: Ocelot, Gulf Coast Jaguarundi

DATA FORM FOR BIOLOGICAL ASSESSMENT

Habitat Area Number: 7

Location: East of Habitat Area 6, north of Hidalgo County Sherriff's Office Training Academy

Description/General Character: Row crops. Crop species not identified; crops had not sprouted at the time of the field investigation.

Vegetation Present:

Species	% Cover
Bare ground	100

Environmental Stressors Observed: Farm vehicle traffic.

Listed Species that this Habitat Area may support: none

DATA FORM FOR BIOLOGICAL ASSESSMENT

Habitat Area Number: 8

Location: North of Hidalgo County Sherriff's Office Training Academy

Description/General Character: Unmaintained rangeland with a low-lying drainage area (no woody species observed within drainage area)

Vegetation Present:

Species	% Cover
Cynodon dactylon	40
Smilax bona-nox	25
Ampelopsis arborea	30
Bothriochloa ischaemum	50
Vachellia farnesiana	10
Baccharis neglecta	10
Solanum eleagnifolium	10
Pennisetum ciliare	50

Environmental Stressors Observed: 2-track road on adjacent parcel to the north of the action area; shooting range in close proximity to the south; some brush piles present.

Listed Species that this Habitat Area may support: none

DATA FORM FOR BIOLOGICAL ASSESSMENT

Habitat Area Number: 9 Location: North and east of Lopez State Jail

Description/General Character: Row crops. Much of this Habitat Area, as well as adjacent areas to the north, were converted to row crops from thornscrub habitat within the year prior to field investigations. This Habitat Area includes the footprint of the proposed detention pond.

Vegetation Present:

Species	% Cover
Sorghum bicolor	95

Environmental Stressors Observed:

Listed Species that this Habitat Area may support: none

DATA FORM FOR BIOLOGICAL ASSESSMENT

Habitat Area Number: 10

Location: Within Habitat Area 9, northeast of Lopez State Jail

Description/General Character: Unmaintained grassy area on elevated ground/berm.

Vegetation Present:

Species	% Cover
Pennisetum ciliare	35
Sorghum halepense	45
Helianthus annuus	2
Smilax bona-nox	5
Solanum eleagnifolium	15
Cirsium texanum	5

Environmental Stressors Observed: Surrounded by adjacent agricultural field.

Listed Species that this Habitat Area may support: none

DATA FORM FOR BIOLOGICAL ASSESSMENT

Habitat Area Number: 11

Location: Within Habitat Area 9, east-northeast of Lopez State Jail

Description/General Character: Light thornscrub

Vegetation Present:

Species	% Cover
Prosopis glandulosa	40
Opuntia stricta	5
Cynodon dactylon	20
Solanum eleagnifolium	10
Pennisetum ciliare	15
Smilax bona-nox	5

Environmental Stressors Observed: Surrounded by adjacent agricultural field.

Listed Species that this Habitat Area may support: none

DATA FORM FOR BIOLOGICAL ASSESSMENT

Habitat Area Number: 12

Location: Southwest corner of proposed detention basin, east of Lopez State Jail

Description/General Character: Shrubland

Vegetation Present:

Species	% Cover
Vachellia farnesiana	40
Baccharis neglecta	40
Opuntia stricta	5
Pennisetum setaceum	25

Environmental Stressors Observed: 2-track vehicle trail adjacent to and south of this Habitat Area

Listed Species that this Habitat Area may support: none

DATA FORM FOR BIOLOGICAL ASSESSMENT

Habitat Area Number: 13

Location: Southern edge of proposed detention pond

Description/General Character: Herbaceous wetland

Vegetation Present:

Species	% Cover
Helianthus annuus	80
Panicum dichotomiflorum	20
Solanum eleagnifolium	10

Environmental Stressors Observed: 2-track vehicle trail adjacent to and south of this Habitat Area, adjacent agricultural field to the west, north, and east.

Listed Species that this Habitat Area may support: none

DATA FORM FOR BIOLOGICAL ASSESSMENT

Habitat Area Number: 14

Location: Southeast corner of proposed detention pond

Description/General Character: Dense thornscrub, mostly isolated

Vegetation Present:

Species	% Cover
Prosopis glandulosa	60
Condalia hookeri	60
Sorghum halepense	30

Environmental Stressors Observed: 2-track vehicle trail adjacent to and south of this Habitat Area, adjacent agricultural field to the west, north, and east.

Listed Species that this Habitat Area may support: Ocelot, Gulf Coast Jaguarundi, Cactus Ferruginous Pygmy-ow

DATA FORM FOR BIOLOGICAL ASSESSMENT

Habitat Area Number: 15 Location: East of Habitat Area 9

Description/General Character: Heavily grazed pasture

Vegetation Present:

Species	% Cover
Pennisetum ciliare	90
Vachellia farnesiana (sapling)	5
Cirsium texanum	20
Cynodon dactylon	20

Environmental Stressors Observed: Heavy cattle grazing

Listed Species that this Habitat Area may support: none

DATA FORM FOR BIOLOGICAL ASSESSMENT

Habitat Area Number: 16

Location: West of Brushline Road, east of Habitat Area 9

Description/General Character: Thornscrub

Vegetation Present:

Species	% Cover
Prosopis glandulosa	45
Celtis pallida	40
Opuntia stricta	5
Vachellia farnesiana	10
Pennisetum ciliare	15
Bare ground	5

Environmental Stressors Observed: Unimproved roads and an unidentified easement are observed to traverse this area on aerial imagery. One unimproved road traverses this Habitat Area along the southern edge of the study area.

Listed Species that this Habitat Area may support: Tricolored Bat

DATA FORM FOR BIOLOGICAL ASSESSMENT

Habitat Area Number: 17

Location: West of Brushline Road, northwest of Habitat Area 16

Description/General Character: Row crops. This Habitat Area was inaccessible and could not be directly observed during field investigations.

Vegetation Present:

Species	% Cover
Row crops	90

Environmental Stressors Observed: Farm equipment traffic.

Listed Species that this Habitat Area may support: none

DATA FORM FOR BIOLOGICAL ASSESSMENT

Habitat Area Number: 18 Location: East of Brushline Road

Description/General Character: Row crops on multiple parcels; crop species could not be identified

Vegetation Present:

Species	% Cover
Prosopis glandulosa (in tree lines between parcels)	10
Row crops	75

Environmental Stressors Observed: Traversed by multiple unpaved farm roads.

Listed Species that this Habitat Area may support: none

DATA FORM FOR BIOLOGICAL ASSESSMENT

Habitat Area Number: 19

Location: East of Brushline Road, north of Habitat Area 18

Description/General Character: Forb-dominated rangeland with scattered small trees/saplings

Vegetation Present:

Species	% Cover
Prosopis glandulosa	5
Ampelopsis arborea	5
Ambrosia psilostachya	15
Helianthus angustifolia	10
Solidago gigantea	85

Environmental Stressors Observed:

Listed Species that this Habitat Area may support: none

DATA FORM FOR BIOLOGICAL ASSESSMENT

Habitat Area Number: 20

Location: East of Brushline Road, north of Habitat Area 19

Description/General Character: Row crops (watermelon)

Vegetation Present:

Species	% Cover
Citrullus lanatus	70

Environmental Stressors Observed:

Listed Species that this Habitat Area may support: none

DATA FORM FOR BIOLOGICAL ASSESSMENT

Habitat Area Number: 21

Location: East of Brushline Road, south and north of 11th Street, surrounded by Habitat Area 20 on north, east, and south

Description/General Character: Unmaintained shrubland; potential wetland conditions

Vegetation Present:

Species	% Cover
Baccharis neglecta	75
Cirsium texanum	5
Cynodon dactylon	10
Helianthus angustifolia	10
Sorghum halepense	40
Typha domingensis (only observed adjacent to 12th Street)	5
Senegalia greggii (only observed adjacent to 12th Street)	2

Environmental Stressors Observed: 11th Street traverses this Habitat Area

Listed Species that this Habitat Area may support: none

DATA FORM FOR BIOLOGICAL ASSESSMENT

Habitat Area Number: 22

Location: East of Brushline Road, north of and adjacent to FM 490

Description/General Character: Thornscrub shrubland with open understory; density of thornscrub canopy varies throughout this Habitat Area with the densest and most mature mesquite trees occurring adjacent to FM 490.

Vegetation Present:

Species	% Cover
Prosopis glandulosa (mature trees)	50
Sorghum halepense (only observed in the southern half of this Habitat Area)	85
Pennisetum ciliare	25
Smilax bona-nox	10
Aristida purpurea	30
Opuntia stricta (only observed in the northern half of this Habitat Area)	3
Ampelopsis arborea	10
Ratibida pinnata	5
Bothriochloa ischaemum (dominant in the northern half of this Habitat Area)	85
Cnidoscolus texanus	5

Environmental Stressors Observed: FM 490, occasional brush piles

Listed Species that this Habitat Area may support: Tricolored Bat

DATA FORM FOR BIOLOGICAL ASSESSMENT

Habitat Area Number: 23 Location: North of Habitat Area 22 and FM 490

Description/General Character: Row crops with a low-lying area; the low-lying area was inaccessible during field investigations and could not be assessed for potential wetland conditions. Crop species was not identified.

Vegetation Present:

Species	% Cover
Row crops	45

Environmental Stressors Observed:

Listed Species that this Habitat Area may support: none

DATA FORM FOR BIOLOGICAL ASSESSMENT

Habitat Area Number: 24 Location: Between Habitat Areas 23 and 25

Description/General Character: Unmaintained rangeland; historical aerials available from Google Earth Pro depict this area as row crops as recently as 2021.

Vegetation Present:

Species	% Cover
Cynodon dactylon	50
Sorghum halepense	50
Helianthus annuus	25
Unidentified forb	15

Environmental Stressors Observed: traversed by an unpaved service road perpendicular to the RDP ROW

Listed Species that this Habitat Area may support: none

DATA FORM FOR BIOLOGICAL ASSESSMENT

Habitat Area Number: 25 Location: East of Habitat Area 24, north of FM 490

Description/General Character: Sparsely-vegetated potential wetland; occasional inundation of this area is visible on some historical aerial imagery available from Google Earth Pro.

Vegetation Present:

Species	% Cover
Typha domingensis	5
Monanthochloe littoralis	10
Bare ground	85

Environmental Stressors Observed:

Listed Species that this Habitat Area may support: none

DATA FORM FOR BIOLOGICAL ASSESSMENT

Habitat Area Number: 26

Location: East of Habitat Area 25, west of Coolidge Street

Description/General Character: Woodland-grassland mosaic; this Habitat Area contains the upstream extent of the existing Raymondville Drain

Vegetation Present:

Species	% Cover
Prosopis glandulosa	50
Sorghum halepense	75
Pennisetum ciliare	15
Opuntia stricta	5

Environmental Stressors Observed: Traversed by unpaved vehicle trails and an unidentified easement.

Listed Species that this Habitat Area may support: Tricolored Bat

DATA FORM FOR BIOLOGICAL ASSESSMENT

Habitat Area Number: 27

Location: North of Habitat Area 26, west of Coolidge Street

Description/General Character: Sparsely-vegetated sandy washout; concave ground surface results in several ephemeral pools. Berm is low to absent in this Habitat Area, but vegetation common to the berm in other parts of the action area is observed in a small area. Salt deposits and multiple species of shorebirds were observed during the field investigation.

Vegetation Present:

Species	% Cover
Prosopis glandulosa	5
Celtis pallida	5
Juniperus ashei	10
Salicornia bigelovii	30
Monanthochloe littoralis	40
Bare ground	30

Environmental Stressors Observed: Barbed-wire fencing is present on the outer perimeter and occasionally traverses the channel.

Listed Species that this Habitat Area may support: Piping Plover, Red Knot

DATA FORM FOR BIOLOGICAL ASSESSMENT

Habitat Area Number: 28 Location: North of Habitat Area 27, west of the drain

Description/General Character: Rangeland with scattered shrubs; historical aerial imagery available from Google Earth Pro depicts this area as row crops

Vegetation Present:

Species	% Cover
Baccharis neglecta	10
Pennisetum ciliare	35
Cynodon dactylon	45
Bothriochloa ischaemum	25
Smilax bona-nox	5
Soghum halepense	25

Environmental Stressors Observed:

Listed Species that this Habitat Area may support: none

DATA FORM FOR BIOLOGICAL ASSESSMENT

Habitat Area Number: 29

Location: West of Coolidge Street, south of Marcedonio Road

Description/General Character: Orchards, tree species not identified

Vegetation Present:

Species	% Cover
Orchard trees	75

Environmental Stressors Observed:

Listed Species that this Habitat Area may support: none

DATA FORM FOR BIOLOGICAL ASSESSMENT

Habitat Area Number: 30

Location: North of and adjacent to Marcedonio Road

Description/General Character: Row crops; crops in some fields had not yet sprouted at the time of the field investigation. Crop species not identified.

Vegetation Present:

Species	% Cover
Row crops	50

Environmental Stressors Observed:

Listed Species that this Habitat Area may support: none

DATA FORM FOR BIOLOGICAL ASSESSMENT

Habitat Area Number: 31 Location: North of Habitat Area 30

Description/General Character: Orchards; no trees were established at the time of field investigations.

Vegetation Present:

Species	% Cover
Cynodon dactylon	30
Bare ground	70

Environmental Stressors Observed:

Listed Species that this Habitat Area may support: none

DATA FORM FOR BIOLOGICAL ASSESSMENT

Habitat Area Number: 32

Location: North of Marcedonio Road; east and west of Coolidge Street

Description/General Character: Pasture with scattered honey mesquite saplings.

Vegetation Present:

Species	% Cover
Prosopis glandulosa (mature trees and saplings)	10
Cynodon dactylon	99
Opuntia stricta	5
Helianthus annuus	5

Environmental Stressors Observed: Coolidge Street and Bucy Road traverse this Habitat Area in a north-south orientation.

Listed Species that this Habitat Area may support: none

DATA FORM FOR BIOLOGICAL ASSESSMENT

Habitat Area Number: 33 Location: Between Bucy Road and FM 493

Description/General Character: Sparsely-vegetated sandy washout adjacent to cattle pasture. No berm present. The channel of the existing Raymondville Drain is shallow and, in some places, vegetated.

Vegetation Present:

Species	% Cover
Prosopis glandulosa (only along north bank of drain)	2
Celtis pallida	2
Cynodon dactylon (only observed within the channel)	5
Rhynchospora caduca (only observed within the channel)	3
Juniperus ashei (only along north bank of drain)	2
Opuntia stricta	2
Monanthochloe littoralis	10
Bare ground	85

Environmental Stressors Observed: Habitat Area traversed/grazed by cattle at unknown intervals

Listed Species that this Habitat Area may support: Piping Plover, Red Knot

DATA FORM FOR BIOLOGICAL ASSESSMENT

Habitat Area Number: 34 Location: West of and adjacent to FM 493

Description/General Character: Unmaintained rangeland

Vegetation Present:

Species	% Cover
Prosopis glandulosa	15
Bothriochloa ischaemum	90
Helianthus annuus	10
Ambrosia psilostachya	15
Cynodon dactylon (only observed along roadside)	10

Environmental Stressors Observed: FM 493, unpaved vehicle trails, occasional shooting at bridges that traverse the drain (spent shell casings observed on bridge surface)

Listed Species that this Habitat Area may support: none

DATA FORM FOR BIOLOGICAL ASSESSMENT

Habitat Area Number: 35

Location: East of and adjacent to FM 493, north of the existing Raymondville Drain

Description/General Character: Maintained woodland buffer of pasture

Vegetation Present:

Species	% Cover
Prosopis glandulosa	50
Bothriochloa ischaemum	50
Pennisetum ciliare	25
Cynodon dactylon	45

Environmental Stressors Observed: FM 493; 2-track vehicle trail traverses this Habitat Area parallel to the drain

Listed Species that this Habitat Area may support: Tricolored Bat

DATA FORM FOR BIOLOGICAL ASSESSMENT

Habitat Area Number: 36

Location: East of Habitat Area 34, west of Habitat Area 39, between SH 186 and County Road 2900 W

Description/General Character: Row crops. Crop species not identified; not all crops had sprouted at the time of the field investigation.

Vegetation Present:

Species	% Cover
Row crops	75

Environmental Stressors Observed: Multiple paved and unpaved roadways traverse this Habitat Area.

Listed Species that this Habitat Area may support: none

DATA FORM FOR BIOLOGICAL ASSESSMENT

Habitat Area Number: 37

Location: West of and adjacent to County Road 5, south of the drain

Description/General Character: Moderate thornscrub

Vegetation Present:

Species	% Cover
Prosopis glandulosa	65
Bothriochloa ischaemum	30
Ebenopsis ebano	5
Celtis pallida	10
Opuntia stricta	15
Vachellia farnesiana	5
Ampelopsis arborea	10
Baccharis neglecta	30
Pennisetum ciliare	50

Environmental Stressors Observed: Unimproved vehicle trails, occasional brush piles

Listed Species that this Habitat Area may support: none

DATA FORM FOR BIOLOGICAL ASSESSMENT

Habitat Area Number: 38

Location: North of the drain, on east and west sides of County Road 10

Description/General Character: Dense thornscrub

Vegetation Present:

Species	% Cover
Prosopis glandulosa	85
Opuntia stricta	30
Aristida adscensionis	5

Environmental Stressors Observed: Multiple private vehicle trails traverse this Habitat Area. Proximity to SH 186 results in significant traffic noise.

Listed Species that this Habitat Area may support: Ocelot, Gulf Coast Jaguarundi

DATA FORM FOR BIOLOGICAL ASSESSMENT

Habitat Area Number: 39

Location: South of the drain, from County Road 5 to County Road 15

Description/General Character: pasture; some scattered shrubs. Low-lying areas/ephemeral pools occur infrequently on properties south of the drain.

Vegetation Present:

Species	% Cover
Prosopis glandulosa	3
Vachellia farnesiana	5
Cirsium texanum (most abundant west of County Road 10)	2
Cynodon dactylon	95
Bothriochloa ischaemum	15

Environmental Stressors Observed: Multiple paved and unpaved roadways traverse this Habitat Area.

Listed Species that this Habitat Area may support: none

DATA FORM FOR BIOLOGICAL ASSESSMENT

Habitat Area Number: 40

Location: North and east side of drain, north of Marina Road and on both sides of Davila Road

Description/General Character: Row crops. Crop species not identified.

Vegetation Present:

Species	% Cover
Row crops	95

Environmental Stressors Observed: Davila Road, Marina Road, some industrial activity visible on aerial imagery adjacent to and north of this Habitat Area.

Listed Species that this Habitat Area may support: none

DATA FORM FOR BIOLOGICAL ASSESSMENT

Habitat Area Number: 41

Location: South and west side of drain, north of Marina Road and on both sides of Davila Road

Description/General Character: Shrubland attached or adjacent to residential property

Vegetation Present:

Species	% Cover
Baccharis neglecta	60
Prosopis glandulosa	15
Vachellia farnesiana	5
Helianthus annuus	5
Ambrosia psilostachya	75

Environmental Stressors Observed: Davila Road, Marina Road

Listed Species that this Habitat Area may support: none

DATA FORM FOR BIOLOGICAL ASSESSMENT

Habitat Area Number: 42

Location: South of and adjacent to Marina Road on the west side of the drain

Description/General Character: Forb-dominated rangeland

Vegetation Present:

Species	% Cover
Ambrosia psilostachya	75
Opuntia stricta	3
Ebenopsis ebano	3
Bare ground	25

Environmental Stressors Observed:

Listed Species that this Habitat Area may support: none

DATA FORM FOR BIOLOGICAL ASSESSMENT

Habitat Area Number: 43 Location: South side of the drain, east of Davila Road

Description/General Character: Shrubland traversed by smaller, concrete-lined drains; small, low-lying water feature observed covered by dense tree canopy.

Vegetation Present:

Species	% Cover
Baccharis neglecta	35
Vachellia farnesiana	35
Opuntia stricta	5
Bothriochloa ischaemum	50
Ratibida columnifera	20

Environmental Stressors Observed: Small service roads for concrete-lined drains

Listed Species that this Habitat Area may support: Tricolored Bat

DATA FORM FOR BIOLOGICAL ASSESSMENT

Habitat Area Number: 44

Location: East of Habitat Area 43, north of the drain, west of County Road 25

Description/General Character: Dense thornscrub with an open understory

Vegetation Present:

Species	% Cover
Prosopis glandulosa	90
Vachellia farnesiana	10
Senegallia greggii (only observed along south edge of this Habitat Area)	5
Opuntia stricta	3

Environmental Stressors Observed:

Listed Species that this Habitat Area may support: Ocelot, Gulf Coast Jaguarundi

DATA FORM FOR BIOLOGICAL ASSESSMENT

Habitat Area Number: 45

Location: West of and adjacent to County Road 25, north of the drain

Description/General Character: Residential property with mature trees; grass is present only in areas not covered by tree canopy

Vegetation Present:

Species	% Cover
Cynodon dactylon	50
Quercus virginiana	30
Bare ground (under tree canopy)	50

Environmental Stressors Observed: County Road 25; this Habitat Area also appears to be used for occasional outdoor activities.

Listed Species that this Habitat Area may support: Tricolored Bat

DATA FORM FOR BIOLOGICAL ASSESSMENT

Habitat Area Number: 46

Location: West of and adjacent to County Road 25, south of the drain

Description/General Character: Unmaintained thornscrub; ground cover consists mostly of forbs. The specific land use of this Habitat Area could not be determined from field observations.

Vegetation Present:

Species	% Cover
Vachellia farnesiana	50
Ambrosia psilostachya	65
Cynodon dactylon	10

Environmental Stressors Observed:

Listed Species that this Habitat Area may support: none

DATA FORM FOR BIOLOGICAL ASSESSMENT

Habitat Area Number: 47 Location: North of and adjacent to Habitat Area 49

Description/General Character: Forb-dominated rangeland

Vegetation Present:

Species	% Cover
Helianthus annuus	60
Cynodon dactylon (only observed on southern and eastern edge of this Habitat Area)	10
Vachellia farnesiana	5
Bare ground	25

Environmental Stressors Observed: house/barn observed nearby

Listed Species that this Habitat Area may support: none

DATA FORM FOR BIOLOGICAL ASSESSMENT

Habitat Area Number: 48

Location: West of and adjacent to County Road 25, south of the drain

Description/General Character: Row crops; crops had not sprouted at the time of the field investigation.

Vegetation Present:

Species	% Cover
Bare ground	100

Environmental Stressors Observed:

Listed Species that this Habitat Area may support: none

DATA FORM FOR BIOLOGICAL ASSESSMENT

Habitat Area Number: 49

Location: West of SH 88, north of and adjacent to Marina Road, south of the drain

Description/General Character: Unmaintained rangeland

Vegetation Present:

Species	% Cover
Prosopis glandulosa	5
Celtis pallida	5
Baccharis neglecta (very young, low to the ground)	90
Juniperus ashei	2

Environmental Stressors Observed: Marina Road

Listed Species that this Habitat Area may support: none

DATA FORM FOR BIOLOGICAL ASSESSMENT

Habitat Area Number: 50

Location: Either side of SH 88 near intersection with Marina Road

Description/General Character: Pasture

Vegetation Present:

Species	% Cover
Bothriochloa ischaemum	70
Cynodon dactylon	50

Environmental Stressors Observed: SH 88, Marina Road

Listed Species that this Habitat Area may support: none

DATA FORM FOR BIOLOGICAL ASSESSMENT

Habitat Area Number: 51 Location: East of and adjacent to Habitat Area 50

Description/General Character: Row crops; crop species not identified

Vegetation Present:

Species	% Cover
Row crops	90

Environmental Stressors Observed:

Listed Species that this Habitat Area may support: none

DATA FORM FOR BIOLOGICAL ASSESSMENT

Habitat Area Number: 52

Location: On west and south side of the drain, surrounded by Habitat Area 51

Description/General Character: Rangeland prairie. This Habitat Area represents high-quality prairie habitat; quail were observed in this location during field investigations.

Vegetation Present:

Species	% Cover
Cynodon dactylon	95
Bothriochlora ischaemum	50
Smilax bona-nox	5
Quincula lobata	10
Vachellia farnesiana (only observed adjacent to the drain service road)	2
Helianthus annuus (only observed adjacent to the drain service road)	2
Senegallia greggii (only observed adjacent to the drain service road)	2

Environmental Stressors Observed:

Listed Species that this Habitat Area may support: none

DATA FORM FOR BIOLOGICAL ASSESSMENT

Habitat Area Number: 53

Location: Northwest outskirts of Lasara, south of the drain

Description/General Character: Pasture

Vegetation Present:

Species	% Cover
Cynodon dactylon	70
Bothriochloa ischaemum	30
Vachellia farnesiana (only observed on the perimeter of this Habitat Area)	10

Environmental Stressors Observed:

Listed Species that this Habitat Area may support: none

DATA FORM FOR BIOLOGICAL ASSESSMENT

Habitat Area Number: 54

Location: Northwest outskirts of Lasara, north of 2nd Street, south of the drain

Description/General Character: Moderate thornscrub with an open understory

Vegetation Present:

Species	% Cover
Vachellia farnesiana	80
Senegalia greggii (only observed along the fence by the service road)	10
Quincula lobata	5

Environmental Stressors Observed: close proximity to a residential neighborhood

Listed Species that this Habitat Area may support: none

DATA FORM FOR BIOLOGICAL ASSESSMENT

Habitat Area Number: 55

Location: Northwest outskirts of Lasara, north of 2nd Street, south of the drain

Description/General Character: Grazed shrubland

Vegetation Present:

Species	% Cover
Prosopis glandulosa	20
Vachellia farnesiana	20
Senegalia greggii	5
Smilax bona-nox	3
Bothriochloa ischaemum	75

Environmental Stressors Observed: close proximity to a residential neighborhood

Listed Species that this Habitat Area may support: none

DATA FORM FOR BIOLOGICAL ASSESSMENT

Habitat Area Number: 56

Location: Northwest outskirts of Lasara, between Habitat Areas 55 and 57

Description/General Character: Residential lawn

Vegetation Present:

Species	% Cover
Bothriochloa ischaemum	95

Environmental Stressors Observed: temporary house observed within the action area.

Listed Species that this Habitat Area may support: none

DATA FORM FOR BIOLOGICAL ASSESSMENT

Habitat Area Number: 57

Location: Northwest outskirts of Lasara, north of 2nd Street, south of the drain

Description/General Character: Grazed shrubland

Vegetation Present:

Species	% Cover
Prosopis glandulosa	20
Vachellia farnesiana	20
Senegalia greggii	5
Smilax bona-nox	3
Bothriochloa ischaemum	75

Environmental Stressors Observed: close proximity to a residential neighborhood

Listed Species that this Habitat Area may support: none

DATA FORM FOR BIOLOGICAL ASSESSMENT

Habitat Area Number: 58 Location: North outskirts of Lasara, along FM 1015

Description/General Character: Residential development (low-intensity development)

Vegetation Present:

Species	% Cover
Cynodon dactylon (in residential lawns)	50
Bare ground (road surface)	50

Environmental Stressors Observed: FM 1015 and intersecting roadways

Listed Species that this Habitat Area may support: none

DATA FORM FOR BIOLOGICAL ASSESSMENT

Habitat Area Number: 59

Location: Northwest corner of FM 1015 and Marina Road, north of Lasara

Description/General Character: Dense thornscrub with no herbaceous understory. Canopy is very dense adjacent to Marina Road and FM 1015; aerial imagery indicates that parts of this Habitat Area further from the roadways have a much more open canopy.

Vegetation Present:

Species	% Cover
Vachellia farnesiana	95
Prosopis glandulosa	10
Senegalia greggii	3
Opuntia stricta	5

Environmental Stressors Observed: Adjacent roadways, vehicle trails observed on aerial imagery

Listed Species that this Habitat Area may support: none

DATA FORM FOR BIOLOGICAL ASSESSMENT

Habitat Area Number: 60

Location: East of and adjacent to FM 1015, north of Lasara

Description/General Character: Active pasture

Vegetation Present:

Species	% Cover
Cynodon dactylon	100
Vachellia farnesiana	5

Environmental Stressors Observed: adjacent roadways, proximity to a residential area

Listed Species that this Habitat Area may support: none

DATA FORM FOR BIOLOGICAL ASSESSMENT

Habitat Area Number: 61 Location: East of FM 1015, northeast of Lasara

Description/General Character: Row crops. Crop species not identified; not all crops had sprouted at the time of the field investigation.

Vegetation Present:

Species	% Cover
Row crops	25
Bare ground	75

Environmental Stressors Observed: farm equipment traffic

Listed Species that this Habitat Area may support: none

DATA FORM FOR BIOLOGICAL ASSESSMENT

Habitat Area Number: 62

Location: North of and adjacent to SH 186, adjacent to North Alamo Water Plant

Description/General Character: Unmaintained shrubland

Vegetation Present:

Species	% Cover
Sorghum halepense	50
Smilax bona-nox	50
Vachellia farnesiana	30
Prosopis glandulosa	10
Senegalia greggii	5

Environmental Stressors Observed: SH 186, water treatment plant infrastructure

Listed Species that this Habitat Area may support: none

DATA FORM FOR BIOLOGICAL ASSESSMENT

Habitat Area Number: 63

Location: North and west sides of the drain, north of SH 186

Description/General Character: Thornscrub, moderate density, with a clear understory. This Habitat Area is traversed by multiple unimproved service roads. The northernmost part of this Habitat Area is included in the Lower Rio Grande Valley National Wildlife Refuge.

Vegetation Present:

Species	% Cover
Prosopis glandulosa	50
Opuntia stricta	10
Senegalia greggii (only observed adjacent to roads)	2
Vachellia farnesiana	10

Environmental Stressors Observed:

Listed Species that this Habitat Area may support: none

DATA FORM FOR BIOLOGICAL ASSESSMENT

Habitat Area Number: 64

Location: Northwest of the County Road 3300-Duarte Ranch Road intersection

Description/General Character: Unmaintained area between two service roads

Vegetation Present:

Species	% Cover
Prosopis glandulosa (in low-lying areas)	20
Prosopis glandulosa (on berm)	85
Bothriochloa ischaemum	45
Bare ground	50

Environmental Stressors Observed: service roads

Listed Species that this Habitat Area may support: none

DATA FORM FOR BIOLOGICAL ASSESSMENT

Habitat Area Number: 65 Location: East of LRGVNWR, along FM 1761

Description/General Character: Row crops; crops had not sprouted at the time of the field investigation.

Vegetation Present:

Species	% Cover
Bare ground	90
Unidentified forbs	10

Environmental Stressors Observed: FM 141, FM 1761, other roadways

Listed Species that this Habitat Area may support: none

DATA FORM FOR BIOLOGICAL ASSESSMENT

Habitat Area Number: 66

Location: North of FM 1761, north side of the drain, east of LRGVNWR

Description/General Character: Unmaintained grass-shrub rangeland

Vegetation Present:

Species	% Cover
Bothriochloa ischaemum	90
Prosopis glandulosa	35
Baccharis neglecta	5

Environmental Stressors Observed: FM 1761

Listed Species that this Habitat Area may support: none

DATA FORM FOR BIOLOGICAL ASSESSMENT

Habitat Area Number: 67

Location: North of FM 1761, north side of the drain, east of County Road 141

Description/General Character: Cattle pasture

Vegetation Present:

Species	% Cover
Prosopis glandulosa	5
Opuntia stricta (observed growing in a cluster)	2
Cynodon dactylon	90
Bare ground	10

Environmental Stressors Observed: agricultural equipment, various artificial structures, heavy cattle grazing

Listed Species that this Habitat Area may support: none

DATA FORM FOR BIOLOGICAL ASSESSMENT

Habitat Area Number: 68

Location: North of FM 1761, northern edge of action area

Description/General Character: Dense thornscrub; species composition is uncertain as this area was inaccessible during field investigations due to a lack of right-of-entry authorization.

Vegetation Present:

Species	% Cover
Prosopis glandulosa	85

Environmental Stressors Observed: adjacent agricultural activity

Listed Species that this Habitat Area may support: Ocelot, Gulf Coast Jaguarundi

DATA FORM FOR BIOLOGICAL ASSESSMENT

Habitat Area Number: 69

Location: Northeast corner of FM 1761 and County Road 156

Description/General Character: Residential property/lawn.

Vegetation Present:

Species	% Cover
Cynodon dactylon	90
Bare ground	10
Prosopis glandulosa	5

Environmental Stressors Observed: County Road 156, house and driveway

Listed Species that this Habitat Area may support: none

DATA FORM FOR BIOLOGICAL ASSESSMENT

Habitat Area Number: 70

Location: East of and adjacent to County Road 156, north of Habitat Area 68

Description/General Character: Thornscrub, moderately dense, open understory; evidence of horse presence observed

Vegetation Present:

Species	% Cover
Vachellia farnesiana	90
Opuntia stricta	10
Prosopis glandulosa	5

Environmental Stressors Observed: County Road 156, horses

Listed Species that this Habitat Area may support: none

DATA FORM FOR BIOLOGICAL ASSESSMENT

Habitat Area Number: 71

Location: East of and adjacent to County Road 156, north of Habitat Area 69

Description/General Character: Shrubland; shrub vegetation is denser closer to County Road 156

Vegetation Present:

Species	% Cover
Baccharis neglecta	75
Bothriochloa ischaemum	30
Smilax bona-nox	10
Prosopis glandulosa	5

Environmental Stressors Observed: County Road 156

Listed Species that this Habitat Area may support: none

DATA FORM FOR BIOLOGICAL ASSESSMENT

Habitat Area Number: 72

Location: East of and adjacent to County Road 156, north of Habitat Area 71

Description/General Character: Row crops; crops had not sprouted at the time of the field investigation.

Vegetation Present:

Species	% Cover
Bare ground	100

Environmental Stressors Observed:

Listed Species that this Habitat Area may support: none

DATA FORM FOR BIOLOGICAL ASSESSMENT

Habitat Area Number: 73

Location: East of and adjacent to County Road 156, north of Habitat Area 72

Description/General Character: Lawns of rural residential properties

Vegetation Present:

Species	% Cover
Prosopis glandulosa	10
Vachellia farnesiana	10
Bothriochloa ischaemum	50
Cynodon dactylon	25
Yucca species	2
Bare ground	5

Environmental Stressors Observed: County Road 156, vehicle traffic in driveways

Listed Species that this Habitat Area may support: none

DATA FORM FOR BIOLOGICAL ASSESSMENT

Habitat Area Number: 74

Location: East of and adjacent to County Road 156, north of Habitat Area 73

Description/General Character: Cattle pasture

Vegetation Present:

Species	% Cover
Bothriochloa ischaemum	85
Cynodon dactylon	10
Prosopis glandulosa	10
Bare ground	5

Environmental Stressors Observed: County Road 156

Listed Species that this Habitat Area may support: none

DATA FORM FOR BIOLOGICAL ASSESSMENT

Habitat Area Number: 75

Location: East of and adjacent to County Road 156, north of Habitat Area 74

Description/General Character: Light thornscrub

Vegetation Present:

Species	% Cover
Prosopis glandulosa	45
Bare ground	45
Cynodon dactylon	30
Opuntia stricta	5
Senegalia greggii	2
Echinocactus setispina	1

Environmental Stressors Observed: County Road 156, Raymondville Drain service road

Listed Species that this Habitat Area may support: none

DATA FORM FOR BIOLOGICAL ASSESSMENT

Habitat Area Number: 76

Location: North of FM 1761, northern edge of the action area

Description/General Character: Dense thornscrub, understory is open along the southern edge of this Habitat Area.

Vegetation Present:

Species	% Cover
Prosopis glandulosa	80
Celtis pallida	15
Senegalia greggii	10
Aristida adscensionis	70
Smilax bona-nox	5
Arundo donax (only observed adjacent to the service road)	5

Environmental Stressors Observed: Nonhazardous solid waste (e.g., discarded tires)

Listed Species that this Habitat Area may support: Ocelot, Gulf Coast Jaguarundi

DATA FORM FOR BIOLOGICAL ASSESSMENT

Habitat Area Number: 77

Location: North of FM 1761 on the south side of the drain, on either side of Lopez Road

Description/General Character: Pasture with woody vegetation along property parcel boundaries. Occasional drainage ditches and artificial structures within the action area. Species of grass used for pasture varies between parcels.

Vegetation Present:

Species	% Cover
Cynodon dactylon	50
Bouteloua curtipendula	50
Sorghum halepense	5
Quncula lobata	5
Ratibida columnifera	2
Smilax bona-nox	2
Baccharis neglecta (planted along property parcel lines)	5

Environmental Stressors Observed: artificial structures, piles of refuse and debris adjacent to the drain

Listed Species that this Habitat Area may support: none

DATA FORM FOR BIOLOGICAL ASSESSMENT

Habitat Area Number: 78

Location: North of and adjacent to FM 1761, east of and adjacent to County Road 205, west side of drain

Description/General Character: Dense thornscrub associated with/attached to a rural residence

Vegetation Present:

Species	% Cover
Prosopis glandulosa	30
Senegalia greggii	30
Vachellia farnesiana	30
Opuntia stricta	30
Aristida adscensionis	60
Baccharis neglecta	5

Environmental Stressors Observed: County Road 205, adjacent residence

Listed Species that this Habitat Area may support: Cactus Ferruginous Pygmy-owl

DATA FORM FOR BIOLOGICAL ASSESSMENT

Habitat Area Number: 79

Location: Between US 77 and Business 77, north of the drain

Description/General Character: Row crops. Crop species not identified; crops had not sprouted at the time of the field investigation.

Vegetation Present:

Species	% Cover
Bare ground	100

Environmental Stressors Observed: Row crops had not sprouted at the time field investigations were conducted in this area (4/3/2023).

Listed Species that this Habitat Area may support: none

DATA FORM FOR BIOLOGICAL ASSESSMENT

Habitat Area Number: 80

Location: Between US 77 and Business 77, north of the drain

Description/General Character: Residential area/lawn. Grass species not identified; this Habitat Area was inaccessible during the field investigation due to a lack of right-of-entry authorization.

Vegetation Present:

Species	% Cover
Prosopis glandulosa	30
Senegalia greggii	10
Vachellia farnesiana	30
Opuntia stricta	5

Environmental Stressors Observed: US 77, Business 77, FM 1761 (to the west), many artificial structures

Listed Species that this Habitat Area may support: none

DATA FORM FOR BIOLOGICAL ASSESSMENT

Habitat Area Number: 81 Location: East of and adjacent to US 77

Description/General Character: Pasture, heavily grazed, scattered woody vegetation.

Vegetation Present:

Species	% Cover
Bothriochloa ischaemum	95
Vachellia farnesiana	5
Prosopis glandulosa	5
Opuntia stricta	3
Ratibida columnifera	5
Celtis pallida (only observed on the south side of the drain)	5
Cirsium texanum	2
Gutierrezia texana	2
Ebenopsis ebano	2
Yucca spp.	1

Environmental Stressors Observed: US 77, electrified fencing present around a property parcel south of the drain.

Listed Species that this Habitat Area may support: none

DATA FORM FOR BIOLOGICAL ASSESSMENT

Habitat Area Number: 82 Location: West of US 77, east of County Road 445

Description/General Character: Row crops. Crop species not identified; not all crops had sprouted at the time of the field investigation.

Vegetation Present:

Species	% Cover
Row crops	25
Bare ground	75

Environmental Stressors Observed: Wind turbines were observed in close proximity to this Habitat Area.

Listed Species that this Habitat Area may support: none

DATA FORM FOR BIOLOGICAL ASSESSMENT

Habitat Area Number: 83

Location: Approximately 1.52 miles east of US 77, south side of the drain

Description/General Character: Vegetated drainageway

Vegetation Present:

Species	% Cover
Prosopis glandulosa	20
Gutierrezia texana	10
Aristida adscensionis	50
Eleocharis compressa (only observed in the centerline of the drainageway)	10

Environmental Stressors Observed: Row crops and unpaved service roads adjacent to this Habitat Area to the east and west; wind turbines located nearby.

Listed Species that this Habitat Area may support: none

DATA FORM FOR BIOLOGICAL ASSESSMENT

Habitat Area Number: 84

Location: Approximately 1.52 miles east of US 77, north side of the drain

Description/General Character: Pasture; area of light thornscrub observed in the southeast corner of this property.

Vegetation Present:

Species	% Cover
Prosopis glandulosa	10
Vachellia farnesiana	50
Bothriochloa ischaemum	50

Environmental Stressors Observed:

Listed Species that this Habitat Area may support: none

DATA FORM FOR BIOLOGICAL ASSESSMENT

Habitat Area Number: 85

Location: Approximately 0.74 mile west of County Road 380, south side of the drain

Description/General Character: Vegetated drainageway, dense thornscrub on slopes

Vegetation Present:

Species	% Cover
Prosopis glandulosa	80
Vachellia farnesiana	30
Senegalia greggii	15
Ebenopsis ebano	10
Opuntia stricta	2
Sporobolus cryptandrus	30
Helianthus angustifolia	10
Bothriochloa ischaemum	5
Sorghum halepense	5
Rumex crispus (only observed in the lowest part of the drainageway)	2

Environmental Stressors Observed: wind turbines nearby, service roads adjacent to this Habitat Area to the east and west.

Listed Species that this Habitat Area may support: none

DATA FORM FOR BIOLOGICAL ASSESSMENT

Habitat Area Number: 86 Location: East of and adjacent to County Road 445

Description/General Character: Maintained rangeland; conversations with the property owner indicate that this Habitat Area represents an attempt to restore historical prairie conditions.

Vegetation Present:

Species	% Cover
Cynodon dactylon	70
Ratibida columnifera	10
Cirsium texanum	5
Bothriochloa ischaemum	30
Smilax bona-nox (only observed adjacent to County Road 445)	2
Sorghum halepense (only observed adjacent to County Road 445)	2
Prosopis glandulosa (most coverage by berm, scattered coverage to the south)	5
Senegalia greggii	2
Celtis pallida	3

Environmental Stressors Observed: wind turbines nearby

Listed Species that this Habitat Area may support: none

DATA FORM FOR BIOLOGICAL ASSESSMENT

Habitat Area Number: 87

Location: East of Habitat Area 85, north of FM 3142 and SH 186

Description/General Character: Row crops; this Habitat Area was completely inaccessible due to a lack of right-of-entry authorizations and was assessed remotely. An area of potential wetland conditions is visible on aerial imagery northeast of the drain, at a point where the drain turns generally southward.

Vegetation Present:

Species	% Cover

Environmental Stressors Observed: wind turbines nearby

Listed Species that this Habitat Area may support: none

DATA FORM FOR BIOLOGICAL ASSESSMENT

Habitat Area Number: 88 Location: East of Habitat Area 86, north of SH 186

Description/General Character: Thornscrub; density varies from dense groves to open glades. The western portion of this Habitat Area was inaccessible due to a lack of right-of-entry authorizations and was assessed remotely. Coverage by species varies greatly throughout this Habitat Area.

Vegetation Present:

Species	% Cover
Prosopis glandulosa	80
Celtis pallida	40
Vachellia farnesiana	30
Senegalia greggii	5
Bothriochloa ischaemum	25
Cynodon dactylon	40
Yucca spp.	1
Carex spp. (only observed in areas away from vehicle trails)	5
Cephalanthus occidentalis	5

Environmental Stressors Observed: Habitat Area traversed by occasional vehicle trails which are more frequent in the western portion (as observed on aerial imagery)

Listed Species that this Habitat Area may support: Ocelot, Tricolored Bat, Gulf Coast Jaguarundi, Cactus Ferruginous Pygmy-owl

DATA FORM FOR BIOLOGICAL ASSESSMENT

Habitat Area Number: 89 Location: North of and adjacent to SH 186

Description/General Character: Pasture with scattered woody vegetation. This Habitat Area was completely inaccessible due to a lack of right-of-entry authorizations and was assessed remotely. Estimates of % Cover were made by analyzing aerial photography of this Habitat Area.

Vegetation Present:

Species	% Cover
Prosopis glandulosa	10
Bothriochloa ischaemum	100

Environmental Stressors Observed:

Listed Species that this Habitat Area may support: Northern Aplomado Falcon

DATA FORM FOR BIOLOGICAL ASSESSMENT

Habitat Area Number: 90

Location: South side of the drain, surrounded by Habitat Area 88

Description/General Character: Huisache woodland-grassland mosaic

Vegetation Present:

Species	% Cover
Vachellia farnesiana	40
Cynodon dactylon	95

Environmental Stressors Observed:

Listed Species that this Habitat Area may support: none

DATA FORM FOR BIOLOGICAL ASSESSMENT

Habitat Area Number: 91 Location: Within Habitat Area 87, east side of drain

Description/General Character: Pond and adjacent grassy areas

Vegetation Present:

Species	% Cover
Prosopis glandulosa	5
Cynodon dactylon	20

Environmental Stressors Observed: Evidence of frequent cattle presence, possible fire damage observed east of the pond outside the action area.

Listed Species that this Habitat Area may support: none, but may be a resource for species that occur in Habitat Area 88

DATA FORM FOR BIOLOGICAL ASSESSMENT

Habitat Area Number: 92

Location: West of and adjacent to eastern project terminus, northeast side of the drain

Description/General Character: Heavily grazed pasture; small shrubs were observed overgrowing the grass, patches of bare ground occur frequently.

Vegetation Present:

Species	% Cover
Condalia hookeri	2
Vachellia farnesiana	3
Cynodon dactylon	25
Carex spp.	10
Salicornia bigelovii	25
Bare ground	50

Environmental Stressors Observed: heavy cattle grazing

Listed Species that this Habitat Area may support: none