RIO GRANDE VALLEY
NATIONAL WILDLIFE REFUGE

Alamo, Texas

ANNUAL NARRATIVE REPORT

Calendar Year 1986

U.S. Department of the Interior
Fish and Wildlife Service
NATIONAL WILDLIFE REFUGE SYSTEM

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REVIEW AND APPROVALS

RIO GRANDE VALLEY NATIONAL WILDLIFE REFUGE

Alamo, Texas

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Calendar Year 1986

Robert W. Schumacher 11/9/87

Robert W. Schumacher
Refuge Manager — Date

Nita M. Fuller 11/10/87

Nita M. Fuller
Complex Project Leader — Date

Billy J. Hawthorne 11-20-87

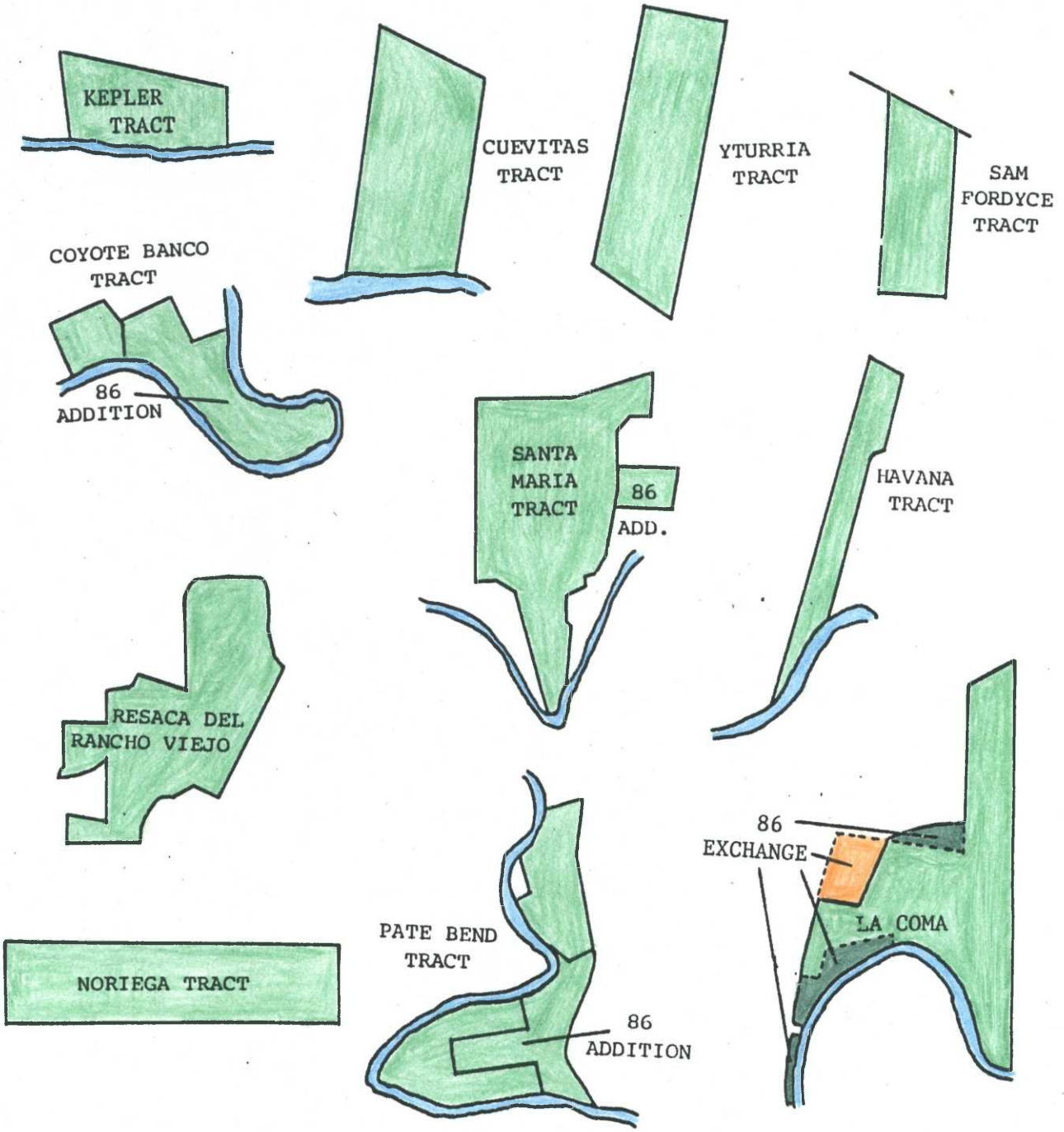
Billy J. Hawthorne — Date
Refuge Supervisor,
South Texas Refuges

W. Ellis Klett 12/03/87

Regional Office Approval — Date

INTRODUCTION

Rio Grande Valley National Wildlife Refuge (RGV NWR) was established with Land and Water Conservation Funds on January 30, 1980. Three thousand four hundred and twenty-eight acres were added to the refuge in 1986. CY 1986 additions include Kepler, Cuevitas, Yturria, Havana, Sam Fordyce, Resaca del Rancho Viejo, and Noriega Tracts and additions to the Coyote Banco, Pate Bend, and Santa Maria Tracts. We also experienced an equal value land exchange at the La Coma Tract. Total acres for RGV NWR at the end of CY 1986 totalled 18,727.54 acres . . . hard earned and excruciating acreages in the acquisition sense--but in perpetuity--well worth the effort and excruciation!!



The refuge is located in Cameron, Hidalgo, Starr, and Willacy Counties of extreme South Texas, an area known as the Lower Rio Grande Valley of South Texas.

Rio Grande Valley NWR lies within the Tamaulipan Biotic Province on the Gulf of Mexico coastal plain. The Valley is sub-tropical and the typical vegetative complex within this province is referred to as Tamaulipan thorn scrub or simply as brush.

The Valley is actually the Rio Grande delta; most of the topography is flat. More than 95% of the original verdant thorn forest has already been cleared and the remainder is threatened. Rio Grande Valley NWR currently manages 18,727.54 acres.

The principal objective of the refuge is to maintain and/or improve the base (1979) population levels of 114 vertebrate species of concern to the U.S. Fish and Wildlife Service (USFWS) through the management and protection of sufficient Tamaulipan habitat. In the Land Protection Plan for Rio Grande Valley NWR, 107,500 acres of unique habitat have been identified for protection and management by the refuge.

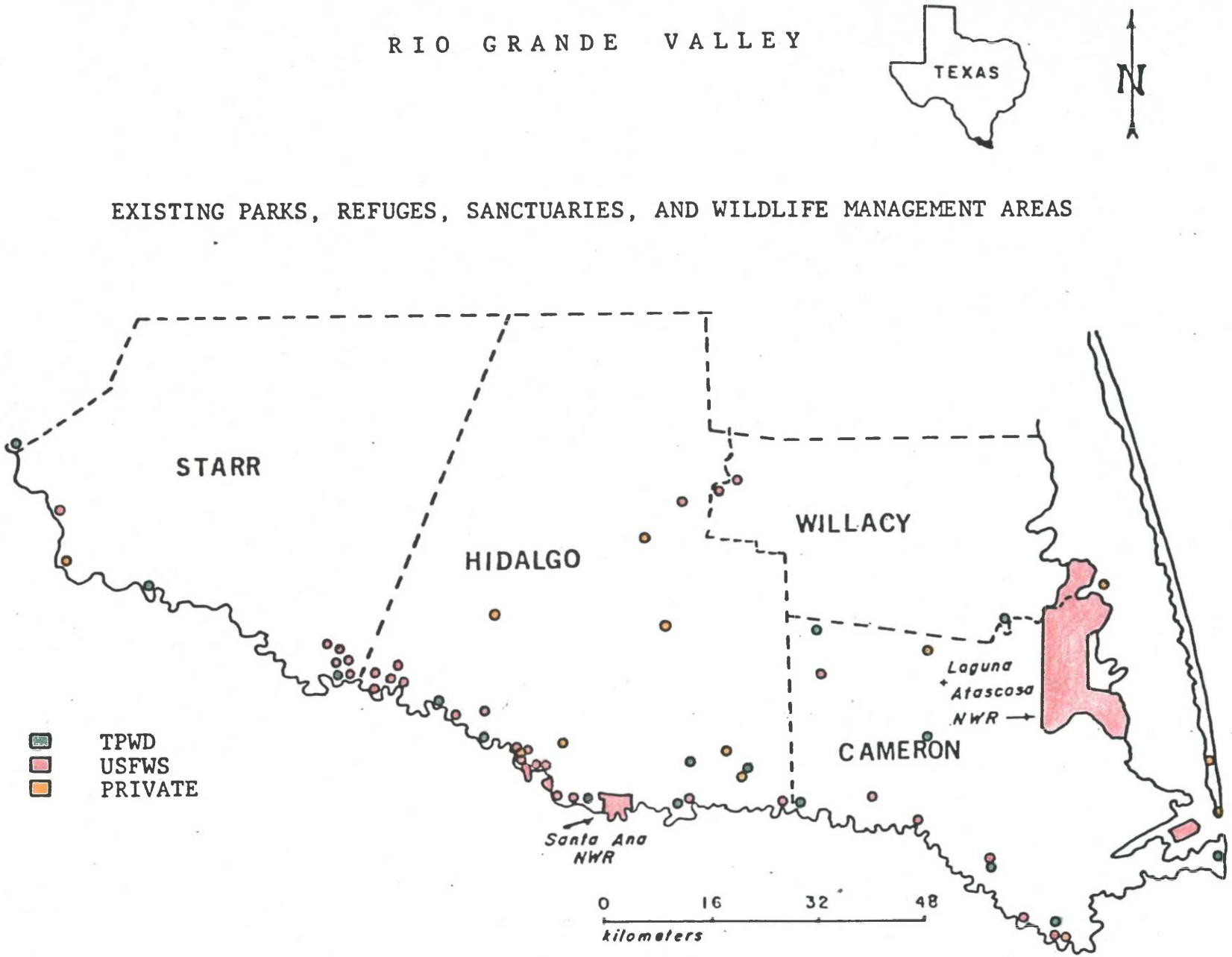
Acquisition funds for FY-86 were $4,773,000. Acquisition emphasis is placed on acquiring wildlife management units within 11 identified biotic communities, each of which is capable of providing the minimal life requirements for a maximum number of species of management concern. Of this 107,500 acre objective level, 20,807 acres were protected by December 31, 1986 (includes Santa Ana NWR). The objective level is delineated by biotic communities with the current estimated level, objective level and deficit as follows:

Biotic Community	Current Level (acres)	Objective (acres)	Deficit (acres)
Sabal Palm Forest	382	3,500	-3,118
Loma/Tidal Flats	5,202	10,000	-4,798
Chihuahuan Thorn Forest	1	24,000	-23,999
Upper Valley Flood Forest	319	10,000	-9,681
Barretal (Baretta Community)	240	5,000	-4,760
Matorral (Upland Thorn Scrub)	1,781	2,000	-219
Mid-valley Riparian Woodland*	6,683	13,000	-6,317
Mid-delta Thorn Forest	1,148	10,000	-8,852
Woodland Potholes and Basins	5,051	20,000	-14,949
Coastal Brushland and Potholes	0	10,000	-10,000
Ramadero (waiting LPP update)	---	---	---
Total all communities	20,807	107,500	-86,693

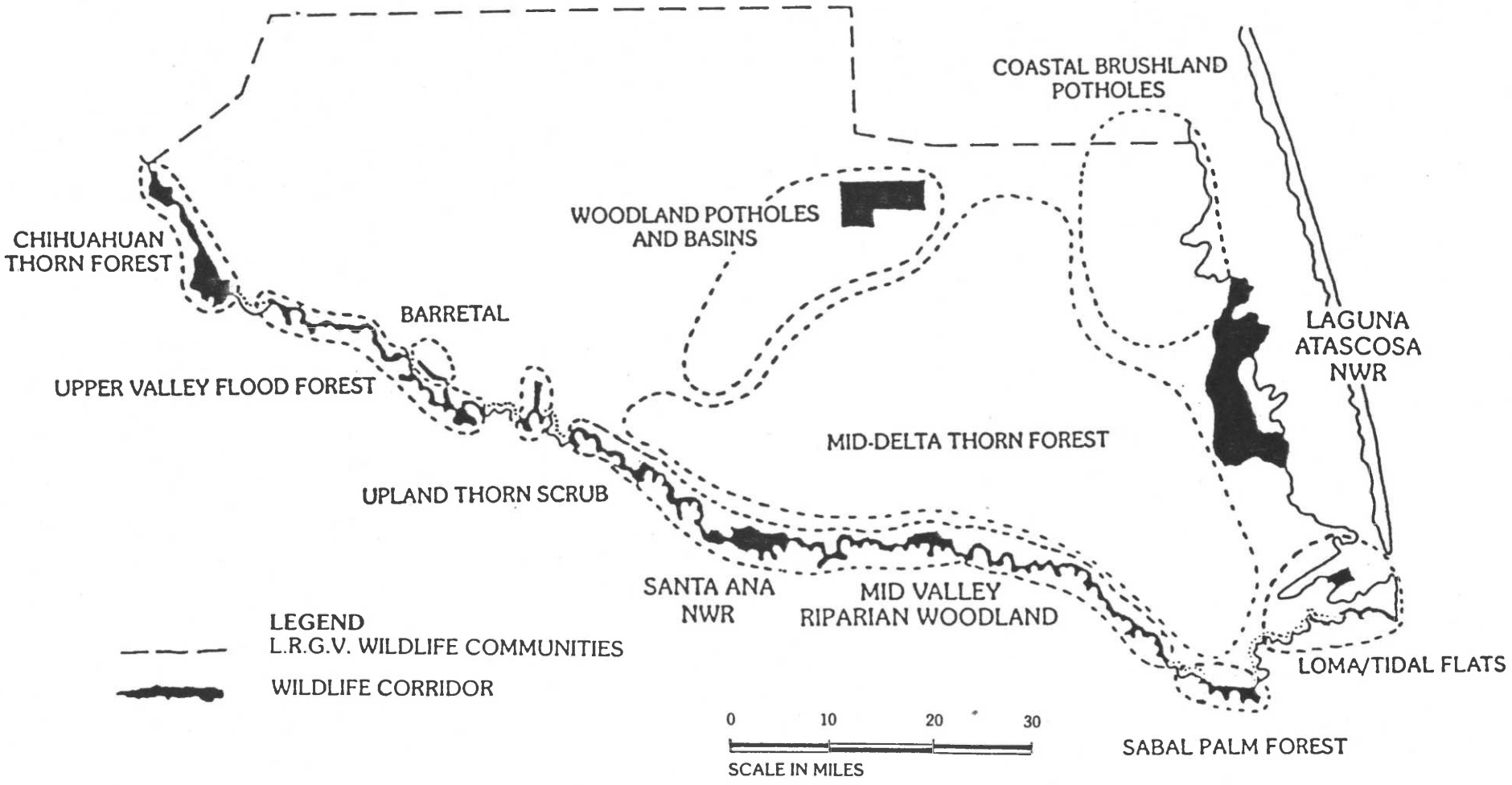
* Includes Santa Ana NWR (2,080 acres)

The community approach is necessary in order to separate the major wildlife and wildland resources in the Rio Grande Valley. The addition of a new biotic community to the Land Protection Plan is an exciting one. The Ramadero Biotic Community (thick brush along intermittent water courses) emphasizes the fact that the Land Protection Plan is dynamic. Each of these communities are unique and of almost equal importance in the protection of the Tamaulipan biota.

RIO GRANDE VALLEY



RIO GRANDE VALLEY NATIONAL WILDLIFE REFUGE
LAND PROTECTION PLAN



INTRODUCTION

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H. PUBLIC USE

I. EQUIPMENT AND FACILITIES

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A. HIGHLIGHTS

Philip Garcia reported to the refuge Complex in January to begin work as an assistant refuge manager. Philip was a graduate of the cooperative education program from New Mexico State University. Although he was to officially work for Santa Ana NWR most of his duties were geared toward RGV NWR due to the relative RGV NWR workload (Section E.1).

In January, Schumacher and Vora met with Jackie Poole and David Diamond of the Natural Heritage Foundation to discuss classification of biotic communities and listing of rare and/or endangered plants by the foundation.

Also in January, Gilbertson and Schumacher inspected the Kepler Tract (proposed for donation) at Salineno. This one acre piece would be the first link in the Falcon Woodlands.

Peter Argentine, a freelance film producer, was in the Valley in January to film segments of the Rio Grande for a public television film on rivers in the United States. He filmed Schumacher, Stuart (Region 2, Realty), and Frank Yturria at the newly optioned Yturria Tract (Section H.7).

In February, a sighting of an ocelot was reported to the refuge. It was observed in the vicinity of our Gabrielson Tract (Section G.2).

In February, Gilbertson attended a one-week Basic Fire Managment Course at Corpus Christi.

Fuller and Schumacher, and Hawthorne, Young (RO), Ruth, and McNeely (IBWC) met in March to discuss issues related to the Wildlife Corridor.

A 200 acre fire occurred on the Boscaje de la Palma Tract in April. Cause of the fire was undetermined, but arson is suspected (Section F.9).

The fire season was extended from April into May due to extremely dry conditions brought on by a two month drought.

During the mid-April to mid-May period, Fuller worked on the National Wildlife Refuge System EIS in Washington D.C.

During the same period, Garcia attended the Basic Refuge Management Academy at Blair, Nebraska.

Greg Bryant, an SCA Intern, began a 12 week work assignment with us in May. He assisted with the woody vegetation inventory, and computer entry of the vegetation data (Section E.3).

In late May, Fuller, Gilbertson, Schumacher and Vora attended the annual 40 hour in-service Law Enforcement Refresher in Albuquerque, New Mexico.

In June, there were two needed additions to the staff. Joel David transferred from Kofa NWR as an assistant refuge manager. He began by assisting Gilbertson with the cropland phaseout program. Zachary Labus began work as a seasonal biological technician. His responsibility is to assist Vora with revegetation and plant inventory projects (Section E.1).

Karen Walter, an SCA intern, began working with us in July. She was involved in a variety of assignments during her 12 week stay at the refuge (Section E.3).

In August, Fuller and Schumacher attended the project leader's meeting in Albuquerque, New Mexico.

Garcia left in late August for law enforcement training at Glynco, Georgia (Section H.17).

Also in August, Fuller, Schumacher, and Gilbertson attended the public hearing conducted by the Corps of Engineers concerning the permit application for Playa del Rio (Section D.4).

Ruth Starman, our third SCA of the year, began her 12 week work assignment with us in October. She worked with Vora on vegetation experiments, greenhouse maintenance, and database programs (Section E.3).

Texas Parks and Wildlife Department's Ted Clark, Ron George, and Gary Waggerman and Migratory Bird Coordinator Roy Tomlinson met in October with Fuller, Gilbertson and Schumacher to review reforestation efforts on TPWD and USFWS tracts.

There were two important additions to the refuge staff in October. Claire Caldes transferred from Imperial NWR to begin serving as ARM GS-9. Caldes is assigned to Santa Ana NWR, but loaned to RGV NWR. Her duties include water management, water rights, oil and gas rights, and ROW's in addition to managing the Yturria Tract. Also, Michael Bornstein arrived to fill the wildlife biologist position. Michael is responsible primarily for the status of the refuge's wildlife populations. Michael will also manage the Loma Preserve (Section E.1).

Several sightings of endangered/peripheral animals were reported to the refuge in November. A jaguarundi was reported at the Pharr Settling Basin, and a peregrine falcon was observed at the La Sal Vieja Unit (Section G.2).

Fuller, Caldes, Gilbertson, and Schumacher met with Bill Hardwicke (Chief of Realty WO), Tom Smith (RO) and Claude Lard (USFWS Biologist) in November to discuss land acquisition for RGV NWR.

Moderate to heavy rains fell Valley-wide during November with the City of Brownsville recording a monthly record of 7.69 inches of precipitation (Section B).

Also in November, Fuller and Schumacher met with National Audubon Society President Peter Berle, Dede Armentrout, Vice President of the National Audubon Society, Southwest Region, and local Frontera Audubon Chapter representatives. Fuller and Regional Director Mike Spear participated in a scheduled panel presentation of Lower Rio Grande Valley habitat protection needs at the conference. The National Audubon Society is interested in the land acquisition program and the protection of natural areas in the Valley (Section E.7).

In December, a peregrine falcon was observed at the La Sal Vieja Unit, and an ocelot with young was reported from northern Hidalgo County (Section G.2).

Writer/Photographer Bob Parvin interviewed several of the refuge staff in December for an article in for Defenders of Wildlife magazine. He focused his attention on the Land Protection Plan, the efforts underway to protect and restore this unique area, and the urgency to complete this project.

B. Climatic Conditions

For an area with little topographic relief, the Lower Rio Grande Valley of South Texas exhibits an amazing diversity of climatic conditions. Thermometer readings can vary as much as 15 to 20 degrees Fahrenheit between coastal tracts near the mouth of the Rio Grande and semi-arid units some 80 miles upstream. Precipitation, mainly in the form of thunderstorms, is also variable and, while one location may be deluged by a four inch rainfall, another nearby tract of land may be in the midst of a drought.

Generally, the Gulf of Mexico is the dominant influence on the local weather patterns. Most of the year prevailing southeast breezes provide a humid and very warm climate. During the winter, cool Canadian airmasses called "northers" occasionally reach as far south as the Valley, but are rarely cold enough to bring subfreezing weather. Situated only 150 miles north of the tropics, the Valley's climate is affected by a variety of factors including the tropics to the south, the desert to the west, temperate climates to the north, and maritime climates to the east.

The Lower Rio Grande Valley lived up to its reputation as a hot, dry climate in 1986. Although January's weather was rather mild, much of the remainder of the spring was unusually warm and dry. A February maximum of 98°F at McAllen was only 7°F below the official February maximum for the United States. A severe drought which began early in the month continued for over 60 days at Brownsville. It was finally broken in late April when approximately .50 inch of precipitation fell, some of it in the form of golf ball size hail in the vicinity of the Santa Ana/Rio Grande Valley Refuge headquarters. The April 20th hailstorm was the first significant amount of precipitation seen in the area since February 3rd (75 Days). The storm, which was unusually strong for the Valley, broke windows, damaged the greenhouse, and blew tree limbs throughout the refuge headquarters area. Several hours were spent repairing damages. The hailstones were estimated to range in size from 1 1/4 inches to the size of a tennis ball.

Fire danger remained extreme for most of the year, being especially high during the spring drought. The dry weather contributed to an all time RGV NWR high of 19 reported fires in CY 86 including a 200+ acre blaze at our Boscaje de la Palma Tract in early April (Section F.9). At the Brownsville National Weather Service Office monthly mean temperatures from January through October were all above average with September's 84.4°F being the third warmest September on record.

1986 MONTHLY MEAN TEMPERATURE (°F) VS 30 YEAR AVERAGE (1956-85)
BROWNSVILLE, TX

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1986	61.0	63.1	69.0	76.8	79.4	83.1	84.8	84.8	84.4	76.3	66.7	60.2
AVERAGE	60.2	63.0	68.4	74.4	79.0	82.7	83.8	84.2	81.3	75.5	67.9	62.1

1986 MEAN MONTHLY PRECIPITATION (IN) VS 30 YEAR AVERAGE (1956-1985)
BROWNSVILLE, TX

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
1986	1.07	0.20	0.00	1.35	2.89	3.72	0.35	2.14	1.71	4.61	7.69	2.42	28.15
AVERAGE	1.36	1.30	1.00	1.45	2.61	2.71	1.86	2.62	5.63	3.18	1.72	1.54	26.98

Soil moisture increased dramatically during the latter part of 1986 when Brownsville again set a record; this time for the wettest November ever recorded (7.69 inches). Lesser amounts, though, were measured at other Valley locations. The wet gloomy weather continued through the end of the year making a muddy mess out of many of our field roads and hampering our outside work activties.

1986 VS NORMAL PRECIPITATION FOR SELECTED VALLEY CITIES

CITY	1986	NORMAL
BROWNSVILLE	23.64	26.98
HARLINGEN	23.17	25.80
RAYMONDVILLE	17.61	23.25
MCALLEN	17.38	22.53
RIO GRANDE CITY	14.22	17.27
MCCOOK	09.21	23.95

In an attempt to better manage our refuge lands, biological information is gathered during the course of a year. Included among this is the collection of climatic data from selected refuge tracts. This is accomplished by placing minimum/maximum thermometers and rain gauges on certain tracts within each biotic community. We are scheduled to visit/patrol each tract of land monthly, checking for climate information as well as completing other management functions. While CY 86 was not a particularly good year for consistent monitoring of climate data, we have compiled pertinent available data and included it on the following tables. Because of vandalism and theft problems, thermometers are usually hidden in tree cavities and rain gauges are located on fence posts or tree stumps. Regrettably this non-standardized placement biases our data. Still it is a useful indicator of long term climatic change as well as a good barometer of our various microclimates.

MAXIMUM MONTHLY TEMPERATURES (^{O}C) ON REFUGE TRACTS

TRACT	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Barretal	30.5	*	39.0	*	40.0	39.0	43.0	43.0	*	41.0	34.5	30.5
La Grulla	31.0	*	36.0	*	37.0	41.0	38.0	43.0	*	*	36.0	31.0
Los Ebanos	28.0	*	*	*	*	*	*	36.0	*	*	34.0	*
Palmview	30.0	*	*	*	*	*	40.0	*	*	39.0	*	32.0
Gabrielson	28.0	*	*	*	*	*	36.0	37.0	*	33.0	31.0	27.0
Pharr S.B.	26.5	*	*	*	*	*	*	*	*	*	*	*
La Coma	*	*	*	*	32.0	33.0	35.0	*	*	34.0	30.0	26.0
Thompson Rd.	33.0	*	31.5	*	*	*	*	*	*	32.0	*	*
Resaca	*	*	*	*	*	*	*	*	*	*	32.0	*
Garza-Cavazos	27.0	*	32.0	*	32.0	34.0	34.0	37.5	*	36.0	32.0	25.0
Brownsville	*	*	*	*	32.0	31.0	34.0	36.5	*	35.0	33.0	29.0
Boscaje	22.0	*	*	*	28.0	*	*	30.0	*	36.0	27.0	22.0
Lomas	26.0	*	31.0	*	34.0	*	*	36.0	34.0	*	*	26.0
La Sal Vieja	28.0	*	35.0	*	34.0	35.0	*	*	*	37.0	*	22.5

* - not recorded

MINIMUM MONTHLY TEMPERATURES (^{O}C) ON REFUGE TRACTS

Tract	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Barretal	1.5	*	5.0	*	14.0	14.0	25.0	26.0	*	12.0	2.5	0.0
La Grulla	1.0	*	5.0	*	14.5	16.0	25.0	22.0	*	*	2.0	0.0
Los Ebanos	4.0	*	*	*	*	*	*	29.0	*	15.0	4.0	*
Palmview	1.0	*	*	*	*	*	25.0	*	*	13.0	*	2.5
Gabrielson	-2.0	*	*	*	*	*	24.0	*	*	13.0	2.0	1.0
Pharr S.B.	1.5	*	*	*	*	*	*	*	*	*	*	*
La Coma	*	*	*	*	15.5	23.0	*	*	*	14.0	4.0	4.0
Thompson Rd.	1.0	6.0	*	*	*	*	*	*	*	11.0	*	*
Resaca	*	*	*	*	*	*	*	*	*	*	4.5	1.0
Garza-Cavazos	2.5	*	3.0	*	15.0	23.0	25.0	22.5	*	13.0	2.0	3.0
Brownsville	*	*	*	*	14.0	24.0	25.0	24.0	*	14.0	4.0	4.0
Boscaje	4.0	*	*	*	16.0	24.0	25.0	23.5	*	16.0	3.0	4.0
Lomas	0.0	*	10.0	*	15.0	*	2.0	22.0	*	*	4.0	4.0
La Sal Vieja	0.0	*	6.0	*	14.0	25.0	*	*	22.0	13.0	*	4.5

* - not recorded

Checking Rain Gauges and Thermometers
is, Hopefully, a Monthly Event (10/85, R.V.)

PRECIPITATION ON REFUGE TRACTS BY MONTH
Unit of Measurement (Inches)

Tract	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Barretal	0.39	*	0.00	*	*	2.00	0.00	*	*	2.24	0.91	2.90
Los Ebanos	0.37	*	*	*	*	*	0.71	0.05	*	*	*	2.90
Abrams	*	*	*	*	*	1.40	0.32	0.13	*	1.30	*	3.85
Palmview	0.46	*	*	*	*	1.10	0.11	0.32	*	1.25	1.22	2.45
Gabrielson	0.50	*	*	*	*	1.28	*	*	*	*	*	1.75
Cottam	0.41	*	*	*	*	*	*	*	*	*	1.75	2.25
Vela Woods	0.82	*	*	*	*	*	*	*	*	*	*	*
La Coma	*	*	*	*	*	1.50	*	*	*	0.65	2.50	2.50
Thompson Rd.	0.92	*	0.58	*	*	*	*	*	*	2.25	*	*
Resaca	*	*	*	*	*	*	*	*	*	*	1.95	3.10
Garza-Cavazos	0.50	*	0.02	*	*	2.90	0.13	0.11	*	*	3.40	2.80
Brownsville	1.10	*	*	*	*	1.55	0.51	0.25	*	2.00	5.70	2.50
Boscaje	1.10	*	*	*	*	*	0.31	0.50	*	0.55	5.35	*
Lomas	0.40	*	*	*	*	2.25	*	2.10	2.74	*	3.45	5.25
La Sal Vieja	0.49	*	*	*	*	0.80	*	0.00	*	2.70	*	*

* - not recorded

C. LAND ACQUISITION

1. Fee Title

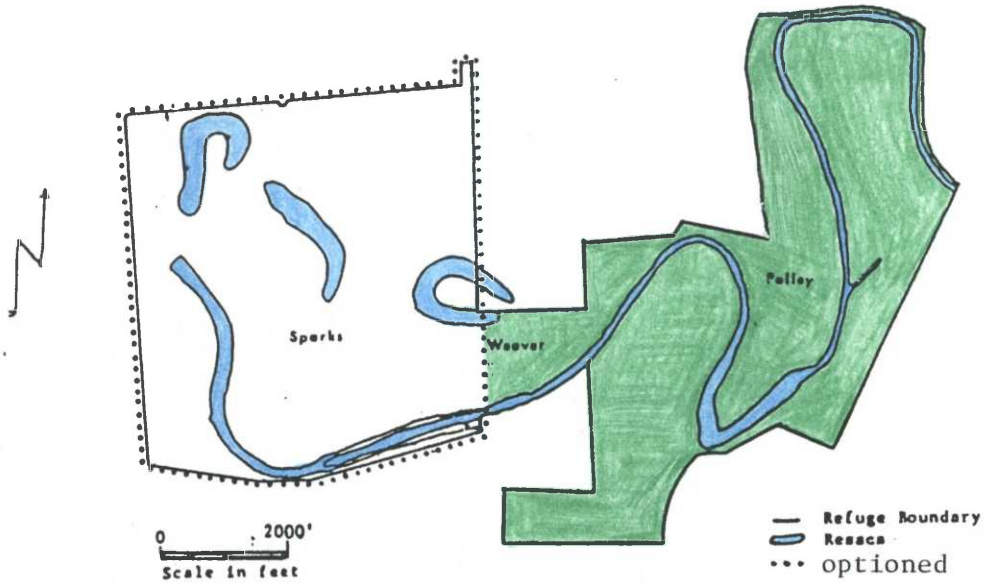
Rio Grande Valley NWR has been in an acquisition mode since it was established in January 1980. The table on page 17 lists fee properties by Realty Tract number.

Fifteen fee tracts were added to the refuge in 1986. Five of these fee tracts were acquired in Cameron County creating the Resaca del Rancho Viejo Unit. The total of 725 acres gave us our largest, contiguous area of Mid-delta Thorn Forest Community. This community type, once an extensive thicket that covered most of the Rio Grande delta, is comprised of a mesquite/granjeno association mixed with Texas ebony, anaqua, and brasil. About 80% of the unit is presently under cultivation with plans to revegetate more than 25% within the next two years. This is important since this area is historic habitat for the white-winged dove. Less than 5% of this habitat is left, and most of that is in fence rows, highway rights of way, canals, and ditch banks.

RESACA DEL RANCHO VIEJO UNIT

MID-DELTA THORN FOREST COMMUNITY

RIO GRANDE VALLEY NWR



Another addition to the Mid-delta Thorn Forest Community this year includes the 200 acre Noriega Tract located in Cameron County, adjacent to Texas Parks and Wildlife Department Management Area Resaca de las Palmas. Fifty percent of the land consists of early successional species being primarily composed of bufflegrass and some retama. The northern portion of the tract is a low lying area which remains wet much of the year. Two resacas cover about 10% of the area with the remainder composed of later successional brush stands.

WILDLIFE COMMUNITY no 8

MID-DELTA

THORN FOREST

GOAL	10,000
FWS	1,148
DEFICIT	- 8,852 acres

ISLANDS OF SEMI-ARID THORN FOREST, AN ASSOCIATION OF EBONY, HUISACHE, BRAZIL, GRANJENO, AND ANAQUA, ARE SCATTERED THROUGHOUT THE DELTAIC PLAIN. THESE ARE THE FAVORED SITES OF THE COLONIAL NESTING WHITE-WINGED DOVE. GOALS ARE TO PROTECT APPROXIMATELY 20 OF THE BEST OF THESE HABITAT ISLANDS. OUR MANAGEMENT OBJECTIVE IS A NESTING DENSITY OF 25 PAIR PER ACRE.

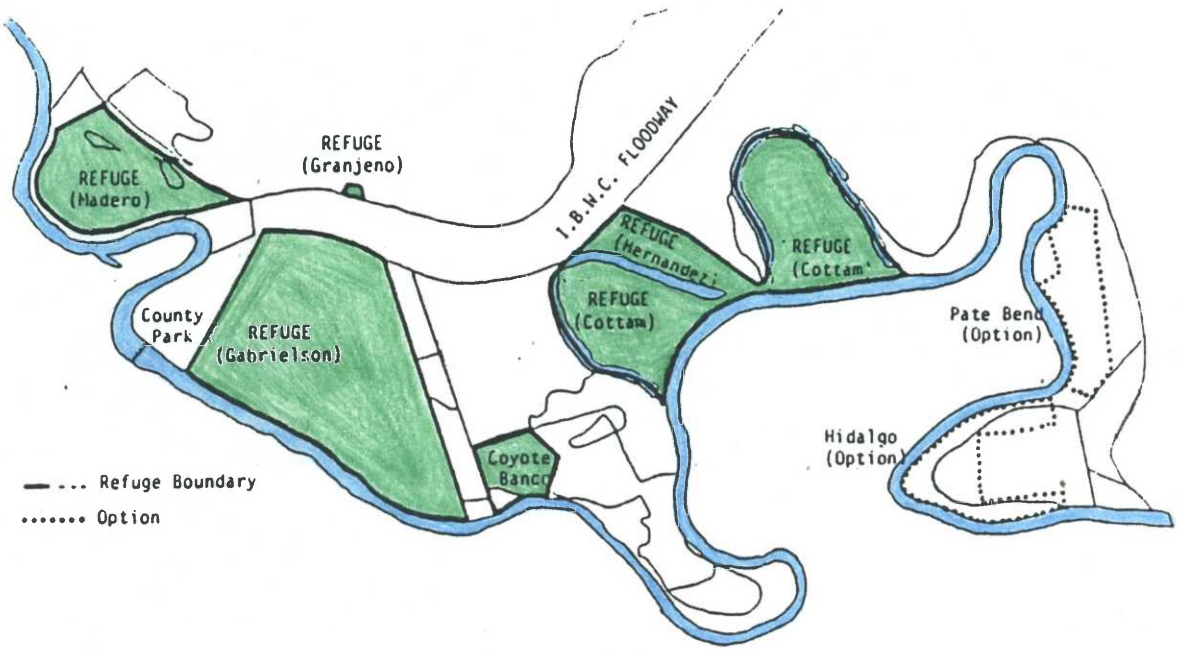
Resaca del Rancho Viejo (8/86, R.W.S.)

Two fee tracts became an addition of 210 acres to Pate Bend. These tracts link the two portions of land purchased in 1985. This newly acquired 210 acres is crucial in maintaining and enhancing an existing white-winged dove nesting colony on Pate Bend. A bobcat with 4 kittens were observed by Border Patrol personnel in November of this year.

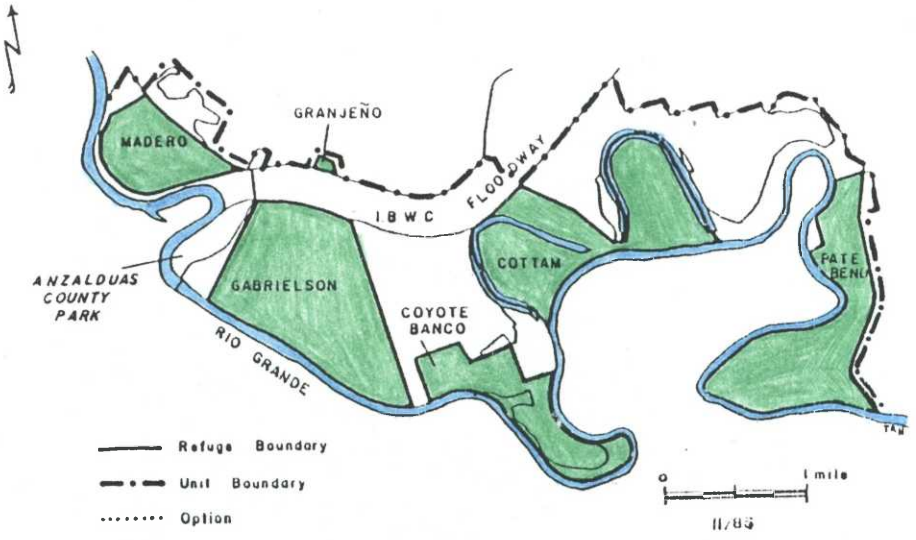
Another tract is a 228-acre addition to Coyote Banco. A portion of this property contains natural vegetation that extends to the Cottam Tract. During the fall, several species of hawks were observed utilizing this area. This area also includes about 5.5 acres of river terrace habitat which is currently sparsely vegetated with native brush.

Within the last two years the acreage acquired for Coyote Banco and Pate Bend has greatly reduced that which is needed for the Anzalduas Unit. They are significant, not only for linking the tracts which comprise the Anzalduas Unit, but also in the formation of the wildlife corridor. With the fusing of these tracts, the area can be more easily managed, and allow wildlife to move about more freely within the tracts with less disturbance from the surrounding community.

On the next page, for comparison, are maps of the Azalduas Unit at the end of 1984 and at the end of 1986. Gaps between tracts are getting smaller, and the wildlife corridor is getting larger.



Anzalduas Unit - 1984

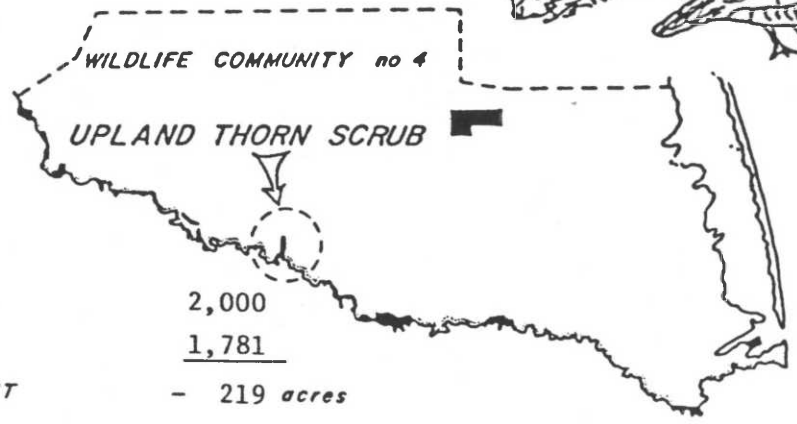


Anzalduas Unit - 1986

Landsat Photo of Anzalduas Unit and Santa Ana NWR (1/83, R.W.S.)

Three other fee tracts totaling 1781 acres were acquired during the year marking the first tracts of land acquired for the Upper Thorn Scrub Community. Havana (North)(45 acres), Sam Fordyce (67 acres), and Yturria Brush (1,669 acres) all make up the F. Yturria Brush Unit, which serves as a wildland corridor connecting riparian habitat with upland habitat. Yturria, Havana (North), and Sam Fordyce Tracts consist mostly of brushland with a relative abundance of species such as cenizo, anacahuite, palo verde, sangre de drago, and allthorn. Over much of the unit, the canopy is 2-3 meters in height, ascending to 4-5 meters along intermittent watercourses and wetlands, proving again the "wetland" value, even without standing water. On the Yturria Brush Tract, the previous landowner has a grazing lease which is to expire in FY 87. Grazing has been one of the major impacts on the flora and fauna in the area, degrading the wetlands and reducing biomass which is critical to native Tamaulipian species. Disturbances to the soil surface by cattle and their attendant caretakers (on horse-back and in vehicles) has promoted the spread of exotic grasses such as bufflegrass, coastal bermuda, and non-native varieties of bluestem. We are already hearing from our leasees, staff, and volunteers about the wildlife comeback as the grazing is being phased out. Canopy is available to native browsers including the white-tailed deer and javalina. These species should provide the appropriate amount of surface impact for the mix of native short grasses and desert shrubs. We will plan on gradual corrective works on this fantastic refuge tract. Harris' hawks, white-tailed hawks, and caracaras are three of the raptors associated with this management unit.

Another fee tract acquired during the course of the year also belongs in the F. Yturria Brush Unit, but is found in the Upper-Valley Flood Forest Biotic Community. Havana (South), which contains 114 acres, consists, for the most part, of mid successional brush including mesquite and huisache. This tract links Havana (North) with the Rio Grande.

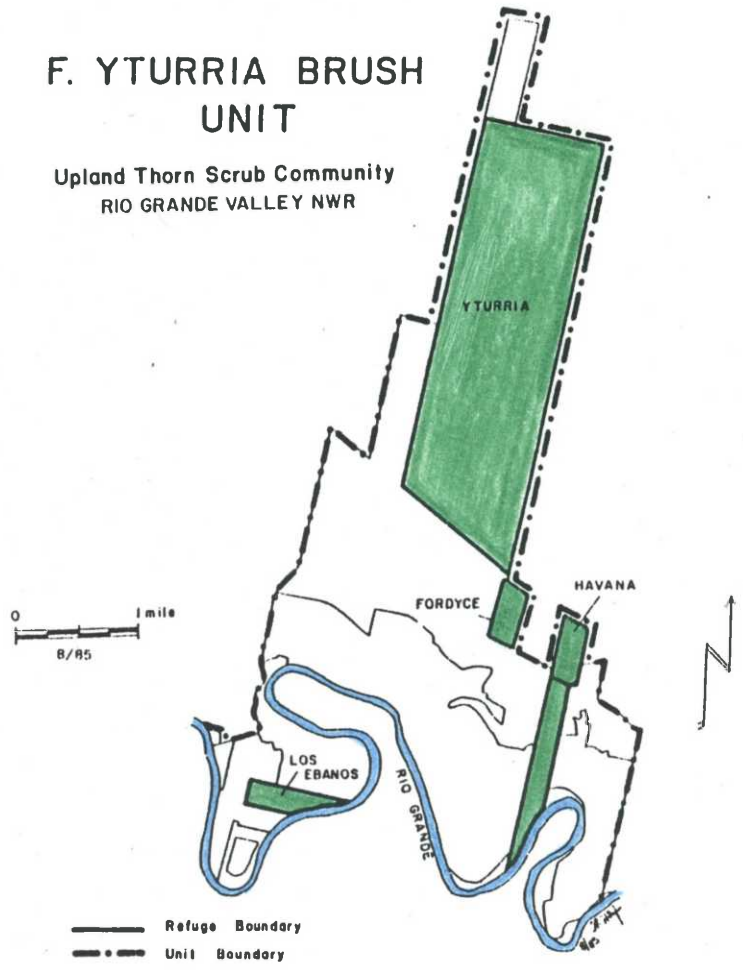


GOAL	2,000
FWS	1,781
DEFICIT	- 219 acres

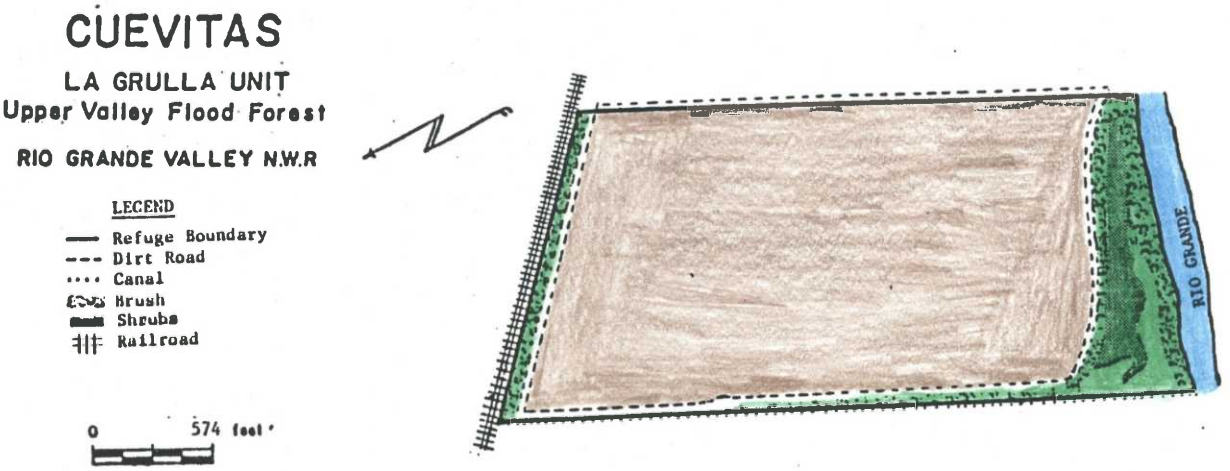
CONVERSION TO DRYLAND FARMING THREATENS THE EXISTING UPLAND THORN SCRUB IN THE RIO GRANDE VALLEY. A SINGLE LARGE REMNANT SURROUNDED BY CROPLAND IS LOCATED BY THE CITY OF LA JOYA ON THE WEST EDGE OF THE DELTA. HERE IS THE STRONGHOLD OF THE HARRIS' HAWK AND A MAJOR STOPOVER FOR MIGRATING RAPTORS. QUAIL, DEER, AND JAVELINA ARE FOUND IN ABUNDANCE ALONG WITH MANY UNIQUE PERIPHERAL PLANT AND ANIMAL SPECIES.

Yturria Brush Tract (7/79, R.W.S.)

Yturria Brush Tract (7/79, R.W.S.)



Another fee tract that lies on the Rio Grande is the newly acquired Cuevitas Tract (95 acres). Approximately 80% of this tract is currently under cultivation. The remaining 20%, located near the river, contains an accretion consisting of black willow, baccharis, and other early successional species. A small, but critical corridor of brush is directly along the river bank and another is along a drain ditch that parallels the west boundary. We will build on these strips and use them as seed sources. These areas provide habitat for songbirds, and mourning and white-winged doves. The cultivated field will be allowed to revert back to native vegetation through succession and assisted by native plantings and will provide a needed link in the wildlife corridor.



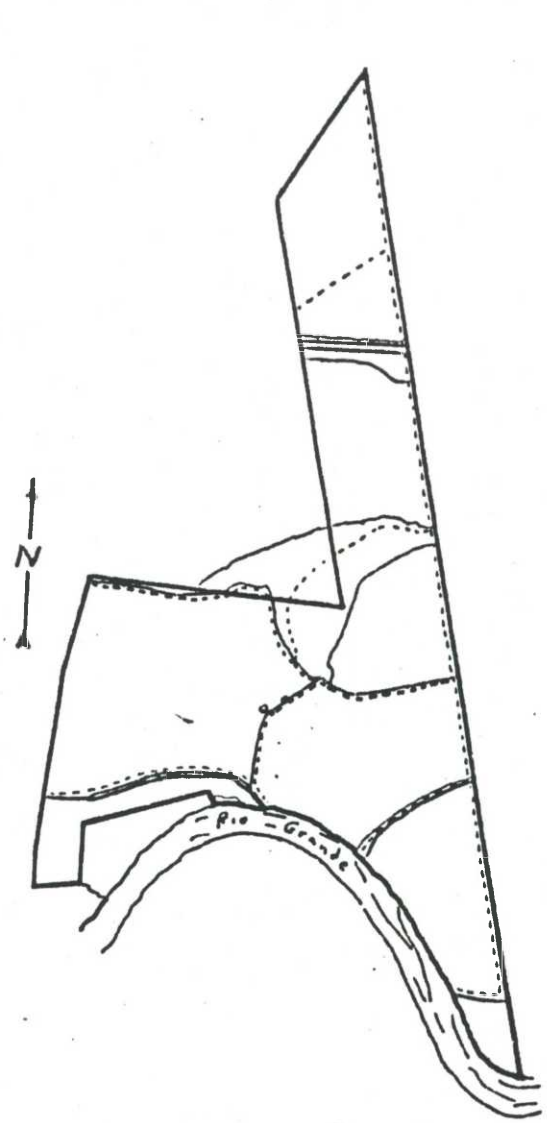
Next, is a 45-acre addition to the Santa Maria Wildlife Management Unit. The Santa Maria Tract was originally acquired for the USFWS by the World Wildlife Fund. This new addition is located on the east central boundary of the tract and is important to our wildlife corridor concept since jaguarundis have been reported in the area.

The last fee tract acquired this year consisted of an equal value exchange at the La Coma Tract. Over 31 acres, consisting mainly of "brush," were exchanged for just over 27 acres of cultivated land. Of course, this exchange benefitted us by being able to add acreage along the Rio Grande. Also, funds that would have been used to revegetate the cultivated land can now be used for revegetation projects on other refuge tracts.

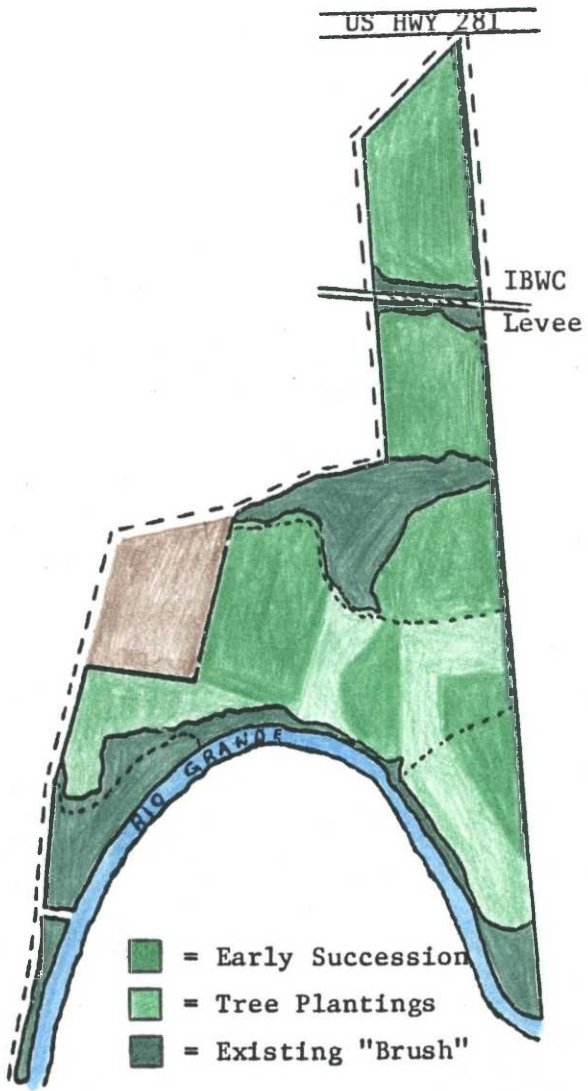
LA COMA

MID VALLEY RIPARIAN WOODLAND

RIO GRANDE VALLEY N W R



BEFORE LAND EXCHANGE



AFTER LAND EXCHANGE

The total fee acreage for Rio Grande Valley NWR as of 12/31/86 is 13,099.69.

RIO GRANDE VALLEY NWR OWNERSHIP IN FEE BY INDIVIDUAL TRACT, 1986

File	Name	County	Acres	Water	Date	Deed	Remarks
115	Payne	Willacy	546.3	-0-	1/02/85	Y	Payne
117	Rudman	Willacy	3936.34	-0-	1/03/85	Y	Rudman
207	Brownsville	Cameron	17.4	-0-	2/15/73	N	** Surplus IBWC
232	**Resaca d R V**	**Cameron**	**15.0**	**-0-**	**12/31/86**	**Y**	**Albert Weaver**
235	**Resaca d R V**	**Cameron**	**382.64**	**-0-**	**8/21/86**	**Y**	**Polley et al**
235a	**Resaca d R V**	**Cameron**	**208.84**	**-0-**	**8/21/86**	**Y**	**Polley et al**
235b	**Resaca d R V**	**Cameron**	**55.69**	**-0-**	**8/21/86**	**Y**	**Polley et al**
236	**Resaca d R V**	**Cameron**	**62.45**	**-0-**	**12/31/86**	**Y**	**Ben Weaver**
237	**Noriega**	**Cameron**	**200.0**	**-0-**	**6/27/86**	**Y**	**Garcia H. et al**
239	Thompson Road	Cameron	30.0	-0-	2/15/79	Y	*
241	Garza-Cavazos	Cameron	115.41	52	4/03/79	Y	*
247	Boscaje Palma	Cameron	364.99	319	1/27/81	Y	TNC help
317	Vela Woods	Hidalgo	128.43	45.46	3/22/78	Y	*
318	" "	Hidalgo	1.3	-0-	9/10/80	Y	*
319	" "	Hidalgo	16.6	16.6	3/30/79	Y	*
320	" "	Hidalgo	17.69	8.8	6/25/81	N	D/T 6/25/81
321	" "	Hidalgo	27.86	17.06	12/21/77	Y	*
322	" "	Hidalgo	9.81	6.96	12/20/78	Y	*
323	" "	Hidalgo	18.69	18.69	6/07/77	Y	*
326	Santa Maria	Hidalgo	422.83	-0-	3/25/76	Y	* WWF help
328	" "	Hidalgo	24.24	-0-	6/09/77	Y	*
348	" "	Hidalgo	65.71	55.0	8/30/84	Y	Martinez, G.A.
353	**" "**	**Cameron**	**45.1**	**-0-**	**1/06/86**	**Y**	**Lopez**
326a	Pharr S. Basin	Hidalgo	67.11	-0-	3/25/76	Y	* WWF help
370	" " "	Hidalgo	151.46	125.0	5/10/84	Y	Griffin & Brand
326b	Gabrielson	Hidalgo	702.56	-0-	3/25/76	Y	* WWF help
326c	Madero	Hidalgo	247.68	-0-	3/25/76	Y	* WWF help
	Granjeno	Hidalgo	2.62	-0-	3/25/76	Y	* WWF help
327	Cottam	Hidalgo	481.0	-0-			USA MOU
343	" "	Hidalgo	84.68	63.0	9/09/83	Y	Hernandez
336	La Coma	Hidalgo	227.39	249.5	9/09/83	Y	Gonzalas
370a	**" "**	**Hidalgo**	**31.33**	**-0-**	**7/30/86**	**N**	**Exch., Griffin & Brand**
345	Schaleben	Hidalgo	350.69	-0-	6/27/85	Y	TNC
345a	" "	Hidalgo	217.73	-0-	12/09/85	Y	TNC
352	Pate Bend	Hidalgo	106.79	-0-	6/25/85	Y	Texas Builders
352a	**" "**	**Hidalgo**	**118.5**	**122.04**	**12/22/86**	**Y**	**Texas Builders**
354b	" "	Hidalgo	125.66	-0-	3/14/85	Y	Spillar et ux.
354c	**" "**	**Hidalgo**	**91.03**	**90.0**	**4/23/86**	**Y**	**Spillar et ux.**
354	Hidalgo Bend	Hidalgo	471.14	-0-	3/14/85	Y	Spillar et ux.
354a	" "	Hidalgo	48.57	-0-	3/14/85	Y	Spillar et ux.
380	Coyote Banco	Hidalgo	64.6	35.0	7/06/84	Y	Henrichson
382	**" "**	**Hidalgo**	**227.64**	**113.0**	**8/01/86**	**Y**	**Glick Twin et al**
425	Los Ebanos	Hidalgo	34.4	4.0	7/13/82	Y	Garza
427	**Havana**	**Hidalgo**	**113.82**	**-0-**	**6/11/86**	**Y**	**Yturria Estate et al.**
427c	**" "**	**Hidalgo**	**44.88**	**-0-**	**6/11/86**	**Y**	**Yturria Estate et al.**
427a	**Yturria**	**Hidalgo**	**1668.84**	**-0-**	**6/11/86**	**Y**	**F. Yturria et al.**
427b	**Fordyce**	**Hidalgo**	**67.15**	**-0-**	**6/11/86**	**Y**	**F. Yturria et al.**
427d	**Cuevitas**	**Starr**	**94.52**	**-0-**	**6/11/86**	**Y**	**Yturria Trust**

File	Name	County	Acres	Water	Date	Deed	Remarks
430	Abrams	Hidalgo	34.38	-0-	2/13/80	Y	Miller
442	Palmview	Hidalgo	92.11	76.12	12/28/84	Y	Bledsoe
444	" "	Hidalgo	49.43	49.43	2/13/80	Y	Greene
444a	" "	Hidalgo	51.8	51.8	6/01/84	Y	Greene
511	Ramirez	Starr	29.36	-0-	7/03/84	Y	Longoria
513	" "	Starr	8.33	7.5	9/30/80	Y	Guerra, Narciso
514	" "	Starr	21.77	-0-	9/30/80	Y	Trevino
515	Guerra	Starr	8.08	7.5	9/30/80	Y	Guerra, Noel
517	Ramirez	Starr	6.2	6.0	10/28/82	Y	Guerra, E.S.
530	Pope	Starr	96.69	-0-	6/06/87	Y	Garza, G.A.
530a	Garza	Starr	143.68	-0-	6/06/84	Y	Garza, G.A.
565	Farias	Starr	2.58	-0-	7/20/82	Y	Farias

* Transferred from Santa Ana NWR 9/1/80
** Transferred from Laguna Atascosa NWR 9/1/80

Options were accepted on the following tracts in 1986:

File	Name	County	Acres	Water	Date
118	Ring Ranch	Willacy	633.8	pending	09/23/86
119	Beasley	Willacy	16.7	-0-	11/20/86
234	Sparks	Cameron	779.8	200.0	03/11/86
233	Bush	Cameron	48.0	-0-	09/04/86

Being involved with the acquisition of a new piece of land is a rewarding and satisfying experience. At the same time, however, at Rio Grande Valley NWR we feel a personal loss when an identified piece of habitat is lost before it can be protected. The threats (housing developments, socio-economic problems, etc.) to our land and wildlife resources in the Lower Rio Grande Valley are imminent and continuing at an alarming rate. Our present rate of land protection seems inadequate for this important task at hand. The most cost effective and resource conscious approach would be to secure the habitat that is critical to wildlife before it is put to another use. TIME IS OF CRITICAL IMPORTANCE IN MANY OF OUR ACQUSITION EFFORTS.

2. Easements

The use of conservation easements remains a viable preservation tool. A perpetual easement is an alternative for those owners who wish to participate but prefer to maintain ownership. Easements can be less expensive than fee purchase, reducing project costs. The typical easement grants USFWS wildlife management rights on the property while the owner retains other rights. Along the corridor, USFWS needs the right to post, fence, and manage the easement area and to prohibit the clearing of brushland or those uses that impact wildlife habitat such as grazing and public use. No easements were acquired by Rio Grande Valley NWR in 1986.

Some of the wetlands, particularly in the Mid-delta Thorn Forest and Coastal Brushland and Potholes Communities were suited as candidates for the easement program. It is critical, however, that easement documents be tailored to each case because wetlands require a different set of restrictions than either brushland or the river corridor.

3. Other

The total lease and management agreement acreage for RGV NWR as of 12/31/86 is 5,627.85.

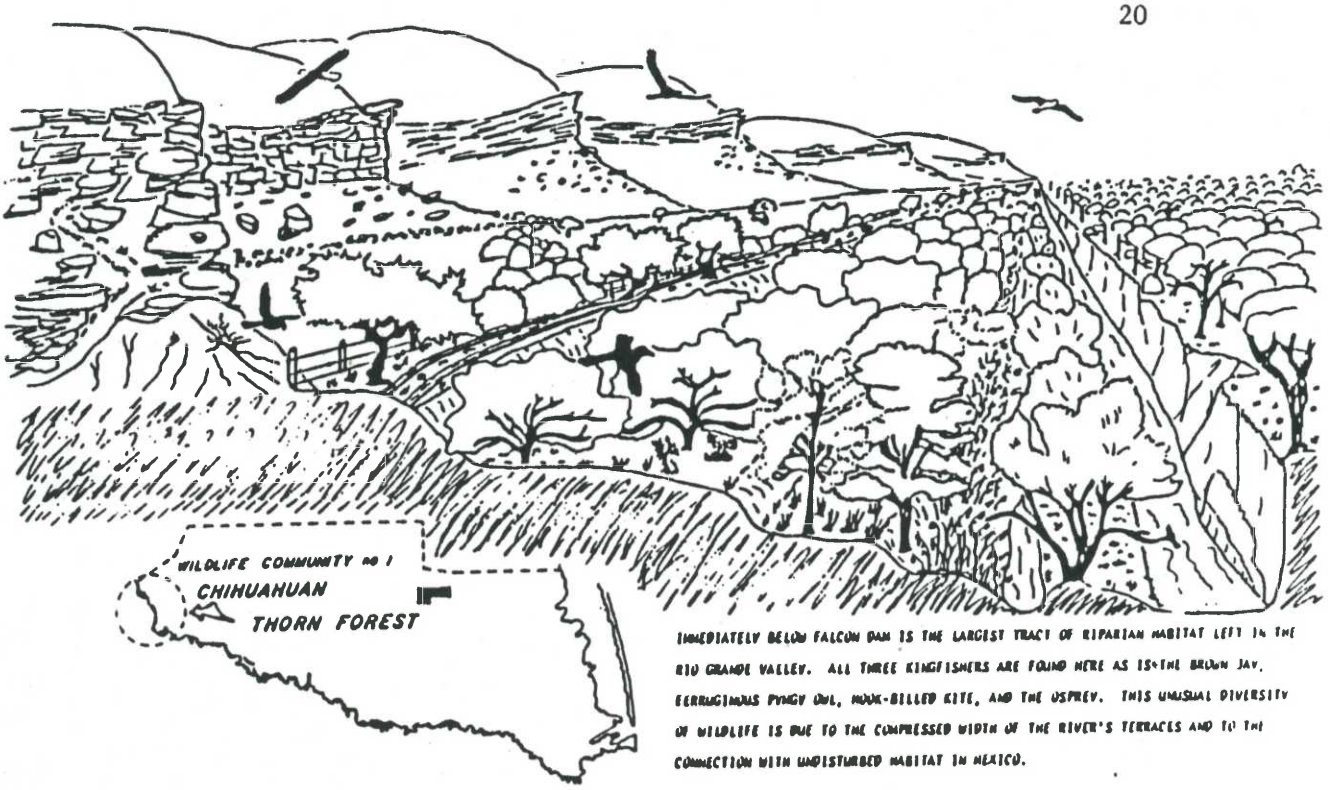
LEASES AND MANAGEMENT AGREEMENTS

File #	Name	County	Acres	Date	Remarks
210m	Loma Preserve	Cameron	4,627	8/09/83	mitigation, Port Brownsville
210am	Loma Preserve	Cameron	575	8/22/85	mgmt. agree., Port Brownsville
329m	Pharr S.B.	Hidalgo	425	5/31/75	HCWD#2 management agreement
658	**Kepler**	**Starr**	**.85**	**3/06/86**	**mgmt. (license) agreement**

Total acres (fee, lease and management agreements) for RGV NWR at the end of CY 86 totalled 18,727.54.

We are excited about the Kepler management agreement since this acreage is the first allocated for the Chihuahuan Thorn Forest Community. The unique feature of this community is the riparian zone and its ecotone with the river on one side and the desert scrub on the other. Kepler is important in that it is yet another link to the vital wildlife corridor. Without the establishment of this corridor, many unique wildlife and plant species would be forever lost.

Narrow Schrub/Riparian Ecotone
on the Kepler Tract (3/86, R.W.S.)



The Regional Office has assigned J.E.B. Stuart, a senior negotiator, to the Rio Grande Valley NWR project. He is now stationed in the Valley and is working on easements and fee acquisitions. Stuart has been a driving force in the land acquisition program here in the Valley. Making sure that details are covered is just one of Stuart's many professional traits. His expertise in negotiations also adds "class" to our land acquisition program.

J.E.B. Stuart (right) takes a Few Minutes to
Chat with MW Mancha (SA) (11/86, C.S.C.)

D. PLANNING

1. Master Planning

Master planning was addressed in the Planning Needs Assessment (PNA) in 1983 and and again in 1986. Master planning for Rio Grande Valley NWR is a LOW PRIORITY RANKING based on the following:

a. A Land Protection Plan for Rio Grande Valley NWR was developed according to the departmental directive dealing with future USDI land acquisition planning efforts as well as providing overall refuge planning/management guidance.

b. The acquisition effort is underway and it is necessary to devote existing personnel to this task.

c. The refuge has improved census techniques and methodologies and continues to gather baseline data which will provide management with better biological information for decision-making purposes. Permanent vegetation plots to monitor ecological succession on existing and acquired Rio Grande Valley NWR tracts as well as research projects to meet refuge objectives will be used.

d. The span of Rio Grande Valley NWR; the lack of restrictive management precedents; the habitat uniqueness; and the peripheral, endangered, and threatened habitat and species involved make Rio Grande Valley NWR a prime candidate for master planning at a priority level once necessary baseline habitat and wildlife data are gathered. at a future date master planning will be ranked a high priority.

The following are immediate planning needs for Rio Grande Valley NWR:

a. We will continue to gather baseline data on existing tracts of Rio Grande Valley NWR and expand data gathering to include new tracts as they are acquired. We recommend developing a habitat and wildlife inventory plan for Rio Grande Valley NWR.

b. We have developed a farm management plan based on the premise that these lands are best used as habitat for those wildlife species of management concern for the refuge (Section D.2).

c. We will develop a reforestation plan that together with the farm management plan will track each field from the time of acquisition.

d. In order to accomplish the refuge's objectives, we must accelerate land acquisition efforts and increase our staff to include another assistant refuge manager, an FMO, and a permanent four person fire/fence crew, with further staff increases as the project continues. An increase in O&M funding in FY87 is needed to cover additional salaries, water costs, vehicles, and revegetation materials.

Budgetary and staff ceiling planning at the regional level should consider an increase in personnel and funding for Rio Grande Valley NWR. Refuge personnel must continue the land acquisition effort, continue gathering data, and protect existing and acquired tracts; Rio Grande Valley NWR funding and staff need to be increased as soon as possible in order to keep pace with the program.

2. Management Plans

The Land Protection Plan for Rio Grande Valley NWR, together with the PNA, is currently serving as the station's primary guidance. The following are the objectives of that plan:

> The primary objectives of Rio Grande Valley NWR are to maintain existing wildlife populations and to preserve existing remnants of important wildlife habitat found in 11 of the most threatened biotic communities in the Lower Rio Grande Valley, Texas without the extirpation or extinction of any of 114 vertebrate species.

This community approach is necessary in order to separate the major wildlife and wildland resources in the Lower Rio Grande Valley. Each resource is unique and of equal importance in the protection of the Tamaulipan biota.

The Rio Grande Valley NWR safety plan is combined with Santa Ana NWR's.

The station's fire management plan was written in 1983 and will be updated in 1987.

A draft reforestation plan was begun by Vora.

The farm management plan was completed by Gilbertson in 1985.

3. Public Participation

In our seventh year of existence, public participation continues as a sensitive yet rewarding function. Major issues include:

- major drainage projects
- proposals to build additional international bridges to enhance local economic growth
- proposal by a private landowner to build a 12,000 acre resort in South Bay.
- water shortages related to competing use and residential growth
- the role of tourism in the Valley

These issues and others are addressed in monthly meetings of the Lower Rio

Grande Valley Development Council Environmental Resources Committee. Fuller normally attends these meetings.

4. Compliance with Environmental and Cultural Resource Mandates

A Land Protection Plan was written for Rio Grande Valley NWR in 1983 and a Finding of No Significant Impact (FONSI) was signed by the Regional Director. In 1986 the acquisition program was in compliance with this plan.

NEPA AND SECTION 7 DOCUMENTATION

Finding of No Significant Impact (FONSI)

> Based on a review and evaluation of the information contained in the supporting references, I have determined that the habitat preservation program in the Lower Rio Grande Valley, Texas is not a major federal action which would significantly affect the quality of the human environment within the meaning of Section 102(2)(c) of the National Environmental Policy Act of 1969.
>
> This proposal is in compliance with Executive Order 11988 "Floodplain Management", Executive Order 11990 "Protection of Wetland", and Section 7 documentation as required by the Endangered Species Act of 1973. Additionally, the proposal has been developed consistently with the Secretary of the Interior's new policy addressing state and federal relationships in managing fish and wildlife resources. Accordingly, the preparation of an environmental impact statement on the proposed action is not required.

The International Boundary and Water Commission (IBWC) has a river bank mowing program whereby in the past they have mowed widths of 200 ft. and more along the river bank at some locations below Brownsville. The mowing of the river bank on our Boscaje de la Palma Tract continued after USFWS acquisition without our knowledge or permission. We contacted IBWC and were informed that they had a 200 ft. wide easement along the river. They continued to mow, and in some places mowed less than the full 200 ft. width. We later determined that the mowing was not supported by any permit or easement. Mowing is in direct conflict with refuge objectives for the immediate river bank and IBWC was informed in 1985 that they would need to apply for a R.O.W. permit. As of December 31, 1986, IBWC still had not applied for a R.O.W. permit. We also will need to work closer with IBWC with regards to preventing improper disposal of household garbage on their property adjacent to our Cottam Tract. That trash is getting into the resaca which is shared with the refuge.

On the Pate Bend Tract, the City of Hidalgo has a stormwater outfall that has eroded over time and now constitutes an erosion threat to refuge property as well as a threat to human safety. The city has an easement for a 50 foot wide right-of-way. The proposed restoration project will go beyond this right-of-way limit. Since we cannot amend an easement that is not ours to grant, it was recommended by Tom Smith (RO) that a special-use permit be granted by the refuge manager to allow work to be accomplished on

the area beyond their easement. This project has been followed closely by the refuge manager over the past two years and several resource concerns have been addressed and incorporated into the new proposal. If the permit is accepted by city officials, the project will be completed in 1987.

Developers of the proposed Playa del Rio, a 12,665 acre resort and recreational development in the wetlands adjacent to South Bay in Cameron County, applied for a permit from The U.S. Army Corps of Engineers in March 1986 to build the resort. A public hearing was held in Brownsville in August 1986. Jim Young (RO) represented the U.S. Fish and Wildlife Service at this hearing and delivered this message:

> The permit application for the construction of the proposed resort and recreational marina development describes a plan to dredge 40 million cubic yards of material to create 48 miles of channels and ten boat basins. Over five square miles of open water and wetlands would be dredged and another seven square miles of the same habitat would be buried to facilitate the development of residential areas, commercial spaces, golf courses, schools, utility sites, and an airport. Adjacent upland habitats on the barrier island and on the lomas would also be subjected to these developments.
>
> No other residential canal development in the U.S., let alone Texas, has ever involved the planned destruction of so great an extent of wetlands. The project's potential adverse impacts to thousands of acres of mudflats, marshes, shellfish beds, waterfowl wintering areas, unique brush associations, fish nursery grounds, sand dunes, and endangered species habitats are without precedent. The Service presumes that these significant habitat losses are avoidable, because most of the project features are not water-dependent. The disposal of dredged or fill material in special aquatic sites for non-water dependent activities is not in accordance with the Environmental Protection Agency 404(b)(1) guidelines.
>
> We recommend that particular attention be paid to the short- and long-term impacts of connecting the waters of the Rio Grande to South Bay. The potential for the proliferation of water pollution, the alteration of salinity regimes in fish and shellfish nurseries, and major changes in sedimentation patterns appear significant. Likewise, the Service recommends an exhaustive analysis of the cumulative impact to the area's dynamic upland ecosystems, particularly those of the barrier islands and lomas. In addition, the cumulative impacts from similar types of developments that will be stimulated by the Playa del Rio project must be considered.
>
> The Service's responsibility regarding this project is not limited to commenting on the proposed Corps of Engineers permit. A substantial portion of the project site lies

within an existing undeveloped unit of the Coastal Barriers Resources System. Congress established the system to minimize the loss of human life, wasteful expenditure of Federal revenues, and damage to fish, wildlife, and other natural resources by restricting future Federal expenditures and financial assistance which have the effect of encouraging development of undeveloped coastal barriers. The Boca Chica Unit of the system contains resources of scenic, scientific, recreational, natural, historic, archeological, cultural, and economic importance which would be irretrievably damaged and lost due to the Playa del Rio project.

In accordance with the Coastal Barrier Resources Act, Federal agencies must consult with the Fish and Wildlife Service on their exemption requests to provide new funds for activities on undeveloped coastal barriers, such as the Boca Chica Unit. If the exemption request does not meet the intent of the Act, the Service would recommend denial. This could preclude federal dollars for VA and FHA mortgage loans; grants for sewage, water, and utility systems; funds for road construction and maintenance and shoreline restoration; assistance for hurricane protection; and most importantly, Federal flood insurance.

In closing, let me repeat that this project has had no equal for actual and potential damage to coastal wetlands in Texas, and its impacts to the unique upland habitats are hardly less significant. The COE and the State of Texas have a good track record in Texas for protecting wetlands from non-water dependent dredge and fill activities: If this permit, the largest non-water dependent action ever, is approved, how will we say no to other developers? From a national perspective, it is clear that Playa del Rio epitomized the kind of development in wetlands and on the coastal barriers that Congress wishes to discourage. We have given top priority to make the case against the use of wetland resources for the non-water dependent activities proposed for this project. THE SERVICE RECOMMENDS IN THE STRONGEST POSSIBLE TERMS THAT PLAYA DEL RIO'S APPLICATION BE DENIED.

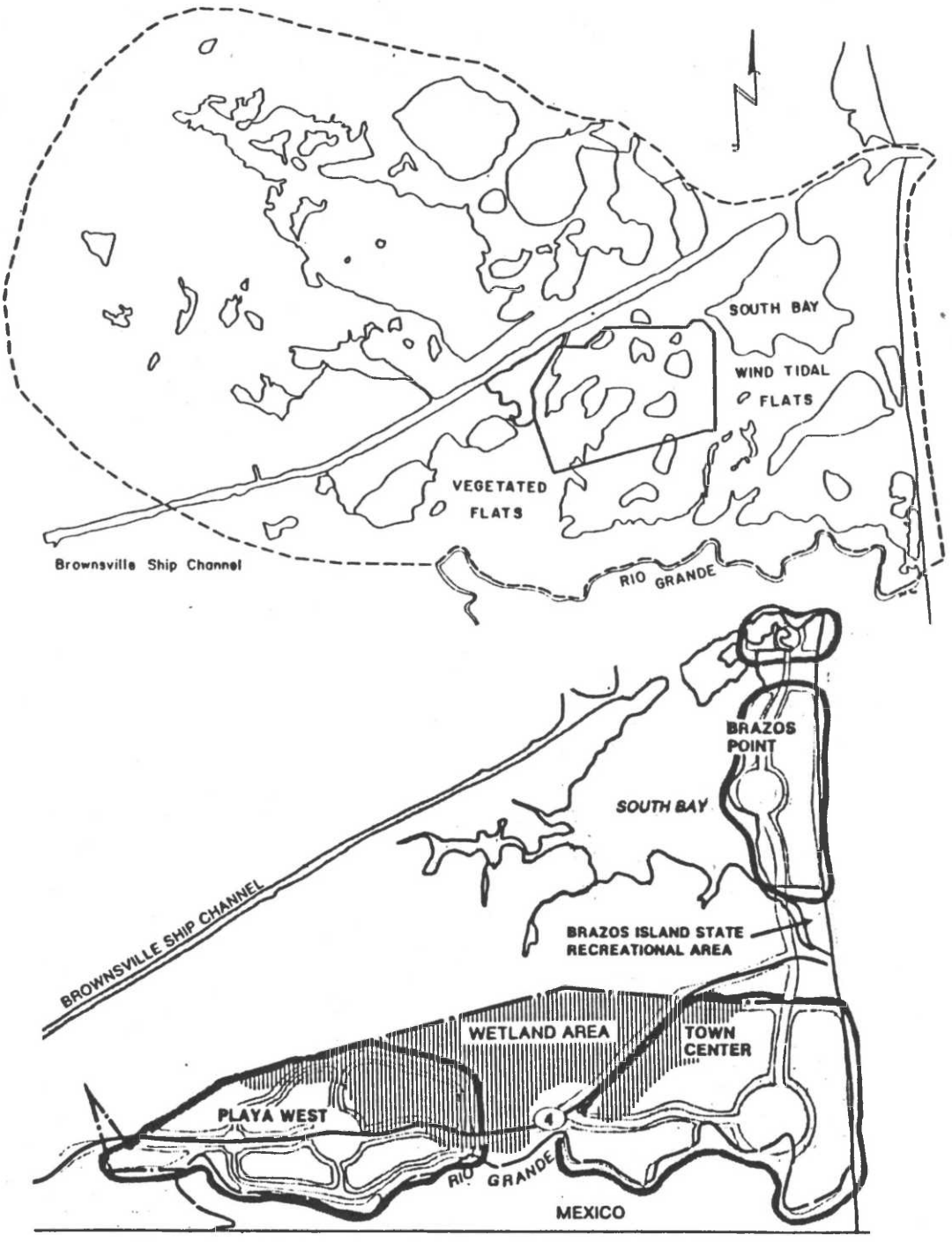
We are certainly supportive of the stand the USFWS is taking on this issue. The Service gained much credibility with the community concerning this clear statement. The "bottom line" is right.

The magnitude of the impact of Playa del Rio on the nation's wildlife resource is displayed via a pair of maps on the following page. The top map depicts one of the 11 biotic communities identified in the Rio Grande Valley in need of protection from the threat of significant land use change. This community includes the existing Loma Preserve; Redhead Ridge, a waterfowl refuge candidate; South Bay, a National Marine Sanctuary candidate; Brazos Island State Park; and the civil war battlefield Palmetto Hill, proposed as a National Park site. The terminal 20+ miles of the wildlife corridor for RGV NWR is a primary site for wintering peregrine falcons, and the major north/south coastal corridor connecting Mexico's fauna with Laguna Atascosa NWR.

LOMA / TIDAL FLATS

(Community Map)

RIO GRANDE VALLEY NWR



The Houston Post/Sun., March 16, 1986/ 7B

Post map by Dick Westbrook

5. Research and Investigation

In CY 86, the refuge received a proposal from Applied Ecological Services, Judea, WI, to conduct lichenological investigations on several refuge tracts. This study was proposed because lichens are sensitive environmental components which are especially vulnerable to air pollution, and thus serve as biological indicators of sulphur compounds, heavy metals, and radionucleotides. The recent development in Mexico, in close proximity to RGV NWR tracts, of a coal-fired power plant, increases the likelihood of sulphur contaminants in the atmosphere, which may threaten the air quality and sensitive biological organisms on the refuge. Due to funding constraints of Applied Ecological Services and the refuge, this study has yet to be implemented.

The following investigations were authorized by Special Use Permits in CY 86:

Rio Grande Valley NR86 - "Distribution, Abundance, and Habitat Preferences of Ocelot and Jaguarundi in South Texas" (21552-007)
Investigator: Dan Twedt, Caesar Kleberg Wildlife Research Institute, Kingsville, TX
RGV-86-01

This study was the conclusion of a two-year project investigating the distribution and habitat preferences of ocelot and jaguarundi in South Texas. Only two weeks of trapping, involving 313 trap nights at the Yturria Brush Tract, were spent on RGV NWR tracts. No endangered ocelots or jaguarundis were caught. Captured species included one bobcat, one coyote, two raccons, two raccoons, one Harris' hawk, and five opossums (See Section G.2 for comprehensive results).

Rio Grande Valley NR86 - "Ichthyological Seasonality and Water Parameters" (21552-016)
Investigator: Matthew Ciomperlik, Department of Biology, Pan American University, Edinburg, TX
RGV-86-02

This study was a continuation of a project began in CY 85 at the Vela Woods Tract, examining the effects of pesticidal use on selected RGV fish species, including water quality analysis. The study was initiated because empty containers of Prefar, an herbicide, were found at this site. The project examined the tolerance of certain fish species to Bensulidae, the active ingredient in Prefar. A pond at Vela Woods was the sight for seine samples No collections were obtained in two seine attempts in January. In February, the investigator was able to collect approximately a dozen mosquitofish Gambusia affinis. During the remainder of his study this pond was in drawdown, thus no additional samples were collected. Results from water quality analysis revealed the Vela Woods water had a pH between 8.0 and 8.1 in January and February, respectively. This water also had dissolved oxygen of 9.4 mg and 9.7 mg for the same period. The investigator concluded from his studies that the pond showed very high amounts of formaldehyde which could have been a result of the use of the herbicide, and which could be potentially responsible for fish toxicity in species such as the Rio Grande Perch, Cichlasoma cyanoguttatum.

E. ADMINISTRATION

1. Personnel

Refuge Staff (left to right): 5, 13, 7, 12, 10, 2
4, 3, 6, 9 (2/87, B.P.)

PERSONNEL

1. Nita M. Fuller.....Complex Proj. Leader.....GS-485-12 PFT
2. Bob Schumacher.....Refuge Manager.....GS-485-11 PFT
3. Nancy Gilbertson....Assistant Refuge Manager.....GS-485-9 PFT
4. Claire Caldes.....Assistant Refuge Manager....EOD 10/86, GS-485-9 PFT
5. Joel David.....Assistant Refuge Manager....EOD 06/86, GS-485-7 PFT
6. Philip Garcia.....Assistant Refuge Manager....EOD 01/86, GS-485-5 PFT
7. Robin Vora.....Forester.....GS-460-9 PFT
8. Michael Bornstein...Biologist.....EOD 10/86, GS-486-7 PFT
9. Zachary Labus.....Biol. Tech.....EOD 06/86, GS-404-5, Temp.
10. David Alanis.....Fire Fighter.....WG-3502-3, Temp.
11. Alfonso Avila.....Fire Fighter.....WG-3502-3, Temp.
12. Juan Rodriguez.....Fire Fighter.....WG-3502-3, Temp.
13. Victoria Pulaski....Fire Fighter.....WG-3502-3, Temp.
14. Greg Bryant.....SCA Intern.....EOD 04/86, Vol.
15. Karen Walter.....SCA Intern.....EOD 07/86, Vol.
16. Ruth Starman.....SCA Intern.....EOD 10/86, Vol.
17. Russel Wagner.....Ecologist.....EOD 02/81, Vol.
18. Duncan MacLulich....Forester.....EOD 11/82, Vol.
19. Bob Kletzly.....Refuge Manager.....EOD 12/83, Vol.
20. Harold Burgess.....Refuge Manager.....EOD 12/83, Vol.
21. Ruth Burgess.....Wildlife Data Collector.....EOD 12/83, Vol.
22. Elias Brown.....Wildlife Data Collector.....EOD 12/82, Vol.
23. John Messerly.....Computer Programer.....EOD 12/84, Vol.

Rio Grande Valley NWR Personnel Strength

FY	PFT	OTHER	FTE
86	6	6*****	10.5
85	4	5****	8.5
84	3	2***	5.0
83	2	1**	2.16
82	1	1**	1.2
81	1	1	2.0
80*	1	2	NA

* First reporting year for Rio Grande Valley NWR
** 60 day special needs appointment (bio-tech)
*** 4 month appointments (co-op students)
**** One co-op student and fire crew of 4 individuals
***** Temporary bio-technician, fire crew of 4 individuals, and one full-time ARM "borrowed" from Santa Ana NWR

Rio Grande Valley NWR received a shot in the ARM (assistant refuge manager's series) with an increase in staff this year. Two permanent, full-time positions and one temporary position were added during the course of the year.

Philip Garcia, a graduate of New Mexico State University, came to us as a permanent employee from the Service's cooperative education program. Philip began his duties of assistant refuge manager in January.

ARM Philip Garcia Takes a Break from
Seeding the Pharr Settling Basin Horseshoe Island (9/86, R.V.)

In June, Joel David transferred from Kofa NWR as an assistant refuge manager. Joel's primary duties have included assisting with cropland phaseout programs for the refuge, serving as Complex Safety Officer, and managing the Resaca del Rancho Viejo Unit.

In October, Claire Caldes transferred from Imperial NWR to assist in the Complex's growing staff. Claire was given the responsibility of managing the refuge's water/oil and gas rights, supervising the fire crew, and managing the Yturria Tract.

Michael Bornstein filled the position of wildlife biologist in October. A master's degree graduate from the University of Colorado, Denver, Michael transferred from the Denver Wildlife Reseach Center. Michael's primary duties include coordinating the refuge's biological programs and organizing baseline data collection.

Zachary Labus started work as a seasonal biological technician in June. Zachary's main duties include assisting the refuge's forester with revegetation and plant inventory projects.

Bio. Tech. Zachary Labus (11/86, R.V.)

Rio Grande Valley NWR has made some progress in the number of personnel necessary to start getting some of its objectives accomplished. However, the staff now has the dubious headache of trying to get back on its feet (ie. back logged paperwork, etc.). Help from SCA interns, volunteers, coop students, YCC enrollees, fire crew members, and Santa Ana NWR staff members is still needed and greatly appreciated. We are combining the concepts of

collateral duties and maximum utilization of other than PFT positions (Section E.1). We still can do a better job for the resource--which is the reason for our establishment in the first place! We cannot, however, proceed much further along these lines without further increases in PFT staff. We shall always need to continue our present team approach and we will continue to utilize the expertise of the specialists at Santa Ana NWR to prevent unnecessary replication of facilities and positions, BUT WE NEED THE BRUTE FORCE OF ADDITIONAL PFT STAFF TO SERVE THE BASIC NEEDS OF THE WILDLIFE RESOURCE.

Thanks Go to MW Fermin Mancha (SA) for All His
Welding Work on RGV NWR Cable Gates (4/86, R.W.S.)

2. Youth Programs

Once again, as in previous years, this year's YCC program was combined with Santa Ana NWR's youth program. Rio Grande Valley NWR shared in the benefits of their labors. Frank Bryce (SA ORP) was in charge of the combined program. Again, the crew's major accomplishment involved the collection of native tree seeds for Rio Grande Valley NWR's revegetation program. Over 500,000 huisache, and 5,000 retama, coral bean, and Texas ebony seeds were collected in all. The YCC crew also completed installation of the second drip irrigation system at the Palmview Tract and seeded the newly completed field with over 700 seeds and 600 seedlings.

YCC Hard at Work Collecting Native Seeds (8/86, SLF.)

Supervision was provided through a contract with Kootenai Salish College. Two individuals were selected for the group leader positions. These supervisors were vital in getting work projects accomplished and allowing the refuge staff time to concentrate on refuge matters.

Through recruitment we were able to attract applicants who were interested in learning about the refuge and environmental issues. Benefits of the program to the enrollees and the resource (in future years) cannot be evaluated; however, hopefully the "seed" was planted in these youngsters to make them more aware of resource problems and environmental issues that will touch everyone in the coming decades.

3. Other Manpower Programs

Many thanks are in line for Martin Suhr, USFWS Fire Coordinator, who worked with us in acquiring necessary equipment for our fire crew. Our intermittent fire crew began its third year of operation in January. Nineteen fires were reported for CY 1986 (Section F.9). Five of these fires were quickly extinguished by the crew while on routine fire patrol. Even when the fire season was closed, our fire crew was busy building fence (limiting vehicle access to high fire threat areas) including projects at the Barretal Tracts, Palmview Tract, and the Loma Preserve Tracts. At present, ARM Gilbertson is our Fire Management Officer (FMO) with ARM Caldes serving as fire crew supervisor. We have reached the point, however, where the refuge needs a full-time FMO.

Example of One of the Fire Crew's
Greentree Firebreaks (4/86, R.W.S.)

Fire Crew with Supervisor Caldes
(Avila Unavailable for Photo) (2/87, B.P.)

The Student Conservation Association (SCA) recruits young men and women interested in preserving and managing this nation's natural resources. The students assist the refuge in numerous biological activities, and, in return, acquire knowledgeable experience that they can put to use later in their careers. Rio Grande Valley NWR is very pleased with the program, and plans to continue it as long as the budget allows. Until our permanent staff has caught up with refuge growth we are dependent on the SCA program.

Greg Bryant began his twelve week SCA internship in April. Greg was very helpful in gathering data on wildlife and plant communities, propagating native plants in the greenhouse, entering field data into our computer, and filing reprints of scientific articles in our library. Greg also assisted Texas Parks & Wildlife Department with their white-winged dove surveys before his departure in late June.

SCA Intern Greg Bryant Hard at Work (6/86, R.W.S.)

In July, Karen Walter, a graduate of Virginia Polytechnic Institute and State University, began her SCA internship at the refuge. Karen was responsible for conducting woody plant inventories and bird censuses, filing of scientific reprint articles, and entering wildlife data into our computer.

With the completion of Karen's work term in September, Ruth Starman was recruited to begin her SCA internship in October. A graduate of Kearney State College, Nebraska, Ruth continued many of the work projects that Karen began until her departure in December. All three of these SCA interns were greatly appreciated for their hard work at Rio Grande Valley NWR.

4. Volunteer Programs

Rio Grande Valley NWR is also greatly indebted to the people who have donated their time and energies to helping us (directly or indirectly) meet our goals. Without such devoted folks, many projects would never even get off the ground. Their help is greatly appreciated.

Dr. Russel Wagner is one of those folks. Dr. Wagner, a retired ecologist from the University of Wisconsin, remeasured the five year old revegetation plots at the Cottam Tract.

Volunteer Russel Wagner (4/83, R.V.)

Dr. Duncan MacLulich was back for his fourth year as a volunteer. A retired forester from the University of Toronto, Ontario, Dr. MacLulich worked on the Gabrielson Tract wildlife survey and it's associated computer program.

Elias Brown, a retired businessman and avid birder, supplied us with excellent bird census data from the Palmview and La Coma Tracts.

Bob Kletzly was back for his third year as a volunteer at the refuge. Mr. Kletzly, a retired state game refuge manager from West Virginia, was very helpful in conducting the bird surveys at the Pharr Settling Basin, Palmview, La Coma, and Gabrielson Tracts.

John Messerly analyzed inventory plot data from Santa Ana NWR and the Palmview Tract using M-Basic computer programs.

Retired refuge manager Harold Burgess and his wife Ruth surveyed many Rio Grande Valley NWR tracts for wildlife and habitat information including the Resaca del Rancho Viejo and Glick options. An excerpt of one of the Burgess' surveys follows:

> From 9 am. to 3 pm. December 23, 1986 Ruth Burgess and I surveyed the La Sal Vieja Unit's Rudman and Beasley Tracts. We started in the southeast corner of the Rudman Tract driving north on the West Road and reporting wildlife as encountered. I walked through the Rudman woods while Ruth continued around by car to the north gate. We then proceeded east on the North Road; south on the Middle Road to Highway 186; east to East Road; north to North Boundary and west to Middle Road. One sign was removed and the other shot up at the northwest corner of the south inholding of the East Road. A sign and post had also been removed from the north end of Middle Road. A number of signs had been bent away from wooden posts. Perhaps strong winds have done that, but I found it impossible to bend them back with the "armstrong" method.
>
> We were suprised to find no waterfowl on Rudman Lake. This may be due to lack of aquatic food or harassment by hunters. We saw hunters drive by the lake, but found no signs of hunting trespass. We found 41 bird species compared to 34 on the Rudman Tract on November 19th.
>
> The Beasley Tract west boundary is fenced with new woven wire running 8" X 6" at top to 3" X 6" at bottom. The north boundary is fenced with heavier and higher woven wire 12" X 10" at top to 4" X 10" at the bottom. This tract's west border is covered with a thick thornbush of Ebony, Mesquite, Granjeno, and Prickly Pear thinning out to near the salty inlet waters which bisect this area. The extreme southeast portion of the Beasley Tract is fringed with heavier thornbush, consisting of Ebony, Granjeno, Colima, Mesquite, etc. thinning to Mesquite, some other thorns and grasses inside. Service access is a problem with this tract. At least one entire day would be needed to acquire basic biological data.

Again, we appreciate our volunteers very much. We just cannot say enough good things about them. Words, however, don't even come close to expressing our appreciation for their devoted energies. Their enthusiasm greatly lifts the spirits of each member of the refuge staff . . . . everyday!

5. Funding

Established January 30, 1980, Rio Grande Valley NWR received an initial "start up" budget of $95,400. For the first two years, funds for this refuge were obligated by Santa Ana NWR and were used to meet expenses on both refuges. The situation has reversed, however, with Rio Grande Valley NWR obligations increasingly impacting Santa Ana NWR's budget. While FY 86 funding marked the highest budget for Rio Grande Valley NWR since its establishment, we continue to widen the money gap between basic expenses and O & M fund levels. FY 82 is the first accurate glimpse at O & M funding for this refuge. Only in FY 84 did funds allocated to RGV NWR begin to be spent on RGV NWR. Budget levels were stagnate for four years (1980-1983) while the refuge grew in size creating a combined staffing and O & M problem that has yet to be resolved.

FY 86 FUNDING

Program	Amount
1260 (O&M)	$227,946
1510 (Fire)	34,943
Management Resources Total	$262,889

Rio Grande Valley NWR O & M Budget since establishment is shown for comparison:

FY	FTE	Amount
86	10.5	$227,946
85	8.5	149,500
84	5.0	129,500
83	2.16	61,100
82	1.2	56,000
81	2.0	105,700
80*	NA	95,400

* First Year of Operation

This year's budget represents an increase over FY 85's budget. This budget will help this refuge to operate as a discrete unit of the National Wildlife Refuge System. Reliance on Santa Ana NWR for funding hinders Rio Grande Valley NWR's capability to operate in a safe and efficient manner, and to carry out its stated objectives, to say nothing of the drain and priority shifts of needed projects required by Santa Ana.

6. Safety

Because Rio Grande Valley and Santa Ana NWR's are complexed, our safety program has been combined with that of Santa Ana's. Since ARM Labuda's (SA) departure in the fall of 1985 the Complex had been without a designated Safety Officer. In September, the Complex again had an official Safety Officer when ARM David was designated as such. Staff safety meetings were held irregularly throughout the year until November when a monthly safety meeting schedule was implemented.

During September, a safety committee was formed consisting of ARM David as Safety Committee Chairman with MW Mancha (SA) and ORP Morrissey (SA) serving as committee members. The committee met monthly with the intention of actively soliciting input into the safety program from all station employees. This was done both verbally and through the use of a safety hazard form (see example on following page) in which employees were encouraged to write down safety hazards and safety improvement suggestions. The hazard forms were instituted in October. They were used sparingly by the staff through the end of the calendar year.

As in past years, concern about personnel safety along the border require us to work in pairs during field assignments. A vehicle checkout log and portable radios added to our personnel safety net. When traveling to any field location, Complex employees are required to sign out and to call in to headquarters and give their destinations. Anytime refuge personnel move between tracts of land they are again required to call in and give their new destinations. When commencing travel back to the refuge headquarters, employees must call in and give their approximate ETA. Employees sign in via the check-out log upon their return to headquarters, resulting in a procedure through which all employees and volunteers can be accounted for at day's end.

During CY 86 RGV NWR personnel were involved in five reportable accidents. Lost workdays during the year totaled twelve.

Reported accidents were as follows:

1) 01/29/86 - Refuge employee had a piece of fencing staple become embedded in individual's thumb while constructing fence on our Palmview Tract.

2) 04/29/86 - Refuge personnel was fencing on our Lomas Tract when employee accidently stepped into a yucca plant. The sharp pointed plant stabbed the individual in the knee resulting in one day of lost work time.

3) 05/06/86 - Fire crew member slipped and lacerated left little finger while picking up hog wire by the old YACC warehouse.

4) 10/14/86 - Refuge employee experienced severe lower back pain shortly after lifting a bag of cement and a gate pipe. This accident resulted in eleven days of lost work time.

5) 12/20/86 - Individual was identifying a sick raptor when the bird grabbed the right hand with its talons. The talons punctured the hand in three different places.

HZD #_____

SANTA ANA/RIO GRANDE VALLEY NWR's

Report of Safety Hazard

Date:_____

Submitted by:_____

Location of Hazard:_____

_____

Description of Hazard:_____

_____

_____

xxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxx

(do not fill in - safety committee use only)

Danger status: High:_____
Moderate:_____
Low:_____

Proposed corrective action:_____

_____

_____

Estimated cost:_____

Reviewed by:_____ Date:_____
Safety Committee Chariman

xxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxx

Approved by:_____ Date:_____
Refuge Manager

Disapproved:_____ Date:_____
Refuge Manager

Remarks:_____

_____

_____

1986 STAFF SAFETY MEETINGS SANTA ANA / RIO GRANDE VALLEY NWR'S

MONTH	PROGRAM	PRESENTOR
April	Fire Procedures	Nita M. Fuller
September	Pumper Truck Operation	David Alanis
November	Back Injury	Joel David
December	Heavy Equipment Safety	Fermin Mancha (SA)

Safety related actions during CY 86 are as follows:

A. In February, Mancha (SA) fixed the fire units and built a tire rack for the jeep fire unit.

B. In May, Mancha (SA) replaced the hand primers on both pumper units.

C. YCC enrollees, group leaders, Bryce (SA) and Morrissey (SA) attended an eight hour American Red Cross Multi-Media Standard First Aid Course in Harlingen on June 10th.

D. All RGV NWR staff members had their hearing rechecked during July as part of the hearing conservation program.

E. Our fire extinguishers were inspected, recharged and tagged by a local company in August.

F. The Emergency Personnel List and Fire Dispatch Plan were updated in August to reflect recent personnel changes.

G. In September, the function and organization of the new safety committee was discussed and a monthly meeting format was agreed to.

H. The safety committee instituted a monthly inspection schedule for the Complex's fire extinguishers in September.

I. Also in September, concern over a possible fire hazard led us to move our supply of calcium hypochlorite from the solar room to an isolated bunker for storage by itself.

J. In October, a painting respirator and additional dust masks were purchased for use by station employees.

K. In November, all of the Complex's generalized safety equipment, i.e. gloves, goggles, ear plugs, etc. were consolidated into a centralized location.

L. In an attempt to keep our water jugs from spilling over and to reduce wear and tear on the jugs, water jug holders were fabricated for our fire trucks in November.

M. In December, face visors in the shop were inspected by the safety committee. Several were replaced, while others just required cleaning.

7. Technical Assistance

a. Vora and Gilbertson attended the Texas Academy of Science Symposium. Gilbertson, a member of the Conservation Committee, helped introduce USFWS speakers. Vora presented a slide program entitled "Propagation of Native Plants of the Lower Rio Grande Valley from Seeds and Cuttings."

b. In November, Fuller and Schumacher met with National Audubon Society's President Peter Berle and Vice President Dede Armentrout, Southwest Region. Both toured Rio Grande Valley NWR tracts on the ground and in the air. The National Audubon Society is interested in the land acquisition program at the refuge in order to help protect natural areas in the Valley.

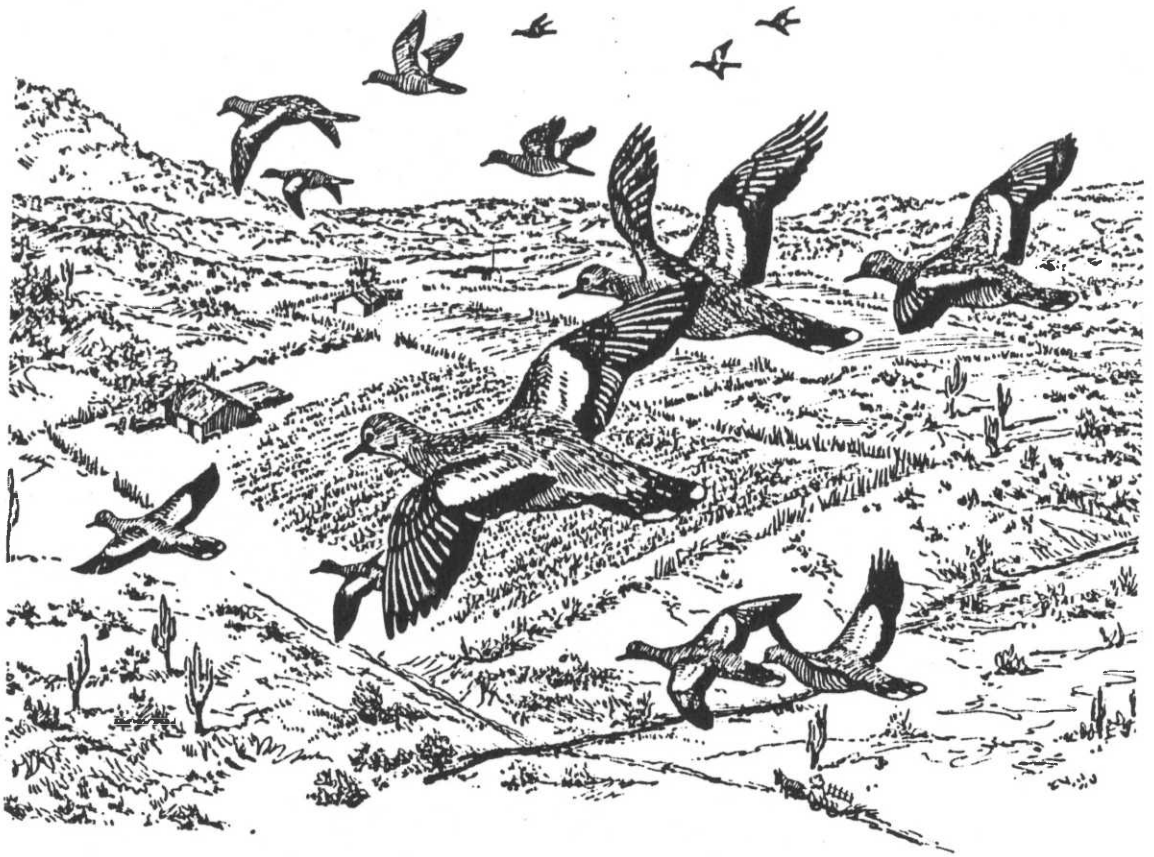
c. All of our staff are interacting more with the community especially in wildlife and plant inquiries. "What do I do with?" and "How do I plant?" questions are being answered more with each passing day. These inquiries help us explain our objectives to interested individuals and establish a good rapport with the community. Community support for the refuge has grown tremendously over the years. As a direct result, local environmental groups such as the Native Plant Project and the Lower Rio Grande Valley Nature Center (see Information Packet for pamphlets) have been established to help carry out our Land Protection Plan objectives.

Community Support is What It's All About (12/84, R.W.S.)

8. Other

This is our seventh year of operation as a refuge. Rio Grande Valley NWR was established during a period of austerity. This refuge runs on community support, and is dependent on borrowed, volunteer, and temporary personnel for many of its accomplishments. Unfortunately, time constraints and safety considerations limit many kinds of assignments essential for the refuge to meet its objectives. We have learned a lot over the past seven years about the strength and willingness of the community to contribute and work for wildlife. We have projected the philosophy of "Give a dime and an hour of staff time, and we will see to it that wildlife in the Rio Grande Valley gets a full dollar and a full day's worth in return." As evidenced by the contents of this report, we have growing pains, and we are beyond nickles and dimes now. We can do the job. We have the community commitment. We now need growth in permanent staff and funding as designed to continue.

Do not mistake our comments as despair or negativity. We are, however, serving notice as to what we see. Despite these constraints, we have had the opportunity to meet many fine people. These people have volunteered their time and labors in a very enthusiastic way. It gives us a good feeling to know that there are people of this calibre in the community, but there is an even greater satisfaction in being able to utilize this human enthusiasm for the benefit of the resource!



F. HABITAT MANAGEMENT

1. General

The management objectives of Rio Grande Valley NWR are to:

a. Maintain through purchase and management those 114 species identified in the Land Protection Plan (1983) as endangered, threatened, peripheral, or of other special management concern at 1979 population (baseline) levels in Cameron, Willacy, Starr, and Hidalgo Counties.

b. Protect and maintain special areas of unique wildlife habitat including, but not limited to, the 11 biotic communities identified thus far (see Introduction).

c. Preserve habitat and revegetate land in order to maintain the historic September Valley population of 1,000,000 white-winged doves.

This is the sixth year we have been establishing permanent plots on our properties and measuring woody vegetation. Five years after each inventory is completed, the plots are remeasured to obtain data on plant associations and succession. To date, 146 plots have been established on 18 tracts of Rio Grande Valley NWR, Santa Ana NWR, and on the Audubon Sabal Palm Sanctuary. Most plots were established in early successional areas because these are the most dynamic and therefore the most critical. These plots are also used to measure wildlife populations. Seven plots at the Palmview Tract were remeasured because they had been established in 1981. As predicted, the large old mesquite trees are dying out and later successional species of woody plants are taking over. A preliminary comparison report using an M-Basic computer program will be out in 1987.

Revegetation efforts are continuing through hand planting and mechanical planting of native seeds and seedlings. We have also tried cluster plantings consisting of 4-5 different seedling species; here we are trying to duplicate natural associations found in the inventory plots. During the 1986/87 farming season, we planted over 600 acres with native seeds and seedlings on 10 tracts.

The experimental drip irrigation system on the Palmview Tract was expanded another acre this year by ARM David and YCC enrollees. Approximately 700 native seeds and 600 seedlings were planted in this new section. The seedlings planted last year seem to be doing well, but there does not seem to be a significant difference between the growth/survival rate of these plants compared to plants planted in areas without watering systems. We will continue to monitor the seeds/seedlings for comparative purposes.

Vora is proceeding with the woody vegetation inventory and revegetation effort. He has authored and co-authored several papers and reports. The first one listed below was presented by Vora at 1986 Texas Academy of Science Symposium:

Germination of Native Plants of the Lower Rio Grande Valley from Seeds and Cuttings

Soil Differences Between Native Brush and Old Fields in the Lower Rio Grande Valley of Texas

Woody Plant Inventory Program Rio Grande Valley National Wildlife Refuge

Revegetation of Old Fields with Texas Ebony and Huisache

Survival of Planting Island at Pharr Settling Basin

Propagation of Two Southern Texas Shrubs by Stem Cuttings (submitted to the Texas Journal of Science)

Estimating Basal Area At Breast Height of Multiple Stem Trees in South Texas

These investigations have brought us closer to managing the refuge as an ecosystem. This research has helped to advance the revegetation program. Our major drawback in the revegetation program is the lack of an abundant seed source and a means of collecting, cleaning, and storing large quantities of seeds, as well as proper equipment to plant several varieties of seeds through the same hopper during each field operation. We are still in the infant stages of trying to interest local nurseries to grow native seeds; however, that has improved over the past year. Nine nurseries grew over 9000 seedlings for the refuge.

Planting Seedlings (3/85, N.F.)

INVENTORY PLOTS COMPLETED (12/31/86)

Biotic Comm.	Eco/Mgmt Unit	Tract	Acres	# Plots
Chihuahuan Thorn Forest	Salineno	Kepler	00.85	0
Upper Valley Flood Forest	Yturria	Los Ebanos	34.4	2
	La Grulla	La Grulla	76.3	0
Barretal	Garciaville	Pope, Garza	240.4	3
Upland Thorn Scrub	Yturria	Yturria	1668.84	6
	Yturria	Havana	158.7	2
Mid-Valley Riparian Woodland	None	Abrams	34.4	0
	Anzalduas	Gabrielson	702.6	2
		Cottam	565.7	40
		Coyote Banco	64.6	0
		Madero	247.7	0
	Santa Ana	Pharr S. Basin	643.6	9
		La Coma	254.6	7
		Vela Woods	220.4	16
		Santa Ana NWR	1867.9	33
	Santa Maria	Santa Maria	512.8	1
		Garza-Cavazos	115.4	1
Mid-Delta	None	Madero	247.7	0
	Santa Ana	Pharr S. Basin	643.6	9
	None	Noriega	200.0	2
Woodland Potholes and Basins	La Sal Vieja	Payne	546.3	1
	La Sal Vieja	Rudman	3963.5	6
Sabal Palm Forest	Boscaje de la Palma	Boscaje de la Palma	365.0	3
		Aud. Sabal Palm	177.0	1
	None	Brownsville	17.4	0
Loma/Tidal Flats	Loma Ecol. Preserve	Loma Ecol. Preserve	4600.0	0
Coastal Brushland Potholes	-----	-----	-0-	---
Ramadero	-----	-----	-0-	---

RGV NWR LAND TYPE INVENTORY 1986

	WETLAND TYPES				UPLAND TYPES					
TRACT	ESTUARINE	RIVERINE	LACUSTRINE	PALUSTRINE	FORESTLAND	CROPLAND	REFOREST	DESERT	ADMIN	TOTAL
PAYNE			77.00		217.20		249.70		2.40	546.30
RUDMAN			88.60	209.00	270.40	2409.00	916.64		42.70	3936.34
SCHALEBEN			0.90		562.80				4.72	568.42
THOMPSON ROAD					25.00		5.00			30.00
LOMA PRESERVE*	4767.00		7.70		408.67				18.80	5202.17
BOSCAJE DE LA PALMA		2.00	3.40	15.80	39.80		302.30		1.69	364.99
BROWNSVILLE			0.70	2.50	14.20					17.40
NORIEGA				15.70	81.20		102.60		0.50	200.00
GARZA-CAVAZOS				3.90	49.60		59.00		2.91	115.41
POLLEY		62.13			106.97	481.00	21.42		53.10	724.62
SANTA MARIA		6.70	16.10		431.27	48.00	50.11		5.70	557.88
VELA WOODS			2.10	54.90	121.94		40.73		0.71	220.38
HIDALGO BEND		3.87		1.10	110.33	302.00	292.48		28.50	738.28
PHARR SETTLING BASIN*			410.00						15.00	425.00
PATE BEND		6.17			120.06		302.34		13.41	441.98
COTTAM		42.26			220.52		298.40		4.50	565.68
COYOTE BANCO		5.40			13.10		266.14		7.60	292.24
GABRIELSON		2.70			672.96		24.50		2.40	702.56
GRANJENO					2.62					2.62
MADERO		2.20	12.10	2.10	225.70				5.58	247.68
LA COMA		3.50			99.00	68.00	84.02		4.20	258.72
PALMVIEW				15.23	27.42	27.00	115.54		8.15	193.34
ABRAMS		0.60			33.78					34.38
LOS EBANOS		0.30			12.30		21.58		0.22	34.40
FARIAS					1.29		1.29			2.58
RAMIREZ					57.17		8.39		0.10	65.66
GUERRA					8.08					8.08
POPE								90.79	5.90	96.69
GARZA							3.70	132.58	7.40	143.68
SAM FORDYCE							14.50	49.75	2.90	67.15
YTURRIA BRUSH		126.10						1516.94	25.80	1668.84
HAVANA		0.90			96.12		9.50	48.98	3.20	158.70
CUEVITAS		0.44			5.36	84.00	3.96		0.76	94.52
KEPLER*		0.01			0.84					0.85
TOTAL	4767.00	265.28	618.60	320.23	4035.70	3419.00	3193.84	1839.04	268.85	18727.54

* Management lease or agreement

2. Wetlands

Resacas (old river oxbows), borrow ditches, tidal flats, salt lakes, and the Rio Grande make up the 5971 acres of wetlands. So far, none of these wetlands have been developed for wildlife management due to staffing constraints. Monitoring conditions and preventing abuse is the present management strategy on the wetlands.

POTHOLES: Restoration of the potholes on the 3,936 acre Rudman Tract was initiated. Drainage ditches were staked out and plugged in hopes that some water would begin to back up and fill the potholes. Through force account, we began this project and hope to complete more in 1987.

Drainage Ditches Plugged at Rudman Tract (4/86, N.M.G.)

TIDAL FLATS: The largest portion of wetlands is the Loma Ecological Preserve which added another 575 acres through a management agreement to bring the total to 5202 acres. The lomas are a part of a larger ecosystem formed by wooded islands in a tidal flat periodically inundated by water from South Bay and the Gulf of Mexico. South Bay and the area surrounding the Lomas is presently unprotected; therefore, additional acreage is needed to complete this unit. South Bay is the source of water for the Lomas. When these wetlands are dry, they are abused by people using off-road vehicles, littering, and using the lomas for firing practice. Fencing portions of the tract and posting with refuge "Area Closed" signs has eliminated some of the abuse.

MariQuest, Inc., the operator of a demonstration shrimp farming project sponsored by the United States Army Corps of Engineers (COE), began growing an exotic shrimp, Pennaeus vannamei on spoil sites between the Brownsville Ship Channel and the Loma Preserve to evaluate the commercial viability of operating a shrimp farm built from COE dredge spoil containment areas. We have concern about where water that has been discharged from the shrimp ponds is going to be drained. No mention of this was made in Mariquest's request for a wastewater discharge permit from the Texas Water Commission (TWC). According to TWC, no permit is needed since it is a short-term project. Traffic through the Loma Preserve has increased from the trucks carrying building materials for the site. Ecological Services is working with us on this issue and more information will be known in 1987.

Loma Preserve (5/86, R.W.S.)

RESACAS: Another addition to the "wetlands" is a portion of an intricate resaca system known as Resaca del Rancho Viejo (Section C). Ocelots and jaguarundis recently have been reported here.

RIO GRANDE: The Rio Grande is still the refuge's most important wetland. The system of interlocking wetlands and adjacent riparian habitats forms a wildlife corridor. This diverse corridor, unparalleled in the U.S., has been abused and neglected.

Throughout the "water supply" history of the Valley, channel dams have been proposed. Presently, the Rio Grande Valley Water Authority is proposing construction of two channel storage dams on the Rio. A feasibility study by the IBWC estimates that the two dams (one at Brownsville and one below the Santa Ana Refuge) would divert 62,000 acre-feet of water annually which "would otherwise be wasted by flowing out to the ocean." According to the study only 25 cfs would be allowed to pass the Brownsville dam during normal operations. Twenty-five cfs amounts to only 3 percent or less of the average seasonal flows past Brownsville. Pedro Ramirez, Jr. of the Corpus Christi Ecological Services Office prepared a report for the SA/RGV refuges in which he states that these dams would significantly impact fish and wildlife resources imperiling vital links in the riparian corridor.

Rio Grande at Falcon Dam (5/84, P.R.)

Wetland development in the Valley should be planned to restore past aquatic ecosystems. Permanent pools and some intermittently flooded areas should be monitored and managed through recognized seral stages. This is of paramount importance because there are 114 vertebrate species of concern requiring management. These species need complex aquatic ecosystems for survival.

3. Forests

Forest lands increased to 4035 acres (see page 46). Part of that increase (987 acres) over last year came from the addition of the beautiful wooded resacas at the Resaca del Rancho Veijo Unit and the Noriega Tract (Section C), both in Cameron County. These wooded resacas provide important inland corridors for the ocelot and jaguarundi.

Another important addition of forestland came through the exchange of 27 acres of agricultural land at the La Coma Tract for 31 acres of wooded land within the small wooded area in the north end and the wooded corridor along the Rio Grande (Section C). This small wooded area historically has had one of largest white-winged dove nesting colonies in the Valley, according to records from the Texas Parks and Wildlife Department. The previous owner, for several years, has seen what he believes to be a jaguarundi using this "forest."

Other additions to the riparian forests came via the Havana Tract purchase in western Hidalgo County. This area of old growth forest including cedar elm and sugar hackberry has been degraded by a local motorcycle club that has maintained a network of bike trails inside the tract.

The bottomland Thorn Forest is the dominant plant community on many of the RGV NWR sites. These lands are to be managed in their present state by the use of more specific management tools such as timber stand improvement techniques, as opposed to those more suited to the restoration lands.

Diversity is the word used to define the forests of Rio Grande Valley NWR. In later successional stages there are few pure stands of any species. It is this woody complexity that provides for much of the wildlife diversity.

4. Croplands

All cropland acres are farmed under land acquisition farming phase out agreements and all croplands are scheduled to be revegetated with native woody plants. Cooperative farmers are aware of our intentions when they sign the agreements. Some smaller, strategically located fields are abandoned to revert through natural succession. Others are replanted with the cooperative farmer providing labor for the privilege of farming the remainder. All fields are scheduled to be revegetated within five years of acquisition. Croplands decreased from 3464 acres in 1985 to 3419 acres in 1986. Of that number, 2364 acres were under cooperative agreements with 8 farmers. One farmer retired from the program and five new farmers were signed. Cooperators' shares ranged from 20 acres to 1800 acres.

SUMMARY OF FARMING AND GRAZING ACTIVITIES ON FEE ACREAGE

	ACRES ADDED[1]		ACRES RETIRED[2]		TOTAL ACRES[3]		
	Cropland	Pasture	Cropland	Pasture	Cropland	Pasture	Total in Refuge
1973	0.0	0.0	0.0	0.0	0.0	0.0	17
1975	0.0	0.0	0.0	0.0	0.0	0.0	499
1976	0.0	0.0	0.0	0.0	0.0	0.0	1,912
1977	28.6	250.0	18.6	0.0	10.0	250.0	2,380
1978	34.8	0.0	28.9	0.0	15.9	250.0	2,547
1979	43.5	17.0	0.0	254.0	59.4	13.0	2,708
1980	38.5	35.0	18.5	5.0	79.4	43.0	2,838
1981	8.5	0.0	10.0	0.0	77.9	43.0	3,205
1982	22.4	0.0	40.5	0.0	59.8	43.0	3,259
1983	230.0	84.7	8.5	13.0	281.3	114.7	8,225
1984	359.2	100.0	185.3	214.7	455.2	0.0	8,931
1985	3,695.8	0.0	687.0	0.0	3,464.0	0.0	14,750
1986	1,102.0	0.0	1,147.0	0.0	3,419.0	0.0	18,728

[1] Acreage added by the end of the calendar year.

[2] Year acreage is retired is the final year of farming or grazing the acreage.

[3] Balance remaining at the end of the calendar year.

Ted Clark (TPWD) Surveys Planting at Rudman Tract (10/86, R.T.)

The farmers are eligible for the USDA "set-aside" program under our cooperative agreements. The refuge benefits from the program as well. We request from the farmer that he either plant wildlife food crops or mow the field as opposed to discing the field. In this way the field has a cover on it all year. We stay in close touch with the ASCS offices in the 4-county area to be sure the cooperative farmer is complying with the program.

We also are in contact with the USDA Soil Conservation Service to provide us with information and to assist us in taking and analyzing soil samples.

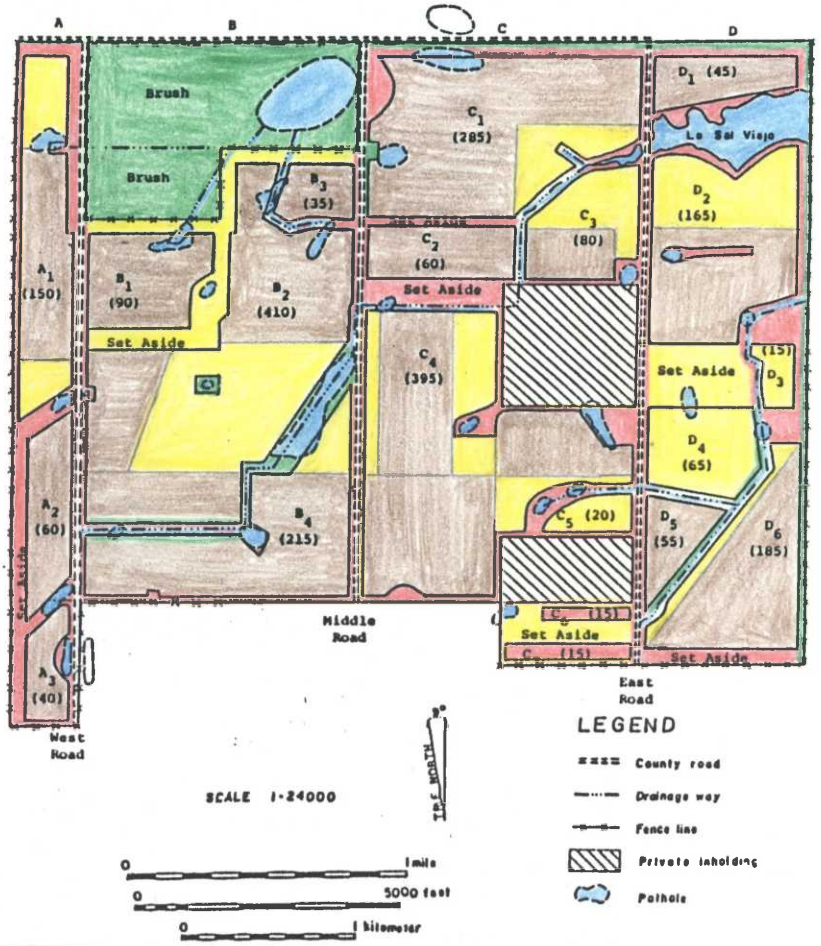
Jerry Jacobs (SCS) Taking Soil Samples (9/86, R.V.)

Under our program, chemicals are not applied to the crops other than fertilizers. This may have certain limitations on what the farmer will grow. This limitation is reflected in the refuge share or what the farmer does for the refuge. Most of the farmers plant corn or sorghum and participate in the USDA "set-aside" program. We have had few complaints and all of the cooperators (11 total since the program began) except one have wanted to continue the program until the full retirement.

During the 1986/1987 farming season, approximately 600 acres were revegetated through cooperative farming agreements. Seeds and seedlings were planted by hand or machine. Unfortunately, spacing and species composition were dictated by the number of seeds collected and the varieties of seeds we were able to collect.

The map on the following page is an example of one of our more complex farming plans at the Rudman Tract. Brown areas are the cooperator's 1986 share planted to sorghum or set-aside; the 1986 USFWS fields are depicted in yellow; the 1985 USFWS share is in red; the wetlands and associated drainages are in blue and the brush is green.

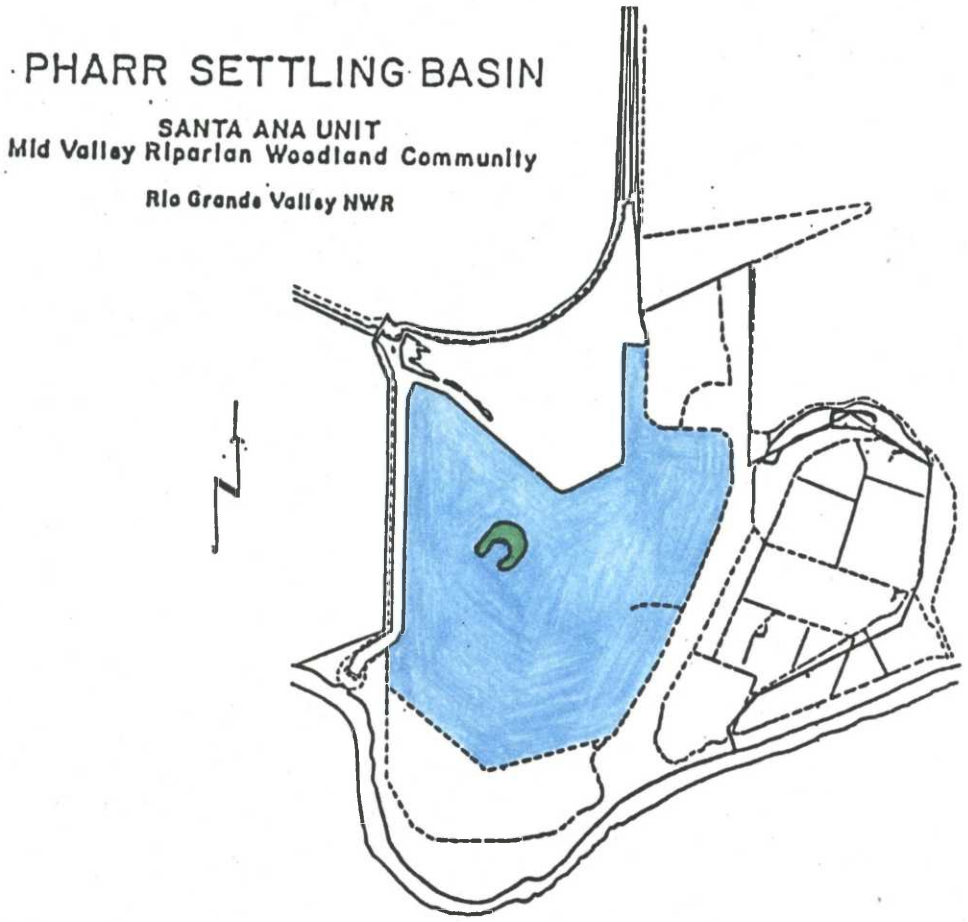
1986 RUDMAN TRACT FARMING PLAN



Refuge Personnel Cleaning Seeds (4/86, R.V.)

5. Grasslands

No part of the refuge is managed as a grassland although areas exist where grasses are intermixed with thorn forest species. We have a management agreement with one of the water districts to manage the Pharr Settling Basin. Included in that land was an old settling basin which was maintained by the water district as a grassland. However, this area (depicted below in blue) was rennovated this year and is now used as a settling basin again.



In several areas where grasses are dominant, the composition is chiefly of exotic grasses such as Bermuda grass and bufflegrass. Because they are exotic and a fire hazard, we are trying to eliminate the non-native grasses where possible on the refuge.

6. Other Habitats

The "desert" habitat type (1839 acres) is used here to recognize those drier sites in the western portion of the project area which are away from the river and generally occur on higher, well-drained caliche soils. Several species of cacti can be found here as well as other desert inhabitants including paloverde and yucca.

An impressive addition to this desert habitat is the Yturria Brush Unit which includes the 1669-acre Yturria Brush Tract as well as the 67-acre Sam

Fordyce Tract and the 45-acre Havana Tract.

Yturria Brush (7/79, R.W.S.)

Restoration lands (3159 acres) are those lands which have been removed from farming or grazing and are awaiting revegetation by mechanical means or by natural succession. They include abandoned farm fields, lands that have been replanted with woody vegetation, and lands which are recovering from grazing. Areas that are reverting through natural succession are included until they progress to the point where we typically would not use broad management techniques (planting, prescribed burning, flooding, etc.). The greenhouse which was constructed in 1984 will be used to work out germination, growth, and survival problems before field trials. Our reforestation goals are to plant a mixture, depending on site and native plant seeds capable of germinating within 72 hours in order to use available soil moisture.

Planting Seedlings (3/85, N.F.)

Vora ran several germination experiments with cuttings and seeds. Gibberilic acid was applied to the base of the cuttings and then the cuttings were placed in different mediums of vermiculite, native soil, commercial potting soil, and a combination of the three.

The greenhouse operation has complicated life for the forester. Vora had to make sure the water (which was controlled by a computerized timer) came on at the right time or came on at all. Plants were getting too much water or none at all. Some plants didn't need as much water as other plants. He had to make sure there was butane so the heater would work in the winter. These problems, however, were gradually worked out.

Seedling contracts were spread out over the Valley with 11 local nurseries to grow seedlings for the reforestation effort. We were interested to see how much it would actually cost a nursery to grow the seedlings and how well the individual nurseries would grow them. We supplied the crates, tubes and the seeds. They supplied the planting medium and the TLC. We bought the "tubelings" for 25 cents each. This is still in experimental stages, but it is a way of sparking interest in the local nurseries to grow native plants

and in turn interest the community in buying and growing their own native trees. Hopefully, these nurseries will get their supply of seeds from their own nursery stock.

The greenhouse will have a secondary objective: the capability of supplying at least 10,000 seedlings per year for additional habitat improvement. We believe that other refuges could benefit from this approach.

Administrative lands (268 acres) include roads, parking lots, well sites, and other developments. Management is confined to vegetative control through mowing and clipping operations and the planting of greentree fire breaks.

8. Grazing

Presently, there is no grazing program for RGV NWR lands. Grazing and the human disturbance associated with it are detrimental to most of the target species at Rio Grande Valley NWR. Under a grazing program, woody cover is set back in favor of grass species and the early successsional wildlife species are benefited. The late successional thorn forest species for which this refuge was established are severely impacted by even moderate grazing. The white-winged dove is a classic example; the thick cover it prefers in the Valley is devoid of grass.

9. Fire Management

In 1986, nineteen fires were reported on Rio Grande Valley NWR.

Date	Tract	Acres Burned
2/20	TPWD by Vela Woods	0.2
3/08	Brownsville	1.0
3/09	Santa Maria	0.6
3/25	Coyote Banco	5.0
3/26	Pate Bend	1.0
3/26	Pate Bend	2.0
4/03	Boscaje de la Palma	200.0
4/04	Santa Maria	1.0
4/21	Coyote Banco	0.5
8/04	Pate Bend	1.0
8/08	Brownsville	22.0
8/18	Park by Gabrielson	0.5
8/19	Pate Bend	0.5
8/20	Pate Bend	30.0
8/27	Pate Bend	0.5
9/02	Resaca del Ran. Viejo	2.0
9/03	Coyote Banco	25.0
10/01	Boscaje de la Palma	65.0
12/07	Palmview	0.3

Most of the fires this year were discovered by the firecrew during routine fire patrol. Several of these were already out at the time of discovery. The Brownsville Fire Department helped us fight the 200 acre blaze at our Boscaje de la Palma Tract. We also enlisted the aid of four people from the Laguna Atascosa NWR. High winds and dry conditions helped to fan the flames. We also had extreme difficulty with radio communications. The radio tower at Weslaco was not powerful enough to reach the headquarters from our position so we periodically had to dispatch someone to drive to the nearest telephone to call for supplies and give a status report.

The City of Hidalgo Fire Department assisted us with two separate fires at the Pate Bend Tract in August. Neighbors had called the fire department on both occasions and the fire department then called us.

Vegetation and weather play a major role in the influence of fire. Exotic bufflegrass and/or Bermuda grass are common on disturbed sites such as overgrown roadways and trails. They both have a high fire fuel rating and are particularly dangerous because illegal traffic on old roads often ignite these grasses. Combustibility of most Tamaulipan woody species is low where they grow in mature, dense stands. Green tree fire breaks work because shaded ground cover and our relative high humidity rapidly breaks down fallen leaves and branches.

When we clear a line for a boundary fence, we create a fire path into and often through our refuge units. Our best defense against boundary fires to date has been the encouragement of woody plant and cacti growth along the fence, creating a greentree firebreak and providing superior wildlife habitat and lowering fire hazards (see photo on page 33).

Hurricanes are an important influence from May through September. If they occur, they cause thunderstorms; if they do not occur, this period can be very dry and fire conditions may become hazardous. During winter, low humidity leads to a high fire hazard, especially if compounded with freezes in December or January. A winter freeze followed by a drought is the one time when there may be enough dry fuel on the ground to carry a fire through a mature stand.

Presently, a four person fire crew is on duty during the high fire danger periods (Section E.3). They follow a daily fire patrol of the tracts having the highest fire possibilities. Their patrol also includes fence repair and greentree firebreak plantings.

Ecologically, a fire would mean a maximum loss to USFWS and to South Texas if the fire destroyed the unique ecosystems in this area. Only 1-5% of the native habitat remains in the Valley. Much of this is found in fencerows and small brush remnants. For example, the native sabal palm jungle once covered 30,000-40,000 acres. Today, the four major stands remaining have been reduced to approximately 300 acres. A major fire could destroy a significant part of this ecosystem, perhaps extirpating one or more wildlife species in the U.S. Several plant species are equally vulnerable.

Burning is a traditional practice in this area to: 1) control agricultural pests - Texas Department of Agriculture has deemed it ineffective because of cost and loss of beneficial species; 2) increase grazing potential - cattle are not part of the present operation; and 3) esthetics or clean

farming - probably the real reason is that many people prefer the savanna-like appearance of the resulting burn.

Local attitudes generally favor suppressing wildfires because of the close proximity of dwellings to agricultural and brushy areas. Fire, however, is used by local farmers to control unwanted herbaceous and woody vegetation in canals and along fencerows and roadsides.

The refuge decision to suppress wildfires is clearly in line with the refuge's major objectives. The alternative is to prescribe burn areas if we find they have wet fire-dependent communities. However, more information needs to be gathered and analyzed before we would activate such an alternative.

The potential for loss of habitat by wildfires is relatively high; however, potential for damage by motorized equipment is also high. Therefore, we will suppress wildfires by using the minimum amount of tools. Where feasible, we will use pulaskis, shovels, axes, brush-hooks, fire slappers, motorized hand tools, chemical retardants, and back-pack type pumper units to contain the fire. Where roads are passable, we will use trailer drawn pumper units and/or local fire department trucks. We will use heavy equipment only as a last resort, in cases when the health or safety of the public is threatened or there may be significant economic loss of private and/or government property.

Thanks to Martin Suhr and the Regional Office our fire cache has been upgraded and a new fire pumper and truck have been ordered. Our radio system has been improved with additional relay towers throughout the Valley as well as a new vehicle and handheld radios.

10. Pest Control

No pesticides or herbicides were used by refuge personnel on Rio Grande Valley NWR in 1986. None of the permittees used pesticides this year. As a result, our farmers are making money and benefits to wildlife are tremendous.

11. Water Rights

Water rights may be purchased with lands when they are available. The refuge currently has 1,417.42 acres of water rights, 215.35 acres of water from the water districts and 1,202.07 acres of water from the Rio Grande. As reported in the 1985 narrative, the Texas Water Commission (TWC) was considering cancelling some of our water rights due to non-use. Based on the testimony given by USFWS on water useage and non-use at a hearing concerning the cancellation, the Commission decided not to cancel the two Certificates of Adjudication in question. The TWC has also had a change in regulations concerning "pooling" water rights. Landowners may now "combine" all water rights which they own under one certificate and use those water rights, any and all, on the tracts of land that they designate on the certificate, if approved by TWC. RGV NWR will initate the process in 1987 of combining all our water rights which have been acquired so far under one certificate and list the points of diversion to include any and all refuge tracts. This will enable us to use water on any or all of the

refuge tracts, including Santa Ana NWR, for wetland maintenance and the revegetation program.

12. Wilderness and Special Areas

The Tamaulipan Biotic Province was perhaps the last major frontier wilderness in the continental U.S. to disappear under agricultural, urban, and industrial changes. Major changes in habitat were taking place as late as the 1950's. The islands of wilderness left are lumped together as "brush". This categorization is false, for upon closer inspection the "brush" reveals shrub deserts, sub-tropical gallery forests, mangrove swamps, salt lakes, palm jungles, tidal flats, limestone cliffs, sand dunes, and clay dunes. We hope to make recommendations for Research Natural Areas after further investigation of these areas.

The Chihuahuan Thorn Forest is one such area that we will propose when and if we succeed in acquiring it before it is destroyed.

Chihuahuan Thorn Forest (3/86, R.W.S.)

G. WILDLIFE

1. Wildlife Diversity

Rio Grande NWR encompasses a four-county area of South Texas, and its ensuing influences of coastal, desert, subtropic, and temperate climates result in vast faunal species diversity. Listed below are those endangered, threatened, potentially threatened, or peripheral species of actual or potential occurrence on Rio Grande Valley NWR.

Endangered, Threatened, Watch List Vertebrates, and Species of Management Concern of Actual or Potential Occurrence on Rio Grande Valley NWR

Common Name	Scientific Name	USDI[1]	TOES[2]	TPWD[3]	RGV[4]
Least Grebe	Podiceps dominicus				P
Eared Grebe	Podiceps nigrocellis				W
American White Pelican	Pelecanus erythrorhynchos				WB
Brown Pelican	Pelecanus occidentalis	E	E	E	C
Olivaceous Cormorant	Phalacrocorax olivaceus				P
Anhinga	Anhinga anhinga				P
Magnificent Frigatebird	Fregata magnificens				C
Reddish Egret	Egretta rufescens		-	T	C
White Ibis	Eudocimus albus				C
White-faced Ibis	Plegadis chihi		T	T	-
Roseate Spoonbill	Ajaia ajaja		WL*		
Wood Stork	Mycteria americana	E	-	T	C
Fulvous Whistling-Duck	Dendrocygna bicolor		T		C
Black-bellied Whistling-Duck	Dendrocygna autumnalis				P
Green-winged Teal	Anas crecca				W
Mottled Duck	Anas fulvigula				P
Northern Pintail	Anas acuta				W
Blue-winged Teal	Anas discors				W
Northern Shoveler	Anas clypeata				W
Canvasback	Aythya valisineria				W
Redhead	Aythya americana				W
Lesser Scaup	Aythya affinis				W
Ruddy Duck	Oxyura jamaicensis				W
Masked Duck	Oxyura dominica		WL		P
Osprey	Pandion haliaetus		-	T*	WR
Hook-billed Kite	Chondrohierax uncinatus				P
Am. Swallow-tailed Kite	Elanoides forficatus		T	T	M
Black-shouldered Kite	Elanus caeruleus		WL*		P
Bald Eagle	Haliaeetus leucocephalus	E	E	E	nP
Common Black-Hawk	Buteogallus anthracinus		T	T	P
Harris' Hawk	Parabuteo unicinctus				P
Gray Hawk	Buteo nitidus		T	T	P
Roadside Hawk	Buteo magnirostris				P
Broad-winged Hawk	Buteo platypterus				M
Swainson's Hawk	Buteo swainsoni				M
White-tailed Hawk	Buteo albicaudatus		T	T	P
Zone-tailed Hawk	Buteo albonotatus		T	T	P
Golden Eagle	Aquila chrysaetos		T		nP
Crested Caracara	Ployborus plancus				P

Common Name	Scientific Name	USDI	TOES	TPWD	RGV
Merlin	Falco columbarius		T		WR
Aplomado Falcon	Falco femoralis			E	P
Peregrine Falcon	Falco peregrinus	E	E	E,T	M
Prairie Falcon	Falco mexicanus		T		nP
Plain Chachalaca	Ortalis vetula				P
Northern Bobwhite	Colinus virginianus				GS
Scaled Quail	Callipepla squamata				GS
Sandhill Crane	Grus canadensis				GS
Limpkin	Aramus guarauna				P
Piping Plover	Charadrius melodus	E,T	-	T	M
Northern Jacana	Jacana spinosa		T		C
Least Tern	Sterna antillarum	E,T	E,T	E	C
Black Skimmer	Rhyncops niger		T		C
Red-billed Pigeon	Columba flavirostris		T		P
White-winged Dove	Zenaida asiatica				P
Mourning Dove	Zenaida macroura				P
Inca Dove	Columbina inca				P
Ruddy Ground Dove	Columbina talpacoti				P
White-tipped Dove	Leptotila verreauxi				P
Groove-billed Ani	Crotophaga sulcirostris				P
Ferruginous Pygmy-owl	Glaucidium brasilianum		WL	T	P
Elf Owl	Micrathene whitneyi				P
Common Pauraque	Nyctidromus albicollis				P
Buff-bellied Hummingbird	Amazilia yucatanensis				P
Ringed Kingfisher	Ceryle torquata		WL		P
Green Kingfisher	Chloroceryle americana				P
Northern Beardless-tyrannulet	Camptostoma imberbe		WL	T	P
Brown-crested Flycatcher	Myiarchus tyrannulus				P
Great Kiskadee	Pitangus sulphuratus				P
Couch's Kingbird	Tyrannus couchii				P
Rose-throated Becard	Pachyramphus aglaiae		WL	T	P
Green Jay	Cyanocorax yncas				P
Brown Jay	Cyanocorax morio		WL	P	M
Mexican Crow	Corvus imparatus				P
Chihuahuan Raven	Corvus cryptoleucus				P
Clay-colored Robin	Turdus grayi				P
Long-billed Thrasher	Toxostoma longirostre				P
Black-capped Vireo	Vireo atricapillus		-	T	M
Yellow-green Vireo	Vireo flavoviridis		WL*		P
Tropical Parula	Parula pitiayum		WL	T	P
Golden-cheeked Warbler	Dendroica chrysoparia		T	T	M
Olive Sparrow	Arremonops rufivirgatus				P
White-collared Seedeater	Sporophila torqueola				P

Common Name	Scientific Name	USDI	TOES	TPWD	RGV
Botteri's Sparrow	Amophila botterii		T	T	P
Great-tailed Grackle	Quiscalus mexicanus				P
Bronzed Cowbird	Molothrus aeneus				P
Hooded Oriole	Icterus cucullatus				P
Altamira Oriole	Icterus gularis		WL		P
Audubon's Oriole	Icterus graduacauda				P
Lesser Yellow Bat	Lasiurus ega		P		
Coues' Rice Rat	Oryzomys couesi		T	T	P
Eastern Cottontail	Sylvilagus floridanus				GS
Collared Peccary	Pecari tajuca				GS
White-tailed Deer	Odocoileus virginianus				GS
Black Bear	Ursus americanus		T	E	P
Coati	Nasua nasua		WL	E	P
Coyote	Canis latrans				PS
Cougar	Puma concolor		T		-
Ocelot	Leopardus pardalis	E	E	E	P
Jaguarundi	Herpailurus yagouaroundi	E	E	E	P
Bobcat	Lynx rufus				PS
Jaguar	Panthera onca	E	E	E	P
Pygmy Killer Whale	Feresa attenuata		T	T	A
Short-finned Pilot Whale	Globicephala sieboldii		-	T	A
Killer Whale	Orcinus orca		-	T	A
False Killer Whale	Pseudorca crassidens		-	T	A
Short-snouted Spinner Dolphin	Stenella longirostris		T		A
Blainville's Spotted Dolphin	Stenella pernettensis		-	T	A
Rough-toothed Dolphin	Steno bredanensis		-	T	A
Lacepede's Bottle-nosed Dolphin	Tursiops nesarnack		T		A
Pygmy Sperm Whale	Kogia breviceps		T	T	A
Dwarf Sperm Whale	Kogia simus		T	T	A
Sperm Whale	Physeter catodon	E	E	E	A
Cuvier's Beaked Whale	Ziphius cavirostris		-	T	A
Gervais' Beaked Whale	Micropteron europeaus		-	T	A
Blue Whale	Balaenoptera musculus	E	-	E	A
Fin Whale	Balaenoptera physalus	E	-	E	A
Northern Right Whale	Balaena glacialis	E	-	E	A
Caribbean Manatee	Trichechus manatus	E	E	E	P
American Alligator	Alligator mississippiensis	T	T		nP
Texas Tortoise	Gopherus berlandieri		T	T	-
Green Sea Turtle	Chelonia mydas	T	T	T	A
Hawksbill Sea Turtle	Eretmochelys imbricata	E	E	E	A

Common Name	Scientific Name	USDI	TOES	TPWD	RGV
Loggerhead Sea Turtle	Caretta caretta	T	T	E	A
Kemp's Ridley Sea Turtle	Lepidochelys kempi	E	E	E	A
Leatherback Sea Turtle	Dermochelys coriacea	E	E	E	A
Reticulated Collared Lizard	Crotaphytus reticulatus		T	T	-
Texas Horned Lizard	Phrynosoma cornutum		T	T	-
Mesquite Lizard	Sceloporus gramniens				P
Speckled Racer	Drymobius margaritiferus		WL	E	P
Texas Indigo Snake	Drymarchon corais		WL	T	-
Mexican Milk Snake	Lampropeltis triangulum		T		-
Ruthven's Whipsnake	Masticophis taeniatus				nP
Black-striped Snake	Coniophanes imperialis		WL	T	P
Northern Cat-eyed Snake	Leptodeira septentrionalis		WL	E	P
Black-spotted Newt	Notophthalmus meridionalis		WL	E	P
Rio Grande Lesser Siren	Siren intermedia		T	E	P
Mexican Burrowing Frog	Rhynophrynus dorsalis		WL	T	P
Giant Toad	Bufo marinus		WL	T*	P
Rio Grande Chirping Frog	Syrrhophus cystignathoides		WL	T*	P
White-lipped Frog	Leptodactylis fragilis		WL	E	P
Mexican Treetoad	Smilisca baudini		WL	T	P
Sheep Frog	Hypopachus variolosus		-	T	P
Fat Snook	Centropomus parallelus		T		-
River Goby	Awaous tajasica		-	T	-
Blackfin Goby	Gobionellus atripinnis		-	E	-

[1] Endangered (E) or Threatened (T), according to the latest U.S.D.I. listing.

[2] Endangered (E), Threatened (T), or Watch List (WL) in Texas per the 1984 Texas Organization for Endangered Species list.

[3] Endangered (E) or Threatened (T) species in Texas per the Texas Parks and Wildlife Department.

[4] Unofficial status based on examining range maps, Marine (A), Peripheral from south (P), Peripheral from coast (C), from north (n), Migrates through (M), Winter Resident (WR), Predator Species (PS), Waterfowl (W), Waterbird (WB), Game Species (GS), status of previous list (*).

[5] All cetaceans on protected lists for Texas are included; few records exist for many species to determine precisely which species should be included on this list.

In addition to the species listed above, the Rio Grande Valley contains more than four hundred and seventy-five invertebrate species. The diversity and color provided by the two hundred and sixty-three species of butterflies and skippers in the Valley is simply astounding.

Blue Wing Butterfly (4/75, SLF.)

The moths are represented in the Valley by even more species than the butterflies and skippers. One of the larger moths, Rothschildia jarilla Westwood, is a member of the giant silkworm moth family, using colima as its larval foodplant. Among the most common longhorned beetles in the Valley is the sawbug, Oncideres postulata LeConte, typically seen on tepeguaje trees in late summer and early fall.

Because the Valley is the site of intensive agriculture, non-native invertebrates have impacted this area, including pesticide-resistant species such as the tobacco budworm. Although information on many of our invertebrates is extremely important, we are too understaffed to investigate this group of organisms.

Io Moth,
a Member of the Family of Giant Silkworm Moths (1/76, SLF.)

2. Endangered and/or Threatened Species

Past records of endangered felids in the Rio Grande Valley have documented the presence of ocelot, jaguarundi, and jaguar. Land acquisition efforts by Rio Grande Valley NWR are critical to the survival and enhancement of these endangered cats, since brush clearing is the single greatest factor responsible for their very low populations. Connecting brush islands can provide a travel corridor for these rare felids, and allow essential avenues for genetic exchange between potentially isolated populations. Due to the ocelot's uniqueness and fragile status, it has been the subject of an ongoing research program conducted by Texas A & I University's Caesar Kleberg Wildlife Research Institute. In CY 86, the refuge received the final report from this study. From a total of 4226 trap-nights between October 1, 1984 and September 30, 1986, four ocelots and no jaguarundis were captured. The same surveys included 1117 camera-nights, resulting in 4733 photographs, and the documentation of eight ocelots. According to project director Dr. Michael Tewes, the ocelot population in the Lower Rio Grande Valley is more vulnerable to extinction since the population is extremely isolated and thus more susceptible to disease or catastrophic events. During CY 86, the refuge received four reports of ocelots in the Valley, including a report of a reproductive pair in the Lomas Preserve. The refuge also received reports of two observations of jaguarundis; one at Hidalgo Bend and another at Pharr Settling Basin. In April, the refuge received a report of a jaguarundi road kill just west of the proposed Playa

del Rio project (Section D.4). The specimen represented the first jaguarundi documentation in several decades in the Lower Rio Grande Valley.

In addition to endangered mammalian species, the Rio Grande Valley is host to six actually or potentially occurring endangered avians, including the brown pelican, wood stork, green kingfisher, peregrine falcon, piping plover, and least tern. Five of these species were recorded on refuge tracts during CY 86. The refuge recorded observations of peregrine falcons on three separate occasions. In addition, refuge staff were briefed on the preliminary findings of a migratory peregrine falcon study on South Padre Island, conducted in CY 86 by Tom Maechtle for the U. S. Army Corps of Engineers. According to Maechtle, the refuge's Loma Preserve supports sizeable numbers of migrating peregrine falcons in the spring and fall when, due to human disturbance, the birds move into the surrounding Lomas Preserve wind tidal flats for feeding and loafing. Maechtle trapped three-hundred and eighteen individual peregrines on Padre Island during CY 86.

In addition to endangered mammals and birds, the refuge also provides critical habitat for seven actually or potentially occurring endangered or threatened reptiles, including the American alligator, Atlantic green turtle, Atlantic hawksbill, Loggerhead, Leatherback, Texas tortoise and Atlantic (Kemp's) Ridley sea turtle.

In CY 86, the refuge received a report from the USFWS describing serious problems between the Atlantic (Kemp's) Ridley sea turtle and shrimp trawling. The extent of this problem is highlighted by the report's finding that approximately 45,000 sea turtles were lost in the Gulf of Mexico and South Atlantic incidental to shrimp trawling operations.

Endangered Felid Reports For CY 86

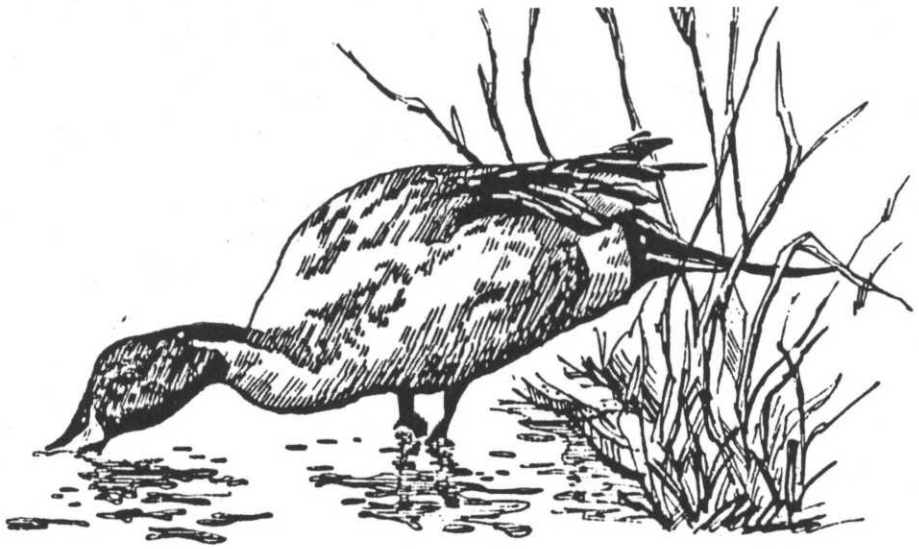
Date	Species	Locality	Report
February	Ocelot	Gabrielson	One report
April	Jaguarundi	E. of Brownsville	Road kill
October	Ocelot	Boca Chica	Reproductive pair
October	Ocelot	W. of Arroyo City	One report
November	Jaguarundi	Hidalgo Bend	One report
November	Jaguarundi	Pharr Settling Basin	One report
December	Ocelot	N. Hidalgo County	One report

Endangered Avian Reports for CY86

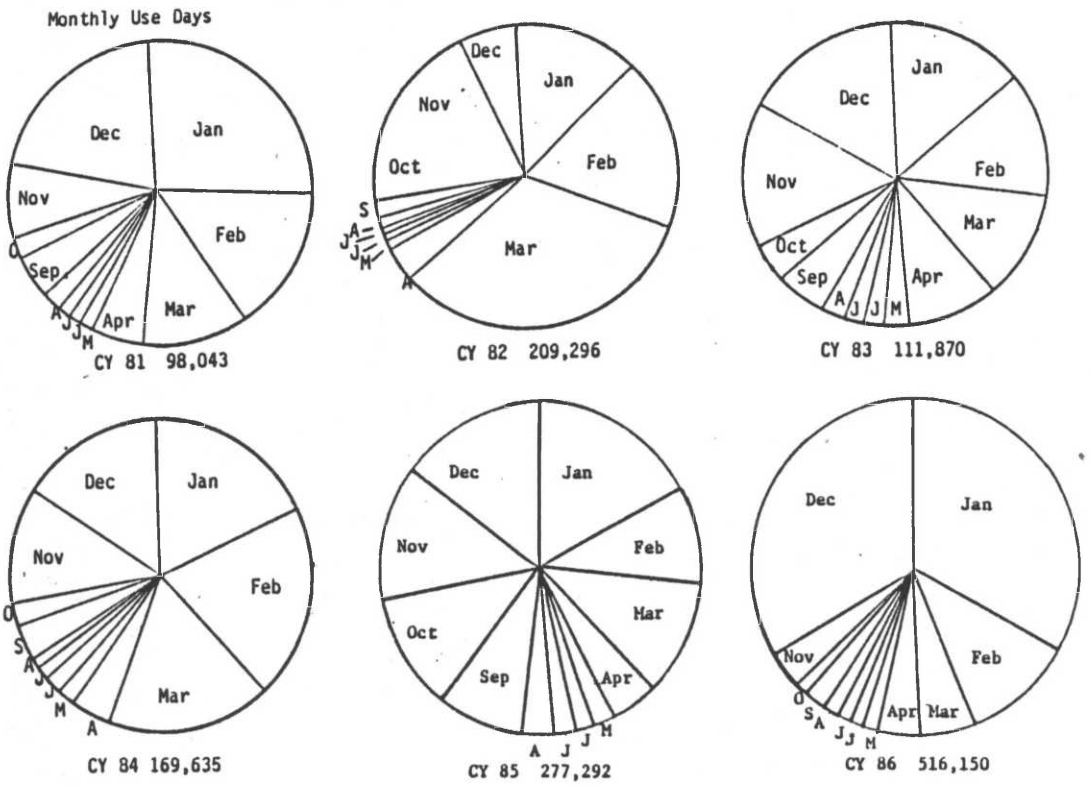
Date	Species	Locality	Report
April/May	Brown pelican	Loma Preserve	Several birds
April/May	Least tern	Pharr Settling Basin	One report
June	Brown pelican	Loma Preserve	One report
June	Peregrine falcon	Palmview	One report
July	Brown pelican	Loma Preserve	One report
October	Wood stork	Gabrielson	One report
November	Peregrine falcon	La Sal Vieja	One report
December	Peregrine falcon	La Sal Vieja	One report

3. Waterfowl

Output reports have been prepared for six full years. Because the southern tip of Texas includes hundreds of small potholes, intensive agriculture, and mild winters, it provides important wintering habitat for migratory waterfowl. However, wetland losses to agriculture pose a major threat to these waterfowl populations. Refuge waterfowl habitat includes the South Bay tidal flats, a pair of salt lakes at La Sal Vieja, and a water district settling basin. Because our water levels experience large fluctuations, our waterfowl populations vary. In December, with ample water present, La Sal Vieja held over five thousand geese, including over eight hundred white-fronted geese.

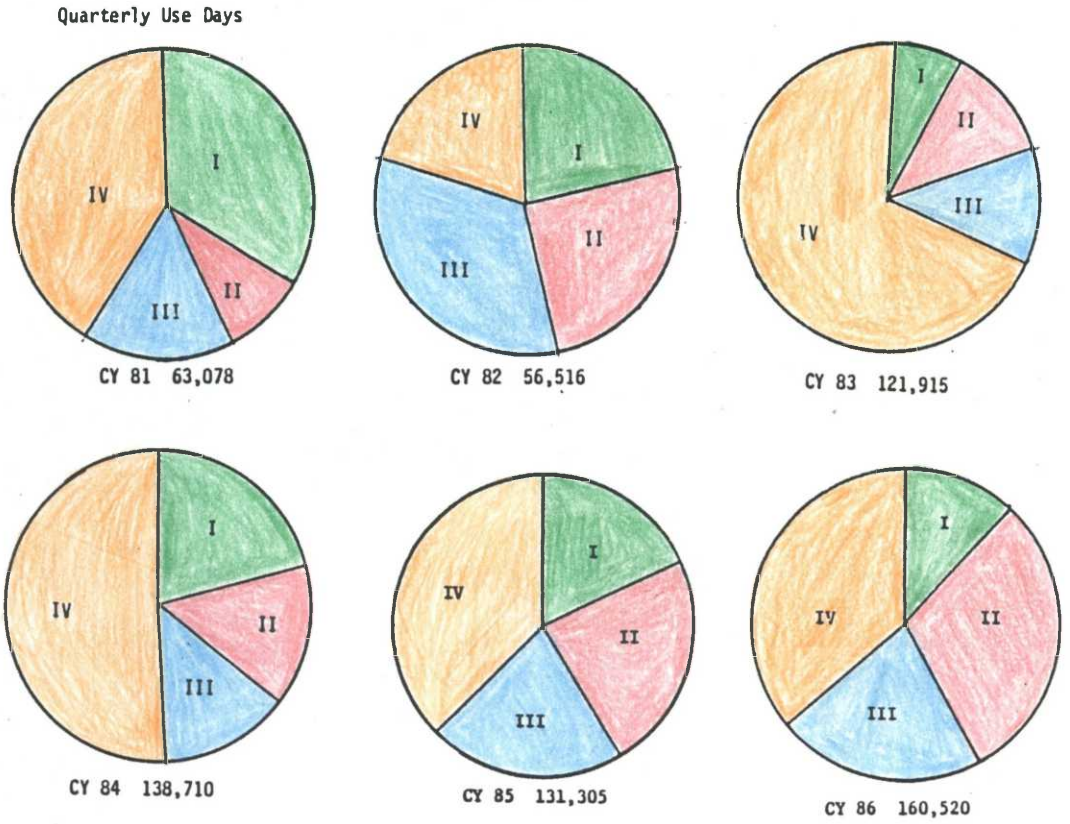


Waterfowl



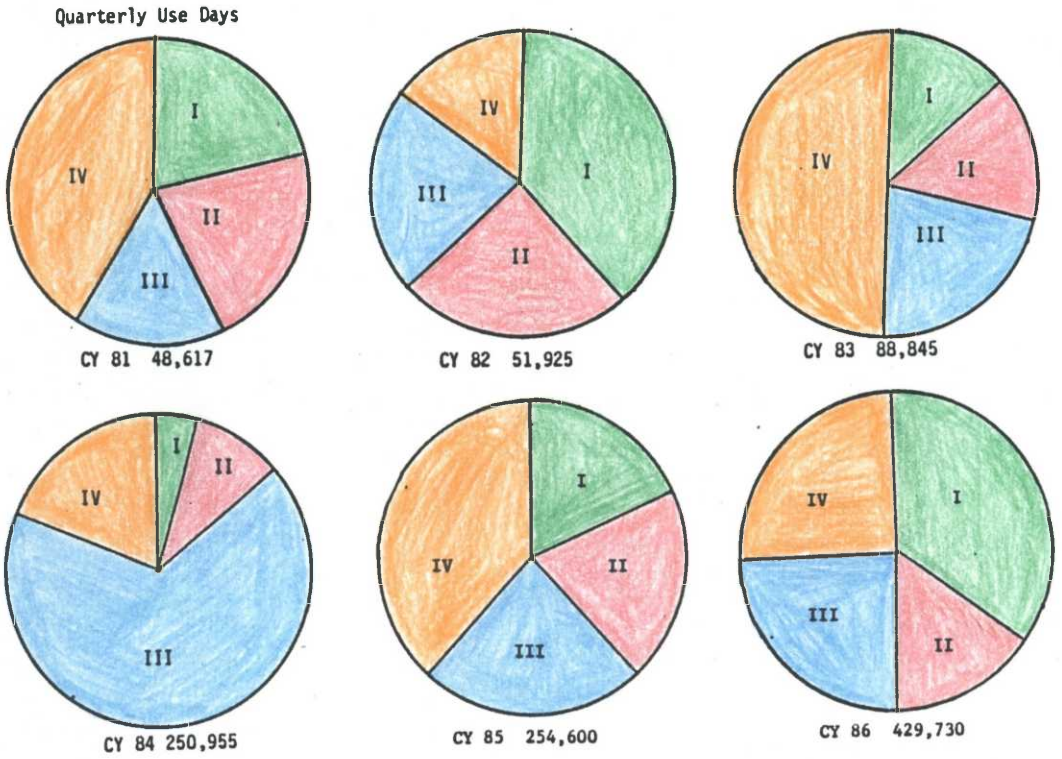
Waterfowl use in CY 86 was almost double CY 85, with greatest increases occurring in December. The CY 86 pie graph shown above illustrates the importance of Rio Grande Valley potholes and basins as a resource for overwintering waterfowl. The greatest usage occurred in the winter months, with over three-quarters of our waterfowl use falling within the period between November-March. This is a more typical pattern than the one seen in CY 85, in which waterfowl use was more evenly distributed throughout the year. This may be, in part, attributed to November and December rainfall approximately four times the normal, and seven times the same period in CY 85. In years when we receive large amounts of precipitation, such as CY 86, our wetlands are frequently the fullest in the fall, following late summer and fall tropical storms. The added rainfall causes an increase in wetland vegetation, resulting in an explosion of aquatic invertebrates. The protein supplied by these invertebrates, coupled with abundant open water and available agricultural grain crops, are critical components in meeting the pre-breeding needs of overwintering waterfowl. In addition to excellent water conditions, the many more CY 86 use-days are also a reflection of increase data collections and new wetlands being added to the system.

4. Marsh and Water Birds



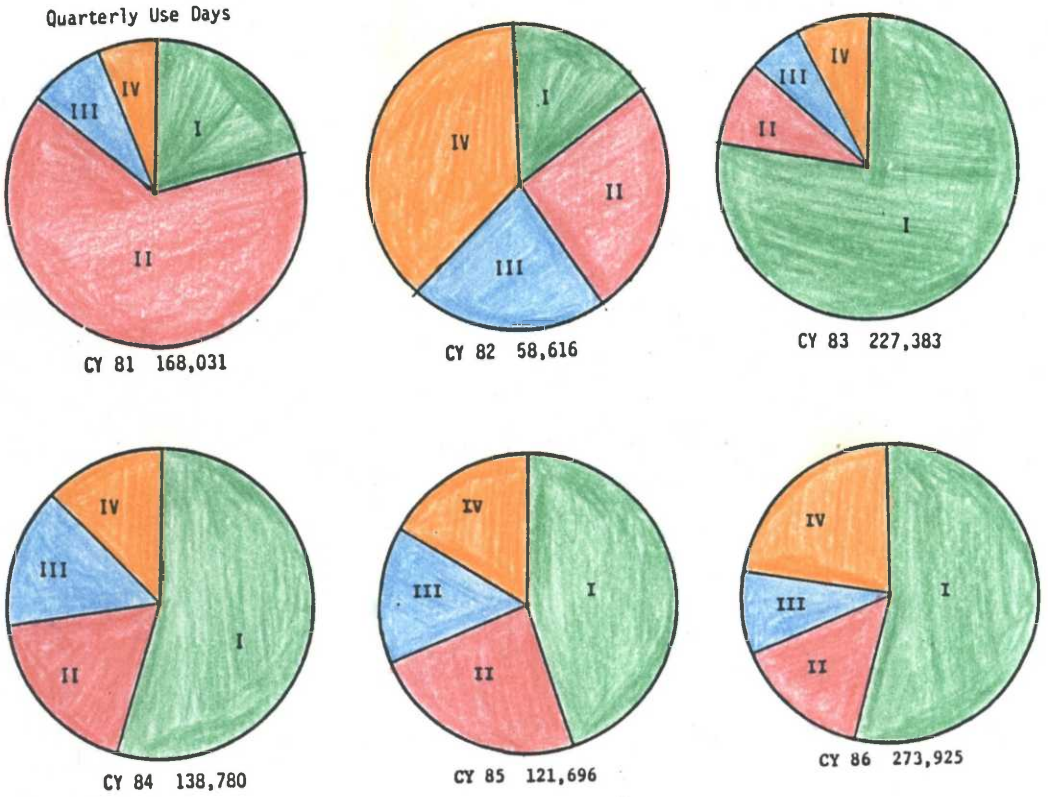
CY 86 marsh and water bird populations increased 23% over CY 85. Our marsh and water bird usage of refuge wetlands is typically the greatest in the winter months, when food resources and available water are the most abundant. This pattern is depicted in the pie graphs. Populations numbers of these species have been the greatest in the fourth quarter (Oct.-Dec.) in five out of the six years for which records have been kept. CY 86 marsh and water bird populations also followed this pattern, with greatest species numbers recorded in the fourth quarter. The increase in these populations could be a result of several factors, including considerably above average fall precipitation, which provided excellent winter water conditions. CY 86 also saw a 17% increase in refuge wetlands habitat, and greater field survey efforts by refuge staff.

5. Shorebirds, Gulls, Terns, and Allied Species



Population levels in CY 86 displayed approximately a 70% increase over CY 85. The pie graphs highlight the importance of our wetlands resources during the winter months (quarters IV and I) to these populations. In five of the past six years, the winter period of the fourth quarter (Oct.-Dec.) and first quarter (Jan.-Mar.) together have held the highest population numbers. This was the case again in CY 86. In winter, our wetlands provide important food resources to these populations in the form of fish and aquatic invertebrates, as well as valuable loafing habitat. A combination of factors most likely explains the increase in the CY 86 population levels, including above average precipitation in late CY 85, with the subsequent result that our greatest increase in these populations was observed in the first quarter of CY 86. In addition, refuge wetlands increased by 17% during this calendar year, and our staff was able to devote more time to field surveys.

6. Raptors



Raptor populations showed more than a twofold increase over CY 85. The greatest increase occurred during the first quarter (Jan.-Mar). During the month of March a private conservation group entitled Hawk Watch provides the refuge with census data from surveys conducted during the spring raptor migration. Since the spring arrival of migrating raptors is somewhat variable, due in part to weather factors, the success of Hawk Watch survey efforts is correspondingly variable. In CY 86 Hawk Watch staff more successfully timed their raptor surveys with the movement of the spring migration than in the preceding year, resulting in larger numbers of raptor sightings in the first quarter. Additional reasons for the substantial increase in raptor numbers is speculated to include a combination of factors, among which could be a greater availability of prey items, more favorable climatic factors, and decreasing use of reproductive-inhibiting pesticides such as DDT.

7. Other Migratory Birds

White-winged Doves-Rio Grande Valley

The white-winged dove is a species of continuing importance to Rio Grande Valley NWR. Holding a Valley-wide population of over 1,000,000 white-winged doves is a primary objective of the refuge. Productive nesting habitat is a key factor in the stabilization and improvement of white-

winged dove populations. White-winged doves are known to nest in citrus, native brush, and thorn scrub. Typical nesting habitat are shrubs and trees two to five meters in height, in vegetation such as citrus, ebony, huisache, granjeno, brasil, mesquite, and cactus, which frequently form a dense, entangled canopy. White-winged dove nest densities in citrus and brush have been reported to vary between 50 and 900 nests per hectare. Thus, the acquisition efforts by Rio Grande Valley NWR to obtain native brush are of critical importance to our white-winged dove population. The results of the 1986 white-winged dove spring breeding season census indicated 472,000 birds were nesting in the Lower Rio Grande Valley in Hidalgo, Starr, Cameron, and Willacy Counties. This was a 31% increase over 1985. According to data from the TPWD, 113,000 white-winged doves were harvested in the Valley in CY 86. Fall feeding flight data obtained from TPWD indicated the presence of 224,834 white-winged doves on RGV NWR tracts. Nine USFWS tracts, out of 36 areas, accounted for 71% of all white-winged doves observed in the Valley.

In CY 86, an organization known as "White-Winged Dove Unlimited" was established by a group of conservation-minded private citizens with the objective of protecting white-winged dove habitats in South Texas and northeastern Mexico. They propose, through private funding and the sale of white-winged dove stamps in Mexico, acquiring 11,244 hectares of land in Mexico, which includes 20 nesting colonies.

Number of White-winged Dove Texas Port Declarations and Dove Harvest Statistics

Year	Texas Port White-winged Dove Declarations[1]	Statewide White-winged Dove Harvest[2]
1963	17,004	Closed season
1964		239,097
1965	24,922	145,108
1966	54,256	233,735
1967		282,136
1968	139,956	
1969	183,379	
1970	178,591	
1974	168,112	
1976	165,036	483,000
1977	232,692	438,000
1978	260,977	305,000
1979	419,251	498,000
1980	636,478	214,000
1981	507,694	262,000
1982	548,273	391,000
1983	566,542	295,000
1984	777,815	313,000
1985	888,686	19,000
1986	796,844	166,000

[1] No data obtained for 1964,1967,1971-73,1975
[2] No data available for 1968-1975

An eight-year mean figure, based on 1979-86 data, indicated white-winged dove declarations at Texas ports of entry averaged 642,700. During the same period, the statewide white-winged dove harvest averaged approximately 270,000 birds.

White-winged Dove Flock (6/80, R.W.S.)

White-tipped Doves

White-tipped, formerly White-fronted doves, a common species in Mexico, are still regarded as unusual by Texas hunters. White-tipped doves are slightly larger than white-winged doves, with the underside of the wing possessing cinnamon-colored wing linings, and a large, rounded tail. The Rio Grande Valley is the only place in the U. S. where this nonmigratory bird can be found. TPWD data indicates that 4,839 white-tipped doves were harvested in 1986. White-tipped doves have been a legal game species in Texas since 1984. At this point there remains some question regarding the overall value of adding this species to the collective bag. The cost of potential hunter misidentification of this species with Red-billed pigeons, coupled with the added expense of incorporating this species into the hunt, may outweigh the benefits of harvesting white-tipped doves.

Mourning Doves

After several years of low population levels, mourning dove production improved substantially in 1986, according to Ron George of the TPWD. Estimates from call-count surveys indicated a 26% increase statewide in mourning dove populations. This represents a 10% above-average population level, and the first time above-average populations have been observed since 1980. TPWD data indicated that 55,932 mourning dove were taken in the Valley in CY 86, of an approximately state-wide take of 5,000,000 birds.

Red-billed Pigeons

Although TPWD does not maintain harvest statistics on this protected species, it is in continual danger of being accidentally taken during dove hunting season by uninformed hunters since these birds appear to the casual observer to resemble white-winged doves, and often fly with them. This bird inhabits thick forest and woodland borders, often near the Rio Grande. It feeds extensively in the crowns of tall trees on wild fruits, nuts, and seeds. This species is in imminent threat of extirpation.

Red-billed Pigeon (11/84, SLF.)

8. Game Mammals

The importance of our land acquisition efforts to the local economy is tied

to the fact that many of the off-refuge hunting opportunities would not exist without ample brushlands which support many game animals, including the white-tailed deer. In a study reported in 1980 by A. Steuter and H. Wright, it was found that the greatest densities of white-tailed deer occurred in habitat with 60-97% total brush cover.

While there are no game populations on refuge tracts large enough to support a viable hunt, the private sector, through some very large game ranches, seem to provide enough of this form of recreation to meet existing demand off-refuge. Trapping is not compatible with refuge objectives.

10. Other Resident Wildlife

Wildlife Inventories

Our wildlife inventories provide important faunal information from several biotic communities, including the Mid-valley Riparian Woodland, Mid-delta Thorn Forest, and Woodland Potholes and Basins.

Refuge staff conducted avian inventories at Pharr Settling Basin, La Coma Tract, Palmview Tract, Gabrielson Tract, and Rudman Tract in CY 86. Pharr Settling Basin is a water district settling pond containing about 410 acres of open water and a small man-made island. Because this wetland receives a fair amount of wintering waterfowl use, waterfowl (and other avians) were surveyed on a weekly basis from January-March, and again in December. The inventory method involved surveying from a vehicle route, recording all birds heard or seen in an encounter-type inventory. The La Coma and Palmview Tracts each have seven .1 ha variable circular plots, previously described by their flora. Since these plots are remeasured once every five years, they provide important data on plant succession, and by conducting wildlife inventories in conjunction with the plots, we hope to develop a clearer picture of wildlife-plant associations in the lower Rio Grande Valley. Avian surveys are conducted at each of the seven plots by recording all birds heard or seen during a ten-minute observation period. Birds heard or sighted off-plot and between plots are also recorded. At the Gabrielson Tract, refuge staff and volunteers conducted weekly bird surveys during the winter months, and bi-weekly counts during the intervening period. Surveys were conducted by recording all bird observations acquired through walking a 2.75 mile route. Within this area, four distinctly different plant communities have been identified and mapped. The Rudman Tract was the site of approximately once-a-month encounter surveys.

Other Residents

Our highest faunal diversity occurs in undisturbed, dense brush, according to USFWS Ecological Services field investigations conducted in CY 84.

Northern bobwhite quail are common on some refuge tracts. Because we frequently acquire land in early successional stages, with adjacent brush cover, there are, at various times, sizeable numbers of bobwhites on the refuge.

The southern plains wood rat is an often overlooked, but important refuge dweller. It makes its dens in brush piles, thorn scrub, and even cactus. It is important in its own right and it has evolved with and is a staple prey food for the endangered ocelot and jaguarundi.

Refuge staff also had the opportunity in CY 86 to observe twelve wild turkeys, including six young, at the Payne Tract.

Our potentially or actually occurring resident mammals include the black-tailed jackrabbit, eastern cottontail, Mexican ground squirrel, fox squirrel, least shrew, nutria, ten species of mice and rats, six species of bats, striped skunk, nine-banded armadillo, opposum, raccoon, ringtail, coati, javelina, long-tailed weasel, badger, beaver, coyote, bobcat, mountain lion, the endangered ocelot, jaguarundi, and jaguar, and several marine mammals, including the West Indian Manatee and and sixteen species of whales and dolphins.

The Omnivorous Javelina Feeds Extensively on
on Prickly Pear Cactus (1/79, SLF.)

There are at least 81 potentially or actually occurring species of amphibians and reptiles on refuge tracts. Due to extensive pesticide use, industrialization, and continuing conversion of native brush to agriculture, our herpetological fauna continues to decline. One such species is the black-spotted newt, Notopthalmus meridionalis, listed as an endangered species by TPWD. The declining number of this species has been attributed to extensive agricultural development, drainage, industrialization, and urban growth. This is another group of organisms which highlight the importance of an accelerated land acquisition program

in the Lower Rio Grande Valley.

In CY 86 a total of five rehabilitated Texas tortoises were released at the Gabrielson Tract into a prickly pear cactus-type habitat.

11. Fishery Resources

Our single greatest fishery challenge is the decreased water flows in the Rio Grande, largely attributable to agricultural demands for irrigation water, according to Dr. Bob Edwards of Pan American University. An additional problem is our continually declining water quality as a result of heavy pesticide use in the Valley.

The Rio Grande is a major fishery resource with its fresh water fishery influence extending far into the Gulf of Mexico. The overriding consideration of the refuge complex is the commitment to riparian habitat which includes native fish habitat, the channel itself. Channel dams and weirs impact and threaten this international fishery resource. More of these are threading their way into the system, with many more in the planning stages. The 1980's and 1990's may well witness the change from riverine habitat to lacustrine habitat on lower reaches of the nation's second longest river. We even lack the resources to document its demise--we are not doing well with the challenge.

Settling basins and their associated delivery canals and ditches are a rich fisheries resource that is not lost on our refuge tracts. Because they are intermittently separated and connected to the Rio Grande by operation and maintenance, they buffer and protect certain populations and species from changes in flow, depth, oxygen, salinity, and contaminants that are part of our present history. The unfortunate side, however, is that they are part of the problem also. The fact is that they are here producing fish and wildlife habitat, and we are incorporating them in our management and planning.

The Loma Preserve provides critical nutrients for South Bay, a part of which is included in the refuge. South Bay is one of only two maritime hypersaline lagoon complexes in the world. It includes estuarine, transitional, and terrestial habitat that supports a large diversity of ichthyofauna, including additional unique organisms such as an oyster, Crassostrea virginica, which occurs in small, scattered clumps in South Bay. This oyster may be a physiologically different race of oyster than its Gulf of Mexico counterparts due to its tolerance of high salinity and turbidity. South Bay also supports fish species such as the snook, Centropomus undecimalis, and the sailfin molly, Poecilia latipinna. The molly is a livebearer, frequently seen in a school of mosquitofish. It is one of two native mollies which inhabit these waters.

La Sal Vieja, two inland hypersaline lakes encompassing approximately 2100 acres of open water, form a unique ecosystem which supports at least 14 fin fish species, including mullet, striped shiners, mollies, and sheepshead minnows.

Peripheral Fish Species of LRGV

		Segment of Rio Grande		
		Upper	Middle	Lower[1]
CATOSTOMIDAE				
Gray Redhorse[2]	Moxostoma congestum			
CENTROPOMIDAE				
Fat Snook	Centropomus parallelus			X
CHARACIDAE				
Mexican Tetra	Astyanax mexicanus	X	X	
CICHLIDAE				
Rio Grande Perch	Cichlasoma cyanoguttatum	X	X	
CYPRINIDAE				
Rio Grande Shiner	Notropis jemezanus	X		
Tamaulipas Shiner	Notropis braytoni	X	X	
ELEOTRIDAE				
Bigmouth Sleeper	Gobiomorus dormitor		X	X
POECILLIDAE				
Amazon Molly	Poecilia formosa	X	X	

[1] Data were obtained from seine samples taken 1981-82 by Dr. Bob Edwards, Pan American University. Upper segment consists of water from Falcon Dam downstream to Anzalduas diversion dam; Middle segment includes water between Anzalduas diversion dam to a point immediately east of Brownsville, Tx; and Lower segment refers to water from the point immediately east of Brownsville downstream to the mouth of the Rio Grande at the Gulf of Mexico.

[2] No collections of this peripheral species were obtained in any segment during 1981-82 seine samples.

14. Scientific Collections

The refuge participated in one project which involved scientific collections in CY 86. This study, conducted by Matthew Cioperlik, Department of Biology, Pan American University, involved the collection of fish samples through seigning at the Vela Woods Tract. Approximately one dozen mosquitofish, Gambusia affinis, were collected in three seigning attempts. The investigator also collected water quality samples for analysis. The purpose of the study was to determine the effects of applied chemicals and drainage into wetlands on selected RGV fish species (Section D.5).

15. Animal Control

Rio Grande Valley NWR is currently documenting potential and actual animal damage control problems. We have conflicts on two refuge tracts with feral hogs, which cause damage chiefly by ground rooting, resulting in destruction to native habitat. Nutria, large exotic rodents which occupy wetland habitats, compete with waterfowl for natural marsh vegetation, feeding on almost every kind of aquatic plant. We may have additional problems with Nilgai, an Indian antelope which has escaped from adjacent exotic game ranches. Exotic bird species such as the European starling also create conflict situations by competing with our native avians for wild seeds and fruits. We have detected conflicts between native and exotic fish species. Examples of this include the Common Carp, Redear Sunfish, and Blue Tilapia, with the latter species aggressively outcompeting one of our native fishes, the Rio Grande Perch. Our principle efforts in resolving or reducing these problems is directed towards habitat restoration activities which we hope will alleviate or minimize similar animal damage control problems in the future. At the field station level we hope to utilize computer conflict analysis in this area. We have thus far increased the public's appreciation for native wildlife to the point that we received no official complaints from our neighbors in 1986 concerning wildlife damage resulting from the presence of our refuge tracts. When we do receive a nuisance call unrelated to the refuge, we attempt to develop an attitude of wildlife appreciation with the caller. We may also refer the individual to the local ADC offfice in McAllen.

The issue of "grackle control and predation" has again been raised. A study has been funded, and, no doubt, we will have comments as there are few legitimate scapegoats in wildlife management.

H. PUBLIC USE

1. General

Public use at Rio Grande Valley NWR is, by design, held to a minimum. Refuge offices are located with those of Santa Ana NWR; therefore, most casual visitors and their inquiries are combined with and reported by Santa Ana. Interest in visiting a particular tract is handled informally and verbally; interested people are encouraged to become volunteers for the refuge. Other uses are handled by issuing special use permits. Prospective visitors are encouraged to first visit Santa Ana and Laguna Atascosa NWRs, Bentsen-Rio Grande Valley and Falcon State Parks, Anzalduas County Park, and the Audubon Sabal Palm Sanctuary where there are similar wildlands under less primitive conditions, and facilities and personnel are available for a safer and more informative visit.

7. Other Interpretive Programs

Fuller and Schumacher attended the National Audubon Regional Conference where Fuller presented a program on the refuge's role for accomplishing habitat protection in the Rio Grande Valley.

Bryce (SA) and Schumacher gave a talk at the Elk's Club meeting on the "Corridor Concept" in land acquisition and refuge management.

Gilbertson and Vora attended the Texas Academy of Science Symposium. Vora gave a slide presentation on propagation of native plants in the Rio Grande Valley.

Peter Argentine, a free lance film producer was in the Valley to film segments of the Rio Grande for a public television film on rivers in the United States. He filmed Schumacher, Stuart (Realty) and Frank Yturria at the newly optioned Yturria Tract. He also filmed members of the Native Plant Project planting trees at the Vela Woods Tract and filmed the Loma Preserve.

Additional programs were presented in the form of field trips, slide shows, lectures and demonstrations for scout, conservation and school groups. Radio and television interviews, articles in the local Audubon Society newsletter, and news releases informed the local community about events dealing with the refuge.

8. Hunting

Rio Grande Valley NWR, while officially closed to hunting, is involved in a major white-winged dove hunting program. The hunts generally take place on private lands, and many of the hunters end up adjacent to our refuge units because our closed (undisturbed) native brush generally provides the best white-winged dove roosting habitat. For the purposes of the hunt, the river corridor is divided into two areas or sanctuaries (see page 85). The special dove hunt alternates sanctuaries with Sanctuary A closed on even numbered years and Sanctuary B closed on odd numbered years. In a year that a particular refuge tract of land is in an open sanctuary,

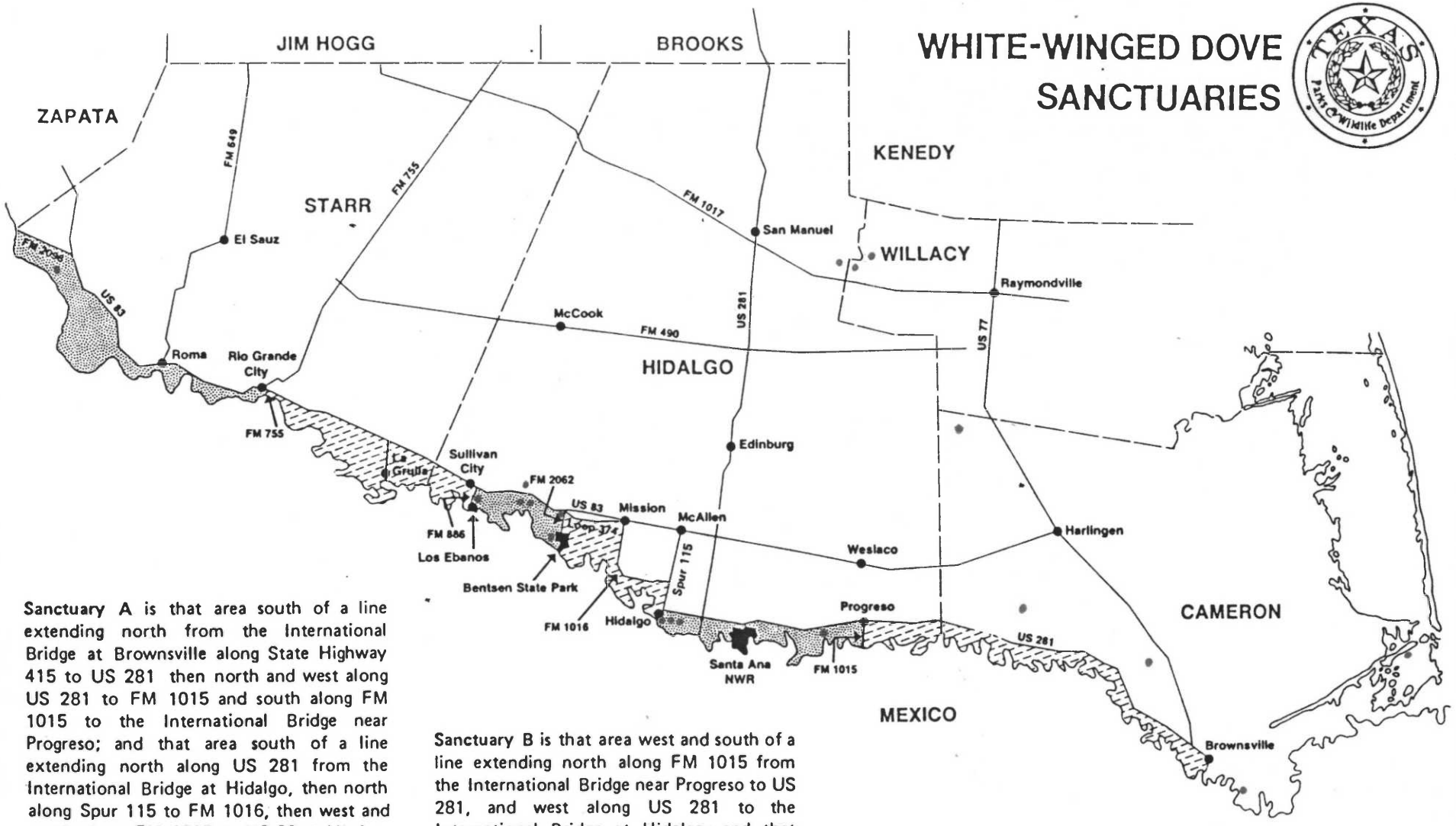
surrounding landowners will commonly plant sunflowers and then lease the fields between the refuge and the sunflowers to the hunters.

The first special white-winged dove season in two years proved to be less than spectacular for the hunting public with many complaining that they "couldn't find a bird to shoot." Still it was estimated that near one tract of land almost fifty percent of the hunters captured their daily bag limit.

The popularity of the hunt has declined from previous years when hunters would sometimes stand shoulder to shoulder directly adjacent to Rio Grande Valley Refuge tracts waiting for the doves to fly past. Reasons for the decline include a decline in huntable dove populations and the cost of the sport, which can get rather expensive when one takes into account ammunition, a state license, a special white-winged dove stamp, and a hunt permit. Our biologist is looking into the demographics of the white-winged dove hunt in order to provide the refuge with improved management guidance. It looks as though there is no easy or magic answer. Acquisition and protection of adequate habitat remains the best guidance.

One of the Lucky Hunters (9/82, R.W.S.)

WHITE-WINGED DOVE SANCTUARIES



Sanctuary A is that area south of a line extending north from the International Bridge at Brownsville along State Highway 415 to US 281 then north and west along US 281 to FM 1015 and south along FM 1015 to the International Bridge near Progreso; and that area south of a line extending north along US 281 from the International Bridge at Hidalgo, then north along Spur 115 to FM 1016, then west and north along FM 1016 to US 83 at Mission, then west along US 83 to Loop 374, then west along Loop 374 to FM 2062 then south along FM 2062 to the entrance of Bentsen State Park and then along the east boundary of Bentsen State Park to the Rio Grande, and that area south of a line extending north from the Rio Grande at Los Ebanos along FM 886 to US 83, then west along US 83 to FM 755 at Rio Grande City, and then south along FM 755 to the Rio Grande.

Sanctuary B is that area west and south of a line extending north along FM 1015 from the International Bridge near Progreso to US 281, and west along US 281 to the International Bridge at Hidalgo; and that area south of a line extending north from the Rio Grande at Bentsen State Park along FM 2062 to Loop 374, then west along Loop 374 to US 83, then west along US 83 to FM 886, and then south along FM 886 to the Rio Grande at Los Ebanos; and that area south of a line extending north from the Rio Grande at Rio Grande City along FM 755 to US 83, then west along US 83 to first junction of FM 2098, then north and west along FM 2098 to the Rio Grande.

REFUGE UNITS LOCATED IN 1986 HUNTING ZONES

Sanctuary A—Closed on even numbered years

Sanctuary B—Closed on odd numbered years

An increase in refuge personnel trained in law enforcement enabled us to increase our presence. This increase both in available refuge staff and, particularly, the increase in new refuge lands account for the corresponding increase in the number of violations during the 1986 hunt.

MBTA HUNTING VIOLATIONS
1981-1986 SPECIAL WHITE-WINGED DOVE HUNT

YEAR	# OF VIOLATIONS	
1981	5	
1982	5	
1983	0	
1984	3	
1985	0	- no hunt
1986	22	

The following refuge units were in hunting zones in 1986:

Los Ebanos - This area was one of our most active this year; therefore, we spent a fair amount of time checking hunters and making educational/ preventative law enforcement contacts. Considering the amount of time spent here, we found few problems. Dove activity was moderate.

Yturria Brush - This tract was quiet and presented no real problems. This was the first hunt for this tract.

Sam Fordyce/Havanna Tracts - Another relatively new land acquisition with adjacent hunting for the first time as USFWS property. Most of our controversy here centered around a lack of boundary signing. Since the hunt, we have constructed fences and placed boundary signs in appropriate locations.

Abrams - This tract was quiet and presented no real problems. Dove flights were minor.

Palmview - Another quiet area with few problems.

Hidalgo Bend - No sign of any hunters near this tract. That's good since it was just inside the closed sanctuary.

Pharr Settling Basin - A generally quiet area. Although we had a report of a hunter inside the refuge boundary, we could not find him/her.

Vela Woods - Opening day was moderately busy with small groups of hunters crowding our boundary. Things seemed to go much better after some educational contacts were made regarding wanton waste laws. Dove flights were also about moderate.

La Coma - Very quiet with no hunters found hunting too close to our boundary.

Resaca del Rancho Viejo - Generally quiet; however, reports were received that hunters were on refuge property.

Thompson Rd. - This area wasn't checked until the second weekend of the season. Once it was patrolled we found too many hunters for such a small piece of brush. The problem here was similar to 1984 when unplugged shotguns, no state hunting license, and over the limit on mourning doves were common violations.

Brownsville - This tract is within the city limits of Brownsville. All was quiet here.

Boscaje de la Palma - This area was not patrolled.

Loma Preserve - This area was not patrolled.

Management of hunting on the refuge consists of educating individuals and agencies about the loss and subsequent waste of large numbers of birds. On average, thirty-three percent of white-winged doves are not retrieved when the hunter is stationed next to the refuge boundary.

9. Fishing

The major fishing attraction in the Rio Grande Valley is the Gulf of Mexico and its attendant estuaries, bays and lagunas. One of these, South Bay, is heavily fished, and is considered by many to be the best inland sport fishery site in South Texas. It is shallow and subject to wind tides creating access chalenges to those who would fish its waters. The recent development of shallow draft boats designed locally specifically for South Bay may change all of that. The refuge includes part of South Bay and fishing will become an increasingly significant management issue in the next few years.

On the other hand, fishing on the Rio Grande is light. Poor access, suspect water quality, and border related law enforcement activity are perhaps some of the reasons. As a result, trespass fishing has, to date, been a significant problem on only two of our refuge tracts. Access to the Brownsville Ship Channel, when open, takes fishermen inside the south boundary of the Lomas Preserve Tract. This access road has now been gated and fenced on both sides, thereby reducing the probability of vehicle trespass on the refuge. We now have the ability to close the access gate to the road when it becomes impassable during wet periods. This closure prevents further damage to the dirt road which, in turn, reduces the likelihood of vehicular trespass around the road. Secondly, at Pharr Settling Basin, we accepted responsibility for reducing trespass (a safety and legal worry for the water district) in exchange for wildlife management rights on the basin (protecting wintering waterfowl). No citations were written this year for trespasss fishing at this tract. We have approached the problem with posting of signs, increased patrols, and limited access. After seven years, our labors for the resource are beginning to resolve the problem.

11. Wildlife Observation

Rio Grande Valley NWR is one of a handful of refuges where observing and photographing rare and peripheral plant and animal species is a matter of national and international concern. This public use issue really demonstrates the ongoing need for an effective working relationship between Santa Ana NWR and Rio Grande Valley NWR. The visitor center located at Santa Ana is used for both refuges. Therefore, a visitor looking for access to Rio Grande Valley NWR is already at Santa Ana NWR. We try to determine what kind of wildlife oriented recreation they are seeking, and usually we can meet their needs right at Santa Ana NWR. This has worked out to be a very positive arrangement both for resource protection and visitor satisfaction. We have found virtually everyone to be supportive of this concept when we have the chance to present this philosophy in the correct environment. When appropiate we also direct visitors to other resource areas that are equiped to accomodate visitation.

16. Other Non-Wildlife Oriented Recreation

Because the refuge is closed to the public, non-wildlife oriented recreation is not permitted. Still, we do have our share of individuals who do use the refuge, illegally, for recreational purposes that have nothing at all to do with their enjoyment of wildlife. Our close proximity to the U.S./Mexico border and relative remoteness makes our lands a popular choice for alcohol and other drug abuses, loiterers, illegal hunters, and vehicle trespassers.

We feel, though, that progress is being made in the reduction of these activities. Our fences and gates, although not aesthetically pleasing, have made access to our lands much more difficult. Our continuing informal education program is also proving effective. By stopping and talking with neighbors we are learning to work with them, and by working together we are benefitting the dwindling wildlife resource of the Rio Grande Valley. This is yet another reason why we are building a trained, committed, resource responsible, and knowledgeable staff.

17. Law Enforcement

Law enforcement at Rio Grande Valley NWR takes on a somewhat different approach from other refuges in the system. Refuge regulations are enforced while performing other duties. There are inherent law enforcement problems associated with administering large numbers of small, scattered tracts that are not as evident on refuges with contiguous ownership and well-defined boundaries. Problems including burning of refuge fence rows, cutting trees for firewood, removing plants and artifacts, etc. can only be solved with more staff hours to locate these problems and an increased work effort on problem prevention as opposed to violation enforcement.

Mesquite Tree Cut for Firewood -
Just One of Many Problems Encountered at RGV NWR (5/85, B.H.S.)

Illegal dumping at several Rio Grande Valley NWR tracts continues to be a significant problem for the refuge. This headache is related to socio-economics, and is likely to change only over a period of time. A combination of signs, gates, strategic plantings, fences, neighborhood contacts, patrols, and citations are our primary tools used to help keep this problem under control.

Fuller, Schumacher, Gilbertson, and Vora attended an in-service law enforcement refresher in Albuquerque, New Mexico in May. Garcia attended the ten week law enforcement training session at Glynco, Georgia, September and October.

Law enforcement training has improved officer knowledge and attitude; however, the current program does not yet satisfy the needs nor resolve the risks at a station like Rio Grande Valley NWR. Refuges need a total package tailored to station needs.

The special white-winged dove hunting season was open the first two weekends in September this year. Our emphasis again this year was on preventative law enforcement techniques and on behavior modification with our goal being resource protection and respect for that resource. Our biggest problem is the uninformed hunter shooting at birds that if hit probably cannot be retrieved. Estimates are that at least one-third of the white-winged doves shot are in this category. The hunt starts at noon. We get out early to contact hunters and give them a courtesy check to insure that they are legal and advise them of not shooting too close to heavy

cover, particularly our refuge tracts. During the rest of the day we maintain contact with the hunting program by travelling from tract to tract to insure compliance and to encourage hunters not to encroach on refuge boundaries. We feel that we are able to effect some control resulting in fewer birds being wasted. As a result, we did not have any major problems during the course of the hunt. A total of 22 violations were issued during this special dove hunt. These violations, as well as others issued throughout the year, have been included in the following chart:

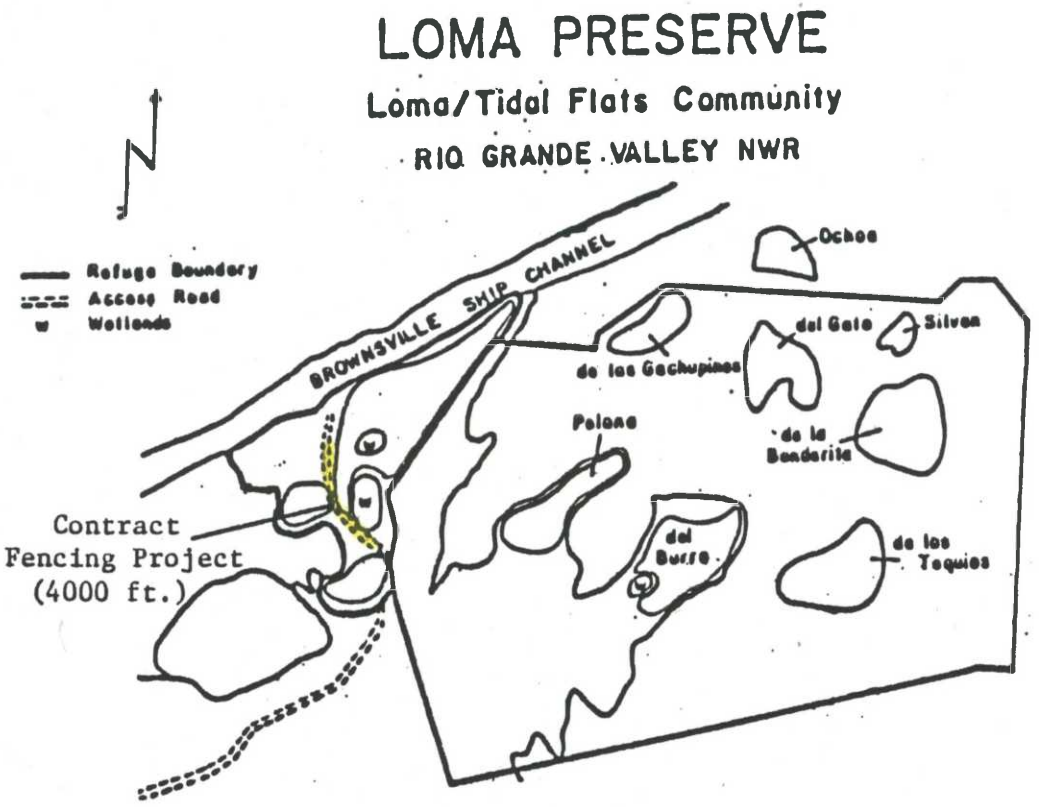
Law Enforcement Violations for 1986

Violation	Number	Disposition
Unplugged Shotgun	5	Paid $100.00/ea.
	1	Paid $125.00
	1	Paid $150.00
	1	Paid $175.00
No White-Winged Dove Stamp	1	Paid $100.00
Trespass	3	Paid $50.00/ea.
	1	Paid $100.00
Over Possession Limit	2	Paid $200.00/ea.
	1	Paid $225.00
	1	Paid $550.00
Take Out of Season	1	Paid $75.00
Hunting in Closed Area	1	Paid $100.00
	1	Paid $125.00
	2	Paid $175.00/ea.
	1	Paid $200.00
Hunting w/o State License	3	Paid $100.00/ea.
	1	Paid $125.00
Collecting Plants on NWR	1	Open
	TOTAL 28	

I. EQUIPMENT AND FACILITIES

1. New Construction

Fences are built as necessary to discourage potential trespass and dumping problems. Overall, the materials for posting, gating, and fencing are purchased from operating funds. All too often, we feel that we have to beg, borrow, or steel the labor to construct these fences. Approximately 8128 feet of fences were constructed this year through the use of fencing contracts. Approximately 4000 feet of barbed wire fence was built under contract at the Loma Preserve Tract. Cooperative farmers built about 9 miles of boundary fence. We estimate that 38 miles of boundary fencing still needs to be accomplished before our boundaries are in control.



Cable gates are installed to discourage vehicle trespass. These gates seem to be able to withstand a lot more stress and abuse given to them by the public than standard aluminum or metal gates. The gate consists of 6 to 8 inch diameter drill pipe, greater than 1/4 inch thick, for gate posts (cemented into the ground), and 5/8 inch galvanized cable and 1/2 inch link chain. A sign frame is suspended from the cable and a FWS Area Closed sign is bolted to the frame. We have been having some difficulty keeping signs on the cables, but hope to have better success in 1987. The cable holding mechanism was the weak point of earlier gates and has been modified a number of times, resulting in a solid, secure gate which has been challenged by bolt-cutters, sledge hammers, gun blasts and yes,

even motor vehicles (the cement around the gate posts usually gives out first in this situation before any of the gate material)! The use of these gates has detered vehicular traffic quite well. This year forty cable gates were manufactured under contract by a local welding shop. Twenty-two of these gates were installed at the Rudman Tract to control access effectively.

Modifications to the Cable Gate Chain Holding Mechanism Provides a Very Secure System (11/86, C.S.C.)

4. Equipment Use and Replacement

The refuge fleet has multiple drivers and vehicles are not assigned to individual staff members, therefore vehicle use and preventative maintenance scheduling is an important part of our operational program. A large blackboard listing the vehicles and each day of the week is located in the refuge office building. Individuals sign out for vehicles in advance and note on the board any mechanical problems with the vehicle after use. Repairs are done by Santa Ana's mechanic Fermin Mancha and the private sector. The scheduling system is working well and repairs are being accomplished in a reasonable amount of time so the fleet is always up and running for our use.

A new 4X4 pick-up was ordered in 1986 to replace a 1977 3/4 ton Jeep which is currently being used with a refuge slip-on fire surpression pump installed on it. The fire trucks and pumpers continue to have functional problems. Through the efforts of Santa Ana's Mechanic Mancha and a local

business which repairs pumper engines, many modifications have been added to the pumpers during the last year which have helped alleviate the problems. As a back up system to the electric primers on the pumps, hand-pump primers have been installed. Written instructions for operation of the pump are carried in the fire fighting unit for easy and fast reference. These instructions are very helpful, especially to the individual who only uses the fire pump occasionally.

5. Communication Systems

The 2-way radio communication system was up-graded in 1985 with the purchase of a VHF high-band system. Each refuge vehicle is equipped with a GE, 16 channel radio. Three, hand-held portable radios were purchased this year and are available to refuge staff when they are away from the vehicle.

When the refuge began using the new radio system, we discovered that there was a Mexican trucking business across the border using the same radio frequency as the refuge. According to the FCC, the company is using the frequency illegally. Martin Suhr, FWS Region 2 Fire Coordinator, and the FCC are working on this problem and hope to have it resolved shortly. Overall, the new system is working well and has increased our communication abilities, which is an added safety measure for our staff.

6. Computer System

The Santa Ana/Rio Grande Valley NWR Complex has two Digital Rainbow computers, a letter quality printer, a dot matrix printer and a modem. Every member of the RGV NWR staff is computer literate to an increasing degree and regularly uses the Rainbow computers. In fact, the computers are in such demand that computer time is scheduled a week in advance and is restricted to a two hour block of time on the letter quality printer. The computers are frequently used to tract refuge projects.

James E.B. Stuart from the USFWS Realty Office in McAllen installed 20 megabyte hard disc drives in the Complex computers this year. We will be using these for dBase, MBasic, Statpak software and attending data for woody vegetation inventory, the Gabrielson wildlife survey, white-winged dove inventories, and realty information.

7. Energy Conservation

The refuge motor vehicle fleet consists of small, light weight, fuel-efficient vehicles. Efficiency of operation will continue to be an important consideration because RGV NWR is scattered throughout four counties with an east to west spread of 150 road miles.

J. OTHER ITEMS

1. Cooperative Programs

Ecological Services in Corpus Christi, Texas, provides us with valuable resource assistance. In the past, they have assisted in handling potential and actual conflicts between private interests and the refuge. In CY 86, the ES office assisted the refuge in investigating a aquacultural site adjacent to the Loma Preserve for possible permit violations (Section J.2). They also provided assistance to the refuge by collecting biological information on the proposed Playa del Rio development (Section D.4). In addition, they produced a study on the impact of channel dams on Rio Grande Valley and Santa Ana NWRs (Section F.2).

Refuge staff co-operated again in CY 86 with the TPWD in conducting white-winged dove coo counts in late spring. Additional assistance was supplied with white-winged dove nest transects in June, and white-winged and mourning dove feeding flight counts in August.

A Cooperative Effort Between the
the State and the USFWS (10/85, R.W.S.)

Pan American University's Biology Department and McAllen High School continued to contribute valuable volunteer time and effort with a variety of mutually beneficial projects. The refuge receives substantial benefits from the biological information gained through these projects, as well as additional community recognition and support.

The Student Conservation Association (SCA) provided the refuge with three volunteers in CY 86. Greg Bryant, Karen Walter, and Ruth Starman all gave the refuge valuable biological assistance during their twelve-week assignments. Our SCA program has proven to be a very worthwhile component of our overall staffing efforts, and we feel we, in turn, offer these volunteers an excellent exposure to many areas of biology (Section E.3).

In CY 86, four refuge employees assisted local birders in four Christmas bird counts. The surveys, held throughout the U.S., provide important indexes of winter bird populations. Local counts included Santa Ana NWR, Anzalduas/Bentsen State Parks, La Sal Vieja, and the coastal tip of Texas.

2. Other Economic Uses

Aquaculture Site - An experimental aquaculture site was constructed next to the Loma Preserve along the ship channel on property owned by the Brownsville Navigation District (BND). This commercial feasibility demostration project is sponsored by the U. S. Army Corps of Engineers (COE). The purpose of this demostration is to profitably culture marine shrimp (Pennaeus vannamei, an exotic white shrimp) on a dredge spoil containment site that MariQuest has leased from the BND for and in cooperation with the COE. The experiment is to last from 6/1/86 through the shrimp harvest season of 1988.

We were not informed of the project from the beginning and had no imput into the plan. There was no written mention of where the discharge water would go. The COE's aquaculture research specialist John Lung contacted us requesting a permit to drain onto the Loma Preserve which would "improve the surrounding estuary." We denied their request based on impacts to the tidal flat. They decided to drain the effluent back into the Brownsville Ship Channel which is where they take the water to begin with.

The COE needed access through the Loma Preserve to work on construction of the ponds and levees, so we provided them with keys to our gate. While the COE was working there, the road became impassable during heavy rains, so they bladed a new road through one of the lomas. The damage to the loma is extensive and it will take decades to remove the scar of the road. We are, however, working with COE to reduce any more damage to the area.

Miramar Oil at Hidalgo Bend - In February, the refuge received a letter from Miramar Petroleum, Inc. requesting a permit for "Access Route and Drilling Site" for the Hidalgo Bend Tract. They planned to drill an 8500 foot exploratory well for oil and/or gas production. Texaco owns certain oil and gas leases on the tract and subleases to Miramar. After an archeological survey and review of the necessary documents, the Regional Office issued the permit. The well turned out to be a producer of natural gas. Miramar offered to sell the gas to Texas Eastern Transmission Company since they had a pipeline in close proximity to the well. Texas Eastern declined the offer, so Miramar installed a pipeline parallel to the Texas Eastern line to market the gas. This pipeline route had been approved in the original permit issued to Miramar. The well is still in production at this time.

3. Items of Interest

Fuller, Gilbertson, and Schumacher met ARD Klett, South Texas Supervisor Hawthorne, and Jim Leupold (PDW) and spent two days in September at the Complex looking at refuge tracts and proposed land acquisitions.

We were saddened by the death of a colleague and friend of the resource. Lloyd Bletsch worked at Santa Ana Refuge as a seasonal employee and as a volunteer for Rio Grande Valley NWR in the early 1980's. He was an active crusader for the protection of the environment.

A major fish, crayfish, and clam die-off occurred just south of Falcon Dam June 7. A combination of extremely high temperatures, and low water levels (caused by a slow-down of water released from the dam) during critical hours was probably the cause of the kill. Chemical contamination was also thought to be a possible combined cause of the die-off that killed thousands of fish including at least ten different fish species.

Falcon Dam Fish Kill - White Spots are Fresh Water Clam "Meats" Floating in the River (6/86, R.W.S.)

The Ecological Services staff in Corpus Christi, Texas, have again done an outstanding job in compiling a special report for the refuge. The Value and Status of Inland Pothole Wetlands in the Lower Rio Grande Valley, Texas (see Information Packet) is an excellent report of one of the most unique habitat types found in the Valley. The ES office's work is a valuable and very much appreciated contribution.

A red tide that plagued most of the central portions of the Texas coast creeped southward towards South Padre Island and Port Isabel during mid-October. Large numbers of fish died as a result.

The Red Tide (10/86, R.W.S.)

Fuller presented the LRGV land protection and acquisition program at the Soil Conservation Service meeting for South Texas. Purpose of the presentation was to encourage considering wildlife needs while developing set-aside programs.

The Native Plant Project held its Board of Directors and general meetings in Weslaco on November 14. Gilbertson discussed native plants. Her talk was subsequently praised as one of the most pertinent Native Plant programs the NPP has ever had.

Fuller and Schumacher discussed the RGV NWR land protection plan and proposed TNC international projects with Ben Brown of the Texas Nature Conservancy.

Two private properties (Martin) were established as private wildlife sactuaries in Hidalgo County. A total of about 230 acres were set aside for this purpose. Also, the Texas Parks and Wildlife Department acquired about 118 acres this year with the addition of their Carricitos Unit in December. With the efforts of the State and private citizens, the wildlife resource definitely will have a fighting chance in the Valley.

4. Credits

This annual narrative report was written by Bornstein, Caldes, David, Garcia, Gilbertson, Rossignol, and Schumacher. It was organized and compiled by Rossignol, and typed and printed on our twin Rainbow computers. Wildlife drawings were drawn by Norman Alfred Brown, Bob Hines, and Vernon C. Weckbacher. Photographers were Claire Caldes, Nita Fuller, Nancy Gilbertson, Bob Parvin, Bob Powell, Bob Schumacher, Brenda Smith, Roy Tomlinson, and Robin Vora. This report was reviewed and edited by Fuller and Schumacher.

K. FEEDBACK

The Feedback section has made for interesting reading since its initiation a few years ago. It is my feeling that the staff here at Rio Grande Valley NWR appreciates the intended purpose of this section. The term "feedback" is usually accepted to mean the return of useable information to the system for further consideration. We believe that in order for this to be true, our comments, although usually serious, need to be and are intended to be constructive. They reflect our perspective and our experience.

Our goal remains the same: better resource management. I would like these comments to be viewed in the spirit they are offered, as looking forward. With this in mind, I'd like to introduce a single subject for discussion: Information Transfer to Refuges. Rio Grande Valley NWR, as well as all refuges, is impacted by the determinations of others.

We are sometimes adversely affected by studies, permits, agreements, and research initiated often without our input or even without our knowledge. The result is that, in some instances, although we would have been able to provide key resource information, commitments have been made and positions taken. At this point, changes in direction or modification are difficult, reluctant, and all too often negative. We understand the levels of decision making. We are discussing the logic of refuge input at the formative stage, not the operative stage. I perceive this as a serious system-wide fault, one of the primary causes of "knee-jerk" reactions. Too many of these decisions later resurface as problems. If we had input at the beginning, the resource would not have to suffer. Our decision makers involved at the conceptual and other planning stages are not always aware of wildlife resources in our area of operation; USFWS interests unique to our area; refuge holdings and authorized additions in our area; or cummulative negative impacts to our specific wildlife resource from independent off-refuge actions.

There needs to be a policy change. We are not refuge caretakers; we are refuge managers. As a matter of protocol, refuges need to be alerted and queried for information during the beginning of FWS involvement. This happens, but not systematically.

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Juan Flores — Orlando Rodriguez

City Representatives

As a membership organization our strength comes from our many interested members. Won't you join us in sharing the knowledge and appreciation of the spectacular and fragile ecology of South Texas' Lower Rio Grande Valley?

MEMBERSHIP

Individual	$15.00
Student	5.00
Family	25.00
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Send payment, along with your name, address and telephone number to:

THE VALLEY NATURE CENTER
PO Box 8125
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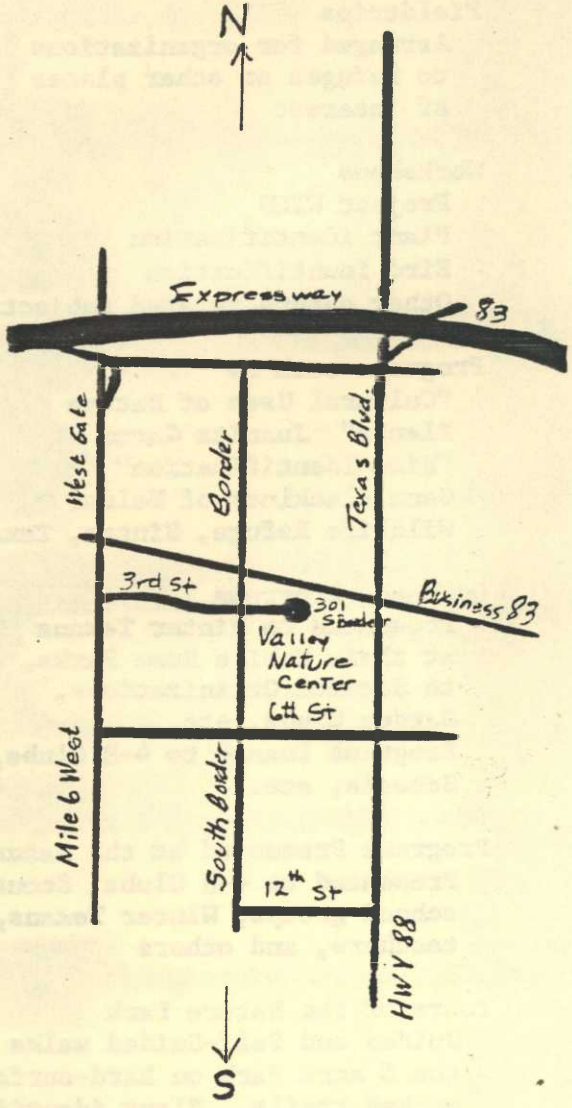
LOCATION MAP



VALLEY

NATURE CENTER

THE LOWER

RIO GRANDE VALLEY

NATURE CENTER

301 S. Border Ave.
Gibson Park
P.O. Box 8125
Weslaco, Texas
78596

THE LOWER RIO GRANDE VALLEY NATURE CENTER

The Valley Nature Center is a Valley-Wide environmental education center located in Weslaco, Texas. The Center came into being in the summer of 1984 when the City of Weslaco and the Frontera Audubon Society entered into a contractural agreement to establish the Valley Nature Center in Gibson Park on South Border Avenue.

GOALS

include:

increasing knowledge and understanding of the natural world and our place in it;

developing an awareness, appreciation, and affection for nature;

developing an environmental ethic which provides for the protection and wise use of the living resources of the earth;

providing a natural area and associated facility where people may study the physical features, native flora and fauna, and the ecology of the Lower Rio Grande Valley;

providing a natural outdoor laboratory for the stimulation of scientific curiosity, especially among young people.

ACTIVITIES AT THE NATURE CENTER

Celebration of Special Events
- Wildlife Week, Coastal Week
- Wildflower Day, etc.

Fieldtrips
- Arranged for organizations to refuges or other places of interest

Workshops
- Project WILD
- Plant identification
- Bird identification
- Other nature related subjects

Programs such as
- "Cultural Uses of Native Plants" Juanita Garza
- "Bird Identification" Gene Blacklock of Welder Wildlife Refuge, Sinton, Texas

Outreach Programs
- Presented to Winter Texans at their Mobile Home Parks, to Service Organizations, Garden Clubs, etc.
- Programs loaned to 4-H Clubs, Schools, etc.

Programs Presented at the Nature Center
- Presented to 4-H Clubs, Scouts, school groups, Winter Texans, teachers, and others

Tours of the Nature Park
- Guided and Self-Guided walks in the 5 acre Park on hard-surfaced marked trails. Plant identification information provided

NATURE PARK

The five acre Nature Park of native vegetation is open to the public from 9:00AM to 1:00 PM Monday through Saturday. Other times can be arranged by calling the Nature Center Office at 969-2475.

The hard-surface trails are marked and the major trees and shrubs are identified. At the waterfall there are small native fish and an unusual bee hive in a mesquite tree nearby. Birds are attracted by the water source and bird feeders that are hung from trees. The Park has many cacti and possibly the largest coyotillo tree on record.

EXHIBITS

The emphasis of the exhibits changes with special programs, but there is always information about birds that migrate through this area and the year round resident birds There are butterfly collections, assorted local sea shells, etc. The aquarium has small native fresh water fish.

LIBRARY RESOURCES

Field Guides for plant and animal identification
Leaflets, brochures, pamphlets, etc.
Posters, games, teacher materials
Slide/easette programs with scripts

MEETING ROOM SPACE

Large room for meetings and activiti
Small room for presentation of programs

We Need You!

The Native Plant Project has no paid staff and is supported entirely by memberships and contributions. All donations are tax-deductible.

Memberships

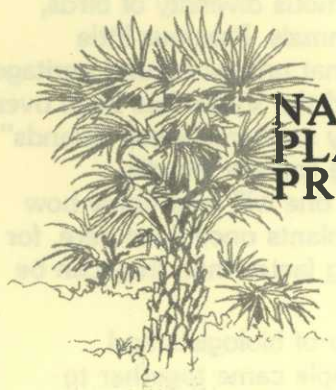
Regular	**$10 per year**
Contributing	**$25 or more per year**
Life	**$150 one time fee per individual**

Each Contributing and Life Member will receive a native tree seedling, along with the satisfaction of participating in the restoration of the Valley's native vegetation. Members will be kept informed of project activities and General Meetings. We ask that you give as generously as you can.

Wild Olive

Plant drawings by Norman Browne
Logo by Sandi Tax

Native Plant Project
Box 1433
Edinburg, TX 78540



NATIVE PLANT PROJECT

A Non-Profit Group

Committed to the Preservation and Propagation of Plantlife Native to the Lower Rio Grande Valley of Texas

The Rio Grande Valley was once a woody wilderness of brush, grasses and trees, home to an enormous diversity of birds, reptiles, and mammals. Precious little remains now of that unique natural heritage, for by man's hand the Valley has been over 95% cleared. Only scattered small "islands" remain, and these too are steadily disappearing. No one will ever know how many species of plants once lived here, for they are vanishing faster than they can be identified.

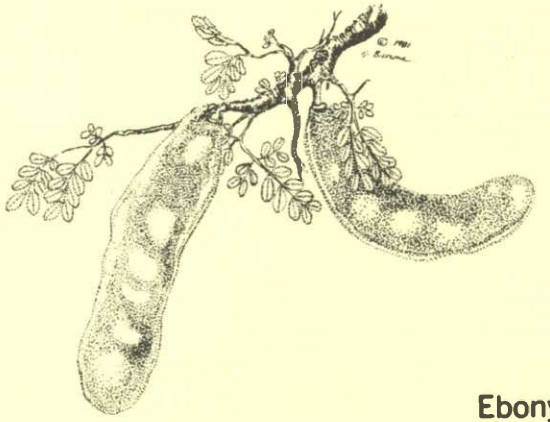
In 1982 a group of biologists and concerned laypeople came together to address this issue that affects us all. The result was the Native Plant Project.

What are Our Goals?

The Native Plant Project promotes the conservation of native plants, particularly those which are endangered, rare, or especially beneficial or attractive.

The Project seeks to increase scientific knowledge of native plant propagation for both horticultural and natural re-vegetation purposes.

The Project seeks to increase the public's knowledge and awareness of the importance of native plants in the Rio Grande Valley, and encourage their use in landscaping, both public and private.



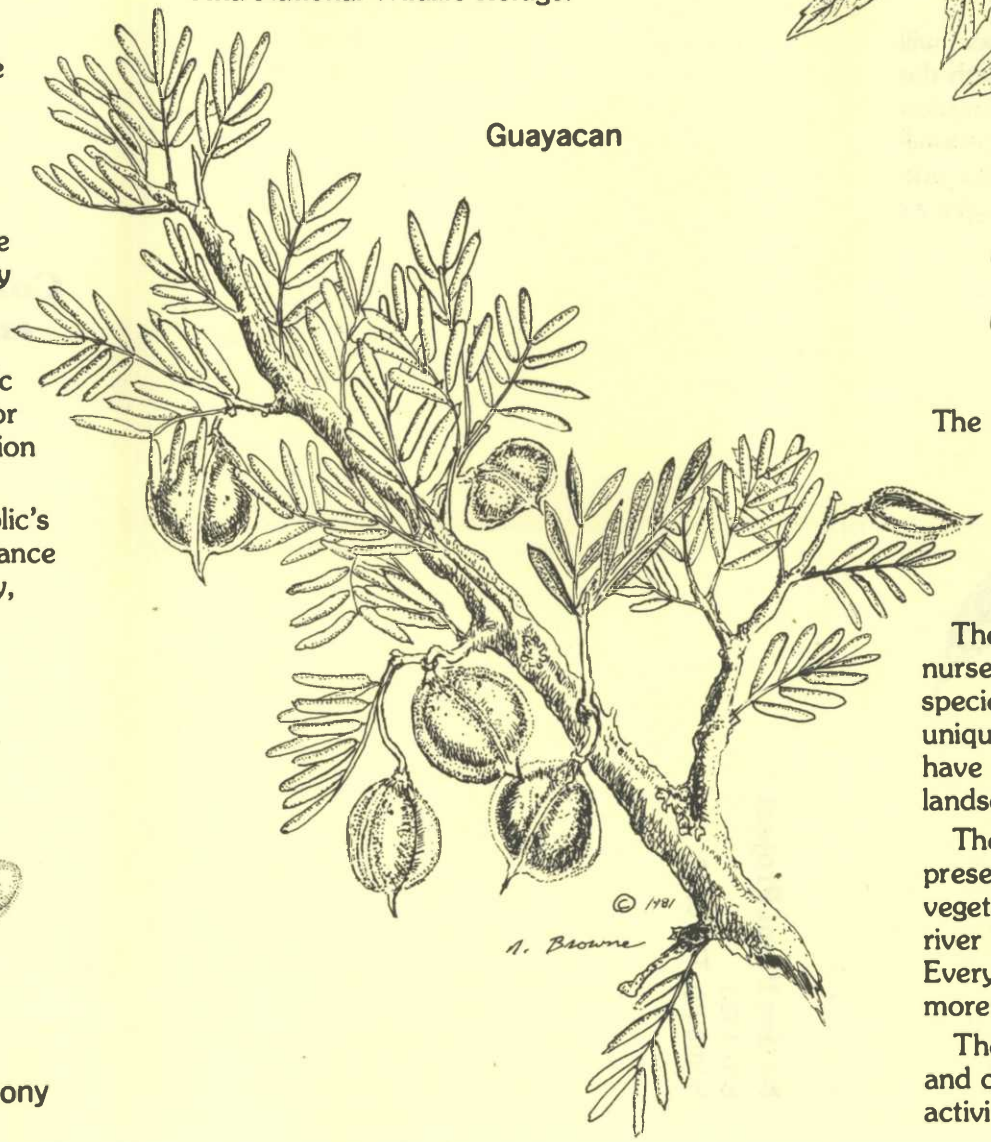
Ebony

What are we Doing Now?

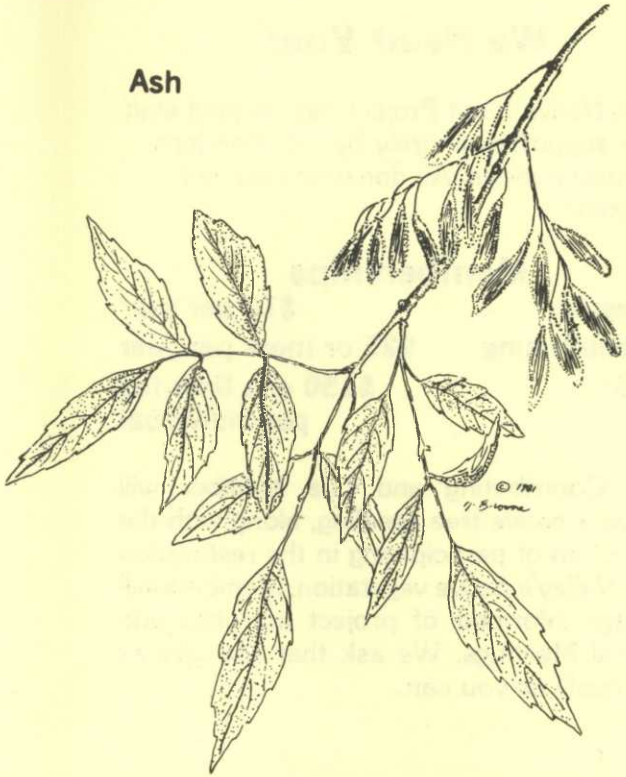
Already the Native Plant Project is busy. The Project is participating with the Rio Grande National Wildlife Refuge in re-vegetating a small tract of cleared land near Alamo.

The Project is assisting the City of Weslaco in developing its 6-acre Nature Park.

The Project plans to landscape several of the large parking lot islands at the Santa Ana National Wildlife Refuge.



Guayacan



Ash

And the Future?

The Native Plant Project is beginning to work on an "endangered species" list of Valley trees and shrubs. Once identified, they will be propagated and distributed as widely as possible.

The Project intends to work with local nurserymen to grow, stock and sell native species. Besides being ideally suited to our unique soil and climate conditions, natives have considerable ornamental and landscaping value.

The Project will work towards the preservation of existing areas of natural vegetation, such as irrigation, floodway or river banks, and highway right-of-ways. Every little bit means more diversity and more wildlife habitat.

The Project seeks to become a resource and clearinghouse for information and activities relating to native plants.

TEAL DUCKS ONLY —
Blue-winged, Green-winged and Cinnamon Teal (Special Early Season)

SEASON: September 13 through September 21, 1986.

SHOOTING HOURS: Sunrise to sunset.

DAILY BAG LIMIT: Four in aggregate; possession limit, eight in the aggregate.

King and Clapper Rails

SEASON: September 1 through November 9, 1986.

SHOOTING HOURS: One-half hour before sunrise to sunset.

DAILY BAG LIMIT: 15 in the aggregate; possession limit, 30 in the aggregate.

Sora and Virginia Rails

SEASON: September 1 through November 9, 1986.

SHOOTING HOURS: One-half hour before sunrise to sunset.

DAILY BAG LIMIT: 25 in the aggregate; possession limit, 25 in the aggregate.

Moorhens (Common Gallinules) And Purple Gallinules

SEASON: September 1 through November 9, 1986.

SHOOTING HOURS: One-half hour before sunrise to sunset.

DAILY BAG LIMIT: 15 in the aggregate; possession limit, 30 in the aggregate.

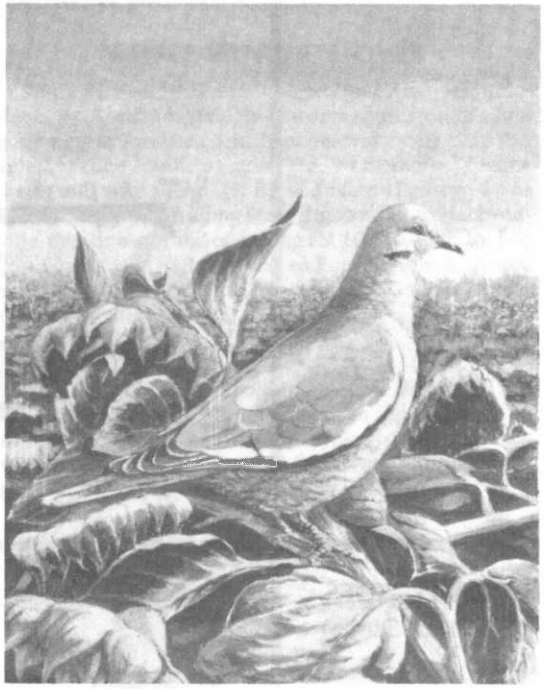
For additional information on hunting and fishing regulations or other subjects related to the Parks and Wildlife Department call our toll-free number: **1-800-792-1112.**

Published by:
TEXAS PARKS & WILDLIFE DEPARTMENT
4200 Smith School Road
Austin, Texas 78744

PWD-BR-7100-128-8/86

Early Season MIGRATORY GAME BIRD

(Doves, Rails, Gallinules, and Teal)



Hunting Regulations 1986 - 1987

THIS DIGEST EXPIRES AUGUST 31, 1987

This painting of a white-winged dove by Texas Parks and Wildlife Department staff artist Chris Morel adorns the state's white-winged dove stamp. The $6 stamp is required of all whitewing hunters during the 1986-87 hunting seasons. In addition, all migratory game bird hunters must have a valid hunting license. Resident hunters under 17 years of age, 65 years of age and older and qualified disabled veterans—Special Resident Hunting, $6.00. All other residents—Resident Hunting, $10.00 or Combination Hunting and Fishing, $15.00. Non-residents—General Non-Resident Hunting, $200.00 or Non-Resident Small Game Hunting, $75.00. Waterfowl (ducks, geese, and coot) hunters are required to have a $5.00 state waterfowl stamp. Stamps and licenses are available at Department offices, most sporting goods stores, department stores and many other outlets across the state. Federal law also requires waterfowl hunters 16 years of age and over to have a federal Migratory Bird Hunting and Conservation Stamp (commonly called a Duck Stamp) available at most post offices. All state and federal stamps must be signed in ink across the face of the stamp. Funds from sales of the two state stamps will be used for whitewing and waterfowl research, management, and habitat acquisition in Texas.

Hunters 17 years of age or older must have a driver's license or personal identification certificate (issued by the Dept. of Public Safety) on their person while hunting.

The number of migratory game birds imported from Mexico may not exceed the export limit set by the Mexican state from which they are imported. It is illegal to import migratory game birds belonging to another person.

Other more restrictive federal regulations may apply to National Wildlife Refuges open to public hunting. For more information contact: Special Agent-in-Charge, U.S. Fish and Wildlife Service, P.O. Box 329, Albuquerque, New Mexico 87103. Telephone 505-766-2091.

MOURNING DOVES

SEASON: North Zone—September 1 through November 9, 1986, in that area north of a line beginning at Fort Hancock, thence east along IH 10 to IH 20, thence east along IH 20 to Fort Worth, thence east along IH 30 to the Texas-Arkansas state line.

SEASON: Central Zone—September 1 through October 30, 1986 and January 3 through January 12, 1987, in that area between the North Zone and the South Zone.

SEASON: South Zone—September 20 through November 18, 1986 (November 14, 1986 in the special White-winged Dove Area) and January 3 through January 12, 1987, in that area south of a line beginning at Fort Hancock, thence east along IH 10 to Van Horn, thence east along U.S. 90 to San Antonio, thence east along IH 10 to the Texas-Louisiana state line.

SHOOTING HOURS: One-half hour before sunrise to sunset.

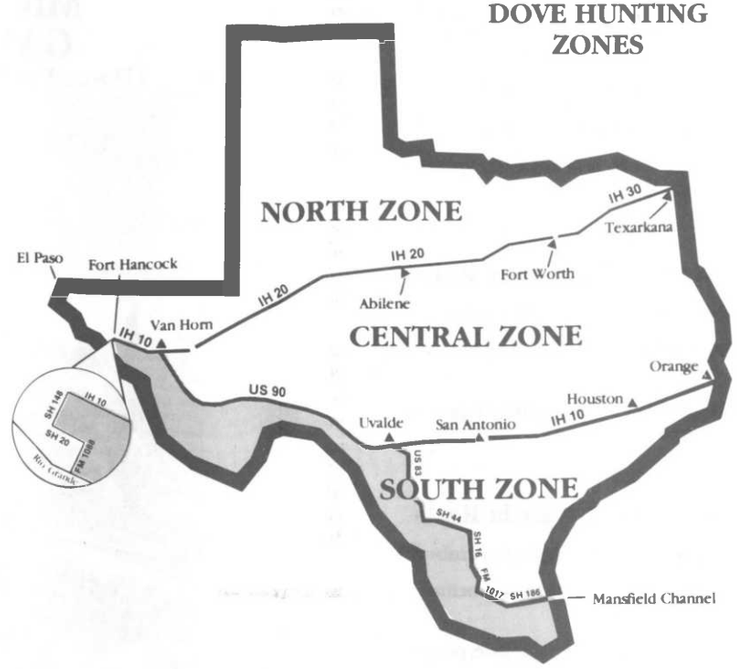
DAILY BAG LIMIT: 12 mourning, white-winged, and white-tipped (white-fronted) doves in the aggregate to include no more than two white-winged and two white-tipped doves; possession limit is twice the daily bag limit.

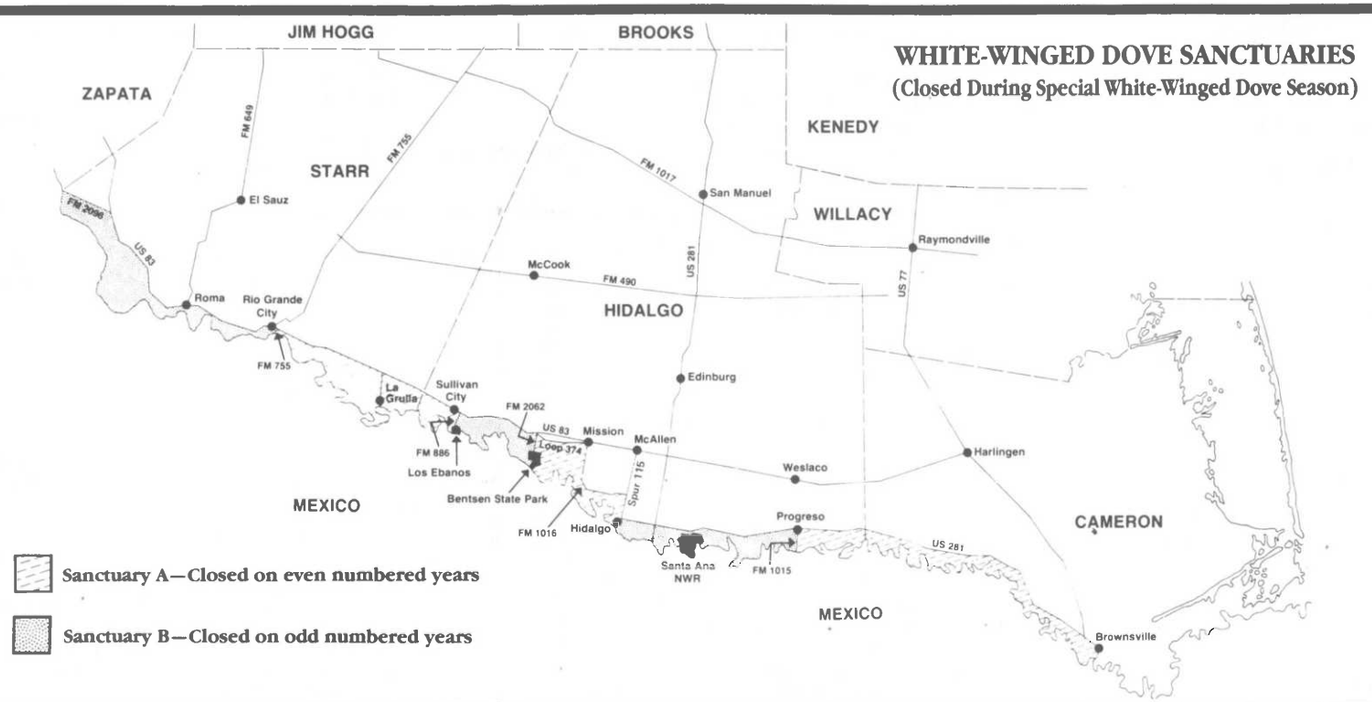
WHITE-WINGED DOVES

SEASON: Special White-Winged Dove Area—September 6, 7, 13 and 14, 1986, in that area southwest of a line beginning at Fort Hancock, thence east along IH 10 to Van Horn, thence southeast along U.S. 90 to Uvalde, thence south and east along U.S. 83 and State Highway 44 to Freer, thence south along State Highway 16 to Hebbronville, thence south and east along FM 1017 to Linn, thence east along State Highway 186 to Port Mansfield, thence east along the Mansfield Channel to the Gulf of Mexico (see sanctuaries below).

SHOOTING HOURS: Noon to sunset.

DAILY BAG LIMIT: 10 white-winged, mourning, and white-tipped (white-fronted) doves in the aggregate to include no more than two mourning doves and two white-tipped doves; possession limit is twice the daily bag limit.





Sanctuary A is that area south of a line extending north from the International Bridge at Brownsville along State Highway 415 to US 281 then north and west along US 281 to FM 1015 and south along FM 1015 to the International Bridge near Progreso; and that area south of a line extending north along US 281 from the International Bridge at Hidalgo, then north along Spur 115 to FM 1016, then west and north along FM 1016 to US 83 at Mission, then west along US 83 to Loop 374, then west along Loop 374 to FM 2062, then south along FM 2062 to the entrance of Bentsen State Park and then along the east boundary of Bentsen State Park to the Rio Grande, and that area south of a line extending north from the Rio Grande at Los Ebanos along FM 886 to US 83, then west along US 83 to FM 755 at Rio Grande City, and then south along FM 755 to the Rio Grande.

Sanctuary B is that area west and south of a line extending north along FM 1015 from the International Bridge near Progreso to US 281, and west along US 281 to the International Bridge at Hidalgo; and that area south of a line extending north from the Rio Grande at Bentsen State Park along FM 2062 to Loop 374, then west along Loop 374 to US 83, then west along US 83 to FM 886, and then south along FM 886 to the Rio Grande at Los Ebanos; and that area south of a line extending north from the Rio Grande at Rio Grande City along FM 755 to US 83, then west along US 83 to first junction of FM 2098, then north and west along FM 2098 to the Rio Grande.

MIGRATORY GAME BIRDS

All wild species of ducks, geese, brant, coot, rail, gallinules, plovers, Wilson's snipe or jacksnipe, woodcock, mourning doves, white-winged doves, white-tipped (white-fronted) doves, red-billed pigeons, band-tailed pigeons, shorebirds of all varieties and sandhill cranes.

OPEN SEASON: Migratory game birds may be taken only during the open seasons specified in either the Early Season or Late Season Digests. If no season is given for a species, the season is closed. Unless otherwise specified, there are no open seasons on state and federal wildlife preserves and sanctuaries, public roads and highways or their rights-of-way, or state-owned riverbeds in Dimmit, Uvalde, or Zavala Counties.

DAILY BAG AND POSSESSION: The daily bag limit is the maximum number of birds as specified for each species which may be taken during the legal shooting hours of any one day.

The possession limit is the maximum number of birds that can be taken legally in two days. For the first day of any season the possession limit is the daily bag limit.

No person shall possess more than one daily bag limit of freshly killed birds while in the field or while returning from the field.

A reasonable effort must be made to retrieve any killed or wounded birds and any wounded bird retrieved must be immediately killed and made part of the bag limit.

No person may possess freshly killed birds during the closed season.

One fully feathered wing must remain attached to dressed birds while being transported between the place taken and the personal abode of the possessor or between the place taken and a commercial processing facility. This regulation does not apply to doves in the North and Central Zones.

One fully feathered wing must remain attached to all migratory game birds imported from Mexico. Persons who import wild game birds or animals from Mexico must obtain a federal statement from a U.S. Customs official at a port of entry, showing that the wildlife was brought into the country.

TAGGING: Any freshly killed birds given to another person, except at a residence of the person giving or receiving the birds, must have a tag attached signed by the hunter who killed the birds stating his address, total number of birds of each species and the date killed. Birds being transported by another person for the hunter or left for cleaning, storage, shipment or taxidermy services must also be tagged in the same manner.

NONTOXIC STEEL SHOT: No person may possess shotgun shells containing lead shot while hunting waterfowl (ducks, geese, and coots) within that area south and east of a line beginning at the Louisiana state line, thence westward along IH 10 to Beaumont, thence westward along U.S. 90 to Houston, thence north and west along IH 610 to its junction with U.S. Highway 290 in Houston, thence westward along U.S. Highway 290 to Hempstead, thence southwestward along State Highway 159 to Bellville, thence eastward along State Highway 36 to FM 2429, thence southwestward along FM 2429 and FM 949 to Interstate 10, thence westward along Interstate 10 to Schulenburg, thence southward along U.S. Highway 77 to the U.S.-Mexico international boundary at Brownsville.

LAWFUL MEANS & METHODS: Shotguns not larger than 10 gauge, fired from the shoulder and incapable of holding more than three shells (shotguns capable of holding more than three shells must be plugged with a one-piece filler which is incapable of removal without disassembling the gun, so the gun's total capacity does not exceed three shells), longbows and arrows, falconry, dogs, artificial decoys and manual or mouth-operated bird calls.

Hunting is permitted in the open or from a blind or other type of concealment (except a sinkbox or livestock) or from any floating craft (except a sinkbox) that is beached, anchored or tied within or alongside a fixed hunting blind. Power boats, sailboats or other craft may be used as a means of picking up dead or injured birds. Rails only may be taken from a floating craft when the only source of propulsion is paddle, oars or pole.

UNLAWFUL MEANS & METHODS INCLUDE: Any firearm other than a legal shotgun as defined above, trap, snare, net, crossbow, fishhook, poison, drug, explosive or stupefying substance.

Baiting (placing feed such as corn, wheat, salt or other feed to lure birds) and hunting over baited areas. Any area that has been baited is considered to be a baited area for 10 days following the complete removal of all bait materials. Standing crops or fields containing shocked grain or grain scattered by normal agricultural activities are not considered baited areas.

Using live birds as decoys.

Using recorded or electronically amplified bird calls or sounds.

Concealment by use of sinkbox (a low floating device permitting a hunter to conceal himself below the surface of the water) or by the use of livestock either on land or water.

Hunting from or by means of motor-driven vehicles and land conveyances or aircraft of any kind except paraplegics and single or double amputees of legs may hunt from stationary motor-driven vehicles or land conveyances.

Using motor-driven land, water or air conveyances or sailboat to concentrate, drive, rally or stir up waterfowl or coot.

ADDITIONAL FEDERAL REGULATIONS: It is not necessary for a hunter to know an area is baited to be in violation for hunting over a baited area.

When shipping migratory game birds the package must be marked with the name and address of the sender, the name and address of the persons to whom the birds are being sent and the number of birds of each species contained in the package.

THE RIO GRANDE A WILDLIFE CORRIDOR

Information Brochure for
Lower Rio Grande Valley, Texas,
Wildlife Habitat Acquisition Program

THE RIO GRANDE A WILDLIFE CORRIDOR

Americans are becoming more concerned with the need to protect lands for wildlife. As a result of spreading urbanization, wildlife habitats and the animals dependent on them are becoming increasingly scarce. The U.S. Fish and Wildlife Service, in cooperation with the Texas Parks and Wildlife Department, is identifying and attempting to preserve some of the most important remaining wildlife areas.

The Lower Rio Grande Valley of Texas, including Cameron, Hidalgo, Starr, and Willacy Counties, has been identified by the U.S. Fish and Wildlife Service and the Texas Parks and Wildlife Department as an area where wildlife habitat is rapidly vanishing and in need of protection. To preserve these lands, the State and Federal Governments are purchasing a portion of the remaining "brushlands" of the Lower Rio Grande Valley. These areas support many wildlife species, including the white-winged dove, approximately 350 species of birds, and numerous species of plants and animals, many of which are unique to the United States.

These lands are important to the wildlife species associated with the brush but also to the local economy of the four-county area. Recent figures show white-winged dove hunting provides over $20 million annually to the local economy. In addition, a large number of people are attracted to native brushland and its associated wildlife. For example, Santa Ana and Laguna Atascosa National Wildlife Refuges and Bentsen State Park attract approximately 300,000 visitors annually, and along with other visitors to the four counties provide nearly $350 million to the local economy.

Under this program, lands will be acquired through easement or fee under authority of the Fish and Wildlife Act of 1956, the Recreation Act, and other appropriate laws. Acquisition funds are derived from the sale of Outer Continental Shelf oil and gas leases, taxes on motorboat fuels, and the sale of certain surplus Federal lands, all deposited in the Land and Water Conservation Fund. The U.S. Fish and Wildlife Service can utilize these funds in the Lower Rio Grande Valley to purchase lands for recreational additions to existing refuges (Santa Ana and Laguna Atascosa) and for lands supporting a diversity of unique or endangered wildlife species. Acquisition funds for the Texas Parks and Wildlife Department are derived from the sale of white-winged dove stamps as authorized by the Texas Legislature in 1971.

Areas purchased or protected through this program will become part of the National Wildlife Refuge System managed by the U.S. Fish and Wildlife Service or Las Palomas Wildlife Management Area managed by the Parks and Wildlife Department. Recreational, educational, and scientific uses will be encouraged where appropriate.

The effort to protect such lands along the Lower Rio Grande, "A Wildlife Corridor," is underway.

The following questions and answers will help to explain the acquisition program in the Lower Rio Grande Valley of Texas:

Q. If someone desires to sell land, are there any advantages or disadvantages in contacting a Federal agency as compared to a State agency?

A. No. Both agencies closely coordinate their acquisition activities and are in no way in competition with each other. Both operate with similar guidelines.

Q. How many acres of brushland will be bought?

A. As many as possible of what remains—limited by money available and the owner's willingness to sell.

Q. Will the water rights be bought with the land?

A. Yes, whenever possible.

Q. If the owner does not wish to sell, will the land be taken by condemnation?

A. There are no plans to purchase other than from willing sellers.

Q. Can private owners lease the land if they do not wish to sell?

A. No. Lands will be acquired either through fee purchase or perpetual easement. The easement would assure continuation of current land uses but allow the land to remain in private ownership. There are no plans to lease any lands.

Q. What will happen to the lands bought?

A. They will be managed for wildlife.

Q. Will hunting be allowed?

A. Wherever possible, but this will depend upon the size, nature, and location of the tracts.

Q. Will there be public access for other than hunting?

A. This may be allowed if it will not conflict with the purpose for which the lands were bought. Examples of appropriate public use are hunting, fishing, birdwatching, nature study, and photography.

Q. How will the offers be determined?

A. Offers will be based on appraisal of the property considering recent sales of comparable land in the area. Federal law requires that price offers cannot be less than market value.

Q. Will the land go off the tax rolls?

A. Yes. However, the Federal Revenue Sharing Act provides for annual payments to counties. In many cases these payments are equal to or greater than previous taxes.

The State of Texas, through its legislature, may provide for payment to counties and school districts in lieu of property taxes on wildlife management areas.

If you desire additional information, please contact:

Regional Director (LA-A)
U.S. Fish and Wildlife Service
P. O. Box 1306
Albuquerque, New Mexico 87103
(505) 766-2174

or

Director, Wildlife Division
Texas Parks and Wildlife Department
4200 Smith School Road
Austin, Texas 78744
(512) 475-4879

U.S. Department of the Interior

January 1985

Prepared by:
Southwest Region of
U.S. Fish & Wildlife Service
Albuquerque, New Mexico

LAND PROTECTION PLAN
FOR
LOWER RIO GRANDE VALLEY NATIONAL WILDLIFE REFUGE
IN
CAMERON, HIDALGO, STARR, AND WILLACY COUNTIES
TEXAS

TABLE OF CONTENTS

Purpose

PURPOSE:

This land protection plan (LPP) presents a combination of alternative actions to protect and maintain 10 distinct wildlife communities totaling 107,500 acres which represent the best remaining habitat for certain threatened species on the U.S. side of the Lower Rio Grande Valley (LRGV). More than 115 species of wildlife will benefit, including the white-wing dove, chachalaca; numerous endangered species such as the jaguarundi, ocelot, bald eagle, brown pelican, and peregrine falcon. Permanent protection of these communities will provide an area for the natural occurrence and distribution of those wildlife species and will eliminate the present threat of habitat destruction.

Present trends suggest that the remaining LRGV brushland in private ownership will be developed (destroyed as wildlife habitat) within five years. Some 90 percent has already been lost. Similar habitat on the Mexico side of the river is also being developed rapidly, particularly for agriculture. The Santa Ana National Wildlife Refuge (NWR) established 1942 and Lower Rio Grande Valley National Wildlife Refuge (NWR) established 1979 are considered in this LPP as a single unit.

Ownership Status

OWNERSHIP STATUS:

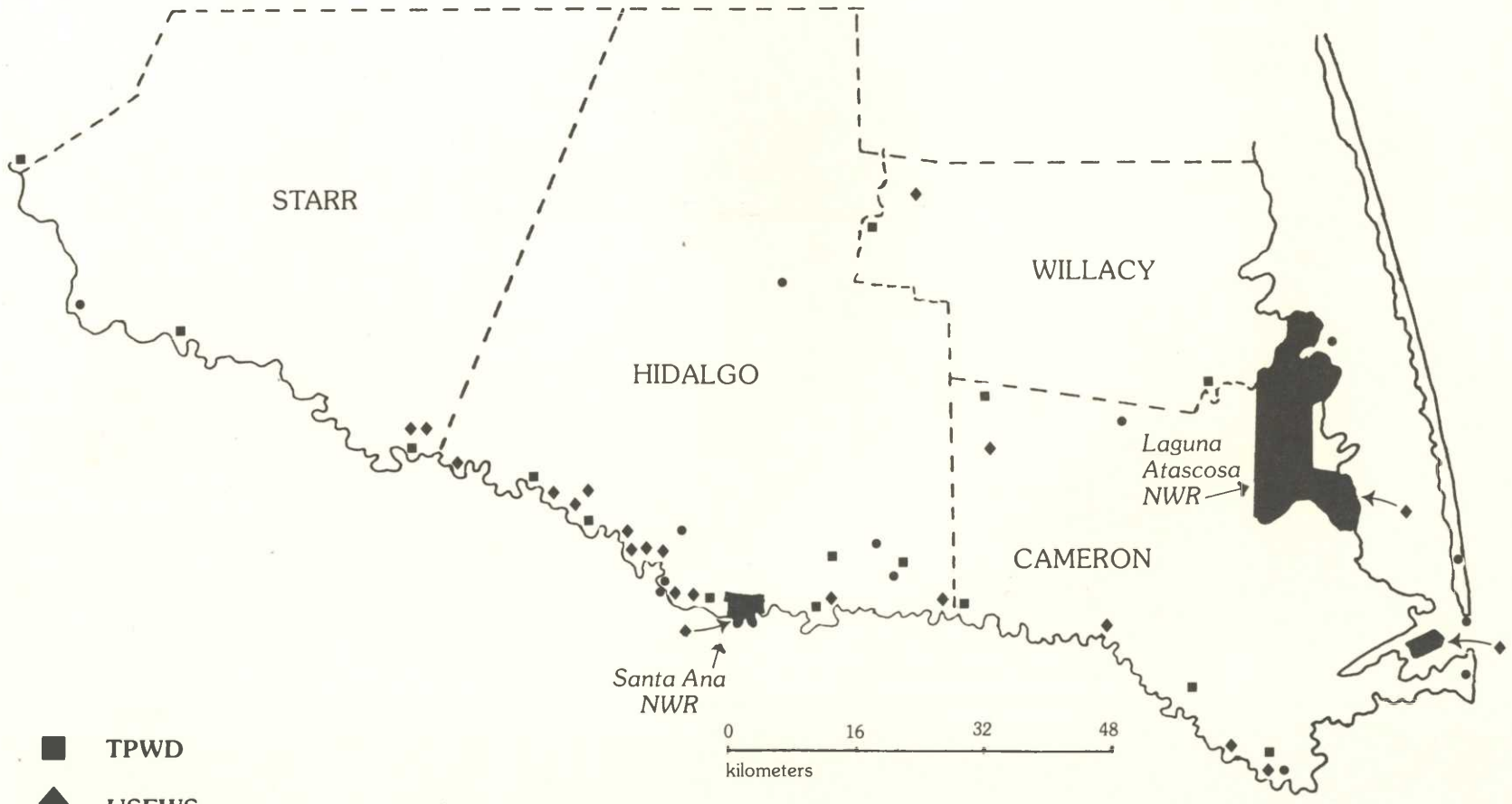
15,742 acres —	Total lands now administered by United States Fish and Wildlife Service (FWS) in the two refuges
10,000 acres —	Lands owned by other public/private conservation agencies
81,758 acres —	Lands held by about 1,000 private landowners, now considered unprotected under some form of permanent basis. The actual ownership of approximately 24,000 acres or 30 percent of the total wildlife community covered in this plan requires quiet title actions by local courts to clear long standing land claims, especially in the Falcon Woodlands area.
107,500 acres —	Total

MAPS:

Figures 1 and 2 locate the study area in Cameron, Hidalgo, Starr, and Willacy Counties, Texas, and the general location of the wildlife communities and connecting corridors proposed for additional protection in this LPP. Additional maps, aerial photos, a slide program and a Spanish/English brochure are available at the Santa Ana Refuge in Alamo, Texas. Environmental Assessments and prior preservation plans and studies of the LRGV are also available at the refuge office for review.

RIO GRANDE VALLEY

EXISTING PARKS, REFUGES, SANCTUARIES, AND WILDLIFE MANAGEMENT AREAS

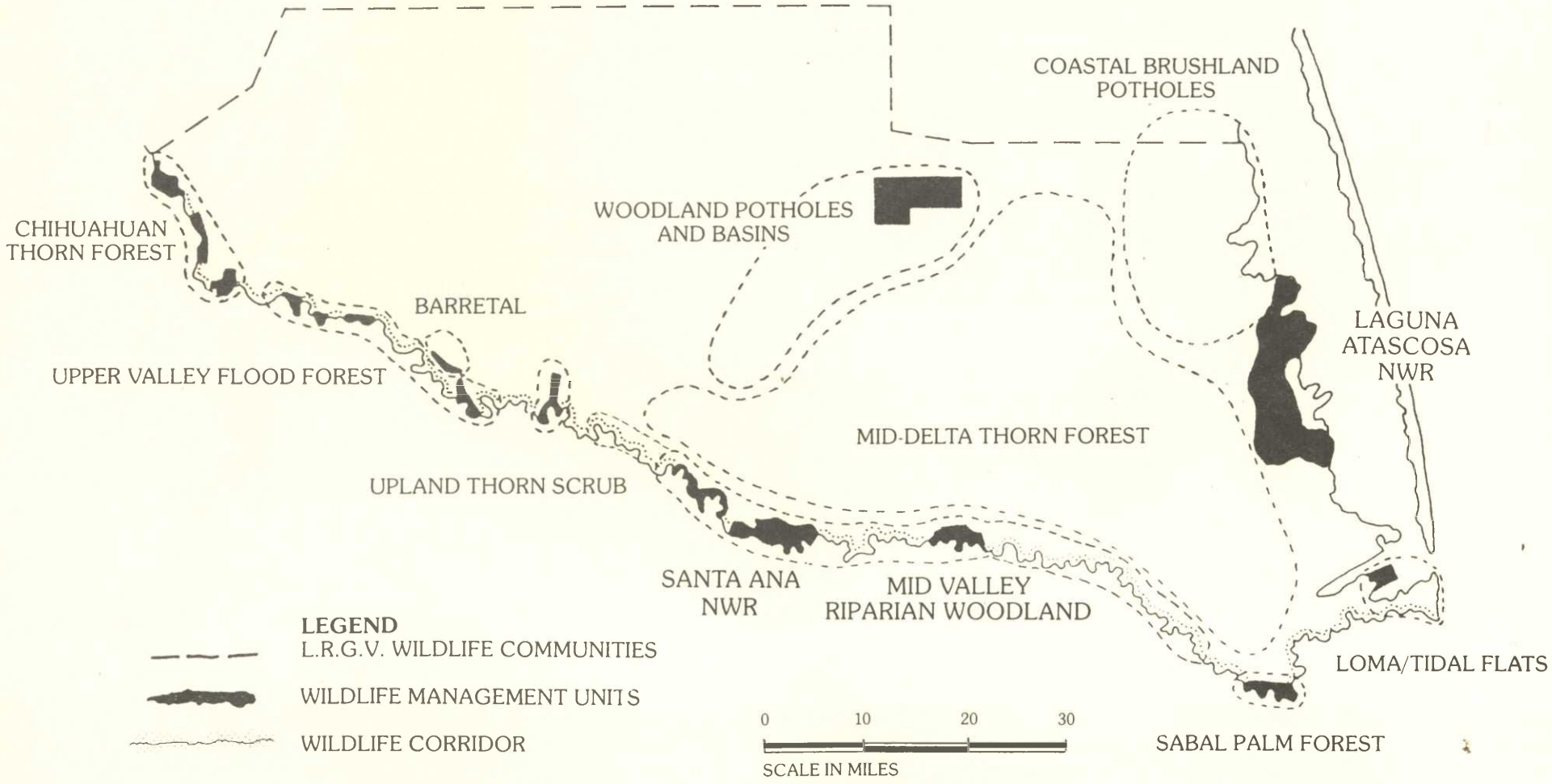


■ TPWD

◆ USFWS

● PRIVATE

RIO GRANDE VALLEY NATIONAL WILDLIFE REFUGE
LAND PROTECTION PLAN



Socio-Cultural

SOCIO-CULTURAL:

There are no known immediate plans for commercial or industrial development of these areas especially the wildlife communities within the flood plain along the Rio Grande. Future oil, gas, and mineral exploration would be permitted under existing laws and regulations. One impact would be the loss of future agricultural production as lands that could be cleared will remain as brush. There would be a reduction of county tax revenues if fee title is purchased but this would be offset by payments to counties by FWS which usually exceed the tax revenues lost. Such payments would be subject, of course, to the continued availability of funds under the FWS Revenue Sharing Program. The few landowners residing on the properties would be assisted in relocating. It is believed that most of these would relocate in the local area. Owners of many of the remaining brush tracts (management units) such as Falcon Woodlands have historically charged the public for access to their lands for hunting and bird watching. Records of the early Spanish explorers to the LRGV in the 1500's refer to the abundant and unusual wildlife game species such as the Mexican turkey (chachalaca) and native Sabal Palm groves along the river. Each year, thousands still come to the area to hunt white-winged doves and typically pour $20 million into the local economy.

Summary of Proposed Action

SUMMARY OF PROPOSED ACTION:

PROPOSED ACTION:

It is proposed to establish corridors connecting the wildlife communities which would be permanently protected by the FWS in fee, although less-than-fee status is desirable on some tracts (see table in summary of proposed action). Due to the rapid development of these areas, it is proposed to accomplish the proposal as quickly as possible depending on landowners acceptance and availability of funds. It is estimated that some 107,500 acres of land, in addition to the 46,000 currently protected at the Laguna Atascosa National Wildlife Refuge will be required. The lands protected through this project initiative would become part of the Lower Rio Grande Valley National Wildlife Refuge, a unit of the National Wildlife Refuge System, managed by FWS.
Data on the 10 areas follows:

Wildlife Communities	Currently Protected by FWS	Objective	Deficit*
Sabal palm forest	367 ac.	3,500 ac.	- 3,133 ac.
Lomal/tidal flats	4,600 ac.	10,000 ac.	- 5,400 ac.
Chihuahuan Thorn forest	-0- ac.	24,000 ac.	-24,000 ac.
Upper Valley Flood forest	111 ac.	10,000 ac.	- 9,889 ac.
Barretal	240 ac.	5,000 ac.	- 4,760 ac.
Upland Thorn scrub	-0- ac.	2,000 ac.	- 2,000 ac.
Mid-valley riparian woodland	5,718 ac.	13,000 ac.	- 7,287 ac.
Woodland potholes and basins	4,483 ac.	20,000 ac.	-15,517 ac.
Mid-delta thorn forest	223 ac.	10,000 ac.	- 9,777 ac.
Coastal brushland potholes	-0- ac.	10,000 ac.	-10,000 ac.
TOTAL	15,742 ac.	107,500 ac.	-91,758 ac.

* includes 10,000 acres in public/private conservation ownerships on which lease or management agreements would be negotiated to protect wildlife habitat and approximately 24,000 acres of land with unknown ownership at Falcon Woodlands which will be permanently protected when title has been cleared.

PROGRAM OBJECTIVES

The objective is to extend protection to the 96,900 acres of habitat identified in the 10 target wildlife communities and to the species dependent on that habitat; and to enhance conditions on the 10,600 acres already under FWS administration by application of additional management techniques. These would include such actions as (1) impounding water to restore water-based habitats formerly maintained by natural flooding, (2) controlled burning on some areas if research indicates that this would improve wildlife conditions, (3) controlled grazing as a habitat management tool in certain areas, (4) selected reforestation, (5) timber stand management to create and adjust habitats, and (6) accelerated inventories of plant and wildlife using current computerized methods.

RESOURCE PROTECTION ALTERNATIVES:

A. *No Action:* Under this alternative, the brush habitats could be destroyed, probably within 5 years, because landowners can substantially increase their income by conversion to citrus, truck crop production or other types of agricultural uses. There is no financial incentive to permanently preserve the habitat, and there are no laws, regulations, or zoning which could prevent their conversion to other land uses. FWS would rely on management of its presently scattered wildlife units plus those in public or private ownership. A program of public awareness and education on the wildlife values of these communities will continue, but this would not likely preserve more than a remnant of the remaining habitat.

B. *Acquisition or Management By Others:* There are approximately 10,000 acres of brush lands now owned by State, County, local governments or environmental organizations as well as the International Boundary and Water Commission (IBWC). These areas can be adequately protected by various forms of cooperative agreements or no cost mutually advantages leases. This approach will be pursued to the greatest extent possible however, census figures show cities in LRGV have the lowest per capital income in the country and most property owners do not have sufficient resources necessary to protect the wildlife populations identified in this plan, without financial assistance.

C. *Less-Than-Fee Acquisition:* The less-than-fee acquisition alternative has merit and will be utilized to the maximum extent possible, especially connecting the fee management units along the river and the La Sal Vieja area, but adverse wildlife impacts will continue to occur since: (1) some property owners may not accept easements on their land, especially in perpetuity, and for a variety of reasons prefer to sell in fee (2) Government overhead and purchase costs associated with acquiring easements on some of the existing privately owned wildlife units will be higher and less cost effective than direct fee purchase. The easement rights essential for protection of the wildlife communities utilizing the corridors between the fee management units include: (1) Development rights, (2) farming, especially to the river bank and shoreline of lakes or ponds, (3) grazing that diminishes brush regeneration, (4) fencing and posting, and (5) hunting rights if adversely effecting wildlife populations.

D. *Fee Acquisition:* The fee acquisition alternative offers the optimum to assure future protection or preservation of brushland habitat, but adverse wildlife impacts will likely occur since: (1) based on past budget levels, it is highly unlikely FWS will receive sufficient acquisition funding in time to preserve all of the wildlife habitat identified in this plan; and (2) some landowners will never willingly sell their brushland property to anyone and elect to clear the land for agricultural or other economic purposes.

E. *Combination:* The use of a combination of all alternatives to the maximum extent possible offers the best opportunity to assure future protection of the wildlife communities identified in this plan. The key will depend on public acceptance and future funding available for protection of this land use by wildlife.

Coordination

COORDINATION:

FWS activities have been closely coordinated with the Texas Parks and Wildlife Department (TPWD), and IBWC, plus local public agencies and chapters of conservation groups. Some 500 landowners have been contacted over the past 10 years on protection of wildlife in LRGV. The TPWD and other private conservation agencies also have contacted many landowners. The overall attitude has been strongly supportive. There have been preferences expressed for reserving mineral rights in private ownership and for freedom of choice in decisions to sell (or not to sell land). The public is also aware of the substantial inflow of hunters' expenditures to the local economy. Copies of this LPP will be distributed to landowners, local and State government agencies and other interested parties.

Summary of Proposed Action by Protection Alternative

SUMMARY OF PROPOSED ACTION BY PROTECTION ALTERNATIVE

Resource Protection Alternative	Proposed Action
A. No Action (Land Acquisition)	Update joint FWS-TPWD Spanish-English brochure and accelerate use of short 8-10 minute slide-tape program to educate the public about the need to protect wildlife resources on private land. Increase wildlife technical and Realty assistance to landowners throughout the LRGV by establishing a Realty Specialist and Forester position at the refuge.
B. Acquisition/Management by Others	Continue to close cooperative joint preservation effort with TPWD. Increase Realty technical assitance to State through Federal aid and other program. Develop cooperative agreement and implement joint plan with IBWC covering purchase of restrictive development easements along wildlife river corridor that complement IBWC and FWS agencies' program needs (if possible utilize a single U.S. easement document that may be used by both agencies). Encourage environmental organizations to accelerate protection of private lands, through donations, deed restrictions, or purchase of additional brushlands. Accelerate work with local, public agencies in developing agreements, licenses, leases, and other cooperative arrangements to protect wildlife habitat on their lands.
C. Less-Than-Fee Acquisition	Initiate major effort to acquire conservation easements with minimum management rights needed to establish wildlife corridor along river (at least 100 meters back from Rio Grande) and connect existing FWS, State and private preserves.
D. Fee Acquisition	Accelerate effort to round out or complete purchase of current public and private management units from list of willing sellers along river and in Tres Corrales-La Sal Vieja area. Strengthen future budget submittals to Central Office as appropriate to clarify need for stable increased funding source during next 5-year critical period.

E. Summary of Proposed Action by Combination Approach for each Wildlife Community

Priority	10 Wildlife Communities*	Tracts	Permanently Unprotected Acres	Method of Protection	Remarks
Group I	Riparian woodlands (river corridor)				
	Chihuahuan thorn forest	600	24,000	No land acquisition until ownership determined	Work with county officials to clear title problems. Contact residents claiming land to encourage protection of brushlands until land title can be cleared through courts and ownership determined.
	Sabal Palm Forest	5	3,133	Fee title	Complete fee acquisition between Federal management unit and Audubon Sanctuary. Protect Saba Palm forest from further destruc tion by burning of young palms that is now being done.
	Upper Valley flood forest	95	889 3,000 6,000 9,889	Lease or agreement easement fee	Complete acquisition of 8 FWS scattered management units. Post and protect brush from further clearing and connect fee areas along river by 100 meter ease ments. Negotiate agreement with IBW to protect river bank.
	Mid-valley riparian woodland	90	847 2,000 5,000 7,847	Lease or agreement easement fee	Complete acquisition of 5 FWS scattered management units. Post and protect brush from further clearing and connect fee areas along river by 100 meter ease ments. Negotiate agreement with IBWC to protect river bank.
Group II	Interior thorn woodlands				
	Barretal (forest)	50	3,000 1,760 4,760	Fee easement	Complete acquisition of 5 FWS scattered management units. Post and protect brush from further clearing and connect fee areas with river corridor or other State park or brush areas by easement.

E. Summary of Proposed Action by Combination Approach for each Wildlife Community *(continued)*

Priority	10 Wildlife Communities*	Tracts	Permanently Unprotected Acres	Method of Protection	Remarks
	Upland thorn scrub	20	1,000 1,000 2,000	Fee easement	
	Mid-delta thorn forest	70	3,000 6,871 9,871	Fee easement	
Group III	Interior wetlands (Salt lakes and brush)				
	Woodland potholes and basins	40	10,000 10,000 20,000	Fee easement	Complete acquisition of 2 FWS management units. Post and protect brush from further clearing and connect fee areas between brush and salt lakes by use of easements.
Group IV	Coastal Wetlands				
	Lomal/Tidal flats	5	5,000 400 5,400	Lease or agreement fee	Complete acquisition of Loma FWS management unit. Post and protect brushlands and coastal wetlands. Negotiate agreement with Brownsville navigation district and State to protect remaining wetlands.
	Coastal brushland/potholes	25	2,000 5,000 3,000 10,000	lease or agreement easement fee	Establish 2 fee management units. Post and protect brush and potholes. Connect fee areas with easements. Negotiate agreement with State to protect remaining wetlands.
TOTALS	10 Wildlife Areas	1,000 tracts	34,533 29,631 8,736 24,000 96,900	Fee easement lease or agreement determine ownership	

**See map on page 4 and table on page 9*

UNITED STATES DEPARTMENT OF THE INTERIOR

FISH AND WILDLIFE SERVICE

REGION 2

SPECIAL REPORT: THE VALUE AND STATUS OF INLAND POTHOLE WETLANDS IN THE LOWER RIO GRANDE VALLEY, TEXAS

JANUARY 1986

THE VALUE AND STATUS OF INLAND POTHOLE WETLANDS IN THE LOWER RIO GRANDE VALLEY, TEXAS

SPECIAL REPORT

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JANUARY 1986

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I. Introduction.

The southernmost tip of Texas has, by virtue of its mild winter climate and flat topography, two extremely valuable resources: hundreds of small wetlands comprising a major overwintering area for waterfowl, and thousands of acres of intensively farmed cropland. Unfortunately, the pattern of development in the inland areas of the Lower Rio Grande Valley, as indeed in the entire United States, has been to expand the latter resource by gradually eliminating the former. In parts of Willacy County, for example, the loss of wetland habitat types most important to waterfowl exceeded 60 percent in the 24 years between 1955 and 1979. These habitat types, identified collectively as "potholes," are the subject of this paper. We will attempt to describe them, quantify their acreage, qualify their values, and explain the reasons for their disappearance.

II. Analysis of wetland resource value.

The potholes of the Lower Rio Grande Valley are shallow basins which generally range in size from 0.1 to 15.0 acres. They typically consist of a relatively circular body of water surrounded by emergent wetland vegetation, but the shape of the pothole and the ratio of open water to vegetation varies with location and season. Normal depths range from 0.5 to 2.5 feet. Most potholes

are filled with clear, fresh water during part, if not all, of the year, but evaporation leads to concentrations of salts in the soils around them during dry spells (SCS 1982).

The typical pothole in Cameron, Willacy, Starr and Hidalgo counties (Figure 1) is found in soils of the Tiocano and Rio series, although other soil series such as Incell and Jarron may also be represented (SCS 1972; SCS 1977; SCS 1981; SCS 1982). The Soil Conservation Service (1983) lists these series as having actual or high potential for hydric soil conditions. All but the Rio series consistently display hydric conditions. The depressions in which the pothole environment forms appear to have originated as blowouts (i.e., from wind erosion), or they may represent the karstic solution and collapse of an underlying cemented caliche "cap rock" (SCS 1981).

Most potholes are found in nearly level surroundings, although some may form in the relict meanders of the Rio Grande (SCS 1977). The soils in which they occur have high clay contents, low permeabilities, and high water tables which may seasonably (most frequently in the months of September through May) rise as much as 3 feet above the soil surface (SCS 1982). Since most rainfall occurs from April through September (SCS 1981; SCS 1982), there is a strong possibility that the wetlands will be inundated or at least saturated by either surface runoff or groundwater much of the average year, even though the average annual rainfall is only 17 to 27 inches (SCS 1972; SCS 1977; SCS 1981; SCS 1982).

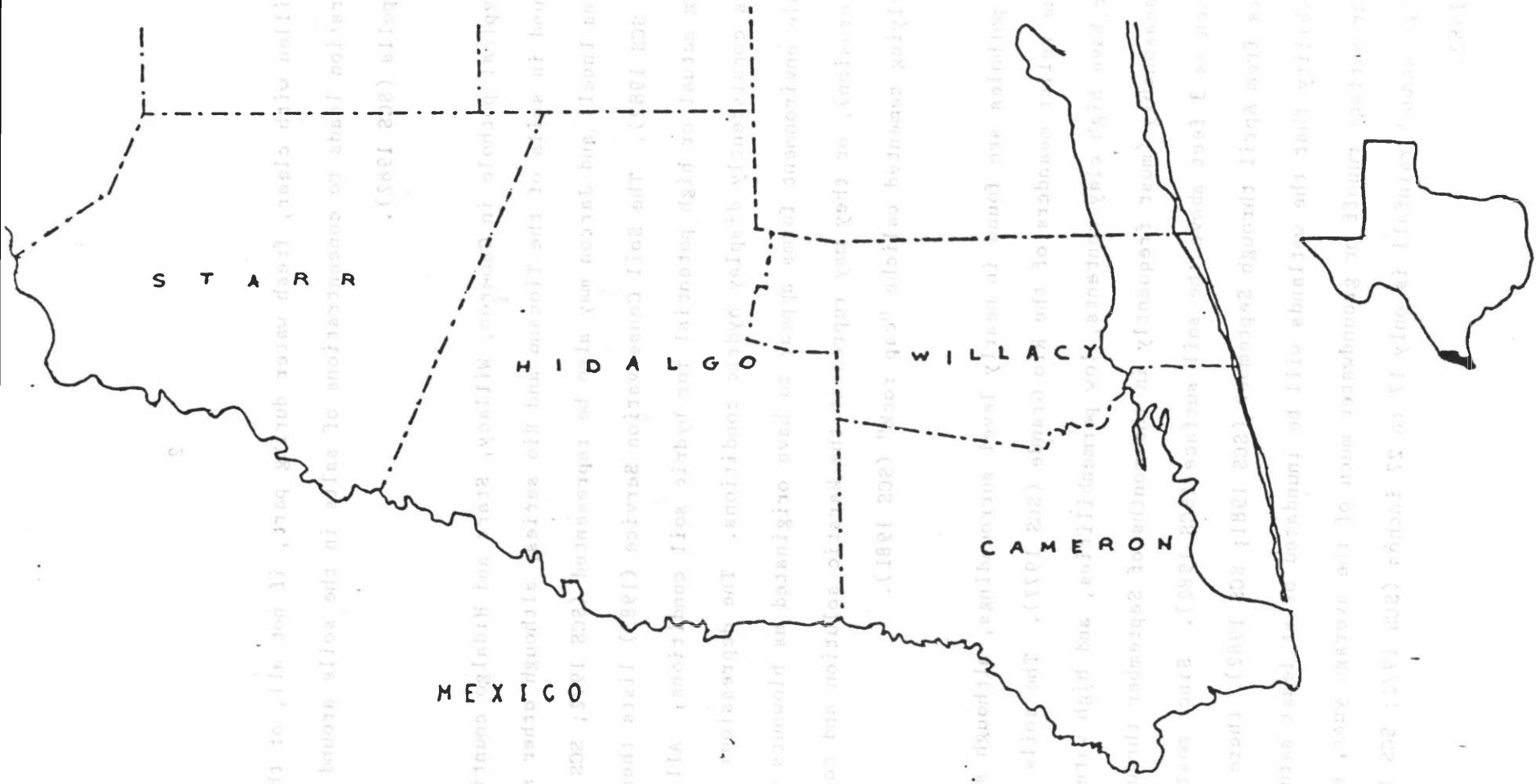

Fig. 1. Lower Rio Grande Valley of Texas.

Spikerushes (Eleocharis spp.), wild millet (Echinochloa spp.), sprangletop (Leptochloa sp.), paspalum (Paspalum spp.), rattlebush (Sesbania spp.), and other wetland plants cover the potholes' exposed bottoms when water levels are low. The deeper, more permanent parts of the potholes support bulrushes (Scirpus spp.), sedges (Cyperus spp.), cattails (Typha spp.), water lilies (Nymphaea spp.) and pondweeds (Potomogeton spp. and Najas spp.). Buttonbush (Cephalanthus occidentalis) and willows (Salix spp.) frequently delineate the normal high water mark of the potholes. Using the U.S. Fish and Wildlife Service classification system entitled "Classification of Wetlands and Deepwater Habitats of the United States" (Cowardin et al. 1977), the potholes generally fall within the following wetland classes: Palustrine Emergent, Palustrine Unconsolidated Bottom, Palustrine Unconsolidated Shore, Palustrine Aquatic Bed, Palustrine Scrub/Shrub and Palustrine Forested.

In a typical year the potholes are at their fullest following the tropical storms of late summer and early fall. This period of maximum inundation triggers a sequence of population expansions throughout the food chain. First there is a major increase in wetland vegetative coverage, followed by a boom in populations of aquatic invertebrates, and finally by an upsurge in populations of fish, amphibians, reptiles, and many water birds. This abundance of both open water and food sources in the fall and winter is especially timely for migratory waterfowl, particularly geese, pintails, mottled ducks, coots, gadwalls, wigeon, teal and shovelers. The protein source represented by the potholes' aquatic invertebrates may be of special

importance for fulfilling the pre-breeding nutritional requirements of migratory waterfowl as well as other birds. Chaney (1981) identified 142 species of birds using the potholes, including over 55 species not typically considered wetland birds, such as white-winged and mourning doves, which may depend on the potholes for drinking water. Chaney (1981) and McAdams, et al. (1982) documented not only the use of potholes by waterfowl for overwintering, but also for nesting by black-bellied whistling duck, fulvous whistling duck, blue-winged teal, mottled duck, American coot, moorhen, pied-billed grebe, least grebe, ruddy duck, and wood duck. So important is this nesting that forty percent of the average annual harvest of black-billed whistling ducks in the Central Flyway came from the Rio Grande Valley during 1971-1980 (FWS 1983).

McAdams, et al. (1982) also pointed out that when potholes go dry, their green foliage is made available for use by wildlife and livestock just as upland sources of forage become depleted through grazing or dessication. They cited bobwhite quail, white-tailed deer, and wild turkeys as examples of wildlife that seasonally depend on wetland vegetation. It is the potholes' importance to overwintering waterfowl, however, that bears the most attention. In an 8,339-square-kilometer (3220-square-mile) area of South Texas, which included parts of the Lower Rio Grande Valley as well as parts of five adjacent counties, McAdams, et al. (1982) estimated that 18,401 ponds supported a January population of approximately 600,000 ducks. By comparison, Texas hunters harvested an annual average of 1,000,000 ducks during 1971-1980, while

the whole Central Flyway's annual harvest averaged 2,600,000 ducks (FWS 1983). Chaney (1981) noted heavy waterfowl hunting pressure at several potholes in the valley.

The fate of two amphibians of special concern, the Rio Grande siren (Siren intermedia texana) and the black-spotted newt (Notophthalmus meridionalis) is linked to the potholes. Both have been classified protected non-game species by the Texas Parks and Wildlife Department (TPWD) and proposed by the TPWD staff for reclassification to State "endangered" status (State Capitol Report, August 15, 1985). Floyd Potter (TPWD; personal communication) cites a marked disappearance of these species from waters in which they were known to occur as reason for the proposed reclassification. Both are also candidates for Federal listing as threatened or endangered and were recently the subject of a report (Judd 1985) to the Fish and Wildlife Service (FWS) concerning their status. Judd (1985) attributes the decline of these species' numbers to farming, road building, urbanization and drainage programs that are eliminating and modifying many of the shallow temporary ponds that constitute their habitat. He reports that specific ponds in Willacy and Hidalgo Counties supporting the black-spotted newt in the 1950's and 1960's have been drained and converted to new crops, and that similar habitat conversion is occurring within the range of both amphibians in Mexico. David Bowman (FWS; personal communication) predicts that one or both of these species could be placed on the Federal list of threatened or endangered species within about one year.

The potholes, like other wetlands nationwide, serve other functions besides fulfilling wildlife habitat requirements. The abundance of waterfowl and birds in general around potholes makes them meccas for hunters and birdwatchers, many of whom are winter residents of South Texas just like their quarry. Chaney (1981) seined a dozen species of fish from potholes during his study and cites the stocking of a pothole with "catfish, bass and perch," suggesting that the more persistent potholes support still another form of water-related recreation. As noted earlier, potholes may provide water and forage for livestock. Potholes have been tapped to provide water for drilling oil wells and constructing roads. Those potholes with groundwater connections serve as recharge areas for that resource. Oddly enough, the smaller, seasonally-flooded wetlands may play a more important role in groundwater recharge than the more permanent wetlands (FWS 1984). Potholes serve to convey floodwaters and to delay and moderate runoff (Office of Technology Assessment 1984). In an area with as little topographic relief and as intensive agricultural development as the Lower Rio Grande Valley, this flood control function may be extremely important. Finally, wetlands and their vegetation trap sediments, pollutants and nutrients, thus reducing agricultural related non-point source pollution (Office of Technology Assessment 1984). These wetlands slow the runoff, allowing the agricultural pollutants, such as pesticides and fertilizers, to break down before entering the Laguna Madre. The pollutants break down during the summer and early fall months before the arrival of migratory waterfowl which use these wetlands during the winter months. Beneficiaries of this pollution control function

include the redhead duck, whose principal wintering habitat is the Laguna Madre adjoining this particular portion of South Texas, many other migratory birds and waterfowl, and a large sport and commercial fishery in the Laguna Madre.

III. Analysis of current status.

Like other wetland resources in this country, it has long been assumed that the potholes of the Lower Rio Grande Valley were disappearing as agriculture flourished. The Soil Conservation Service (1982) makes the following observation for Willacy County: "On air photos, particularly those taken during the 1930's, before the current intensive cultivation, drainage, and land-leveling activities, the [land] surface displays a complex pattern of meander belts or distributions and flood basin deposits, only part of which is revealed on the present soil maps." The other counties in the lower valley exhibit a similar loss of depressional areas, but until recently no attempt was made to quantify the pothole losses.

In 1983, the Corpus Christi FWS Field Office made use of the National Wetlands Inventory (NWI) to fill some of the data gap. When a manual comparison of six pairs of NWI maps (based on USGS Quadrangles; see Figure 2) was made to selectively identify potholes, significant losses of this particular habitat were found over the 24-year span (Ramirez and Spiller, unpublished). Table 1 shows the results of this specific analysis.

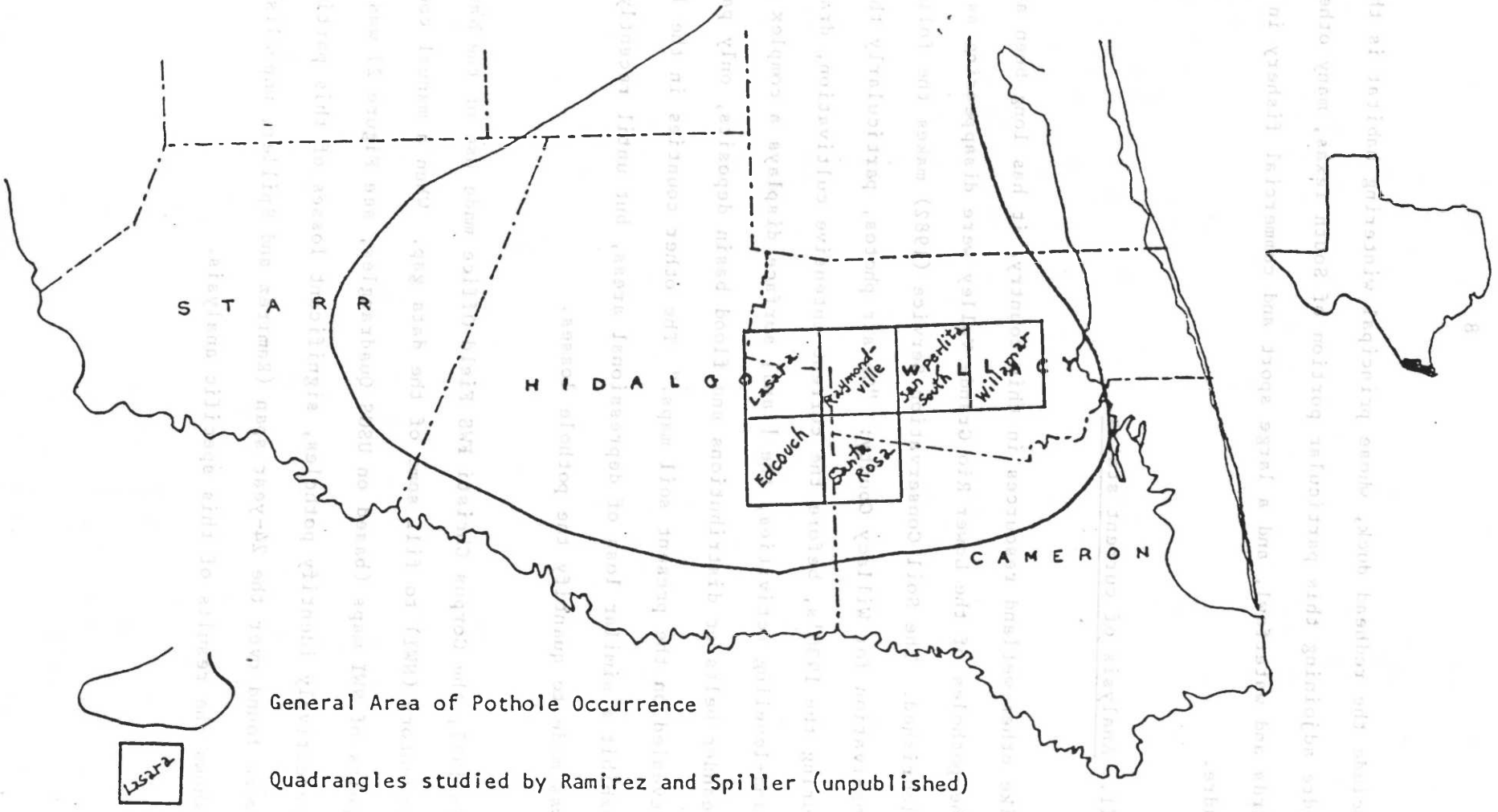

Fig. 2. Wetland trend detailed study area, 1955-1979.

Table 1. Rio Grande Valley Pothole Losses, 1955 - 1979 (Ramirez and Spiller, unpublished).

USGS QUANDRANGLE	Acres of Potholes in 1955	Acres of Potholes in 1979	Percent Loss
Edcouch	115	42	63
Lasara	590	234	60
Raymondville	107	37	64
San Perlita South	334	255	23
Santa Rosa	228	86	62
Willamar	2070	1758	15
Total / Average	3444	2412	30

USGS QUANDRANGLE	Number of Potholes in 1955	Number of Potholes in 1979	Percent Loss
Edcouch	86	38	56
Lasara	395	117	55
Raymondville	117	57	51
San Perlita South	224	167	25
Santa Rosa	147	75	49
Willamar	755	557	26
Total / Average	1724	1011	41

USGS QUADRANGLE	NUMBERS OF POTHOLES LOST TO SPECIFIC CAUSES: Urban	Crops	Drainage	Roads	Other	Total
Edcouch	4	31	9	4	0	48
Lasara	1	173	38	6	0	218
Raymondville	0	46	3	11	0	60
San Perlita South	2	48	4	3	0	57
Santa Rosa	0	46	14	12	0	72
Willamar	0	153	5	37	3	198
Total	7	497	73	73	3	653
Percent	1	76	11	11	1	100

In each of the NWI maps examined by Ramirez and Spiller, pothole losses occurred during the study period. This sample revealed that 41 percent of the potholes were destroyed, reducing the pothole acreage by 30 percent. In some quadrangles, these figures exceeded 50 and 60 percent, respectively. Table 1 provides a breakdown of the specific causes for each pothole's loss, indicating that croplands replaced the majority of the potholes destroyed. If only half of the losses attributable to the next most damaging causes, construction of drainage canals and roads, is assumed to be related to farm development, then agriculture caused seven-eighths of the reduction in pothole numbers.

Another apparent trend affecting potholes is that their average size increased between 1955 and 1979. Table 2 shows that the increase was not uniform in all quadrangles examined, but the overall average size changed from 2.0 acres in 1955 to 2.4 acres in 1979. At first glance, this could be attributed to the differences in antecedent rainfall for those dates; the early- and mid-1950's were drought years, while 1979 was much wetter. However, McAdams, et al. (1982) noted in a survey of 18,401 ponds in South Texas, including part of this report's study area, that when ponds found in sand dune, coastal, rangeland, and farmland habitats were compared, farmland ponds averaged larger and occurred less frequently than those in the other three habitats. Perhaps because they are shallower, more frequently dry, and easier to land level, it might therefore be inferred that the smaller potholes are being filled faster than the larger potholes. From examination of the NWI maps, it appears that

Table 2. Trends in Size of Rio Grande Valley Potholes, 1955 - 1979.

USGS QUADRANGLE	Average Size of Pothole in 1955 (Acres)	Average size of Pothole in 1979 (Acres
Edcouch	1.3	1.1
Lasara	1.5	2.0
Raymondville	0.9	0.6
San Perlita South	1.5	1.5
Santa Rosa	1.6	1.1
Willamar	2.7	3.2
Overall average	2.0	2.4

both explanations for the increase in average pond size may have merit because many small ponds disappeared at the same time the large ponds got larger.

Other factors potentially influencing the rate of pothole conversions to agriculture include Federal tax programs and the changing prices of farm commodities. Many sources cite tax incentives as the key factor influencing the farmer's decision to drain wetlands (Barrows et al. 1982; Thompson 1983; Leitch 1984; Office of Technology Assessment 1984).

Still another factor to be considered regarding pothole conversions is the suitability of the pothole soils for farming even if drained. Some, like the Tiocano clays, would never be more than poorly suited for crops, and would be only moderately well suited for grazing (SCS 1982). Unless they are land-leveled (i.e., filled with another soil type) many drained potholes are unlikely to be arable. This might lend credence to a theory that the rate of pothole losses may be decreasing as the average size of the remaining potholes increases. However, LeRoy Wolfe of the SCS (personal communication) suggests that large potholes may continue to be drained in an attempt to lower the water table beneath the more arable soils surrounding them. In this way, the farmers might hope to lessen the moisture and salt content of their existing fields and thus increase their yield without increasing the actual acreage planted. Mr. Wolfe also points out that the desired effect on the water table could as readily be obtained by placing tile drains around the potholes, rather than draining them outright, and that since some potholes have an

impervious clay liner, draining them would have no significant effect on the water table, anyway. An in-depth hydrologic study would be needed to determine whether a given pothole served as a water table recharge area or simply as a perched basin.

Until more recent photography is obtained it will probably not be possible to estimate pothole losses since 1979 and thus to determine whether the loss is occurring at a steady, predictable rate. If the smaller potholes are indeed more vulnerable to agricultural development than the larger ones, and no other activities occur affecting this apparent trend, then the rate of loss may decrease. However, in its analysis of the Lower Rio Grande Basin, Texas, Flood Control and Major Drainage Project (FWS 1981), the Corpus Christi FWS Field Office estimated that this Federal project alone would eliminate 230 acres of inland wetlands due to channel construction during the first two phases of the project. The third phase of the project, which would involve on-farm improvements, such as land-levelling with installation of tile drains and vertical downspouts in fields, and the erection of berms around potholes, has the potential for bringing many more acres under cultivation at the expense of wetland resources. Consequently, far from revealing a reduction in pothole losses, future wetland inventory efforts may show an increased rate of destruction. The destruction of the Valley potholes is not regulated by state or local ordinance. The filling of the potholes could be regulated under Section 404 of the Clean Water Act by U.S. Army Corps of Engineers (Corps),

but only if the Corps considers the potholes to be "waters of the United States," i.e., within Federal jurisdiction.

IV. Summary

Inland pothole wetlands have been shown to have important roles in supporting waterfowl production and overwintering in the Lower Rio Grande Valley, as well as in flood control, groundwater recharge, livestock maintenance, and water pollution abatement. Studies have indicated that the pothole wetlands in the Lower Rio Grande Valley plus parts of five adjacent counties support a January population of approximately 600,000 ducks. It has been demonstrated that these wetlands have been converted at such a rapid rate that some species may be threatened with extinction. The destruction of these wetlands has a strong influence on the production of agricultural commodities through a natural flood control function and on the fishery resources harvested from the Laguna Madre through pollution abatement. These resources are sold or transported in interstate commerce, and provide a large portion of the attraction the Valley holds for interstate travelers. The destruction of these wetlands also has international impact on the migratory bird species using the Central Flyway. A spot check of about a quarter million acres in the Rio Grande Valley showed 41 percent of the pothole wetlands were destroyed in the 24-year period between 1955 and 1979. These potholes have many functions affecting commerce.

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