MCFADDIN AND TEXAS POINT

NATIONAL WILDLIFE REFUGES

Sabine Pass, Texas

ANNUAL NARRATIVE REPORT

Calendar Year 1988

U.S. Department of the Interior

Fish and Wildlife Service

NATIONAL WILDLIFE REFUGE SYSTEM

REVIEW AND APPROVALS

MCFADDIN AND TEXAS POINT NATIONAL WILDLIFE REFUGES

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Calendar Year 1988

Jim Krakowski — 1-28-92

Submitted by Refuge Manager — Date

Tom Ciccone — 1/29/92

Project Leader — Date

Billy D. Hawthorne — 2/14/92

Refuge Supervisor Review — Date

Regional Office Approval — 3/5/92

Date

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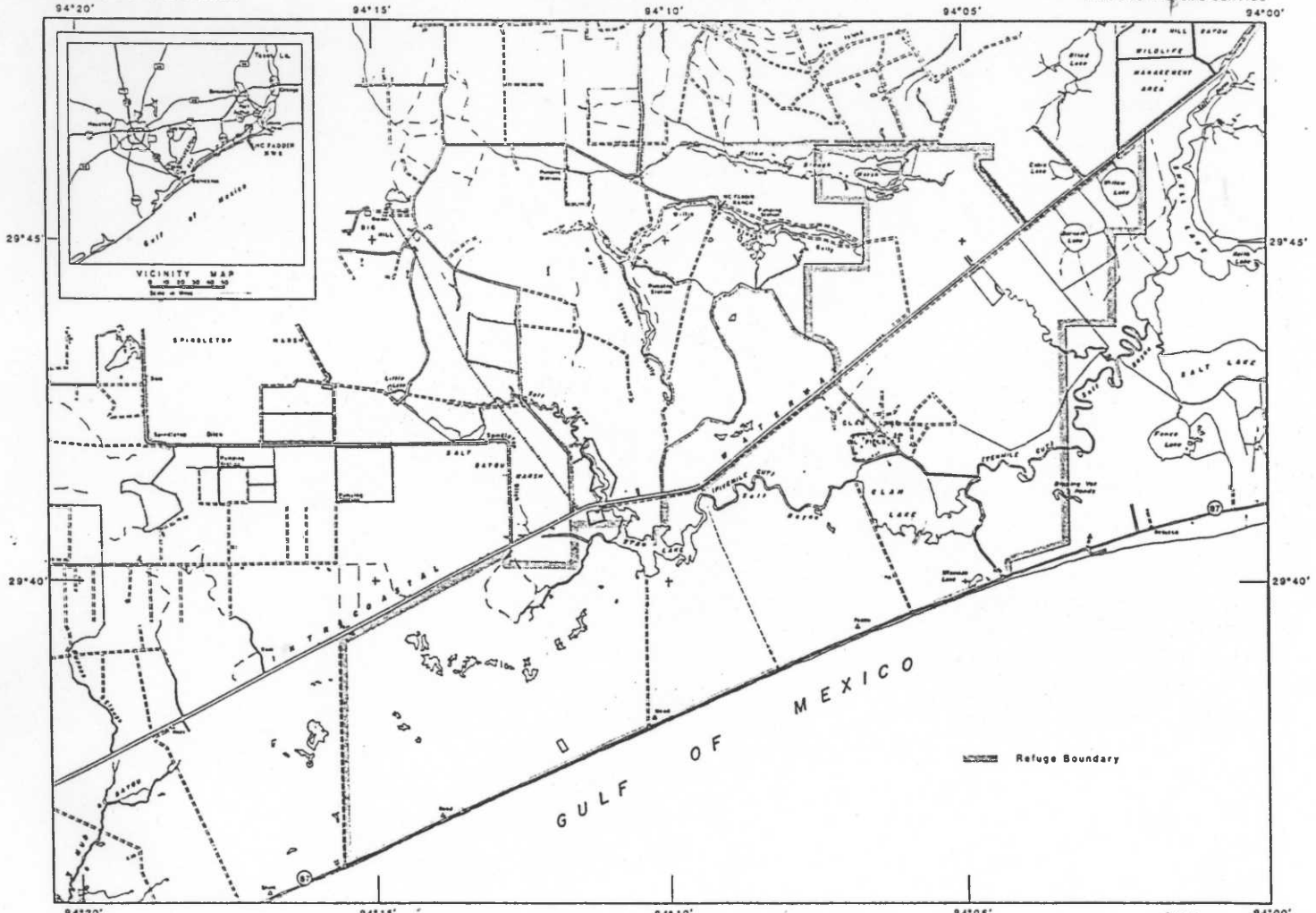
MC FADDIN NATIONAL WILDLIFE REFUGE

JEFFERSON COUNTY, TEXAS

UNITED STATES
DEPARTMENT OF THE INTERIOR

UNITED STATES
FISH AND WILDLIFE SERVICE



COMPILED IN REALTY
FROM U.S.G.S. QUADRANGLES,
SURVEYS FOR F.W.S. AND
OTHER OFFICIAL RECORDS.

ALBUQUERQUE, NEW MEXICO JANUARY 1980

0 6000 12000 18000 24000 FEET

0 1 2 3 4 5 6 KILOMETERS

True North
Magnetic N.
7.5°
MEAN
DECLINATION
1970

INTRODUCTION

ADDRESS

MCFADDIN NWR
P.O. Box 609
Sabine Pass, TX 77655

LOCATION

The refuge lies 12 miles west of Sabine Pass, TX and 28 miles southwest of Port Arthur, TX. It is bordered on the east by Sea Rim State Park, on the south by the Gulf of Mexico and on the north and east by large private ranches.

AREA

This 42,956-acre tract is located along the upper Texas Gulf Coast. The Intracoastal Waterway (ICWW) cuts through the refuge and divides what was once an interconnected water system into two distinct units, lying north and south of the ICWW. The 35,768-acre south unit is predominately an intermediate-brackish marsh complex consisting of a series of shallow lakes, ponds, and rivers that drain to the east into Sea Rim State Park and eventually into the ICWW and Sabine River. The 7,188-acre north unit includes Willow Slough and is dominated by a fresh marsh that also drains to the east. 1,274 acres of the north unit is under conservation easement.

TOPOGRAPHY

The topography of the refuge is flat and ranges from below sea level to approximately six feet in elevation. The spoil levees on the Intracoastal bank reach as high as fifteen feet and are the highest points on the refuge. Most of the vegetation south of the Intracoastal is salt-tolerand. Dominant species include marshhay cordgrass, seashore saltgrass, seashore paspalum, saltmarsh and Olney bulrush, and spikerushes. The fresh water marshes of the morth unit contain numerous types of grasses, sedges, rushes, and other herbaceous plants. The dominant aquatic plant in Willow Slough is American lotus.

Generally, only the eastern portions of the south unit are subject to daily tidal flows and as a result, represent the most brackish marsh on the property. High storm tides and hurricanes are capable of flooding much of the south unit creating saline conditions; however, the conditions are usually short-lived.

CLIMATE

The climate along the upper Texas Gulf Coast is generally mild and humid. The area is cooled by prevailing southerly offshore winds in the summer and warmed by the Gulf influence during the winter. Temperatures rarely reach above 100 degrees or below 32 degrees. High temperatures (mid-90's) and high relative humidity (75% and up) during the summer months can make for uncomfortable working conditions.

JURISDICTION Proprietary

LEGISLATIVE DISTRICT 9 Texas

CURRENT CONGRESSMEN House - Jack Brooks
Senate - Lloyd Bentson, Phil Graham

LAND ACQUISITION The refuge was established on May 1, 1980, by the authority of the Migratory Bird Conservation Act.

PURPOSE The refuge was established to preserve wintering habitat for migratory waterfowl as well as habitat for birds using the Texas Gulf Coast as a resting area during spring and fall migration.

OBJECTIVES The refuge follows the objectives established by the Environmental Quality Standards set forth in the "Principles and Standards of the Proposed Acquisition of Sea Rim Marsh (now Texas Point NWR). They include: (1) Provide habitat and protection for migratory and resident waterfowl; (2) Provide habitat and protection for special recognition species; (3) Provide habitat and protection for threatened species; (4) Provide interpretation in a natural environmental setting; (5) Provide wildlife-oriented recreation; and (6) Preserve the natural estuarine habitat of the area.

I N T R O D U C T I O N

T A B L E O F C O N T E N T S

F. HABITAT MANAGEMENT

G. WILDLIFE

H. PUBLIC USE

I. EQUIPMENT AND FACILITIES

J. OTHER ITEMS

K. FEEDBACK

L. INFORMATION PACKET

(Inside Back Cover)

A. HIGHLIGHTS

Refuge prepares for Hurricane Gilbert's landfall, the storm veers into Mexico, yet still impacts the refuge (Section B).

Sabine Ranch is the Region's top land acquisition prospect (Section C.1)

A water management plan for the Salt Bayou System is proposed (Section D.2, D.4).

A public meeting to discuss refuge hunt programs was held on 3/11/88 (Section D.3).

The Corps of Engineers reviews 16 refuge construction projects to determine if 404 permit applications are needed (Section D.4).

ARM Archibeque and RM Krakowski receive awards for FY88 performance (Section E.1).

Two YCC enrollees help out during the summer (Section E.2).

Millet and sprangletop communities flourish in Star Lake pasture (Section F.2).

Problems arise within the Clam Lake Short Duration Grazing Program (Section F.7).

A total of 12,600 acres of marsh burned during the year (Section F.9).

Exxon moves refuge pole barn and fuel tanks to the shop area (Section I.1).

Riprap rock and base gravel are stockpiled to address ICWW erosion problems (Section I.1).

MW Morvent is converted to WG-10 electrician to address refuge electrical needs (Section I.2).

Rehabilitation of the refuge office interior and exterior nears completion (Section I.2).

Exxon drills 5 new oil wells during the year (section I.8).

B. CLIMATIC CONDITIONS

Total precipitation during 1988 was 52.01 inches or .1 inch below the 52.11 inch average of the past seven years. Table 1 displays the distribution of rainfall for each month of the year. Rain is sporadically received throughout the year and there appears to be no pattern to its monthly distribution. Generally, it was a dry year except for the months of March, July, August, and September. A very hot May through June period followed by several months of heavy rainfall created "blackwater" conditions in these coastal marshes (Section F.2). The refuge had an 8 inch rain during the first week in September. On February 7 the refuge received a thin blanket of snow. High tides washed out major portions of Hwy 87 on 4/29. Hwy 87 was closed for several days as a result.

Lightning storms during the month of July ignited several major marsh fires. Another lightning storm during the month of August struck near the refuge office and damaged the office radio base station and computer modem.

Hurricane Gilbert entered the Gulf of Mexico during the early part of September. This tropical depression gained strength in the warm waters of the Gulf and threatened to be the worst storm of the century. As the storm approached the Texas coastline, refuge personnel prepared for the worst before evacuation. The refuge boats and heavy equipment were transported to the Murphree Wildlife Area. Their headquarters is further inland and protected by a high storm levee. The dragline and grader were parked on high ground next to the Intracoastal Canal which is three miles from the Gulf. Valuable portable property and records were transported to the Anahuac office. The windows at the refuge residence and office were covered with plywood. All of the file cabinets, desk drawers and storage shelves were taped shut or covered with plastic. The boards were taken out of the three 48" culverts at Perkins Levee in order to protect this levee from being washed out by high water from the east or west. Refuge personnel took administrative leave one day (9/15) prior to landfall to take care of personal business and evacuate. Luckily for us the storm veered to the south and made a landfall in Mexico about 100 miles south of the Texas border. Yet the hurricane still had an impact on this part of Texas. Extreme high tides carried beach material onto Highway 87 as it passes through the refuge. The road was closed for almost a month while State Highway employees excavated the road and made the necessary patches. Some of the high tidal waters entered Star Lake Pasture, but had no major impact on vegetation communities.

McFADDIN RAINFALL 1987–89

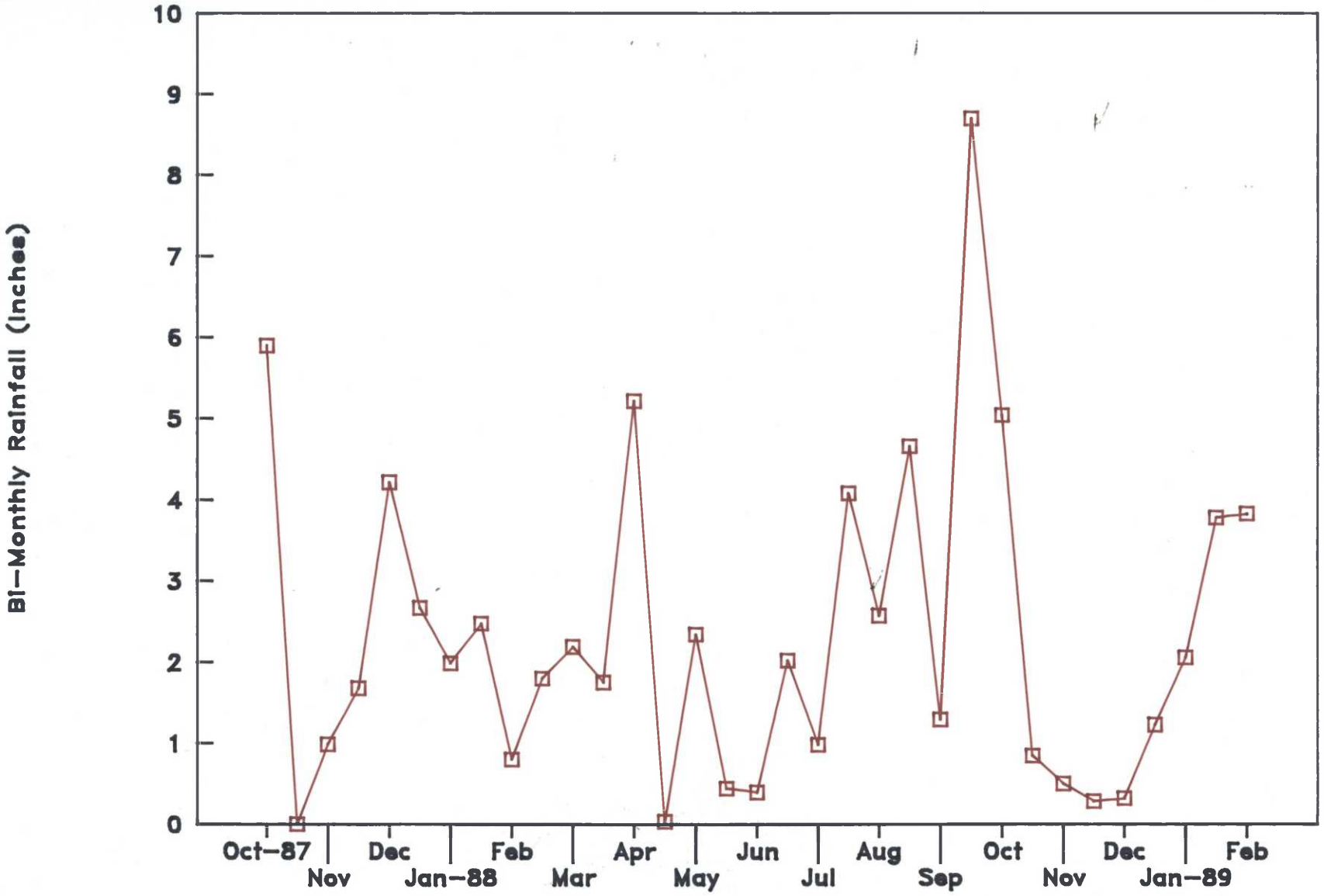


TABLE 1. RAINFALL RECORDED AT McFADDIN NWR DURING 1988

	1988 RAINFALL
JAN	3.28
FEB	3.99
MAR	6.97
APR	2.37
MAY	0.83
JUN	3.00
JUL	6.65
AUG	5.95
SEP	13.74
OCT	1.34
NOV	0.60
DEC	3.29
TOTAL	52.01

C. LAND ACQUISITION

1. Fee Title

There was renewed interest in acquiring the 11,500 acre Sabine Ranch. This tract of land abuts the North Unit tract of the refuge. It contains some very high quality fresh marsh habitat used extensively by waterfowl, alligators and nesting waterbirds. Several noteworthy waterbird rookeries can also be found on the area.

The property also includes half of Willow Slough and access to it. The other half of the Slough is refuge property, but those landowners that surround the refuge will not permit access to it. Willow Slough is fished, but only by those "privileged" few who have the landowner's permission. Willow Slough contains a fishery of largemouth bass and crappie. Sabine Ranch was part of the original refuge acquisition plan, but this property was withdrawn during negotiations. The public was under the impression that with the refuge's establishment, Willow Slough and its fishery would be opened to the public. This has been quite a disappointment and we continue to receive public pressure to acquire the property.

On 3/24, PL Ciccone toured the Sabine Ranch lands with RO-Realty personnel Smith and Lingman. The Ranch was the Region's top land acquisition priority for 1989. Lingman was reviewing private appraisals of the property. Later we heard that Sabine Ranch was not in a position to sell at this time.

The FWS was also exploring the possibilities of buying the Pipkin property which abuts the refuge boundary. This property is of great importance to the overall water management on McFaddin NWR, because 2-60" concrete culverts with flashboard risers located on the property control water within the refuge's Star Lake Pasture (15,000 acres). As part of the Taylor's Bayou dredging mitigation, the Corps of Engineers will construct a new water control structure on Star Lake near Perkins Levee on refuge land. Subsequently, the refuge will need to fill in the Gulf Camp culverts (2-60" culverts) to insure sole control of the hydrology of Star Lake. The Pipkins own this property. The refuge will need some type of control of this property to legally fill in the two culverts. On 7/21, Ed Candelaria (RO-Realty) visited the refuge to view the Pipkin tract. The next day he attempted to meet with Pipkin representatives, but was unsuccessful. Later he learned that they were also not interested in selling.

In September, we heard rumors that the Broussard property north of the North Unit was for sale. Much of this property is extremely valuable marsh habitat. The RO-Realty Office was notified, but no further developments were heard.

2. Easements

The FWS is also exploring the option of obtaining an easement on the Pipkin property which abuts the refuge boundary. This property is of great importance to the overall water management of McFaddin NWR. Efforts were unsuccessful in 1988.

D. PLANNING

2. Management Plans

The fire management plan was amended to denote areas scheduled for burning during 1988.

In 1988, the refuge followed the Star Lake water management plan adopted in 1987.

ARM Archibeque completed an Environmental Assessment on an Alligator Hunt at McFaddin NWR. We decided to hold off until 1989 before initiating a permit hunt in order to evaluate Anahuac NWR's Alligator Hunt Program, which was held in 1988 for the first time.

On 9/8, FWS personnel Hawthorne, Ciccone, Neaville, and Krakowski met with Texas Parks and Wildlife Department (TPWD) in Austin, TX to discuss water management within the McFaddin/Sea Rim/Murphree basin and the refuge's application for a Corps 404 Permit to dredge out the channels of the Permit Area. TPWD was represented by personnel from their Wildlife, Fisheries, Parks, and Resource Protection Divisions. Dale Witt of TPWD is extremely concerned over the loss of marsh habitat to salt water intrusion. Mr. Witt believes that TPWD and FWS should stop and reverse the extent of salt water intrusion within the Salt Bayou drainage system. This could be accomplished by installing water control structures at strategic locations within the system. Most members present at the

meeting were in agreement. However, C.E. Bryan, Dir. of TPWD Fisheries Resource Program, remained noncommittal on the question of habitat loss from salt water intrusion. He also indicated that his department would not fund any plan to install a structure at Keith Lake Pass. Mr. Witt suggested that a Water Management Plan for the system be drafted to include water control structures. Drafting was assigned to the committee of: TPWD - Charles Stutzenbaker, Kirby Brown, Fred LaBlanc and FWS - Ciccone, Neaville, Krakowski. Stutzenbaker and Ciccone were assigned as lead individuals. A first draft date was set for 11/15/88. The team did gather data on vegetation, water levels, and history of the area during the last quarter of 1988, but a first draft was not completed.

3. Public Participation

At 7:00pm on 3/11, a public meeting was held at the Media Room of Jefferson County Airport, Nederland, TX. The meeting was called to gather verbal comments on the refuges' hunt programs. In addition, the public was permitted to send in written comments if they could not attend the meeting. The FWS was represented by Managers Ciccone, Krakowski, and Archibeque. Thirty-one people attended the meeting. Krakowski chaired the meeting and initiated it with a brief review of the current hunt regulations. Archibeque followed with a summation of past season's waterfowl populations and bag statistics. Afterwards, the public gave their verbal comments. Those wishing to make comments signed a registration sheet posted outside the meeting hall. Public comment followed the order of the registration sheet. Krakowski informed the group that the FWS did not want to discuss issues at this meeting only gather comments upon which the FWS would evaluate their program. Many of the comments dealt with issues beyond the scope of the hunt programs. Most of the McFaddin comments dealt with the following issues: additional hunt days, boat ramp improvement, change the airdrive regulations, open McFaddin to weekend fishing, and the lack of water management plans. The meeting was orderly and the participants appreciated the chance to air their feelings. The refuge responded to the public's comments via a written memo addressing each major comment. Copies of the memo were sent to all attending the meeting and to the two local outdoor writers. One change to the hunt program was the extension of the McFaddin hunt season to include the late goose-only season (see Sec H.8). No other changes were made.

4. Compliance with Environmental and Cultural Resource Mandates

In June of 1987, RM Clapper requested that the U.S. Army Corps of Engineers (Corps) review 16 major proposed construction projects on McFaddin and Texas Point NWR's and identify which projects would require Section 404 or 10 Permits.

In addition to field trips accomplished in 1987, on 3/22 and 4/5, RM Krakowski gave Paula Rankin of the U.S. Army Corps of Engineers a tour of construction projects proposed for McFaddin NWR. Eleven projects were reviewed.

In June, the Corps officially made determinations on 16 projects. McFaddin Projects that are covered under the Nation-wide Permit include: Rehab of West End Levee; Rehab of Perkins Levee; Rehab of Pond 7 dike; and Project 10 dike repair. The following projects on McFaddin were determined not to need a permit:

Construction of firelanes in upland areas; Repair of Clam Lake levee and installation of culverts along Clam Lake. The following projects would require a permit: Repair of dikes and installation of culverts within the Permit Area; Cleaning out the Permit Area ditches; and Construction of boat ramps on the Intracoastal Waterway (ICWW).

The Corps also determined under separate letter that Corps Permits would not be required for 2 bank stabilization projects proposed on McFaddin NWR. Both areas are on the ICWW where barge wakes are eroding the banks of the ICWW and threatening fresh/brackish marshes of the refuge. The first area is located at the intersection of Clam Lake Road and the ICWW. The second area is a few hundred yards west of the Perkins Levee/ICWW intersection. Both areas are less than 500 linear feet and are covered by Nationwide Permit 13. $50,000 of riprap material was purchased and stockpiled at the two sites during the later part of the year (See Sec. I.1).

On 9/8, FWS personnel Hawthorne, Ciccone, Neaville, and Krakowski met with Texas Parks and Wildlife Department (TPWD) in Austin, TX to discuss water management within the McFaddin/Sea Rim/Murphree basin and the refuge's application for a Corps 404 Permit to dredge out the channels of the Permit Area. TPWD was represented by personnel from their Wildlife, Fisheries, Parks, and Resource Protection Divisions. The ditch clearing was to have taken place after the installation of the Wild Cow Bayou weir structure. However, the group decided that a new initiative stopping salt water intrusion was needed. It was decided that the Wild Cow Bayou structure should be part of the McFaddin/Sea Rim/Murphree Water Management Plan and plans for constructing a weir were put on hold. As a result, the 404 Permit Application for ditch clearing was rescinded.

5. Research and Investigations

During 1988 -- the following research projects were conducted on the refuge.

McFaddin NR88 - "Mottled Duck Wing Bone Analysis for Lead"

Mark Merchant, an undergraduate student at Lamar University completed an undergraduate chemistry project investigating lead concentrations in mottled duck upper wing bones. The project was supervised Dr.'s Hugh Akers and Shyam Shukla of the Lamar Chemistry Department. The crushed bones were boiled in nitric acid; treated with the following solutions: ammonium hydroxide, cyanide, sulfite and ammonia, along with dithizone; separating out the final lead dithizonate layer. The lead dithizonate layer was then analyzed for lead content using an atomic absorption instrument and checked against results obtained from lead dithizonate solutions analyzed spectrophotometrically. Refuge personnel collected the wings at the McFaddin check station and occasionally at Texas Point NWR checkpoints. He also obtained wings from the Anahuac NWR check station.

Merchant completed his collection of mottled duck wings by the end of the 1987-88 waterfowl season. Bones were analyzed in 1988. A paper presenting the results of this study was not completed by year's end.

McFaddin NR88
"The Reproductive Biology and Behavior of the Naked Goby"

A Master's Degree project supervised by Dr. David Bechler, Department of Biology, Lamar University. Graduate student Candace Conn initiated the study in 1987 and data collection continued through 1988. The objectives of the study were as follows:

1. To study the reproductive biology of Gobisoma bosci (fecundity, size at sexual maturity, length of breeding season, lifetime reproductive potential, and spawning sites) as found in a southeast Texas marsh;

2. To examine mating strategies and determine whether Gobisoma bosci is polygamous, polyandrous, or monogamous, or whether a combination of these mating strategies is used;

3. To determine the structure of the genital papillae and body color as opposed to actual sex of the animal;

4. To determine the significance of color in the species reproductive biology.

Collections of gobys continued through the year. Most were obtained from the east bank of Clam Lake. The researcher developed a PVC nesting structure that was used by the fish.

McFaddin NR88
"Agonistic Behavior in the Mud Crab (Rhithropanopeus harrisii)"

A Master's Degree project supervised by Dr. David Bechler, Department of Biology, Lamar University. Graduate student Terrie Ling collected field data from McFaddin's Clam Lake throughout 1988. The purpose of the study was to examine the following behavioral parameters as they relate to shelter acquisition in R. harrisii:

1. To determine the effect of body size, sex, and prior residency on shelter defense by R. harrisii;

2. To record and analyze agonistic behavior exhibited during encounters between pairs of R. harrisii and compare it to other studies conducted on xanthid crabs;

3. To determine the effect of size and sex without prior residency on shelter acquisition;

4. To determine if a pheromone is released

Crabs were collected on the refuge during the year mostly from Clam Lake. A research paper was still in development at year's end.

McFaddin NR88 - "Shot Ingestion Study"

Anahuac NWR personnel analyzed refuge mottled duck gizzards for lead shot at the Murphree Waterfowl Management Area on 4/12. McFaddin had 41 samples of which 13 (32%) had lead or other shot and 10 (24%) that had steel shot. A total of 23 (56%) had shot in their gizzards.

On 4/19-20, ARM Archibeque assisted Brian Cain with FWS Ecological Services (Clear Lake Office) with the trapping of crabs for contaminant analysis on McFaddin NWR. Crabs were collected in the salt water ditch near the Exxon Clam Lake Oil Field.

Refuge Biological Data Collection

During the year, ARM Archibeque collected the following biological data:

1. Salinities and water levels: this information was collected every two weeks at Chevron Camp, Star Lake, 5-Mile Cut, 10-Mile Cut, Wild Cow Marsh, and the ICWW Ditch.

2. Star Lake Pasture water levels and vegetation status. A transect line through the pasture was established. Specific monitoring stations along this line were surveyed each month.

3. With the help of Jim Neaville, vegetation plots within the Clam Lake Short Duration Grazing Unit.

4. Monthly waterfowl census. These will verify and compliment FWS aerial surveys.

5. Marine mammal and turtle stranding surveys.

6. Other

On 3/8, Managers Ciccone and Krakowski participated with TWPD in a tour of the McFaddin/Sea Rim/Murphree watershed presented to North American Waterfowl Management Plan (NAWP) Coordinators Jerry Johnson and Dick Hopper. The proposed NAWP projects on state and federal areas were reviewed.

E. ADMINISTRATION

1. Personnel

Three permanent full-time positions are allotted to this station. These include a Refuge Manager GS-11, and two Maintenance Worker WG-8/9's. One other full-time position, Refuge Manager GS-7/9, is allotted to Texas Point NWR. Much of this person's duties and time involve working on McFaddin NWR.

Two personnel changes occurred during the year. ARM Archibeque was promoted from GS-485-7 to GS-485-9 and Maintenance Worker Morvent was given a temporary 120-day promotion to a WG-2805-10 Electrician to complete much needed electrical work on the refuge. No new FTE's were added to the refuge.

ARM Archibeque and RM Krakowski received Sustained Superior Performance Awards for work conducted during FY88.

FIG. 1. THE MCFADDIN NWR STAFF: LEFT TO RIGHT - KRAKOWSKI, LEWIS, MORVENT, ARCHIBEQUE. (AA)

1. Domenick Ciccone, Project Leader, GM-485-13 (PFT)
2. James Krakowski, Refuge Manager, GS-485-11 (PFT)
3. Aaron M. Archibeque, Assistant Refuge Manager, GS-485-9 (PFT)
4. Wayne A. Morvent, Maintenance Worker, WG-4749-8 (PFT)
5. Gerald M. Lewis, Crane Operator, WG-5725-9 (PFT)

Table 2. Summarizes personnel distribution on McFaddin NWR the past seven years.

TABLE 2. EMPLOYEE DISTRIBUTION ON McFADDIN NWR SINCE FY 1982.

	PERMANENT			
	FULLTIME	PARTTIME	TEMPORARY	TOTAL FTE
FY 88	3	0	0	3
FY 87	3	0	0	3
FY 86	3	0	1	3
FY 85	3	0	3	3
FY 84	3	0	1	3
FY 83	3	0	2	3
FY 82	3	1	1	4

The ARM GS-7/9 position is listed under the Texas Point NWR narrative.

2. Youth Programs

Two individuals from Sabine Pass were selected for the 8-week YCC Program. They were Shanna Jennings (15 years) and Brandon Burkhalter (16 years). The program began on 6/15/88 with an orientation on the refuge and its function. Aside from the usual routine maintenance tasks such as mowing, painting, and trash pickup, the two assisted refuge personnel with the construction of a 6' chain link fence around the refuge residence, rehabilitation of two propane tanks, and barrier construction around the shop septic tank and leach field. Environmental education included assisting ARM Archibeque with transect data collection, marine mammal and sea turtle stranding censusing, and alligator stomach analysis. The two individuals also attended an 8-hour Defensive Driving Course.

FIG. 2. MCF 1988 YCC CREW - SHANNA JENNINGS AND BRANDON BURKHALTER. (AA)

4. Volunteer Program

Cynthia Krakowski contributed a total of 74 hours during the year. Cynthia helped with early morning observations of nesting mottled ducks and assisted with the coordination of the April McFaddin NWR bird count. In June she also conducted a teacher workshop at the refuge headquarters. Nine 3rd grade teachers from Port Arthur participated in the Project Wild "Marsh Munchers" Program. Cynthia's help throughout the year was greatly appreciated.

5. Funding

Refuge funding was sufficient to accomplish a minimum of the Annual Work Plan objectives. Major funded projects included: $30K ARMMS project to rehabilitate the McFaddin NWR headquarters and a $50K RPRP project to purchase riprap to control boat/barge wake erosion on the Intracoastal Waterway.

Funding was distributed under the following categories:

O&M	ARMMS	RPRP	FIRE	YCC	NUS	6860		TOTAL
116.8	30.0	50.0	3.0	1.4	12.8	4.0	=	$218.0K

Total funding over the past five fiscal years was as follows:

FY 88	-	$218,000
FY 87	-	$290,800
FY 86	-	$271,000
FY 85	-	$220,000
FY 84	-	$149,400

A Refuge Revenue Sharing check of $48,143 was presented to Jefferson County on April 25. The payment was 59% of the total authorized for the 50,634 acres in fee title at McFaddin and Texas Point NWR's. Jefferson County Tax Assessor Nick Lampson accepted the check.

6. Safety

ARM Archibeque served as the Station Safety Officer and as a member of the Complex Safety Committee along with ARM Couch and MW Henry of the Anahuac staff. Quarterly safety meetings were coordinated and held between the Anahuac and McFaddin/ Texas Point Refuges. In addition, monthly safety meetings were held at the McFaddin office. Topics covered included hearing protection, back problems and exercises, seat belts, airboat operation, fire pumper operation, and review of material safety data sheets. The following certified training sessions

were attended by all four refuge employees.

7/88 Annual Audiometric Testing (Staff)
7/19 Defensive Driving (Staff and YCC)
8/15 Cardio-Pulmonary Resuscitation (Staff)
10/19 Multimedia Standard First Aid (Staff)

A considerable amount of staff time was spent correcting safety deficiencies and hazards identified on the refuge. Some of the major items addressed were as follows: remodeling of the refuge office which involved replacing the old wiring, installation of another exit, and reconstruction of the entrance stairs; upgrading the gasoline island to a gravity feed system, thereby eliminating the electrical and fire hazard; installation of GFCI's in the refuge residence, shop, and office; upgrading safety shields, guards, and extension cords on all maintenance equipment and power tools; the installation of back-up alarms on all heavy equipment; and installation of the shop first-aid and eye wash stations.

The hazardous material safety data sheet system was maintained and updated throughout the year. In addition, the station's safety and health checklist was updated. The checklist is incorporated into monthly safety meetings and updated as those items requiring attention are addressed.

A draft Station Safety Plan was completed during the year. The plan followed recommendations made by the 1988 Regional Office Station Evaluation Team. The plan is to be completed in final form during FY89. McFaddin and Texas Point had been operating under Anahuac's Plan. During the Regional Office Evaluation the station was recognized for it's safe operation and the strong safety work ethic of the entire crew.

No injuries occurred during the year. However, MW Morvent did develop a foot problem with his steel-toed safety boots. This required a visit to the doctor's office. No work time was lost and a new pair of boots were purchased. No other accidents were reported by station personnel during the year.

7. Technical Assistance

The refuge staff participated in the Annual Marine Resources Field Day at Sea Rim State Park. ARM Krakowski presented a coastal birds program to a group of 80 4-H youth.

ARM Archibeque assisted FWS Ecological Services (Clear Lake Office) personnel with the collection of 30+ blue crabs for contaminant analysis. Collection sites were along ditches within the Clam Lake Oil Field.

ARM Archibeque assisted CB Jim Neaville with white-fronted goose productivity surveys within the Eagle Lake, TX area. He also assisted CB Neaville with the analysis of alligator stomachs for classes at Anahuac High School.

ARM's Krakowski and Archibeque provided assistance to Attwater Prairie Chicken NWR during the avian cholera die-off, which occurred late in the year.

On 3/21 ARM Archibeque assisted Anahuac NWR with their mottled duck census. The McFaddin marsh buggy was used to ground-truth the aerial census.

8. Other

RM Krakowski attended the 1988 Wetlands Workshop held in Clute, Texas. The stations marsh buggy was taken to the workshop and utilized during the field trip.

ARM Archibeque attended the 1988 Wing-Bee in Santa Fe, New Mexico.

On 3/8-9 RM's Krakowski and Archibeque attended portions of the Central Waterfowl Flyway Council meetings in Port Arthur, Texas.

RM Krakowski attended the Refuge Zone Meeting in Austin, Texas on 3/15-16.

ARM Archibeque attended a mottled duck census workshop in Clute, Texas on 4/26-27.

ARM Archibeque attended the 40-hour FWS basic fire training session held in Jackson Hole, Wyoming from May 2-6.

During the week of 5/16-19, a Regional Office Evaluation Team reviewed the operation of both refuges. The multi-disciplinary team consisted of Conrad Fjetland, Pat Langley, Bill Hawthorne, and Roger Monson. The inspection went relatively well. Their report mentioned that many improvements in facilities and management have occurred since the last inspection. Their report also noted that their appeared to be a high level of safety awareness at the station. Major deficiencies included the need for a separate oil and paint storage building for the shop and a Station Safety Plan.

FIG. 3. RO-EVALUATION TEAM OF FJETLAND, LANGLEY AND HAWTHORNE READY FOR AN AIRBOAT TOUR OF THE REFUGE. (JK)

RM Krakowski appeared before the Jefferson County Commissioner's Court in Beaumont, TX to deliver the April Revenue Sharing check and answer any questions the commissioners may have. This year Jefferson County received $48,143, which was about 59% of the amount authorized for the 50,634 acres in fee title at McFaddin and Texas Point NWR's. Tax assessor Nick Lampson accepted the check.

ARM Archibeque attended a Wildlife Disease Workshop at the TPWD Murphree Area on 5/17-18. The workshop was taught by personnel from the National Wildlife Health Center, Madison, Wisconsin.

RM Krakowski attended the Annual Project Leader's meeting in Albuquerque, New Mexico during the week of 8/8-12.

F. HABITAT MANAGEMENT

1. General

Habitat management on the refuge involves three main techniques. These are prescribed burning, grazing, and water control. Prescribed burning is the technique over which refuge personnel currently have the greatest control. Due to the location of the refuge, danger of prescribed fires escaping to private

lands is not great. This allows the extensive use of fire to restore or improve habitat for waterfowl by reversing plant successional trends to favor the emergence and growth of a variety of subdominant plants, many of which are key foods preferred by ducks and geese. Cool season grazing is another technique which is being used and explored more extensively. Proper grazing can be an effective means of opening up dense stands of vegetation, increasing food availability, and encouraging plant community retrogression. Water management is another important management tool employed at McFaddin. Maintaining proper water levels is very important. Changes in depth, salinity, turbidity, and other water quality parameters directly affects waterfowl diversity, use, and abundance. This technique is still not a perfected art on McFaddin due primarily to the lack of functional water control structures. However, the addition of flap gates on the Pipkin Structure and the development of a water management plan for the Star Lake area has allowed us to effectively manipulate water levels in this unit. Future plans to construct new and upgrade existing structures will add to our ability to properly manage specific units within the refuge.

In an effort to document the effects of land use and management practices employed on the refuge a water quality and vegetative monitoring program was initiated. At present Staff gauges have been set at seven key areas within refuge waters (Figure 3.) and are being monitored on a bi-monthly basis. Data on water levels, salinity, and turbidity were recorded during the year at these sites. With the acquisition of new equipment additional parameters such as dissolved oxygen, Ph, and temperature will be taken at these sites. Monitoring stations have also been established within Star Lake, Star Lake Pasture, and the Permit Area. Figure 4. also displays the specific location of each monitoring site. A description of monitoring efforts can be found within it's following respective management unit summary.

2. Wetlands

STAR LAKE SYSTEM

This unit is located in the far west end of the refuge's south unit. Due to its distance from tidal activity, this is the freshest system within the south unit. Problems with salt water intrusion have occurred in the past when the two 60" Pipkin culverts allowed saline Intracoastal Waterway (ICWW) water into the Star Lake system. The problem was corrected in August of 1987 with the installation of two flap gates. Metal hooks were added to the flashboards to facilitate removal. Locks were also installed to insure that refuge personnel have sole control over water levels for the system.

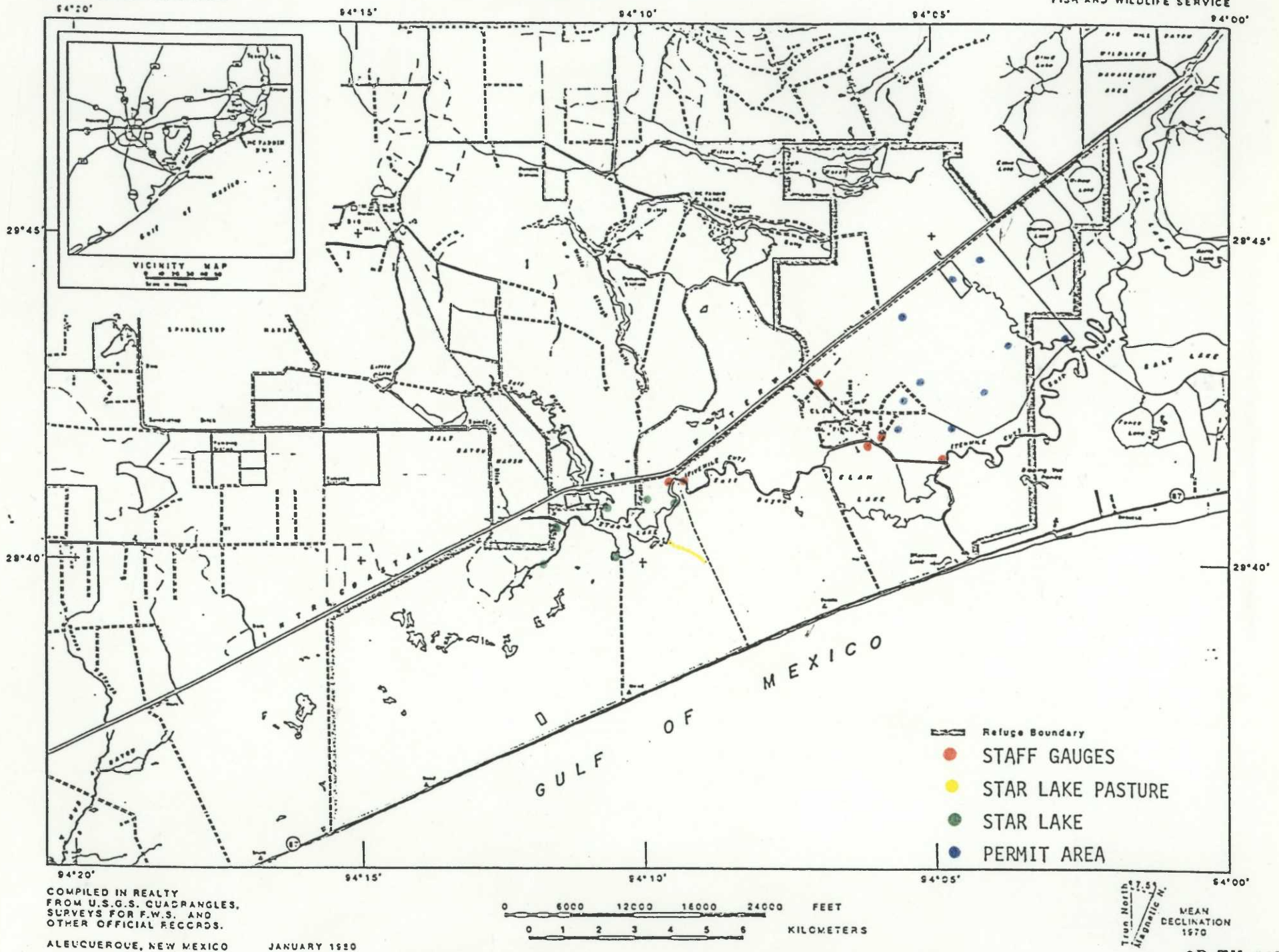
Table 1. outlines the water management plan for the Star Lake system. The management strategy and rationale were designed under the direction of ZB Biologist Neaville. Water level control required the frequent manipulation of flashboards at the Perkins Levee and Pipkin culverts. Although every effort was made to stay within the management plan, environmental conditions would sometimes dictate otherwise. In addition, "blackwater" conditions persisted throughout the summer months necessitating unplanned drawdowns to try and alleviate potential toxic water problems. Although little is understood about the actual process blackwater is a phenomenon which is believed to occur in brackish water during

MC FADDIN NATIONAL WILDLIFE REFUGE

JEFFERSON COUNTY, TEXAS

UNITED STATES
DEPARTMENT OF THE INTERIOR

UNITED STATES
FISH AND WILDLIFE SERVICE



COMPILED IN REALTY
FROM U.S.G.S. QUADRANGLES,
SURVEYS FOR F.W.S. AND
OTHER OFFICIAL RECORDS.

ALBUQUERQUE, NEW MEXICO JANUARY 1990

0 6000 12000 18000 24000 FEET

0 1 2 3 4 5 6 KILOMETERS

True North 17.5° Magnetic N.
MEAN DECLINATION 1970

Fig 3. 1988 WATER QUALITY AND VEGETATIVE MONITORING SITES

summer months, usually after a hot, dry period followed by a heavy influx of fresh water, such as rain. At present there are two schools of thought on the actual process. The first being that the heavy influx of fresh oxygenated water combines with dead vegetative and organic matter speeding up the process of decomposition. Decomposition occurs at such an increased rate that oxygen levels (dissolved oxygen) decrease sharply to the point where fish and other aquatic die-offs occur. The second school of thought is similar in that the fresh oxygenated water combines with vegetative and organic matter increasing the rate of decomposition however, the organic matter is believed to be rich in sulfides and as various chemical reactions occur throughout the decomposition process hydrogen sulfide is produced. The hydrogen sulfide itself is toxic which at certain levels results in fish, other aquatic, and vegetative die-offs. By-products of the chemical process gives the water it's characteristic tea (black) color and sulphur smell. Dissolved oxygen levels do drop sharply but are not believed to be the cause of die-offs in this case. According to Dr. Chabreck at Louisiana State University, black water conditions occurred within Sabine NWR in 1960 resulting in large scale fish and muskrat die-off. Muskrats were collected and sent to the Atlanta Health Center where they were diagnosed as having died from hydrogen sulfide poisoning.

From January through mid-April water levels remained within the desired management goals. The lack of rainfall from mid-April through July caused salinities to increase to a high of 5ppt and water levels to fall and stay below the prescribed level. The 5.95" of August rainfall brought Star Lake levels up to the desired goal. However, this influx of fresh water created blackwater conditions within the system. Boards were pulled at the Pipkin structure in an attempt to flush the blackwater and reduce any possible environmental threats. The boards were out for a week and the lake level was dropped by six inches. No fish kills or vegetation die-offs were observed. Blackwater conditions had dissipated until an extremely wet September once again created the blackwater problem. The boards were again pulled at the Pipkin Structure and nine inches of water were flushed out of the system. By mid-October the blackwater problem had begun to dissipate. No fish kills were observed although vegetation along the fringe of the lake started to show signs of stress. Star Lake remained below the desired management levels throughout the remainder of the year due to lack of rainfall.

Although water levels remained below the prescribed management levels throughout most of the summer months, vegetative response in Star Lake pasture was excellent. Subsurface soil moisture remained adequate and many desirable species were able to germinate and establish dense communities within the unit. Barnyard grass (Echinochloa crusgalli), Walter's millet (Echinochloa walteri), sprangletop (Leptochloa fascicularis), and water-hyssop (Bacopa monneri) were some of the major species found to be in abundance this year. Figure 4. outlines where dense communities of these plants were found. As for Star Lake itself, little submergent vegetation was noted. Turbid water abetted by the blackwater phenomenon appeared to be the major limiting factor. Organic deposition, increased rough fish populations, lack of submergent vegetation, wave action, and fluctuating salinity levels all contributed to the problem. We believe that until the lake is drawn down and the bottom allowed to dry, crack and aerate, little submergent vegetation will occur. By drying the lake, organic and suspended particulate matter can oxidize and incorporate itself within the

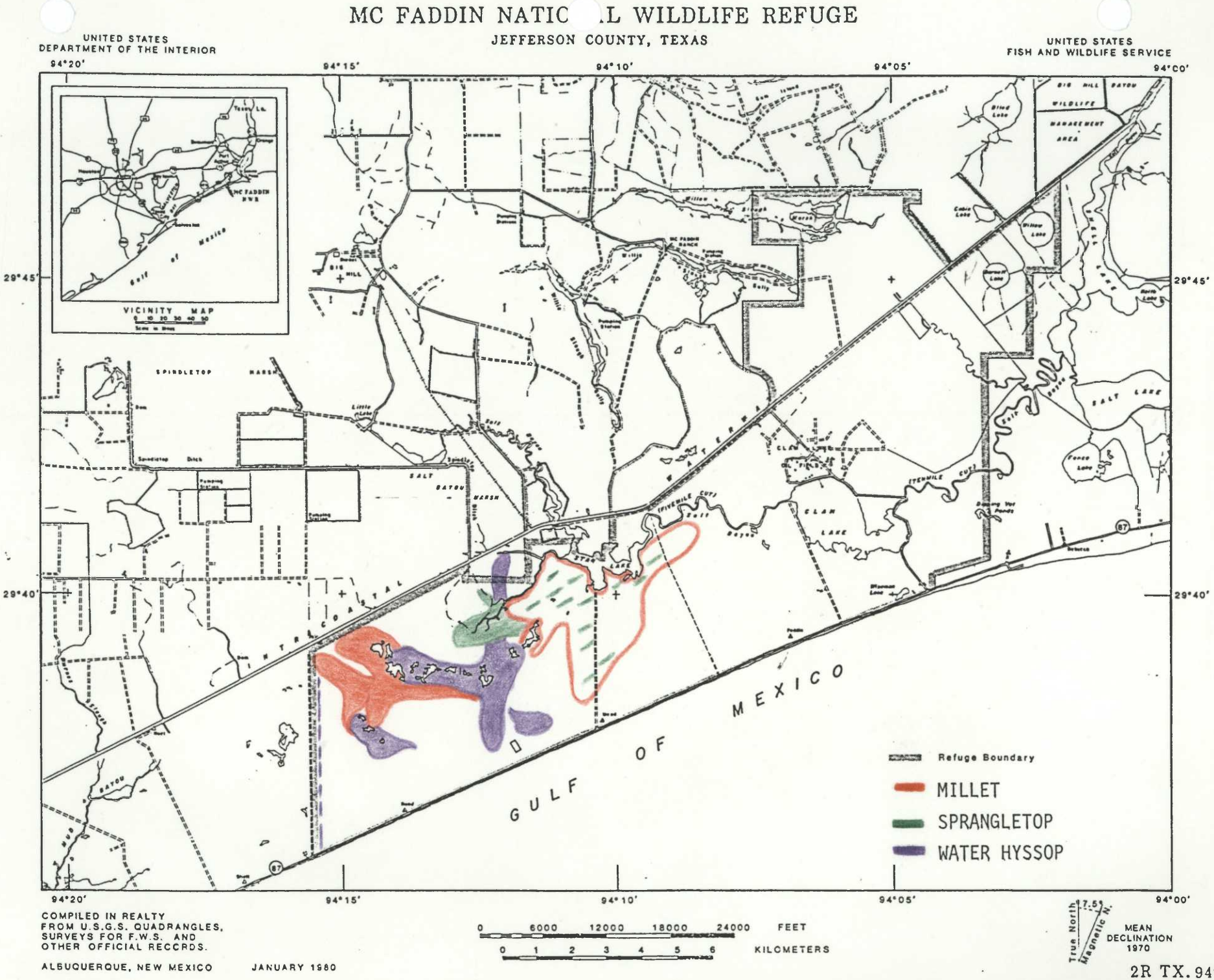


Fig 4. PLANT COMMUNITY LOCATIONS IN STAR LAKE PASTURE.

lake's bottom. As a result, turbidity will decrease and sunlight will penetrate deeper stimulating a vegetative response. Aquatic vegetation can take root and stabilize the bottom, which will reduce the impact of wave action. A drawdown would also reduce rough fish populations temporarily. Stabilizing salinities and incorporating the load of organic material within the lake bottom may help reduce the black water problem.

In addition to the water management plan, water quality and vegetative monitoring programs were initiated within this unit. The first, a line-intercept transect line was established off of Perkins Levee extending into Star Lake Pasture. Nine stations occur along the line. At each station a 50ft. line is stretched and readings are taken at one foot increments. Vegetation is recorded above ground and basally, from which we are able to determine the frequency of occurrence of individual species and as well as plant community composition over the entire area. Height/density relationships are also recorded utilizing a Robel Pole. Readings are taken at the four cardinal points and an average value is recorded. Marsh water levels and salinity are recorded in an effort to relate them to the staff gauge at Star Lake. From the data collected over the initial period we determined that the Perkins Levee line did not adequately represent vegetation over the entire unit. Although we will never be able to sample with any statistical validity we are going to establish two other lines within the unit in an effort to achieve a more representative sample. The second monitoring program was established within Star Lake itself. Six stations identified in Figure 3 were setup at key areas within the lake. At each station a 50ft. line is stretched out into the lake, water levels and vegetation are recorded at the 0, 12.5, 25, 37.5, and 50ft. marks. Salinity, turbidity, and dissolved oxygen will also be collected at these sites. This transect line is run on a monthly basis so that any changes in aquatics and water quality can be readily noted. The objectives of the two monitoring programs are to begin developing baseline data on vegetative species composition, height/density relationships, frequency of occurrence, and water quality as it relates to land use and management practices employed within the unit.

FIG. 5. MILLET STANDS IN STAR LAKE PASTURE WERE TALL AND DENSE. (AA)

FIG. 6. MILLET SEEDS PICKED UP FROM THE BOTTOM OF THE AIRBOAT AFTER A RIDE THROUGH THE MARSH. (AA)

Table 1. STAR LAKE WATER MANAGEMENT PLAN

	feet msl Water Level
April 15 - June 1: Hold water within the confines of Star Lake, No shoreline exposed, Stable water conditions for mottled duck nesting/brooding activities.	1.20
June/July: add 1" to the water level; insure adequate mottled duck brood habitat.	1.28
August/September: add 2" to the water level; this is the period of early duck migrants, backs up 2" of water into the pasture which provides additional waterfowl habitat.	1.45
October 1 - January 15: winter target level; water is 6" above the natural full level of Star Lake, Provides additional waterfowl habitat within the pasture, yet doesn't flood the entire pasture. Flooding the entire pasture would cause problems for cattle.	1.70
January 15-31: Begin drawdown from winter level; Expose submergent foods and invertebrates to wintering and migrating waterfowl.	1.70
April 15: Cycle complete	1.20

5-Mile Cut/Clam Lake System

Star Lake waters flow into 5-Mile Cut via the Perkins Levee culverts, which in turn flow into Clam Lake. In addition, this system receives fresh water from pastures to the north and south. Clam Lake waters flow in and out of the brackish tidal waters of 10-Mile Cut. 5-Mile Cut remained relatively fresh with saline conditions beginning to show up in early May and reaching their peak of 7ppt in late July. August rainfall brought down the saline conditions and by the end of the month 0ppt was recorded. The cut remained fresh throughout the remainder of the year. Dense stands of water shield (Brasenia schrebia), banana water lily (Nymphaea mexicana) and wigeon grass were noted but these areas received limited waterfowl use.

Clam Lake is a 1,037 acre lake which is influenced by tidal waters through 10-Mile Cut. Salinities ranged from a low of 0ppt to a high of 8ppt in late July

and early August. Turbid conditions, fluctuating water levels and salinities prevented any submergent vegetation from becoming established in the lake. Except for the small ponds and cuts along the southern fringe of the lake, limited waterfowl use was noted in this area. Clam Lake is an important nursery area for a variety of marine organisms and fish and is currently one of the TPWD release sites for thousands of redfish fingerlings.

10-Mile Cut/Permit Area

10-Mile Cut flows eastward from Clam Lake into Salt Bayou which in turn flows into a series of lakes and cuts eventually ending at the Keith Lake exchange. It is here and at portions along the Intracoastal waterway where tidal waters enter the system. The Wild Cow Bayou Marsh (WCBM) is located along the northern fringe of 10-Mile Cut and is separated from the Cut by a 2' to 3' levee. Three large cuts in the levee allow saline water from 10-Mile Cut to enter the system. In 1986, refuge personnel constructed weirs at these locations in an effort to stabilize salinity and water levels. However, that same year Hurricane Bonnie wiped out the major structure along Wild Cow Bayou which exchanges water from the WCBM to 10-Mile Cut. Due to funding constraints this cut remained open during 1988. As a result, the eastern portion of the Permit Area was subject to daily tidal fluctuations which prevented any submergent vegetation from becoming established in these areas. The western portion, although affected somewhat by a series of ditches, contained fresher water and remained somewhat stable allowing for dense stands of wigeon grass (Ruppia maritima) and sago pondweed (Potamogeton pectinatus) to grow. Sago pondweed grew extensively in ponds 5, 7, 13, and 18 but as salinities reached 7-8ppt growth slowed and at 9ppt and higher this species broke off and lost vigor. The wigeon grass continued to grow but when salinities exceeded 13ppt a major die-off of the plant occurred. Both species reached maturity and seeded out during the months of August and September. Fresher waters later in the year regenerated vegetative growth by both plants which was used extensively by waterfowl. Although other factors, such as temperature and turbidity, play a key role in the growth of these species, it appears that stabilizing water levels and salinities at the Wild Cow Bayou Cut will greatly enhance the potential of this area. South of 10-Mile Cut are the Dipping Vat Ponds which are still considered part of the Permit Area Unit. These ponds are extremely productive for valued wetland plants and are used extensively by mottled ducks and migrating waterfowl. Although influenced by 10-Mile Cut during very high tides or heavy rainfall, these ponds remained fresh throughout most of the year. Good growth of sago pondweed, wigeon grass, duckweed (Lemna Spp.), and watermeal (Wolffia Spp.) was noted in these areas. In addition, these areas provide an abundant supply of invertebrate life which is crucial to the production of the resident mottled duck.

North Unit

The Intracoastal Waterway cuts through the refuge separating the North Unit from the remainder of the refuge. More than 50% of this unit is fresh water marsh dominated by Willow Slough. Giant cutgrass (Zizaniopsis milliacea), American lotus (Nelumbo lutea), alligatorweed (Alternanthera philoxeroides), and water shield are the dominant aquatic species found within this system. Large

concentrations of ring-necked ducks and other ducks utilize this area during the winter months. Charles Stutzenbaker of the TPWD has also stated that, "Willow Slough is the single most important area on the Gulf Coast for molting mottled ducks". No active management takes place in this area although, the lower dike on Willow Slough is in great need of repairs. This problem is to be addressed in FY89.

A small marsh also exists just north of the ICWW across from LeBlanc's Reservoir. An old oil well gut from the ICWW into this area is currently destroying what was once a fresh water marsh. The gut was plugged in the past but erosion has once again opened this area to salt water intrusion from the ICWW. Funding has been appropriated to eliminate this problem and action is expected to take place in FY89.

3. Forests

The pine groves of the North Unit continue to recover from Hurricane Bonnie. A number of trees were destroyed or extensively damaged as a result of the storm. This area is of concern because it provides some of the first suitable habitat for thousands of spring migrants arriving from the Yucatan Peninsula of Mexico. Few places in the United States can provide the diversity of species one might observe in a day of bird watching in and around these areas.

5. Grasslands

Grasslands are managed through the use of grazing and prescribed burning. The objective is to open up and maintain the marsh and prairie sites in order to optimize waterfowl use. The techniques are discussed in detail in sections 7 and 9.

6. Other Habitats

On 4/23, ARM Archibeque assisted with the collection of trash from McFaddin beach as part of the "Texas Beach Trash Off". Hundreds of volunteers helped in the effort. A refuge truck was used to collect the trash.

7. Grazing

A. 1987-88 SEASON:

Bill White was the only permittee that managed cattle on the refuge this year. During the 1987-88 season, his cattle grazed within both the North and South Units of the refuge. Cattle use and billing was as follows:

	In	Out	Cattle #'s	Total AUM's
North Unit	10/30/87	01/27/88	207	621
South Unit	10/17/87	06/14/88	2,246	13,256.5
				13,877.5

Charges were as follows: $2.43/AUM for 10,696 AUM's = $25,991.28
$3.07/AUM for 3,181.5 AUM's = $9,767.21
$35,758.49

Grazing by domestic livestock is one of the most important tools employed on McFaddin NWR. Grazing is permitted on a seasonal basis. Portions of both the North and South Units of the refuge are grazed. The North Unit is grazed during the spring and early fall. Grazing on the South Unit occurs from late fall through late spring, until insect infestations force cattle out of the marshes.

Proper grazing is an inexpensive and effective method of managing refuge grassland communities by performing the following functions:

a. opening up dense stands of grasses, sedges, and rushes; creating sheet water loafing and invertebrate feeding areas.

b. increasing food availability for waterfowl by removing old decadent growth and allowing birds to get at the roots, tubers, and shoots of mature and new growth.

c. stimulating and encouraging plant retrogression to favor the emergence and growth of subdominant plant species, many of which are preferred foods by ducks and geese.

d. complimenting the merits of marsh burning by prolonging the time browse (tender new green growth) is available for goose use.

B. 1988-89 SEASON:

Mr. White was again the only permittee for the 1988-89 season. He started the season on 10/31/88 with 205 head on the North Unit and 747 head on the South Unit. His heard peaked at 205 head on the North Unit and 2,368 head on the South Unit. Two grazing strategies were again employed on the refuge this year. The first was a seasonal grazing scheme in which herds were placed in specific pastures (Star Lake, Arco, and White) and allowed to graze throughout the season. This method proved to work extremely well in conjunction with the refuge burning program. On 10/26/88, 800 acres of Arco pasture was burned, the remainder (2,000 acres) of this unit was burned on 11/2/88. Cattle were moved in on 12/1/88 to take advantage of the lush green growth. White pasture was ignited on 1/5/89 making another 1,500 acres available to cattle and waterfowl. On 1/27/89 additional cattle were moved into the pasture to help maintain the new growth

at levels conducive to those preferred by waterfowl. Heavy rainfall combined with the grazing and burning programs creating sheetwater at depths between two and 14 inches. Bird use was extensive within these pastures with goose populations reaching a peak of over 91,000 birds.

Cattle movements in Star Lake, Arco, and White pastures were as follows.

Star Lake Pasture

11/10/88	762 head moved in
11/30/88	461 head moved out
01/27/89	301 head moved out

Arco Pasture

12/01/88	200 head moved in
01/06/89	200 head moved out
01/07/89	388 head moved in
01/24/89	388 head moved out
01/27/89	921 head moved in

White Pasture

11/26/88	859 head moved in
01/26/89	344 head moved in

CLAM LAKE SHORT DURATION GRAZING PROGRAM

The second grazing strategy is the experimental Short Duration Grazing (SDG) program employed in Clam Lake Pasture. This system is spearheaded by Zone Biologist Jim Neaville. The 5,270 acre Clam Lake Pasture was divided into 10 grazing cells. Nine pie-shaped cells radiate out from the cattle management center, located along Hwy 87 at a south-central location within the pasture. The last cell is located along 5-mile Cut. The cells vary in size from 378 to 650 acres. The management center contains high ground and the only fresh water in the system. This is the second year that the SDG has been in operation. A stocking rate of 7 AC/AU was set prior to the start of the grazing season. Cattle did not graze all cells within the pasture this year due to the following reasons according to ZB Neaville. First, unusually dry spring and summer conditions favored the emergence of Colorado River hemp (Sesbania macrocarpa) within the pasture. Growth of this legume was so dense that the grazing cycle originally planned had to be altered so that those areas with the greatest potential for waterfowl use would be "opened" prior to any rains and increases in water levels. The pasture along the periphery of 5-mile Cut and the grit site pasture were of highest priority in the grazing sequence. Secondly, this year's grazing operation was hampered due to the USDA bovine brucellosis screening program (BANGS) which began in early December and terminated in mid-January. The grazing permittee's losses were costly as approximately 20% (390 head) of the refuge's herd tested positive for the contagious disease. Cells within the SDG program were used to isolate reactors and non-reactors to the disease.

Grazing within the SDG program began on 10/30/88 when 747 head were moved into cell #19. Grazing down this unit was of highest priority because of it's potential to provide feeding areas for waterfowl along 5-mile Cut. The cattle were then rotated into cell #13. Cattle movements from this point on were done in order to accommodate the needs of permittee White as testing for BANGS was initiated. The following is a breakdown of cattle movements within the system.

CLAM LAKE PASTURE (SDG PROGRAM)

10/31/88	747 head moved into cell #19
11/15/88	747 head moved from cell #19 to #13
11/26/88	747 head moved from cell #13 to #3
12/01/88	127 head moved out of #3
12/01/88	388 head moved into cells #15 & #17
12/11/88	620 head moved from #3 to #5
12/27/88	620 head moved from #5 to #7
01/07/89	388 head moved out of cells #15 & #17
01/27/89	620 head moved out of cell #7

Cells 1, 9, and 11 were not grazed during the cycle

It remains difficult to evaluate the Short Duration Grazing Program. The desired cattle impact was not achieved throughout the entire area due to problems discussed earlier. It is apparent that the system is strongly influenced by environmental conditions and if it is unable to adapt, the desired goals cannot be achieved. Burning is no longer a viable option due to the extensive fencing involved, and continuation of BANGS testing may hamper future grazing within the unit. No waterfowl use was observed within the Clam Lake unit this year. Inadequate rainfall and water levels also contributed to the problem.

Grazing permittee White remains skeptical about the program. Although willing to go on with the program he continues to express the following concerns: 1. Lack of high ground within the pasture makes it unsuitable for calving; 2. SDG grazing is conducted during the winter months when little regrowth occurs, meaning cattle cannot be continually cycled through the system; 3. Quality of forage is lower than in other pastures within the refuge because fire cannot be used to eliminate old growth and regenerate quality forage; 4. Moving cattle from cell to cell and maintenance of fences, etc., requires a great deal of time.

Mr. White's concerns are being taken into consideration and ZB Neaville is making every attempt to make the system function while addressing the needs of permittee White and the refuge. The SDG program was implemented with the understanding that it would be in place for a five year period at which time an extensive review and evaluation will take place.

9. Fire Management

Prescribed fire is an important habitat management tool for coastal marsh managers. Basically, fire is used to open up marsh and grasslands to improve the

habitat for waterfowl. The fire removes the thick, rank above ground vegetation which facilitates goose access to the roots and tubers of various marsh plants. The geese will also feed on the young green shoots of vegetation that follow the burn. The removal of vegetation also creates lakes of sheet water areas that are used extensively by ducks who feed on invertebrates and annual seeds. Both geese and ducks use these burned areas as roosts or loafing areas because the lack of vegetation makes it difficult for any predator to approach unnoticed. The burns also revitalize the marsh by oxidizing dead vegetation, which returns minerals to the soil, and enhances new growth. The burns reduce the amount of accumulated litter and rank vegetation, which if allowed to build up, presents a fire hazard that is difficult to control. Generally, areas within the refuge are burned on a two year rotation, however the actual condition of the burn unit dictates the need. Burns are conducted during the fall and winter months on days when approval can be obtained from the Texas Air Quality Control Board and when weather conditions fall within prescribed limits.

A total of 11,000 acres was prescribed for burning in the FY 89 McFaddin NWR Prescribed Burn Plan. However, due staff logistical constraints only 8,800 acres were burned. In addition, a total of 3,800 acres burned as a result of wildfire (arson or lightning fires).

Fire on McFaddin NWR followed this order in 1988/89:

Date	Area Burned	Acres	Comments
7/4/88	Unit 4	600	Wildfire - fireworks
7/26/88	Unit 7	2,000	Wildfire - lightning
7/30/88	Unit 6	1,200	Wildfire - lightning
10/26/88	Unit 1a	800	Prescribed Burn
11/2/88	Unit 1a(2)	2,000	Prescribed Burn
11/23/88	Unit 7	1,500	Prescribed Burn
11/29/88	Unit 7	1,500	Prescribed Burn
1/5/89	Unit 1	1,500	Prescribed Burn
2/8/89	Unit 5	1,500	Prescribed Burn
	Total =	**12,600**	

10. Pest Control

Herbicide use on the refuge is limited. Texas Parks and Wildlife Department (TPWD) employs a spray crew whose main job is to control water hyacinth clogging waterways within the county. McFaddin NWR has a problem with this plant in the North Unit. Periodically, TPWD would enter this Unit from the east and spray the hyacinth with 2,4 D. This herbicide application was approved by the Regional

Office.

Exxon also received RO approval to spray herbicide around their Clam Lake flow lines and facilities to reduce the fire hazard and facilitate maintenance. Approved herbicides included: Roundup, Arsenal, and Atrazine applied at manufacturer's prescribed rate.

G. WILDLIFE

1. Wildlife Diversity

In an attempt to create more habitat diversity, and thus more wildlife diversity, the refuge burning program has been geared to burn areas on a two year cycle. Some burning is being accomplished during late winter and early spring to determine whether dominant vegetation can be changed to species that are more beneficial to waterfowl.

The planned installation and maintenance of water control structures will also enable managers to increase wildlife diversity by maintaining water levels at various depths throughout the refuge.

2. Endangered and Threatened Species

ARM Archibeque served as the Upper Texas Gulf Coast Marine Mammal and Sea Turtle Stranding Coordinator. This involved censusing the beach from the Sabine Pass ship channel to Roll Over Pass. Six sea turtles were documented within the Jefferson County Region, two of which were found by ARM Archibeque. A rare stranding for this area, discovered on 4/27/88, was a large leatherback (Dermochelys coriacea) which was tagged on the left rear flipper with NMFS tag #AAW824. The animal was collected and kept at the refuge shop until personnel from the Galveston NMFS Office could pick it up. The cause of death has not yet been determined but preliminary information received indicated that the turtle was an adult male tagged in the Bay of Uruba in Colombia, South America. The other turtle found was a Kemp's ridley (Lepidochelys kempi).

FIG. 7. ARM ARCHIBEQUE WITH A RARE STRANDING, A LARGE LEATHERBACK SEA TURTLE. (JK)

Over the past couple of years there has been a decline in the number of sea turtles found. Local rumor has it that the shrimpers are sinking any turtles caught in their nets to insure that data collected from these strandings cannot be used as justification for the controversial turtle exclusion devices (TED's).

SEA TURTLE STRANDINGS DURING 1988

DATE	SPECIES	COUNTY	LAT.	LONG.
04/27/88	Lepidochelys kempii	Jefferson	29`37'	94`22'
04/28/88	Dermochelys coriacea	Jefferson	29`39'	94`07'
06/??/88	Lepidochelys kempii	Jefferson	collected by NMFS	
10/??/88	Lepidochelys kempii	Jefferson	collected by NMFS	
11/??/88	Lepidochelys kempii	Jefferson	collected by NMFS	
11/??/88	Lepidochelys kempii	Jefferson	collected by NMFS	

An environmental assessment dealing with a proposed alligator harvest was completed during the year. The harvest was not implemented this year due to limited manpower and priority of other projects. A harvest plan will be completed during FY89 and a harvest is expected to take place in the upcoming year. Current plans are to accept applications from experienced alligator hunters. A public drawing will be held from which ten permittees will be

selected. Each permittee will be allowed two helpers, assigned a specific harvest unit, and allowed to harvest a predetermined number of alligators. Harvest quotas will be set following aerial nest counts conducted by the TPWD. The harvestable population will be extrapolated from the nest counts based on a sustained yield process whereby eight percent of the total alligator population can be harvested with no significant impacts on the population. Only hook and line will be allowed, sport hunting will be prohibited. The FWS will receive a predetermined percentage of revenues generated from the sale of each hide. Harvest regulations will follow those established by the TPWD.

3. Waterfowl

The primary objective of McFaddin NWR is to provide and maintain habitat for wintering, migratory, and resident waterfowl. The refuge and surrounding wetlands are of great importance to coastal wintering populations of migratory waterfowl in the Central Flyway. Waterfowl numbers are usually highest on the refuge during January and early February, often commensurate with the close of the waterfowl hunting season. Populations decrease with the onset of the annual spring migration northward. During the summer months the main waterfowl species using the refuge is the resident population of mottled ducks.

1988-89 peak duck numbers were up over last year's, with increases occurring during the months of January and February. However, duck numbers during the months of October-December continued to decline. Three factors have probably contributed to this decline: overall declining duck populations; competition from agricultural areas in the vicinity of the refuge; and the continued loss of quality habitat due to salt water intrusion. It's important to note that even though refuge duck numbers were up this year, the increase occurred primarily during the month of February. As mentioned earlier, this coincides with the beginning of the spring migration northward. Good to excellent conditions on the refuge, as compared to surrounding areas, also played a role in the increase. Overall, the number of birds wintering on the refuge is well below those recorded in prior years.

Duck use was recorded throughout most of the refuge with divers found on the deeper bodies of water. Ring-necks made up the largest number of divers with the majority gathered in the Willow Slough area. Major concentrations of puddle ducks occurred in the Wild Cow Bayou Marsh (west end), Dipping Vat Ponds, and Star Lake Pasture. A decline in the number of birds using Star Lake itself was evident this year. The major factor causing this lack of waterfowl use can be attributed to Star Lake's turbid, salty waters which prevent the growth of aquatic vegetation. A "blackwater" condition in August/September also setback the marginal submergent growth that did occur. Heavy use was recorded in the west end of Star Lake Pasture in which prescribed burns, heavy goose use, grazing, and adequate water levels combined to create ideal habitat conditions. The most frequently observed species were green-winged teal, gadwall, wigeon, and shoveler.

Refuge goose populations continued to increase, with an all-time high of 91,565 recorded during the month of February. Snow geese made up the majority at 91,230 birds. Heaviest use was concentrated on the west end of Star Lake Pasture. The

geese took advantage of two prescribed burns conducted late in the year. Two major factors have most likely contributed to the increase in refuge goose populations. These are the overall general increase in snow goose populations and the fact that the refuge burning program has been geared to burning more total area later in the year. Local goose populations tend to utilize the prairie and rice fields to the north in the fall and shift to the marshes further south prior to the spring migration northward. Exposing and maintaining areas prior to this movement with the use of fire and grazing has helped create habitat conditions favorable for this species.

The following tables represent this year's peak monthly waterfowl populations and those surveyed by ZB Neaville and Regional Pilot Winship.

Table 2. PEAK MONTHLY WATERFOWL POPULATIONS 1988-89

	DUCKS	GEESE	COOTS
OCT.	1,585	0	437
NOV.	5,230	0	665
DEC.	10,445	5,901	1,882
JAN.	20,185	56,845	7,469
FEB.	45,979	91,565	4,550

Table 3. MONTHLY AERIAL WATERFOWL COUNTS 1988-89

	DUCKS	GEESE	COOTS
OCT.	1,379	0	437
NOV.	3,431	0	665
DEC.	9,704	3,148	1,882
JAN.	18,026	56,845	7,469
FEB.	45,282	91,565	4,509

TABLE 4. 1988-89 MCFADDIN NWR
PEAK WATERFOWL POPULATION BY SPECIES

SPECIES	OCT.	NOV.	DEC.	JAN.	FEB.
Mallard	20	215	311	311	300
Pintail	40	1250	641	975	450
Gadwall	183	300	2012	2012	1300
Wigeon	57	400	520	384	975
Shoveler	46	175	646	902	6350
Blue-winged Teal	300	170	226	226	1200
Green-winged Teal	95	450	3539	3875	20300
Mottled Duck	120	200	260	80	310
Redhead	0	0	0	0	30
Wood Duck	0	20	20	0	4
Canvasback	0	30	100	300	150
Merganser, Hooded	0	20	20	0	0
Merganser, Common	0	10	10	0	0
Merganser, R.Brst.	0	0	20	0	0
Ring-necked	720	1700	1700	10600	1620
Scaup	4	220	350	300	1260
Ruddy	0	40	40	0	0
Bufflehead	0	30	30	0	30
Snow Geese	0	0	5000	55600	91230
White-Fronted Geese	0	0	820	1145	275
Canada Geese	0	0	81	100	60
TOTAL DUCKS	1585	5230	10445	20185	45979
TOTAL GEESE	0	0	5901	56845	91565
TOTAL COOTS	437	665	1882	7469	4550

4. Marsh and Water Birds

The inland lakes, ponds, ditches, and marshlands provide ideal habitat for a great variety of marsh birds. The most common species include great, snowy, and cattle egrets; great blue, tri-colored, and green herons; white and white-faced ibis; olivaceous and double-crested cormorants; pied-billed grebes; common moorhens and purple gallinules; and least and American bitterns. The three major marsh zones (fresh, intermediate, and brackish) provide habitat in which all six species of North American rails may be found. Numerous broods of king and clapper rails were observed during the months of April and May. A brood of sora rails was also observed in the small pond adjacent to the refuge residence. Other nesting birds documented on the refuge include common moorhens, least bitterns, and green herons.

Nesting activity at the Willow Slough Rookery, located on the north boundary levee, appears to have stabilized. A decline in the number of species and birds nesting was evident over the last five years. However, the 1988 census yielded

a total of 2,360 adults comprised of eight species, slightly above last year's total of 1,959 birds and eight species. The birds are only using about 3,300' of levee which is now in two sections, the central portion containing the majority of nesting birds, and the western section containing a small population of cattle egrets.

The following data was collected during the 1988 colonial nesting bird census.

Species	# active nests	# adults	Est. breed. pairs
Olivaceous Cormorant	360	720	360
Anhinga	30	60	30
Great Egret	170	340	170
Snowy Egret	70	240	120
Tricolored Heron	37	150	75
Cattle Egret	350	700	350
Black-crowned Night Heron	26	60	30
Roseate Spoonbill	22	90	45

FIG. 8. YOUNG ROSEATE SPOONBILLS AT THE WILLOW SLOUGH ROOKERY. (AA)

The predominant species now occurring on the levee are as follows; Chinese tallow, McCartney rose, black willow, sugar hackberry, yaupon, elderberry, pokeberry, blackberry vines, and dewberry vines.

5. Shorebirds, Gull, Terns and Allied Species

Killdeer, black-necked stilts, and least terns were observed nesting on the refuge. Large concentrations of dowitchers, willets, sandpipers and gulls were noted on the mudflats of Star Lake and the Permit Area during late winter and early spring. Lowering water levels soon after the waterfowl season is especially beneficial to these migrants.

6. Raptors

The most common raptorial birds observed on the refuge were the northern harrier, the American kestrel, and the red-tailed hawk. Other birds seen throughout the year included the merlin, Swainson's, broad-winged, Cooper's, and sharp-shinned hawks. Black-shouldered kites and an osprey were also seen in and around the refuge. Owls commonly observed included short-eared and barn owls. A unusual sighting of a burrowing owl was made on the refuge near the cattle pens on Highway 87. The owl had apparently taken up residence in a pile of fill and debris excavated for a cattle watering hole. Barn owls have also found homes underneath the office and refuge residence.

Peregrine falcons were once again observed during their annual migrations. These birds are most commonly spotted on the fences and brush along Highway 87.

On January 13th an immature red-shouldered hawk was obtained from a resident in Sabine Pass. The bird appeared to have struck a powerline damaging its right wing. After an unsuccessful attempt at locating a rehabilitator in the area, ARM Archibeque caged and fed the bird for two weeks. On January 27th, it was successfully released on the refuge.

7. Other Migratory Birds

The pine groves of the North Unit and the cane breaks that are found throughout the refuge provide some of the first suitable resting habitat for thousands of spring migrants arriving from the Yucatan Peninsula of Mexico. The Gulf Coast of Texas is well known by birders and ornithologists across the country for its tremendous bird watching opportunities. Few places elsewhere in the United States can provide the number of species one might observe in and around the area. In an effort to create a refuge birdlist, seasonal bird counts were conducted. On 1/30, 24 local birders surveyed McFaddin's marshes and uplands. The weather was cooperative and the count produced 93 species. On 4/30, local birders participated with refuge personnel in a refuge spring bird count. A weather front passed through the area during the previous night and the group experienced some exceptional birding as 140 species were recorded. To date, 181 species have been observed on the refuge. Data collected from future annual bird counts will most likely increase the number of species recorded for the refuge.

Common night hawks, red-winged blackbirds, and boat-tailed grackles continued to nest within the refuge .

8. Game Mammals

A small herd of white-tailed deer continue to use the upland areas of the North Unit. A census has not been conducted but the population appears to be stable. A large buck and several does are routinely observed on trips to this area of the refuge.

Bobcat and coyote are also known to populate the refuge. Observations of these animals are made throughout the year. The female bobcat seen over the past few years was once again observed in the vicinity of the Exxon Oil Field Road with three kittens. Coyotes have been seen from the beachfront property to areas along the Intracoastal Waterway. Their presence is also evident by sign left on roads throughout the refuge. A large canine was spotted in the North Unit during the spring bird count. The group of birders were extremely excited at the "red wolf" sighting. ARM Archibeque was with the group and explained to the individuals that, although the last known red wolves were captured within this area there were no longer any pure wolf populations in Texas. It is believed that some red wolf X coyote hybrids do exist in the area, but no matter, the group supported the claim of the "wolf" sighting.

Muskrat activity continues to increase throughout many areas of the refuge. Their "beds" have been discovered in areas that previously had no activity since the refuge was established. Muskrat activity is beneficial to waterfowl and the re-establishment of this species is a welcome sight.

Other mammals observed during the year included nutria, otters, raccoons, opossums, and skunks. Baseline data is lacking on these and other mammals which inhabit the refuge. Personnel constraints do not allow us to adequately survey this aspect of the refuge but as contacts are made with local university professors it is hopeful that graduate level research will be initiated to develop some baseline information.

9. Marine Mammals

Seven bottlenosed dolphin strandings (Tursiops truncatus) were recorded during the year. Causes of the strandings are still unknown however. The peak stranding period was again March and April this year. Tissue and tooth samples were collected and sent to officials in Galveston for future analysis. The animals were marked and pulled off of the beach to avoid recounts in the future.

10. Other Resident Wildlife

Since 1984 a total of 84 alligators have been captured and tagged. No tagging occurred this year. However, baseline information on habitat preferences, displacement and movements, growth characteristics, and food habits can be obtained from the current sample size. Information from the upcoming harvest will help us set guidelines and management strategies to insure the healthy existence of this species.

Feral hogs continued to be observed on the North Unit of the refuge. During one outing two hogs were seen rooting next to the road adjacent to the pine groves. Predators and adjacent landowners have helped reduce the problem.

11. Fisheries Resources

Jerry Mambretti of the TPWD Coastal Fisheries Branch continued his ongoing study of fish and other aquatic organisms within Clam Lake. Catch rates for species caught in non-reef oyster dredge and bag seine samples were calculated as total catch/total sample effort. Gill net sampling was also conducted. Copies of the monthly data sheets were sent to the refuge. Statistics on salinity and temperature were also provided. Species sampled included red drum, spotted seatrout, Gulf Menhaden, Atlantic croaker, sheepshead, southern flounder, mullet, alligator gar, spotted gar, yellow bass, tidewater silverside, blue crab, brown shrimp and white shrimp. Monitoring of coastal finfish and shellfish resources began in 1975 and is a continuing program. Objectives of the program are as follows.

1. Develop long-term trend information on finfish and shellfish population abundance and stability in Texas Bays and the Gulf of Mexico.

2. Monitor environmental factors which may influence finfish and shellfish availability.

3. Recommend oyster and Gulf shrimping season opening and closing dates.

4. Determine movement, growth, and mortality of selected species through the recapture of tagged fish and scale analysis.

The North Unit is known for its excellent largemouth bass and crappie fisheries. However, water quality in Willow Slough was poor and it may of had some affect on the fisheries. Dry conditions followed by excessive rainfall accelerated decomposition of accumulated organic matter, creating anaerobic conditions for a period of time. ZB Neaville reported a small turtle die-off during his December aerial waterfowl census. Some fish kills were also reported. Investigation by refuge personnel revealed no die-offs. Willow Slough is becoming choked with submergent, emergent, and floating vegetation. Eutrophication is taking place and the fishery is declining. Currently the refuge has no water management capabilities in this area.

The National Marine Fisheries Service (NMFS) has primary Federal responsibility for the conservation, management, and development of living marine resources and for the protection of certain marine mammals and endangered species under various Federal laws. Their policy also states that the NMFS is vitally concerned about the habitats that support living marine resources since the well-being of these resources and the fishing industry depends upon healthy and productive habitats. As such, regional guidelines have been established and directed primarily at meeting responsibilities of NMFS as mandated by the Fish and Wildlife Coordination Act. Under the Act, NMFS is required to advise Federal agencies (e.g., the Army Corps of Engineers, and Fish and Wildlife Service) proposing to

construct or permit modifications of structures in waters of the United States of anticipated adverse impacts and recommend mitigative measures. Specific guidance is that 1) proposals for impounding or partially impounding previously unimpounded marsh is unacceptable, 2) proposals to reimpound previously impounded wetlands that are now tidally influenced are generally unacceptable, and 3) proposals to repair or replace water control structures will be addressed on a case-by-case basis. This is where conflicts between the objectives and mandates of the refuge and those of NMFS come into play. Many areas on the refuge that were once fresh or excluded from tidal fluctuations are now subject to restrictions of the NMFS. Future plans to manage or implement changes for the benefit of waterfowl will now have to address the effects these strategies will have on the fisheries and aquatic resources of the area.

12. Wildlife Propagation and Stocking

The Coastal Fisheries Branch of the Texas Parks and Wildlife Department under the guidance of Jerry Mambretti continued their stocking of redfish within the Clam Lake System. A total of 546,000 redfish fingerlings were released during the month of August. Since the stocking effort began in May of 1986 approximately 1.5 million fingerlings have been released in refuge waters. These efforts are part of the State's plan to insure the survival of a significant economic and recreational fisheries resource. Clam Lake was selected as one of the release sites because it offers the young reds a better chance of survival than they would have had if introduced into the open bay.

On November 21st retired Refuge Manager Russ Clapper reintroduced a female otter into Clam Lake. The otter was causing problems to crawfish farmers in the Anahuac area. Russ live-trapped the animal and felt it would have a better chance of surviving on the refuge than if released elsewhere.

14. Scientific Collections

Various species were collected throughout the year. These have been described in sections D5 and G11 of this report.

15. Animal Control

ARM Archibeque assisted a Sabine Pass homeowner who found an eight-foot alligator in her garage. The animal would not leave so officials were called to assist. A snare attached to a cane pole was used to control the animal and once it tired it was secured with rope and placed into the vehicle. The local Channel 12 TV News captured the action on film. The incident was shown on the 6pm and 10pm news.

H. PUBLIC USE

1. General

Public use on the refuge can generally be classified under three categories: waterfowl hunters, fisherman, and wildlife observers. The traditional popularity of Gulf Coast waterfowl hunting and the limited amount of public lands in Texas makes waterfowl hunting a key aspect of the refuge public use program. Fishing and crabbing activity is high during certain periods of the year and could be enhanced if the refuge was opened during summer weekends. Wildlife observation is not pursued by many people due in part to the lack of adequate facilities and the time restrictions one can visit the refuge.

On 10/25, RM Krakowski attended a TPWD public meeting in Beaumont to review the Texas Outdoor Recreation Plan. McFaddin and Texas Point NWR's are included in the plan.

2. Outdoor Classrooms-Students

RM Krakowski presented a talk on coastal birds at the annual 4-H Marine Resources Field Day held at Sea Rim State Park. The program was sponsored by the Texas Agricultural Extension Service.

8. Hunting

Three major regulation changes were made prior to the 1988-89 waterfowl season. The first was the elimination of the early teal season. The second, the elimination of the point system to a three bird bag with special restrictions on mallards, pintails, and mottled ducks. And third changing shooting hours from a half-hour prior to sunrise to sunset. A total of 18 days were open to hunting, down seven from last year's total of 25. As expected, many of the hunters felt the regulation changes were too restrictive. The only major change in refuge hunting regulations was the addition of the "Goose Only" season. Goose hunting was allowed following the close of the regular duck season. Access was restricted to walk-in points along HWY 87 and the Intracoastal Waterway. The entrance gate was not open during the goose only season. In all, 12 hunt days were added to the 18 days of the regular duck season. Hunters were extremely grateful for the additional days however, many expressed an interest in seeing the refuge gate opened so that areas accessible by boat could be used.

On 11/12, McFaddin NWR conducted an "open house" for area waterfowl hunters. The refuge entrance gate was left open during the hours of 7:30am to 3:00pm so hunters could visit the refuge and become familiar with the hunting areas. Twelve hunters participated in the event.

A break-down of this year's waterfowl harvest data (excluding the goose only season) can be found in Table 5. In all, a total of 1,296 hunters were checked for total bag of 2,205 birds and an overall average of 1.7 birds/hunter. A total of 1,586 hunters were estimated to have used the refuge for an estimated total kill of 2,651 birds. The estimated figures show a decrease of 47% in hunter

participation from last season. This figure is misleading because of the change in the number of hunt days, although looking at the number of hunters per hunt day a decline of 34% from last season is evident. During the 1987-88 season an average of 134 hunters used the refuge each day and for the 1988-89 season an average of 88 hunters used the refuge each hunt day. The decrease was evident in the number of hunters using the special permit hunt. Of the 29 permits available each day an average of 9 areas remained open each hunt day. This is up from last season's average of 5 open permits per hunt day.

Over the past eight years, hunter success has averaged 2.45 birds/hunter. The high of 3.2 was recorded during the 1984-85 season, and the low of 1.7 during this year's season. As mentioned earlier, this year's bag limit was reduced from a possible five bird to a straight three bird limit.

The primary species of ducks harvested this year were green-winged teal, gadwall, pintail, wigeon, and mottled ducks. The most notable change over last year was the number of mottled ducks harvested. During the 1987-88 season 170 mottled ducks were known to have been killed while during the 1988-89 season 174 mottled ducks were harvested. The change is significant in that the number of hunt days (25 vs. 18) and the number of hunters checked (2,574 vs. 1,296) during the past season were much lower than the previous year, and yet more mottled ducks were harvested. The increase may be attributed to the change in regulations which allowed a hunter to take one mottled duck in addition to two other birds to complete his three bird bag. The previous year a 100 point value was placed on this species and although reordering did take place it may have deterred individuals from killing these ducks.

This 1988-89 season represents the first year that goose hunting was allowed following the close of the regular duck season. The following statistics were recorded during this period. A total of 130 hunters were checked with a total kill of 198 birds for an average of 1.52 birds per hunter. It was estimated that 236 hunters used the refuge for a total estimated kill of 336 geese. These figures do not include the geese that were harvested during the regular waterfowl season. Goose hunting was best at the close of the waterfowl season and during the last few days of the goose only season. Cold, wet weather combined to create ideal hunting conditions.

Prior to the beginning of this year's hunting season seven wooden cross- overs were constructed and placed along the electric fence on HWY 87. The cross-overs were placed in the areas used most often by hunters. The structures provided safe access over the electric fence and helped orient hunters as to the locations of the open and closed areas.

MCFADDIN NWR 1980–88

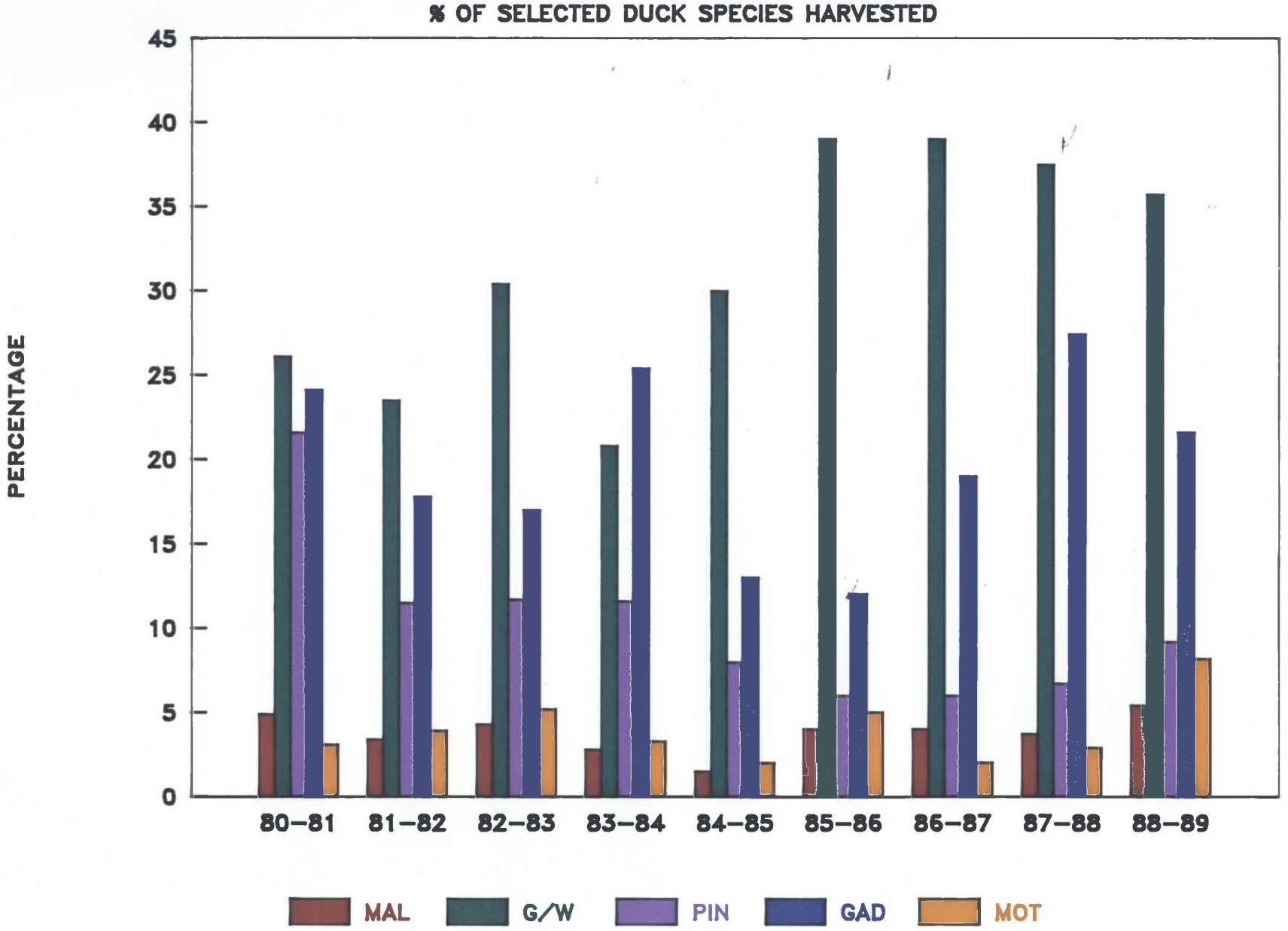


TABLE 5. MCFADDIN NWR WATERFOWL HARVEST DATA 1988-89 SEASON

SPECIES	PERMIT AREA	5 MILE/ CLAM LAKE	STAR LAKE	HWY 87	TOTALS
Mallard	53	33	9	19	114
Pintail	143	29	4	19	195
Gadwall	371	29	29	29	458
Wigeon	152	7	13	12	184
Shoveler	74	16	4	6	100
Blue-winged Teal	48	4	1	0	53
Green-winged Teal	468	159	93	37	757
Mottled Duck	111	31	20	12	174
Redhead	0	0	0	0	0
Wood Duck	5	2	0	0	7
Canvasback			Season Closed		
Merganser, Hooded	0	0	0	0	0
Merganser, R.Brst.	0	1	0	0	1
Ring-necked	1	1	0	0	2
Scaup	39	5	10	8	62
Ruddy	6	0	2	0	8
Bufflehead	0	1	2	1	4
Snow Geese	28	25	3	14	70
White-Fronted Geese	3	1	0	0	4
Canada Geese	6	1	1	0	8
TOTAL	1509	348	191	157	2205
HUNTERS CHECKED	804	268	118	106	1296
BIRDS/HUNTER	1.9	1.3	1.6	1.5	1.7
EST. HUNTERS	804	268	118	396	1586
EST. TOTAL BIRDS	1509	348	191	603	2651

note These figures do not include the estimated crippling loss of 14%.

9. Fishing

Refuge waters provide excellent fishing opportunities at certain times of the year. During the summer months alligator gar are regularly caught in Clam Lake. These fish often exceed five feet in length and weigh in excess of 40 pounds. Fall runs of redfish and flounder increase public use on the 10-Mile Cut Bridge. Blue crabs can be harvested whenever water temperature and salinities are adequate. Many individuals continue to express their interest in seeing the refuge opened for fishing during the weekends. The idea is being considered. Exxon has indicated that they are not in favor of this for reasons of liability and vandalism. Personnel constraints would also limit our ability to adequately

patrol and provide protection for facilities, equipment, and visitors.

The freshwater marsh north of the ICWW is known for its excellent largemouth bass fishing. Unfortunately for fisherman, access to the Willow Slough area is limited to foot access (virtually impossible) because the area is surrounded by private property. Only the landowners or individuals who receive permission are able to use this area. In a sense, Willow Slough has become a private fishing area for those lucky few who can gain access. Acquisition of the Sabine Ranch will eliminate this problem and will require that management develop a fishery management plan for this unit to insure healthy fisheries.

15. Off-Road Vehicling

The Highway Department has initiated a program to help prevent and discourage ATV traffic from damaging the beach dune system. A number of access points along HWY 87 were plugged and posted against entry. Those areas where entry is allowed have been upgraded and posted so that only these areas are used. The Highway Department is also experimenting with placing discarded Christmas trees along damaged areas in hopes that they will catch windblown sand and accelerate the formation of dunes in damaged areas.

These actions discouraged off-roading somewhat, but the dunes continue to be damaged. A plan to post and enforce the regulations has been discussed, but we may be fighting a losing battle because we are limited in personnel and the state has designated the area as a public beach. Off-road vehicles as well as automobiles are allowed on many Texas beaches.

17. Law Enforcement

Once again a great deal of time and manpower was spent working law enforcement during the waterfowl season. A total of 1,296 hunters were checked for an average of 324 encounters per Refuge Officer. A total of 16 violation notices were issued during the year, down from last years total of 24. The decrease is due in part to the reduction in the number of hunt days and hunters using the refuge. The following is a breakdown of NOV's issued.

Violation	Collateral	Officer
Careless Driving	$50.00	Morvent
Careless Driving	$50.00	Morvent
Careless Driving	$50.00	Morvent
Careless Driving	$50.00	Archibeque
Lead Shot	$100.00	Archibeque
Lead Shot	$100.00	Krakowski
No Federal Stamp	$200.00	Krakowski
No Federal Stamp	$200.00	Morvent
No Federal Stamp	$200.00	Archibeque
Improperly Plugged Gun	$150.00	Krakowski
Improperly Plugged Gun	$125.00	Archibeque
No State License	$200.00	Archibeque
Closed Area	$150.00	Archibeque
Special Regulations	$100.00	Archibeque
Non-Hunting Day	$150.00	Archibeque
Non-Hunting Day	$150.00	Archibeque

ARM Archibeque assisted FWS Special Agents with the "Take Down" of illegal waterfowl hunters along the Texas Coast. The operation was the climax to a three year undercover investigation of commercial hunting operations in Texas, and resulted in criminal charges against approximately 200 individuals. The charges included felony and misdemeanor violations of the Migratory Bird Treaty Act and the Lacey Act. The LaBove Shooting Resort located 12 miles east of the refuge was the site of the single largest take down. Approximately 1,300 criminal charges were filed with the majority having taken place on the LaBove Resort.

Two individuals implicated in the undercover operation have since been caught in violation of hunting regulations on the refuge. This information was passed on to Special Agents in hopes that these flagrant violators will be punished to the fullest extent of the law. Two juveniles related to individuals implicated in the operation have also been a problem to refuge officers. Although violation notices could not be issued, an effort was made to contact the parents of the juveniles. These talks appeared to have been successful.

In July, two illegally killed alligators were found floating in the Intracoastal Ditch of the Exxon Field. ARM Archibeque examined the animals and found that one had been shot in the head and the other had a broken knife blade embedded in the skull. The tails had been removed from both alligators. Exxon officials were notified and told that if anyone was caught illegally taking or harassing wildlife he or she would be prosecuted to the fullest extent of the law. Exxon personnel are not suspected but were asked to ensure that contractors working for the company were well informed before entering the refuge.

I. EQUIPMENT AND FACILITIES

1. New Construction

In January, Rite-Way Plumbing under contract for $1,400 installed a toilet, shower, wash sink, and water fountain at the shop.

Also in January, Crane Operator Lewis used the refuge dragline to excavate a 1/2 acre cattle watering pond at southeast corner of the Star Lake unit.

In June, refuge staff and YCC enrollees completed the construction of a pipe barrier around McFaddin NWR's shop septic system.

The refuge crew also constructed a 6' high chainlink fence around the refuge residence.

In July, the refuge initiated work to fill and elevate the area around the shop building to facilitate access and facility growth. Attwater Prairie Chicken NWR graciously allowed us to use their frontend loader for a couple of months as we moved fill from stockpiled areas near the Intracoastal Waterway.

Early in the year, Exxon informed us of their plans to drill several new wells on the refuge. One of the wells (#90), was located adjacent to the refuge polebarn and fueling station. An agreement was worked out whereby Exxon would use the pad where these refuge facilities stood and prevent further loss of wetland habitat. Exxon agreed to move the polebarn and fuel tanks to the refuge shop area near Hwy 87. A contractor jacked up the polebarn and moved it with a house moving trailer. They also brought in fill and gravel to the shop to serve as a foundation for these facilities.

The shop fuel tanks were sandblasted, patched, and painted. Stands were constructed to elevate the tanks and a gravity feed system replaced the previous battery-powered electric pumps that were in constant need of repair in this corrosive environment.

During the last quarter of the year, the refuge received 1,605 tons ($37,624) of 18" rock riprap and 682 tons ($12,375) of 1-4" blanket stone for erosion stabilization along the ICWW. The material was stockpiled near two areas where bank protection was desperately needed. One area is located at the junction of Clam Lake Road and the ICWW Road, while the other is about 200 yards west of the Perkins Levee/ ICWW Road junction. Both areas need approximately 500 linear feet of riprap protection. Funds for installation of the riprap were not available.

2. Rehabilitation

In May, the 0540 Lycoming airboat received a new polymer bottom ($1,400). This feature will make it possible for the boat to cross elevated dikes.

In July, console steering and electric starting capabilities were added to the Monarch/mercury johnboat.

In August, Maintenance Worker Morvent was temporarily promoted to a WG-10 electrician and replaced faulty wiring in the office, shop, and refuge residence. This was a 120-day promotion that extended through November.

In September, Bryam Construction of Beaumont initiated their $12,722 contract to repanel the exterior roof and walls of the refuge office.
The office had deteriorated greatly over the years. Every time it rained the buckets and mops had to come out. Construction was completed by early December. They also replaced the wooden office stairway with a galvanized metal structure. This work on the office, both inside and out greatly improved our image as professional managers and the morale of the employees working there.

Swain Construction of Beaumont was awarded a $15,175 contract to dry wall and refloor the interior of the refuge office. They started their work in November and were near completion by the end of the year.

FIG. 9. REHABILITATION OF THE REFUGE HEADQUARTERS BEGINS. (JK)

One of the 2" wooden flap gates at Chevron Camp had to be replaced after vandals damaged the first one. It was replaced with 3" treated tongue and groove lumber.

3. Major Maintenance

The refuge operates two airboats and both received considerable repair during the year. One airboat is a 14-foot Panther with a 327 cu. in. automobile engine. This boat won't jump dikes, but will travel in shallow water areas and is a good

work and tour boat. Early in the year we discovered that the block was cracked. A Port Arthur engine shop installed a short block for $1450.

Our other airboat is a 13-foot Airgator with a 0540 Lycoming aircraft engine with 260 hp. This boat needed major work during the year. In May, Stan Floyd of League City, initiated work on the carburetor ($300). This was followed by a $1,500 contract to rehone cylinders; and replace pistons, magnetos and a voltage regulator. Mr. Floyd kept the boat throughout the fall during which time his mechanic died in a boating accident. After hiring a new mechanic the engine was put back together. When we finally got it back the boat did run better, but past spark plug fouling problems remained. After Mr. Floyd suggested some additional work we decided not to do business with him anymore.

In March, a leak in the buried water line to the Clam Lake Pasture was discovered after the refuge received a bill for $672. Water to the pasture was shut off until the ranching permittee repaired the leak.

The rolligon received a new radiator during the month of March.

4. Equipment Utilization and Replacement

In February, the refuge acquired 50 rolls of chain link fence and 120 pieces of top rail pipes both excess property from the Boeing Petroleum Services, Sulphur, Louisiana.

The refuge received a 1988 Chevrolet Blazer 4x4 on 6/29. This vehicle replaces the 1982 Chevrolet 4x2 pickup truck.

In November, a new Minolta EP 370 Z copy machine was received.

The refuge acquired an excess Rhino Model M131 disk from Hagerman NWR during the month of August. This disk will be used to construct firebreaks on both refuges.

A Yamaha 350cc, 4-wheel ATV was purchased ($3,419) in September. This vehicle will be used for marine mammal and turtle stranding work as well as for upland marsh travel.

5. Communications Systems

A radio was installed in the dragline and portable radio station capabilities were installed in the airboats and rolligon.

6. Computer Systems

A surplus Rainbow Computer System was acquired in February. A modem was added later.

In June, an additional telephone line finally added to the McFaddin NWR office. This computer line gave the refuge electronic mailing capabilities.

J. OTHER ITEMS

2. Other Economic Uses

Exxon leases the Clam Lake Oil Field which had 32-35 active oil wells during the year. Most of the wells are gas generated, a few are pumper driven. Exxon will no longer install below ground flow lines in this field. The above ground lines are easier to maintain and if leaks occur they are much easier to detect and repair. Above and below ground flow lines carry the oil to storage tanks on the ICWW. During the year, Exxon drilled 5 new wells within the field. The new well numbers were #89-93. The location of wells 90 and 93 were of greatest concern. Well #93 was originally staked in Wild Cow Bayou Marsh a few hundred feet south of the refuge office. Exxon agreed to directionally drill this well from pad #87 and not threaten this valuable marsh. Well #90 was staked in wetlands adjacent to an old pad where the refuge polebarn and fuel tank facilities were located. Again Exxon agreed to directionally drill from the existing pad and move our facilities to the shop area adjacent to Highway 87.

FIG. 10. ONE OF SEVERAL OIL SPILLS (LEAKS) WITHIN EXXON'S CLAM LAKE FIELD. OLD FLOW LINES (ABOVE) ARE BEING REPLACED AND PUT ABOVE GROUND TO MONITOR MORE EFFICIENTLY. (AA)

Four oil well leaks occurred within the Clam Lake Field during the year. On 2/1, an old, non-functional pipeline leaked about 2 barrels of oil into the marsh. Exxon operators were slow to report and clean up the spill. After consultations with the Exxon supervisor in Anahuac, the clean up efforts accelerated and promises for better communication were made. On 4/12 and 4/16 two separate leaks occurred within the field. Both leaks developed from rusted valves or pipe fittings and a total of 2 barrels were spilled into wetlands. Vacuum trucks , booms, and absorbent pads were used to pick up the oil. On 5/28, a leak at the production header caused the spillage of 90 barrels of oil. Exxon spent the following 2 weeks cleaning up the spill. Luckily, it did not get into Clam Lake where clean up would have been difficult.

4. Credits

ARM Archibeque wrote Sections: F,G and H. RM krakowski wrote and reviewed the rest of the narrative.

K. FEEDBACK

Nothing to Report.

L. INFORMATION PACKET --- (inside back cover

TEXAS POINT NATIONAL WILDLIFE REFUGE

Sabine Pass, Texas

ANNUAL NARRATIVE REPORT

Calendar Year 1988

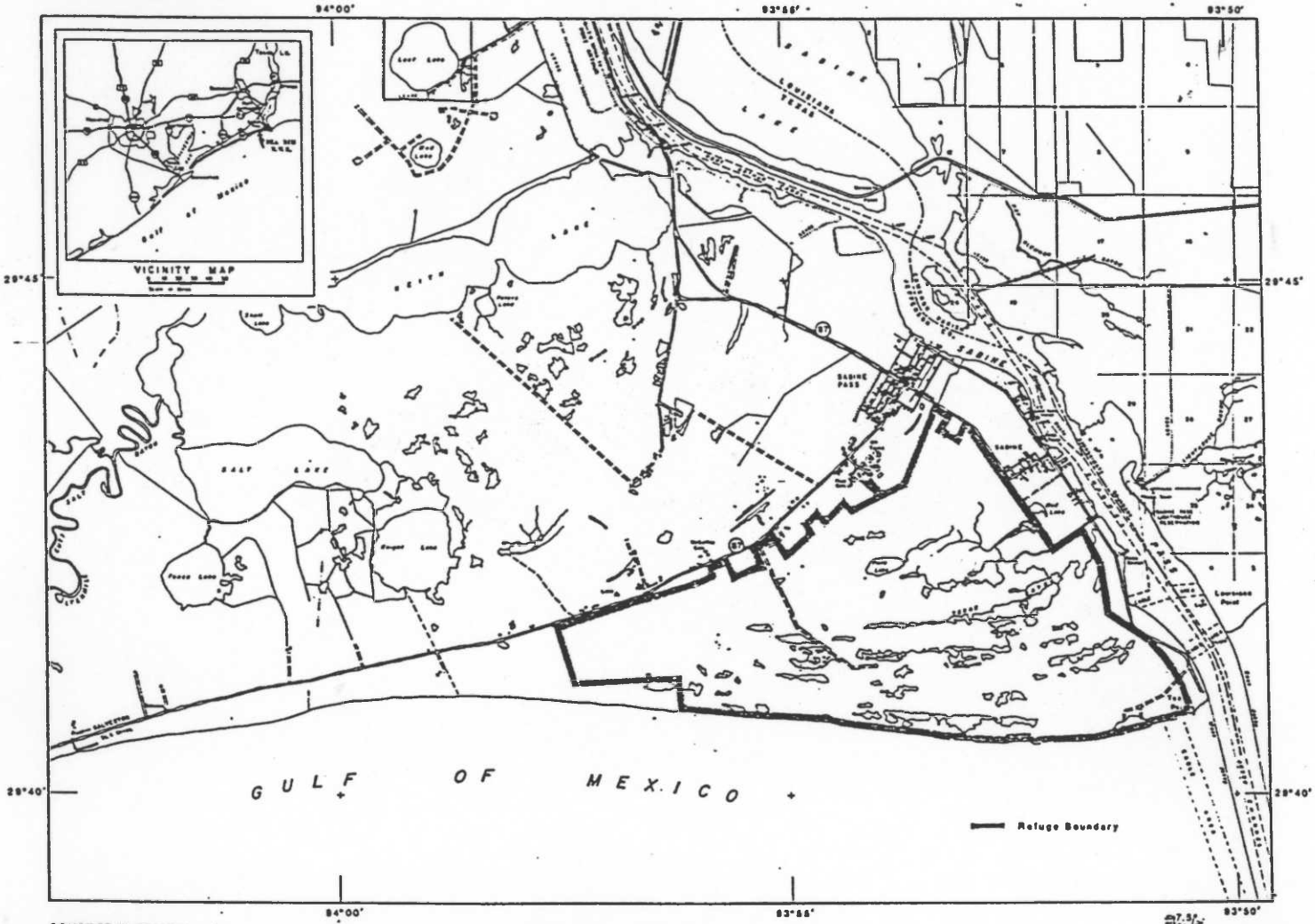
U.S. Department of the Interior
Fish and Wildlife Service
NATIONAL WILDLIFE REFUGE SYSTEM

TEXAS POINT NATIONAL WILDLIFE REFUGE

JEFFERSON COUNTY, TEXAS

UNITED STATES
DEPARTMENT OF THE INTERIOR

UNITED STATES
FISH AND WILDLIFE SERVICE



COMPILED IN REALTY
FROM U.S.G.S. QUADRANGLES,
SURVEYS FOR F.W.S. AND
OTHER OFFICIAL RECORDS.

ALBUQUERQUE, NEW MEXICO
REVISION: 12/81

JANUARY 1980

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MEAN
DECLINATION
1978

2R TX. 950 406

INTRODUCTION

ADDRESS

TEXAS POINT NWR
P.O. Box 609
Sabine Pass, TX 77655

LOCATION

The refuge lies approximately one mile south and west of Sabine Pass and twelve miles south of Port Arthur, Texas. The refuge is bordered on the east by the Sabine River (Port Arthur ship channel), on the south by the Gulf of Mexico, on the west by private property and on the north by Texas Highway 87 and private property.

AREA

This 8,952-acre tract of coastal marshland is located in the Central Flyway along the upper Texas Gulf coast in the extreme southeastern tip of Jefferson County, Texas.

TOPOGRAPHY

TEXAS POINT NWR is within the TX/LA Chenier Plain and is predominately a saline-brackish marsh complex dominated by smooth cordgrass, marshhay cordgrass and seashore saltgrass. The only significant elevation changes are associated with natural cheniers. The elevation ranges from below sea level to approximately seven feet above sea level next to State Highway 87.

CLIMATE

The winter climate along the upper Texas Gulf coast is tempered by the warmth of the Gulf resulting in mild, humid, weather. Although prevailing southerly winds usually prevent summer temperatures from reaching 100 degrees, the offshore breezes produce uncomfortable high humidity for several months. The mean annual average temperature is about 68 degrees. Summer temperatures rarely reach 100 degrees and winter temperatures are rarely below freezing. The average growing season is approximately 250 days. The average annual precipitation is about 55 inches, with the rainfall usually distributed uniformly throughout the year.

JURISDICTION

Proprietary

LEGISLATIVE DISTRICT

9 Texas

CURRENT CONGRESSMEN	House - Jack Brooks Senate - Lloyd Bentson, Phil Graham
LAND ACQUISITION	The refuge was established on July 26, 1979, by the authority of the Migratory Bird Conservation Act.
PURPOSE	The refuge was established to preserve wintering habitat for migratory waterfowl as well as habitat for birds using the Texas Gulf Coast as a resting area during spring and fall migration.
OBJECTIVES	The refuge follows the objectives established by the Environmental Quality Standards set forth in the "Principles and Standards of the Proposed Acquisition of Sea Rim Marsh (now Texas Point NWR). They include: (1) Provide habitat and protection for migratory and resident waterfowl; (2) Provide habitat and protection for special recognition species; (3) Provide habitat and protection for threatened species; (4) Provide interpretation in a natural environmental setting; (5) Provide wildlife-oriented recreation; and (6) Preserve the natural estuarine habitat of the area.

I N T R O D U C T I O N

T A B L E O F C O N T E N T S

F. HABITAT MANAGEMENT

G. WILDLIFE

H. PUBLIC USE

I. EQUIPMENT AND FACILITIES

J. OTHER ITEMS

K. FEEDBACK

L. INFORMATION PACKET

(Inside Back Cover)

A. HIGHLIGHTS

Hurricane Gilbert threatens to make landfall on the upper Texas Coast (Section B.).

Helicopter traffic continues to deter refuge goose use (Section G.3).

Hunter participation and success is the lowest ever recorded on the refuge (Section H.8).

B. CLIMATIC CONDITIONS

Total precipitation during 1988 was 53.60 inches or .08 inch below the 53.68 inch average of the past seven years. Table 1 displays the distribution of rainfall for each month of the year. Rain is sporadically received throughout the year and there appears to be no pattern to its monthly distribution. Generally, it was a dry year except for the months of March, July, August, and September. A very hot May through June period followed by several months of heavy rainfall created "blackwater" conditions in coastal marshes. The refuge had an 8 inch rain during the first week in September. On February 7 the refuge received a thin blanket of snow. High tides washed out major portions of Hwy 87 on 4/29. Hwy 87 was closed for several days as a result.

Hurricane Gilbert entered the Gulf of Mexico during the early part of September. This tropical depression gained strength in the warm waters of the Gulf and threatened to be the worst storm of the century. As the storm approached the Texas coastline, refuge personnel prepared for the worst before evacuation. The refuge boats and heavy equipment were transported to the Murphree Wildlife Area. Their headquarters is further inland and protected by a high storm levee. The dragline and grader were parked on high ground next to the Intracoastal Canal which is three miles from the Gulf. Valuable portable property and records were transported to the Anahuac office. The windows at the refuge residence and office were covered with plywood. All of the file cabinets, desk drawers and storage shelves were taped shut or covered with plastic. The boards were taken out of the three 48" culverts at Perkins Levee in order to protect this levee from being washed out by high water from the east or west. Refuge personnel took administrative leave one day (9/15) prior to landfall to take care of personal business and evacuate. Luckily for us the storm veered to the south and made a landfall in Mexico about 100 miles south of the Texas border. Yet the hurricane still had an impact on this part of Texas. Extreme high tides carried beach material onto Highway 87 as it passes through the refuge. The road was closed for almost a month while State Highway employees excavated the road and made the necessary patches. Tidal waters covered much of the refuge but had no major impact on vegetation communities.

TABLE 1. RAINFALL RECORDED AT TEXAS POINT NWR DURING 1988

	AVERAGE (1980-87)	1988 RAINFALL
JAN	3.50	2.94
FEB	4.34	4.52
MAR	3.78	4.91
APR	1.91	2.20
MAY	6.21	0.88
JUN	5.50	4.85
JUL	3.70	6.34
AUG	2.74	7.86
SEP	5.87	13.51
OCT	5.98	1.54
NOV	4.76	0.60
DEC	5.28	3.45
TOTAL	53.57	53.60

C. LAND ACQUISITION

Nothing to report.

D. PLANNING

2. Management Plan

The fire management plan was amended to denote areas scheduled for burning during 1988.

3. Public Participation

At 7:00pm on 3/11, a public meeting was held at the Media Room of Jefferson County Airport, Nederland, TX. The meeting was called to gather verbal comments on the refuges' hunt programs. In addition, the public was permitted to send in written comments if they could not attend the meeting. The FWS was represented by Managers Ciccone, Krakowski, and Archibeque. Thirty-one people attended the meeting. Krakowski chaired the meeting and initiated it with a brief review of the current hunt regulations. Archibeque followed with a summation of past season's waterfowl populations and bag statistics. Afterwards, the public gave their verbal comments. Those wishing to make comments signed a registration sheet posted outside the meeting hall. Public comment followed the order of the

registration sheet. Krakowski informed the group that the FWS did not want to discuss issues at this meeting only gather comments upon which the FWS would evaluate their program. Many of the comments dealt with issues beyond the scope of the hunt programs. Most of the Texas Point comments dealt with the following issues: additional hunt days, cattlewalk improvement, and the lack of water management plans. The meeting was orderly and the participants appreciated the chance to air their feelings. The refuge responded to the public's comments via a written memo addressing each major comment. Copies of the memo were sent to all attending the meeting and to the two local outdoor writers.

4. Compliance with Environmental and Cultural Mandates

On April 5, RM Krakowski met with Paula Rankin, physical scientist with the U.S. Army Corps of Engineers. A review of proposed work projects was conducted in order to make jurisdictional determinations as to whether Section 10 or 404 permits would be required. The cattle walk project was reviewed from the marsh buggy. No determinations were made during this visit.

E. ADMINISTRATION

1. Personnel

One permanent fulltime position is allotted to this station. ARM Archibeque is assigned to Texas Point NWR, but much of his duties involve work on McFaddin NWR. Personnel stationed at McFaddin NWR aid in the maintenance and management of Texas Point NWR.

Two personnel changes occurred during the year. ARM Archibeque was promoted from GS-485-7 to GS-485-9 and Maintenance Worker Morvent was given a temporary 120-day promotion to a WG-2805-10 Electrician to complete much needed electrical work on the refuge. No new FTE's were added to the refuge.

ARM Archibeque received a Sustained Superior Performance Award for work conducted during FY88.

Employee distribution over the past five years has been as follows:

	PERMANENT			
	FULLTIME	PARTTIME	TEMPORARY	TOTAL FTE
FY 88	1	0	0	1
FY 87	1	0	0	1
FY 86	1	0	0	1
FY 85	1	0	0	1
FY 84	1	0	1	2
FY 83	1	0	1	2

PERSONNEL

EMPLOYEE	TITLE	GRADE	STATUS
Domenick Ciccone	Project Leader	GM-485-13	PFT
Jim Krakowski	Refuge Manager	GS-485-11	PFT
Aaron Archibeque	Asst. Refuge Mgr	GS-485-07	PFT
Gerald Lewis	Crane Operator	WG-5725-9	PFT
Wayne Morvent	Maintenance Worker	WG-4749-8	PFT

5. Funding

Funding level changed very little from last year. The level is only enough to fund one fulltime position with little left over. Of the $37.1K allotted in FY88, $2K went for grazing maintenance and $0.4K went to quarters maintenance at McFaddin NWR. Texas Point NWR has no buildings, pumps, culverts or other facilities. The only other costs incurred are those maintenance costs for: fencing, posting, other signs, and parking lot maintenance. Funding levels for the past five years have been:

FISCAL YEAR	AMOUNT
FY 87	36,300
FY 86	37,200
FY 85	30,100
FY 84	57,600
FY 83	54,600

6. Safety

ARM Archibeque served as the Station Safety Officer and as a member of the Complex Safety Committee along with ARM Couch and MW Henry of the Anahuac staff. Quarterly safety meetings were coordinated and held between the Anahuac and McFaddin/ Texas Point Refuges. In addition, monthly safety meetings were held at the McFaddin office. Topics covered included hearing protection, back problems and exercises, seat belts, airboat operation, fire pumper operation, and review of material safety data sheets. The following certified training sessions were attended by all four refuge employees.

7/88 Annual Audiometric Testing (Staff)
7/19 Defensive Driving (Staff and YCC)
8/15 Cardio-Pulmonary Resuscitation (Staff)
10/19 Multimedia Standard First Aid (Staff)

A considerable amount of staff time was spent correcting safety deficiencies and hazards identified on the refuge. Some of the major items addressed were as follows: remodeling of the refuge office which involved replacing the old wiring, installation of another exit, and reconstruction of the entrance stairs; upgrading the gasoline island to a gravity feed system, thereby eliminating the electrical and fire hazard; installation of GFCI's in the refuge residence, shop, and office; upgrading safety shields, guards, and extension cords on all maintenance equipment and power tools; the installation of back-up alarms on all heavy equipment; and installation of the shop first-aid and eye wash stations.

The hazardous material safety data sheet system was maintained and updated throughout the year. In addition, the station's safety and health checklist was updated. The checklist is incorporated into monthly safety meetings and updated as those items requiring attention are addressed.

A draft Station Safety Plan was completed during the year. The plan followed recommendations made by the 1988 Regional Office Station Evaluation Team. The plan is to be completed in final form during FY89. McFaddin and Texas Point had been operating under Anahuac's Plan. During the Regional Office Evaluation the station was recognized for it's safe operation and the strong safety work ethic of the entire crew.

No injuries occurred during the year. However, MW Morvent did develop a foot problem with his steel-toed safety boots. This required a visit to the doctor's office. No work time was lost and a new pair of boots were purchased. No other accidents were reported by station personnel during the year.

7. Technical Assistance

The refuge staff participated in the Annual Marine Resources Field Day at Sea Rim State Park. RM Krakowski presented a coastal birds program to a group of 80 4-H youth.

ARM Archibeque assisted FWS Ecological Services (Clear Lake Office) personnel with the collection of 30+ blue crabs for contaminant analysis. Collection sites were along ditches within the Clam Lake Oil Field.

ARM Archibeque assisted CB Jim Neaville with white-fronted goose productivity surveys within the Eagle Lake, TX area. He also assisted CB Neaville with the analysis of alligator stomachs for classes at Anahuac High School.

RM's Krakowski and Archibeque provided assistance to Attwater Prairie Chicken NWR during the avian cholera die-off, which occurred late in the year.

On 3/21 ARM Archibeque assisted Anahuac NWR with their mottled duck census. The

McFaddin marsh buggy was used to ground-truth the aerial census.

8. Other

RM Krakowski attended the 1988 Wetlands Workshop held in Clute, Texas. The stations marsh buggy was taken to the workshop and utilized during the field trip.

ARM Archibeque attended the 1988 Wing-Bee in Santa Fe, New Mexico.
On 3/8-9 RM's Krakowski and Archibeque attended portions of the Central Waterfowl Flyway Council meetings in Port Arthur, Texas.

RM Krakowski attended the Refuge Zone Meeting in Austin, Texas on 3/15-16.
ARM Archibeque attended a mottled duck census workshop in Clute, Texas on 4/26-27.

ARM Archibeque attended the 40-hour FWS basic fire training session held in Jackson Hole, Wyoming from May 2-6.

During the week of 5/16-19, a Regional Office Evaluation Team reviewed the operation of both refuges. The multi-disciplinary team consisted of Conrad Fjetland, Pat Langley, Bill Hawthorne, and Roger Monson. The inspection went relatively well. Their report mentioned that many improvements in facilities and management have occurred since the last inspection. Their report also noted that their appeared to be a high level of safety awareness at the station. Major deficiencies included the need for a separate oil and paint storage building for the shop and a Station Safety Plan.

RM Krakowski appeared before the Jefferson County Commissioner's Court in Beaumont, TX to deliver the April Revenue Sharing check and answer any questions the commissioners may have. This year Jefferson County received $48,143, which was about 59% of the amount authorized for the 50,634 acres in fee title at McFaddin and Texas Point NWR's. Tax assessor Nick Lampson accepted the check.

ARM Archibeque attended a Wildlife Disease Workshop at the TPWD Murphree Area on 5/17-18. The workshop was taught by personnel from the National Wildlife Health Center, Madison, Wisconsin.

RM Krakowski attended the Annual Project Leader's meeting in Albuquerque, New Mexico during the week of 8/8-12.

F. HABITAT MANAGEMENT

1. General

Habitat management on the refuge involves two techniques: grazing and prescribed burning. The objective of both techniques is to improve waterfowl use of the marsh by creating openings in otherwise dense vegetation.

2. Wetlands

Due to the proximity of Texas Point to the Gulf of Mexico, water levels are strongly influenced by tidal fluctuations. No functioning water control structures are located on the refuge, therefore no water management occurs. The wetlands of the refuge are critical nursery areas for marine organisms.

Vegetation is primarily salt tolerant, dominated by species such as marsh hay cordgrass, smooth cordgrass, and seashore saltgrass.

7. Grazing

a. 1987-88 Season:

Max Fortenberry was the only permittee who managed cattle on the refuge. He repaired approximately 3 miles of fence on the north boundary during the fall. The refuge provided the new wire and staples. He started the season with 205 head on 11/25/87. His herd peaked at 316 head. His cattle were off the refuge by May 4. He was charged for 1,623 AUM's at $2.43/AUM or $3,943.89.

Grazing by domestic livestock is one of the most important tools employed on Texas Point NWR. Grazing is permitted on a seasonal basis. Portions of the entire refuge are grazed. Grazing on the refuge occurs from late fall through late spring, until insect infestations force cattle out of the marshes.

Proper grazing is an inexpensive and effective method of managing refuge grassland communities by performing the following functions:

a. opening up dense stands of grasses, sedges, and rushes; creating sheet water loafing and invertebrate feeding areas.

b. increasing food availability for waterfowl by removing old decadent growth and allowing birds to get at the roots, tubers, and shoots of mature and new growth.

c. stimulating and encouraging plant retrogression to favor the emergence and growth of subdominant plant species, many of which are preferred foods by ducks

and geese.

d. complimenting the merits of marsh burning by prolonging the time browse (tender new green growth) is available for goose use.

b. 1988-89 Season:

Max Fortenberry was again the sole permittee who managed cattle on the refuge this season. He started the season on January 4, with 239 head. His herd peaked at 310 head.

9. Fire Management

Prescribed fire is an important habitat management tool for coastal marsh managers. Basically, fire is used to open up marsh and grasslands to improve the habitat for waterfowl. Fire removes thick, rank, above ground vegetation which facilitates goose access to roots and tubers of various marsh plants. The geese will also feed on the young green shoots of vegetation that follow the burn. The removal of vegetation also creates lakes of sheet water areas that are used extensively by ducks who feed on invertebrates and annual seeds. Both geese and ducks use these burned areas as roosts or loafing areas because the lack of vegetation makes it difficult for any predator to approach unnoticed. The burns also revitalize the marsh by oxidizing dead vegetation, which returns minerals to the soil, and enhances new growth. The burns reduce the amount of accumulated litter and rank vegetation, which if allowed to build up, presents a fire hazard that is difficult to control. Generally, areas within the refuge are burned on a two year rotation, however the actual condition of the burn unit dictates the need. Burns are conducted during the fall and winter months on days when approval can be obtained from the Texas Air Quality Control Board and when weather conditions fall within prescribed limits.

A total of 1,650 acres was prescribed for burning in the FY 88 Texas Point NWR Prescribed Burn Plan. However, due to staff logistical constraints only 920 acres were burned. In addition, a total of 2,400 acres burned as a result of wildfire (arson or lightning fires).

Fire on Texas Point NWR followed this order in 1988/89:

Date	Area Burned	Acres	Comments
1/21/88	Cattle Walk	920	Prescribed Burn
5/26/88	Beach	500	Wildfire
11/28/88	Pole Lake	1,000	Wildfire
12/18/88	West End	900	Wildfire

G. WILDLIFE

1. Wildlife Diversity

Currently, the only management practices being employed on the refuge to increase wildlife diversity are those of prescribed burning and grazing. The installation and maintenance of water control structures would also help in creating more wildlife diversity in the area, but due to logistics and budget constraints this has not been feasible.

2. Endangered and Threatened Species

ARM Archibeque served as the Upper Texas Gulf Coast Marine Mammal and Sea Turtle Stranding Coordinator. This involved censusing the beach from the Sabine Pass ship channel to Roll Over Pass. Six sea turtles were documented within the Jefferson County Region, two of which were found by ARM Archibeque. A rare stranding for this area, discovered on 4/27/88, was a large leatherback (Dermochelys coriacea) which was tagged on the left rear flipper with NMFS tag #AAW824. The animal was collected and kept at the refuge shop until personnel from the Galveston NMFS Office could pick it up. The cause of death has not yet been determined but preliminary information received indicated that the turtle was an adult male tagged in the Bay of Uruba in Colombia, South America. The other turtle found was a Kemp's ridley (Lepidochelys kempi).

Over the past couple of years there has been a decline in the number of sea turtles found. Local rumor has it that the shrimpers are sinking any turtles caught in their nets to insure that data collected from these strandings cannot be used as justification for the controversial turtle exclusion devices (TED's).

SEA TURTLE STRANDINGS DURING 1988

DATE	SPECIES	COUNTY	LAT.	LONG.
04/27/88	Lepidochelys kempii	Jefferson	29`37'	94`22'
04/28/88	Dermochelys coriacea	Jefferson	29`39'	94`07'
06/??/88	Lepidochelys kempii	Jefferson	collected by NMFS	
10/??/88	Lepidochelys kempii	Jefferson	collected by NMFS	
11/??/88	Lepidochelys kempii	Jefferson	collected by NMFS	
11/??/88	Lepidochelys kempii	Jefferson	collected by NMFS	

3. Waterfowl

The primary objective of Texas Point NWR is to provide and maintain habitat for wintering, migratory, and resident waterfowl. The refuge and surrounding wetlands are of great importance to coastal wintering populations of migratory waterfowl in the Central Flyway. Waterfowl numbers are usually highest on the

refuge during January and February, often associated with the close of the hunting season. Populations decrease with the onset of the spring migration northward. During the summer months the main species of waterfowl using the refuge is the resident population of mottled ducks.

This seasons duck numbers were up from previous years totals. In fact, these numbers represent some of the highest recorded since the establishment of the refuge. The increase is attributed to large concentrations of lesser scaup which utilized the ponds along the south boundary of the refuge. Goose use continues to be almost non-existent on this refuge. The problem of low level aircraft in the area is the main factor. A number of helicopter companies have set up business along the northern boundary of the refuge. These helicopter services are used extensively by offshore oil rigs. Air traffic is almost continual over the entire refuge. Duck populations have suffered also but not to the extent of geese.

This season represents the only time that geese were observed on Texas Point NWR. A late season fire burned the western section of the refuge creating favorable conditions for geese. A dense fog over a period of days caused all air traffic in the area to be grounded. During this period geese were able to locate the burn and started to utilize it. Their stay was brief, the fog lifted and helicopter traffic in the area increased, once again causing the birds to leave the refuge.

The following tables represent this year's peak waterfowl populations (ground & aerial counts) and those surveyed by Zone Biologist Neaville and Regional Pilot Winship.

Table 2. PEAK MONTHLY WATERFOWL POPULATIONS

	DUCKS	GEESE	COOTS
OCT.	1,845	0	40
NOV.	2,555	0	100
DEC.	12,773	0	110
JAN.	12,202	7,000	20
FEB	7,990	0	20

Table 3. MONTHLY AERIAL WATERFOWL CENSUS

	DUCKS	GEESE	COOTS
OCT.	1,487	0	14
NOV.	1,299	0	16
DEC.	11,246	0	0
JAN.	7,116	0	19
FEB.	7,823	0	0

The primary species of birds using the refuge were lesser scaup, gadwall, green-winged teal, and shoveler.

Flocks of lesser scaup numbering from 500-700 birds were observed rafting in the Gulf off the refuge's beach.

TEXAS POINT NWR
1988-89 SEASON
PEAK WATERFOWL POPULATIONS

SPECIES	OCT.	NOV.	DEC.	JAN.	FEB.
Mallard	0	40	60	8	20
Pintail	30	800	75	0	20
Gadwall	261	75	800	1104	2250
Wigeon	711	750	300	23	40
Shoveler	238	250	173	242	800
Blue-winged Teal	350	80	80	0	90
Green-winged Teal	195	200	600	443	2300
Mottled Duck	60	50	79	80	80
Redhead	0	0	0	0	0
Wood Duck	0	0	6	0	0
Canvasback	0	10	10	0	20
Merganser, Hooded	0	30	30	2	20
Merganser, Common	0	0	0	0	0
Merganser, R.Brst.	0	0	10	0	0
Ring-necked	0	90	110	0	0
Scaup	0	50	10300	10300	2350
Ruddy	0	40	40	0	0
Bufflehead	0	90	60	0	0
Snow Geese	0	0	0	7000	0
White-Fronted Geese	0	0	0	0	0
Canada Geese	0	0	0	0	0
TOTAL DUCKS	1845	2555	12773	12202	7990
TOTAL GEESE	0	0	0	7000	0
TOTAL COOTS	40	100	110	20	20

4. Marsh and Water Birds

The refuge supports a large population of marsh and water birds. Most commonly observed species include white pelicans, great and snowy egrets, roseate spoonbills, white-faced ibis and olivaceous cormorants.

Populations of these species appear to be stable. No water bird rookeries exist on the refuge due to the lack of trees and shrubs in remote areas.

5. Shorebirds, Gulls, Terns and Allied Species

Texas Point is very rich in this area of bird life due to the fact that the

refuge has two highly productive ecosystems. The first, a very high quality estuary system and the other is the vast and productive Gulf of Mexico. The merging of these two ecosystems provides an abundant source of food for avian species. Some of the more commonly seen are laughing gulls, herring gulls, Caspian terns, royal terns, ring-billed gulls, least terns, black skimmers, American avocets, black-necked stilts, ruddy turnstones and different species of sandpipers and plovers. Use of the refuge by these species has increased steadily throughout the last few years. Attempts to census part of the marsh and beach are difficult because of rough marsh conditions and the beach washouts caused by Hurricane Alicia in 1983. The three-wheeler ATV is used to census the six miles of refuge beach front. Peak periods of bird use are during the months of October through April. Resident species use the beach during the spring and summer as feeding, loafing and breeding area. Black skimmers, killdeer, common nighthawks, Wilson's plovers and least terns have been known to nest on the sand bars along the southern portion of the refuge.

6. Raptors

The most common raptorial birds observed on the refuge are Northern harriers, red-tailed hawks, American kestrels, turkey and black vultures. Osprey were sighted on several occasions along the north boundary.

7. Other Migratory Birds

The refuge is an important resting and feeding place for migrating passerines crossing the final leg of their journey over the Gulf of Mexico. The peak passerine migration is usually observed in late April. Warblers, catbirds and doves utilize the tree-lined north boundary as resting and staging areas.

8. Mammals

Armadillos, opposums, skunks and cotton-tailed rabbits are commonly found along the wooded area on the north boundary.

Muskrat activity appeared to be down this year. Muskrats are important to waterfowl management on Texas Point NWR because they create openings in the marsh which enhance waterfowl resting and feeding sites.

9. Marine Mammals

Seven bottlenosed dolphin strandings (Tursiops truncatus) were recorded during the year. Causes of the strandings are still unknown however. The peak stranding period was again March and April this year. Tissue and tooth samples were collected and sent to officials in Galveston for future analysis. The animals were marked and pulled off of the beach to avoid recounts in the future.

11. Fishery Resources

The primary importance of the refuge regarding fisheries is to act as a nursery ground for the Gulf's fin and shellfish. Any attempts to control water on the refuge will have to address this issue.

15. Animal Control

ARM Archibeque assisted a Sabine Pass homeowner who found an eight-foot alligator in her garage. The animal would not leave so officials were called to assist. A snare attached to a cane pole was used to control the animal and once it tired it was secured with rope and placed into the vehicle. The local Channel 12 TV News captured the action on film. The incident was shown on the 6pm and 10pm news.

H. PUBLIC USE

1. General

Public use on the refuge can generally be classified under these three categories: waterfowl hunters, fishermen and wildlife observers. The strong waterfowl hunting tradition in this area and the limited amount of public lands in Texas make waterfowl hunting a key aspect of the refuge's public use program. Fishing and crabbing activity is increasing especially during summer months. Access to refuge waters can be obtained through Texas Bayou during high tides. Wildlife observation is not pursued by many people due to the lack of adequate facilities at the walk-in site. Development of a trail in the wooded area along the north boundary would increase this type of activity greatly.

8. Hunting

Texas Point was open for waterfowl hunting on Saturdays, Mondays and Wednesdays of the early teal season and the regular waterfowl season. Three major regulation changes were made prior to the 1988-89 waterfowl season. The first was the elimination of the early teal season. The second, the elimination of the point system to a three bird bag with special restrictions on mallards, pintails, and mottled ducks. And third, changing shooting hours from a half-hour prior to sunrise to sunset. A total of 16 days were open to hunting, down two from last year's total of 18. As expected, many of the hunters felt the regulation changes were too restrictive.

Table 4 lists the results of the harvest data collected during the year. Green-winged teal and gadwall again were the species most often harvested.

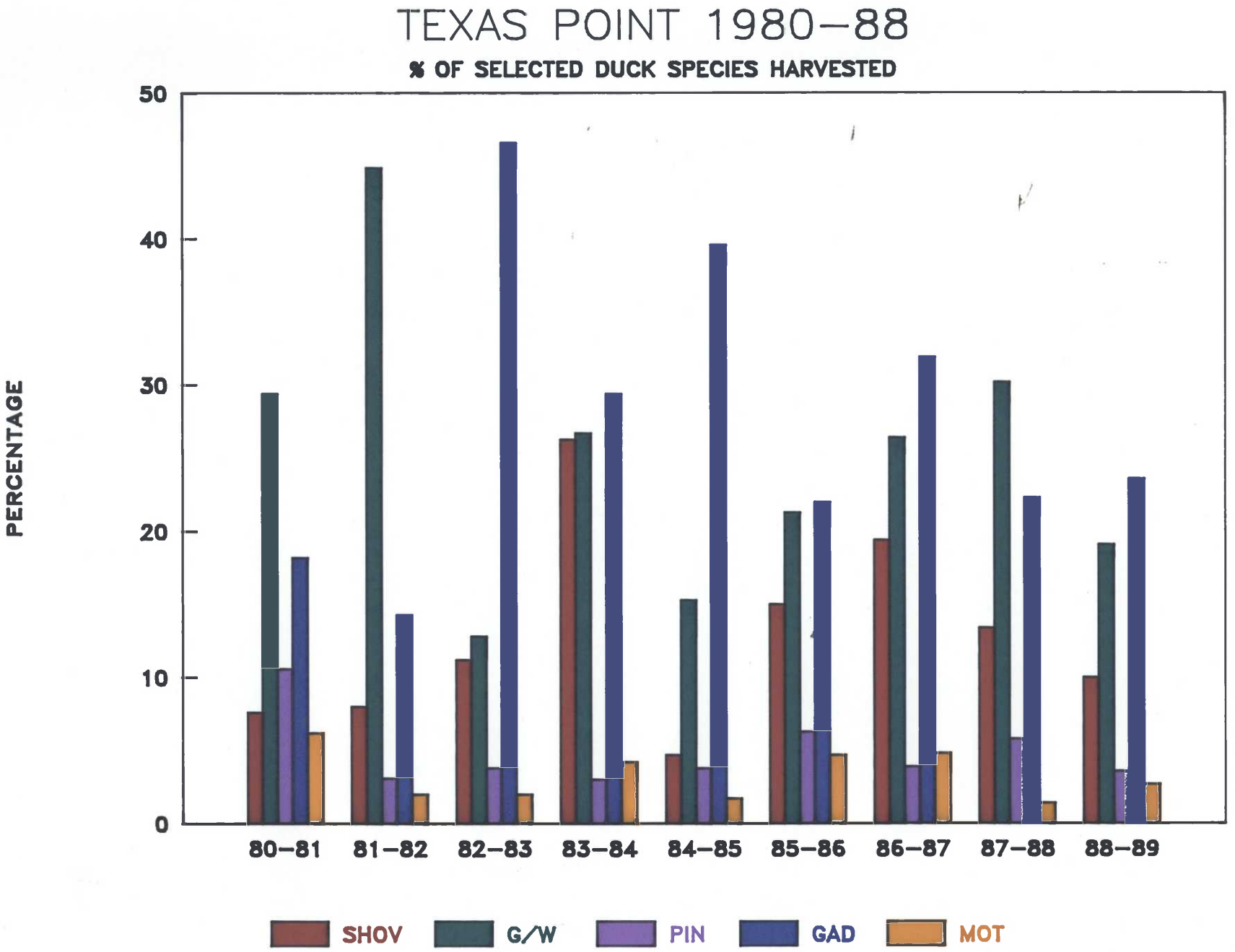

TEXAS POINT 1980–88
% OF SELECTED DUCK SPECIES HARVESTED
PERCENTAGE
50
40
30
20
10
0
80–81
81–82
82–83
83–84
84–85
85–86
86–87
87–88
88–89
SHOV
G/W
PIN
GAD
MOT

Table 4. WATERFOWL HARVEST DATA 1988-89 SEASON
TEXAS POINT NWR

MALLARD	4
PINTAIL	4
GADWALL	26
WIGEON	7
SHOVELER	11
BLUE-WINGED TEAL	4
GREEN-WINGED TEAL	21
MOTTLED	3
REDHEAD	0
WOOD DUCK	0
MERGANSER, HOODED	0
MERGANSER, RED-BREAST	0
RING NECK	0
SCAUP	0
RUDDY	0
BUFFLEHEAD	2
SNOW GEESE	0
WHITE-FRONTED GEESE	0
CANADA GEESE	0
TOTAL	110
HUNTERS CHECKED	77
BIRDS/HUNTER	1.4
EST. HUNTERS	263
EST. TOTAL BIRDS	391

NOTE These figures do not include the estimated crippling loss of 14%.

The figures for this year's waterfowl hunt were the lowest number of hunters and ducks harvested in the history of the refuge. Hunter participation is on the decline for several reasons. First, access to hunting sites is very difficult as compared to other public waterfowl hunting units in the area. Second, the refuge has a bad reputation as a hunting area due to boggy conditions and low duck numbers. Third, reduced participation may have been caused by regulation changes that have reduced the bag limit and increased the fees required to waterfowl hunt.

9. Fishing

Fishing activities were limited to the eastern portion of the refuge, primarily

from boats in the ponds and chain of lakes. Quite a few fishermen line up on the mouth of Texas Bayou to catch redfish and flounder migrating out of the bayou during the fall. Some crabbing is done in a channel adjacent to the Jetty Road that runs down the east boundary of the refuge.

11. Wildlife Observation

Migrations of passerine and raptorial birds provide good birdwatching opportunities for refuge visitors along the wooded areas adjacent to the north boundary. Development of a trail in this area would greatly enhance the participation of this activity.

15. Off-Road Vehicling

With the increase in popularity of ATV vehicles some problems have arisen with driving of three-wheelers in unauthorized areas.

17. Law Enforcement

A great deal of time and manpower was spent working law enforcement during the waterfowl season. Most of the effort was concentrated on McFaddin NWR because of the greater number of hunters. A total of 77 hunters were checked. A breakdown of violation notices issued for McFaddin/Texas Point NWR's Can be found in the McFaddin NWR 1988 Annual Narrative.

ARM Archibeque assisted FWS Special Agents with the "Take Down" of illegal waterfowl hunters along the Texas Coast. The operation was the climax to a three year undercover investigation of commercial hunting operations in Texas, and resulted in criminal charges against approximately 200 individuals. The charges included felony and misdemeanor violations of the Migratory Bird Treaty Act and the Lacey Act. The LaBove Shooting Resort located six miles north of the refuge was the site of the single largest take down. Approximately 1,300 criminal charges were filed with the majority having taken place on the LaBove Resort.

In December, an aluminum fence gate was stolen from the refuge. The grazing permittee replaced the gate with barbed wire.

I. EQUIPMENT AND FACILITIES

3. Major Maintenance

Prior to the start of the waterfowl hunt season, the refuge signs at George's Bait Camp and the refuge parking lot were renovated.

J. OTHER ITEMS

2. Other Economic Uses

The Goodrich Company reworked one of their wells which is located at the end of their service road on the east end of the refuge. Work was completed in November.

3. Items of Interest

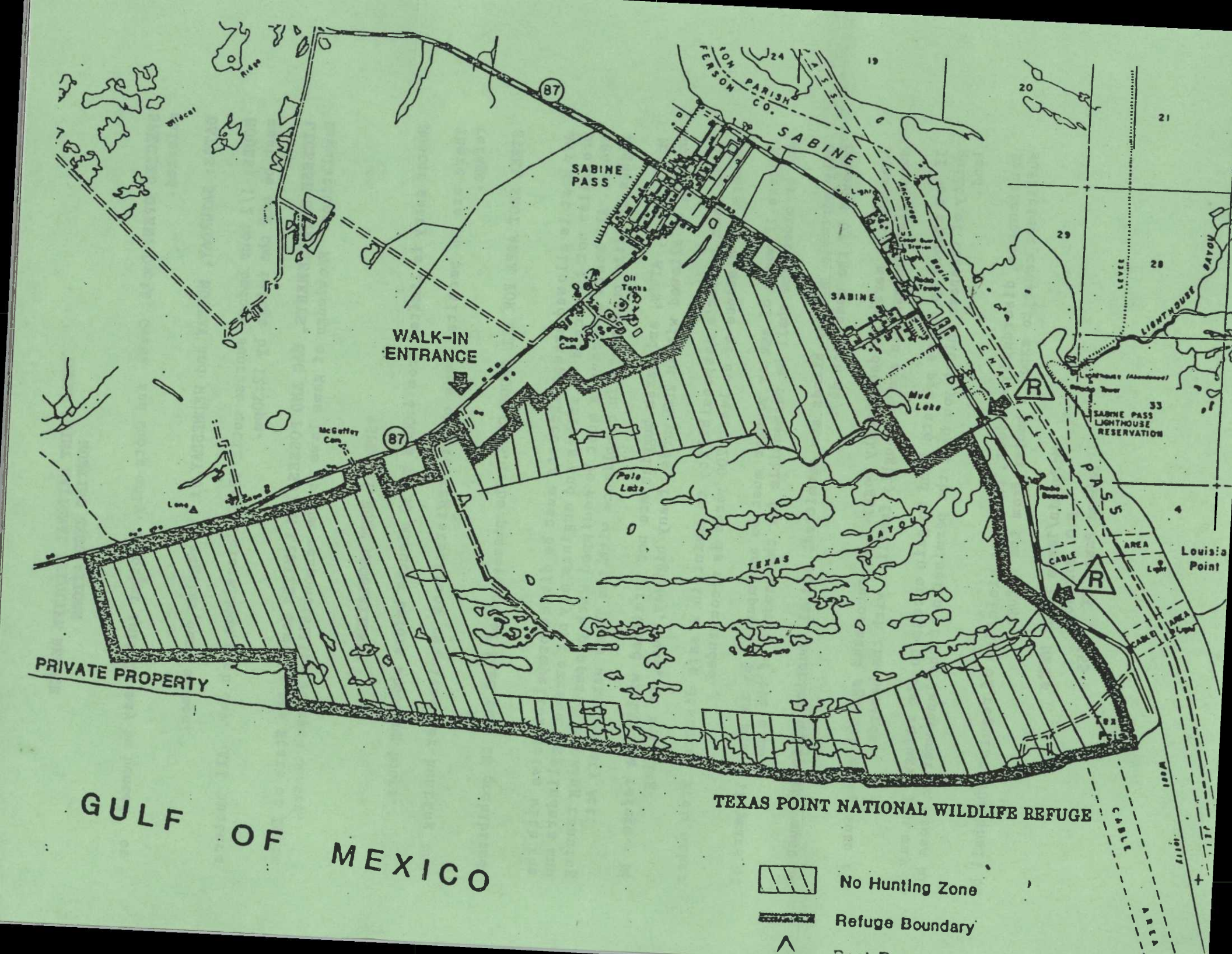
Howard Hatfield, who owns beachfront property west of the refuge, has constructed a jetty out into the Gulf of Mexico without Corps of Engineers review. The FWS has helped the Corps in their investigation of the incident. We normally access the refuge beach area through his property. This access may be more difficult in the future.

4. Credits

ARM Archibeque wrote Sections: F,G, and H. RM Krakowski wrote and reviewed the rest of the narrative.

K. FEEDBACK

Nothing to report.


SABINE PASS
WALK-IN ENTRANCE
SABINE
SABINE PASS LIGHTHOUSE RESERVATION
Mud Lake
Pole Lake
TEXAS
PRIVATE PROPERTY
GULF OF MEXICO
TEXAS POINT NATIONAL WILDLIFE REFUGE
Louisiana Point
No Hunting Zone
Refuge Boundary

TEXAS POINT NATIONAL WILDLIFE REFUGE
HUNTING REGULATIONS

SPECIES OPEN: Ducks, Geese and Coots only. No other animals may be hunted or molested.

DATES: SATURDAY, MONDAY and WEDNESDAY of the regular duck season.

HOURS: 1/2 hour before sunrise until 12:00 o'clock noon each day. All hunters must be off the refuge by 12:30pm.

LICENSE REQUIREMENTS, BAG AND POSSESSION LIMITS: Same as the State of Texas Regulations. Knowledge of game laws is the responsibility of each hunter.

SPECIAL HUNT REGULATIONS

Hunter entry is limited from 4:00am to 30 minutes before shooting hours.

There are no permits, fees or pre-registrations required for hunting the refuge.

STEEL SHOT AREA FOR ALL GAUGE GUNS. The possession of lead shot is prohibited.

Any boat is allowed except airboats must be direct propeller drive with the propeller not to exceed 48 inches and engines may not exceed 2 cylinders and 484 cc. All boats and canoes must be equipped with properly working running lights and life preservers in compliance with the Texas water Safety Act.

Motorcycles, ATV's, and marsh buggies are not permitted within the refuge. No hunting is allowed within 200 yards of any highway, road, or building.

It is each hunter's responsibility to maintain a safe distance from other hunters. A distance of at least 200 yards is recommended.

Hunters 17 years of age or younger must be accompanied by an adult 18 years of age or older who shall be responsible for the conduct of the minor.

Only portable hunting blinds are permitted, and all hunting equipment must be removed by the user each day.

Some of the marsh is dangerously boggy. We recommend against going into the marsh alone unless you are thoroughly familiar with the hazards.

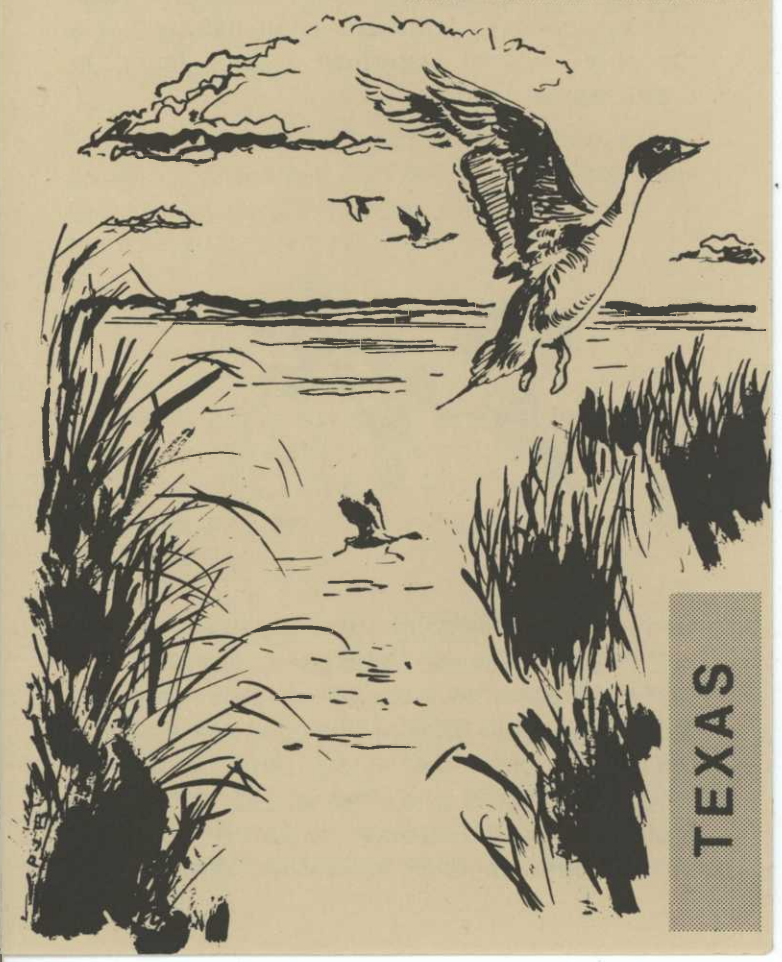
If you choose to cross private land to gain access to the refuge, you may be guilty of trespass unless you have the permission of the landowner to cross his land.

Drunkenness, disorderly conduct, flagrant violation of regulations shall be sufficient cause to expel a hunter from the refuge.

McFaddin/Texas Point NWR's
P.O. Box 609
Sabine Pass, TX 77655

McFaddin Marsh and Texas Point

NATIONAL WILDLIFE REFUGES



TEXAS

TEXAS POINT and McFADDIN MARSH NATIONAL WILDLIFE REFUGES contain 50,634 acres of marshland on the upper Texas coast. The two areas, acquired in 1979 and 1980 with duck stamp revenues, are important links in the chain of refuges administered by the U.S. Fish and Wildlife Service extending southward along the Gulf coast of Texas.

WILDLIFE

Texas Point and McFaddin Marsh are of great importance to wintering populations of migratory waterfowl in the Central Flyway. Concentrations of snow geese in excess of 60,000, along with white-fronted and Canada geese, utilize the marsh from October through March. Ducks on the refuges number up to one hundred thousand with 23 species represented. The mottled duck uses the marsh for summer nesting habitat and is the only resident waterfowl species found in these coastal marshes.

National Wildlife Refuges play an important role in the protection of endangered species. The McFaddin Marsh was one of the last strongholds for the red wolf. Due to hybridization with the coyote and loss of habitat, pure red wolves no longer exist in the wild. Red wolves captured on McFaddin Marsh and other coastal areas are now being bred in captivity in Tacoma, Washington.

The McFaddin Marsh contains one of the densest populations of American alligators in Texas. Alligators are most easily seen during the spring, but are often visible throughout the summer and fall.

The endangered southern bald eagle and Arctic peregrine falcon are rare visitors, but they may occasionally be seen during the peak spring and fall migration periods.

Muskrat, river otter, mink, raccoon, striped skunk, opossum, armadillo, gray fox and bobcat are all native Texas mammals found on the refuge. The coyote has spread from the western U.S. while the nutria has been introduced from South America. Most of these mammals are nocturnal and are not commonly seen by the refuge visitor.

Large portions of both refuges form estuarine environments with tidal grounds for shrimp, crabs and fish. These estuaries are productive communities and are an important place in the life cycle of many marine species. Fish found in the brackish marshes include alligator gar, carp and redfish. Largemouth bass, crappie and channel catfish are found in the freshwater areas.

PUBLIC USE

Activities on the refuges include wildlife observation, photography, waterfowl hunting, fishing and crabbing. The 12 miles of McFaddin beach along the Gulf of Mexico provide opportunities for swimming, fishing, camping, picnicking and beachcombing.

Eight miles of interior roads on McFaddin Marsh Refuge provide wildlife viewing opportunities and give access to inland lakes and waterways. Three boat launches are located to facilitate hunting, fishing and wildlife observation. Depending on water conditions, inland lakes may be navigable only by canoe or shallow draft boats and rarely exceed a few feet in depth. Airboats with less than 10 hp are permitted on the refuge; off road vehicles are prohibited. The Clam Lake Road is open from 7:30 a.m. to 3:00 p.m., Monday through Friday and is closed weekends and holidays. There is no charge to visit the refuge.

Access is a major factor in public use on the Texas Point Refuge. Vehicular roads are non-existent and there is no public access to the beach. For a small fee, shallow-water boats can be launched into Texas Bayou from a private boat launch located on the east side of the refuge. A cattle walk located at the refuge parking lot along Highway 87 provides access by foot into the marsh for wildlife observation, hunting and crabbing. Conditions often require wearing rubber boots on the cattle walk. There are no entrance fees or restrictions on visitor hours on the Texas Point Refuge.

The McFaddin Marsh and Texas Point Refuges provide waterfowl hunting opportunities for the public at no charge. Portions of both refuges will be open for steel shot only hunting several mornings per week during the early teal and regular duck season. Interested hunters should contact the refuge in the fall for detailed hunt regulations.

Fishing and crabbing can be good on both refuges but varies greatly with the time of year and water conditions. Birdwatching is best during the winter waterfowl concentrations and during the spring migration. Over 270 species of birds have been recorded in the area.

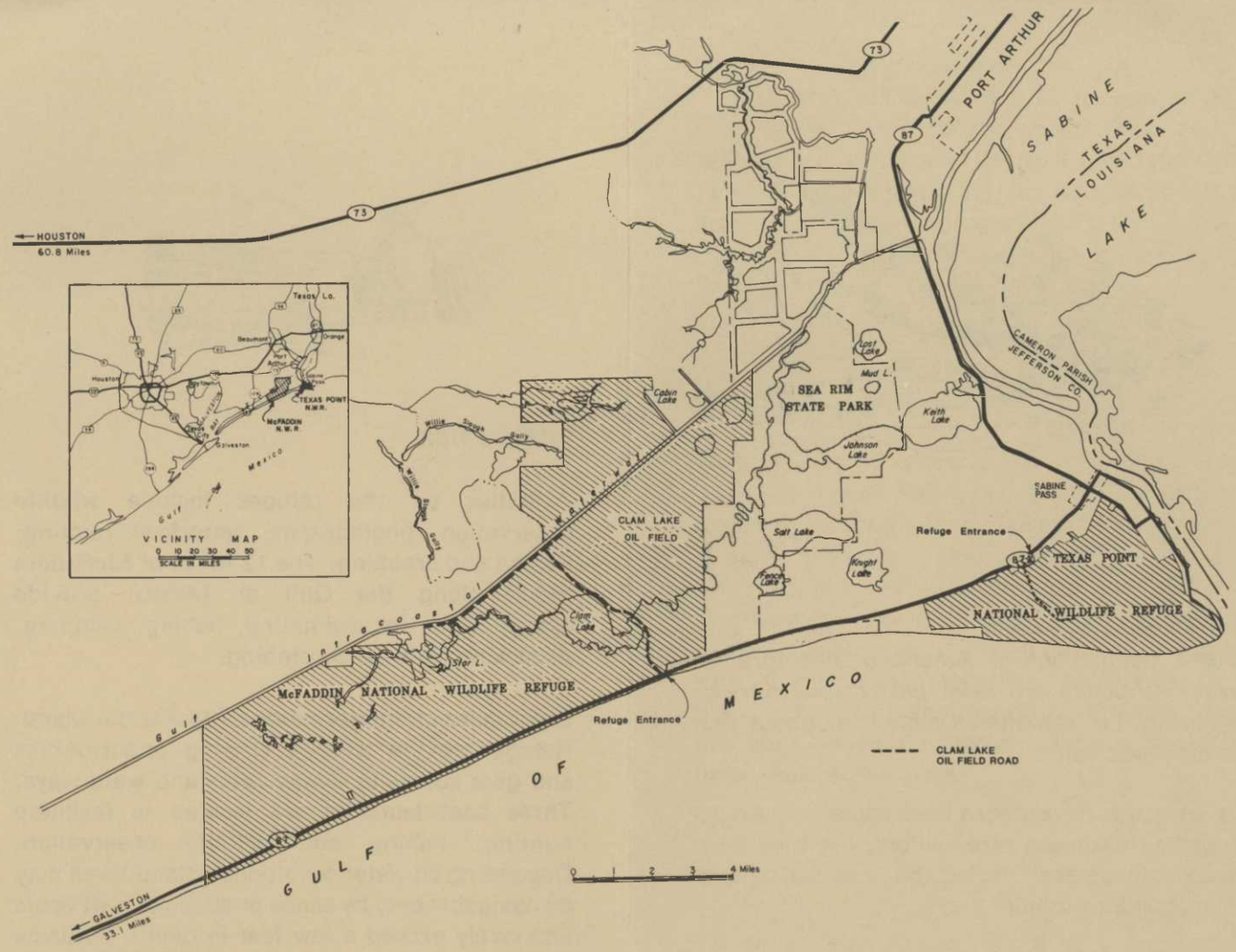
Other public facilities in the area are located at the Sea Rim State Park. Motel accommodations can be found in High Island, Sabine Pass and Port Arthur, Texas.

DEPARTMENT OF THE INTERIOR
U.S. FISH AND WILDLIFE SERVICE

As the Nation's principal conservation agency, the Department of the Interior has responsibility for most of our nationally owned public lands and natural resources. This includes fostering the wisest use of our land and water resources, protecting our fish and wildlife, preserving the environmental and cultural values of our national parks and historical places, and providing for the enjoyment of life through outdoor recreation. The Department assesses our energy and mineral resources and works to assure that their development is in the best interests of all our people. The Department also has a major responsibility for American Indian reservation communities and for people who live in island territories under U.S. administration.

On your visit to this refuge, or any type of public use area, please practice good sportsmanship — remember the people who will visit after you, not only next year, but in generations to come.

RF-21525-1 JANUARY 1990



LOCATION

Both refuges are located along Highway 87 at the southeastern tip of Texas, approximately 15 miles south of Port Arthur and 90 miles east of Houston. Texas Point is adjacent to Sabine Pass, while McFaddin Marsh lies 12 miles further to the west. A field headquarters is located at McFaddin Marsh along the Clam Lake Oil Field Road.

The refuges are administered by the Anahuac National Wildlife Refuge headquarters in Anahuac, Texas. Inquiries can be made to the Anahuac headquarters or the McFaddin Marsh field headquarters at the following addresses:

Refuge Manager
Anahuac National Wildlife Refuge
P.O. Box 278
Anahuac, TX 77514
(409) 267-3337
(409) 839-2680

or

Refuge Manager
McFaddin National Wildlife Refuge
P.O. Box 609
Sabine Pass, TX 77655
(409) 971-2909

MCFADDIN NATIONAL WILDLIFE REFUGE
HUNTING REGULATIONS

SPECIES OPEN: Ducks, Geese, and Coots only. No other animal may be hunted or molested.

DATES: SATURDAY, SUNDAY, AND TUESDAY of the regular duck season. The refuge will be open during these same days for the late goose-only season (following the close of the final day of the regular duck season) west of the Entrance Road. The refuge will not be open Christmas Day.

HOURS: 1/2 hour before sunrise until 12:00 o'clock noon each hunt day. All hunters must be off the refuge by 12:30pm.

LICENSE REQUIREMENTS, BAG AND POSSESSION LIMITS: Same as the State of Texas Regulations. Knowledge of game laws is the responsibility of each hunter.

SPECIAL HUNT REGULATIONS

STEEL SHOT AREA FOR ALL GAUGE GUNS. The possession of lead shot is prohibited.

Access to the hunt area is by foot or boat. No marsh buggies or all-terrain vehicles are permitted in the refuge marsh. Airboats must be direct propeller drive with the propeller not to exceed 48 inches and engines may not exceed 2 cylinders and 484 cc.

All boats and canoes must have properly working running lights and life preservers. Vehicles and Trailers must also have properly working lights.

Hunters are not permitted to enter closed areas with the exception of Perkins Levee which may be used as an access corridor.

No hunting is allowed within 200 yards of any highway, road, or building.

Hunters 17 years of age or younger must be accompanied by an adult 18 years of age or older who shall be responsible for the conduct of the minor.

Only portable hunting blinds are permitted, and all hunting equipment must be removed by the user each day.

The endangered bald eagle, peregrine falcon, and alligator are found within the refuge. These animals have been given special protection by State and Federal Laws. Do not harm or molest these animals.

Hunter entry is limited from 4:00am to 30 minutes before shooting hours on hunt days. On non-hunt days the entrance gate will be open from 7:30am to 3:00pm. Monday thru Friday only.

During the late goose-only season, duck hunting special regulations will apply except: access will be by foot only (via HWY 87 or the Intracoastal Canal); the entrance gate will be operated on the non-hunt schedule.

Parking is limited and hunters are not to block the roads or boat ramps.

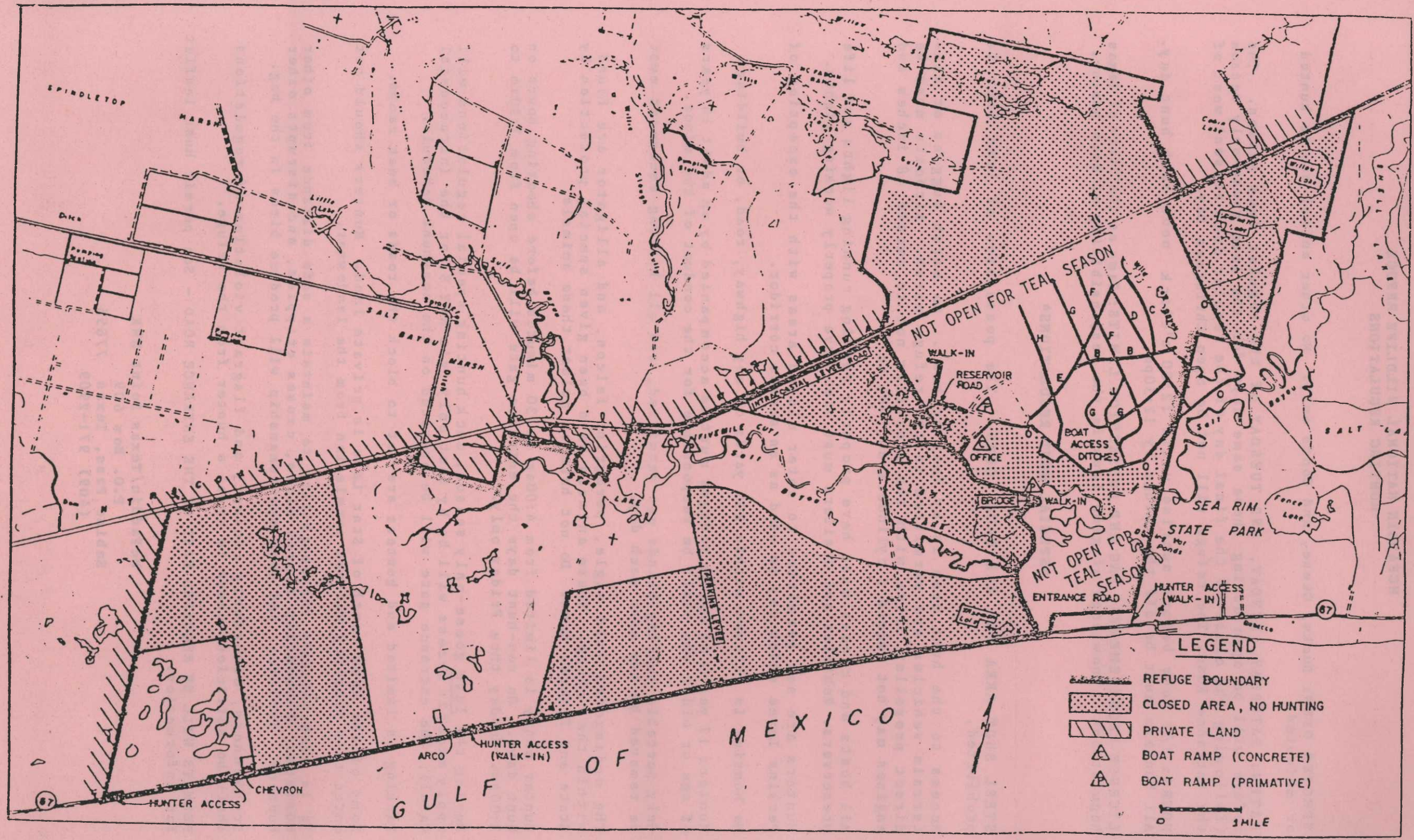
Some of the land north of Star Lake is private land. Hunters should not enter this property without permission from the landowner.

It is each hunter's responsibility to maintain a safe distance from other hunters. Skybusting flares birds, causes cripples, and disrupts other hunters. Patience, and good sportsmanship will produce birds in the bag.

Drunkenness, disorderly conduct, and flagrant violation of regulations shall be sufficient cause to expel a hunter from the refuge.

PERMITS WILL BE REQUIRED EAST OF THE ENTRANCE ROAD - See permit hunt leaflet for information.

McFaddin/Texas Point NWR
P.O. Box 609
Sabine Pass, Texas 77655
(409) 971-2909


SPINDLETOP
MARSH
Dike
Pumping Station
Little Lake
Spindletop
SALT BAYOU
MARSH
INTRACOASTAL CANAL
INTRACOASTAL LEVEE ROAD
FIVEMILE CUT
STAR LAKE
NOT OPEN FOR TEAL SEASON
WALK-IN
RESERVOIR ROAD
OFFICE
BOAT ACCESS DITCHES
CLAY LAKE
BRIDGE
WALK-IN
SEA RIM STATE PARK
NOT OPEN FOR TEAL SEASON
ENTRANCE ROAD
HUNTER ACCESS (WALK-IN)
67
PERKINS LEVEE
ARCO
HUNTER ACCESS (WALK-IN)
CHEVRON
HUNTER ACCESS
67
GULF OF MEXICO
LEGEND
REFUGE BOUNDARY
CLOSED AREA, NO HUNTING
PRIVATE LAND
BOAT RAMP (CONCRETE)
BOAT RAMP (PRIMATIVE)
0
1 MILE

McFaddin National Wildlife Refuge

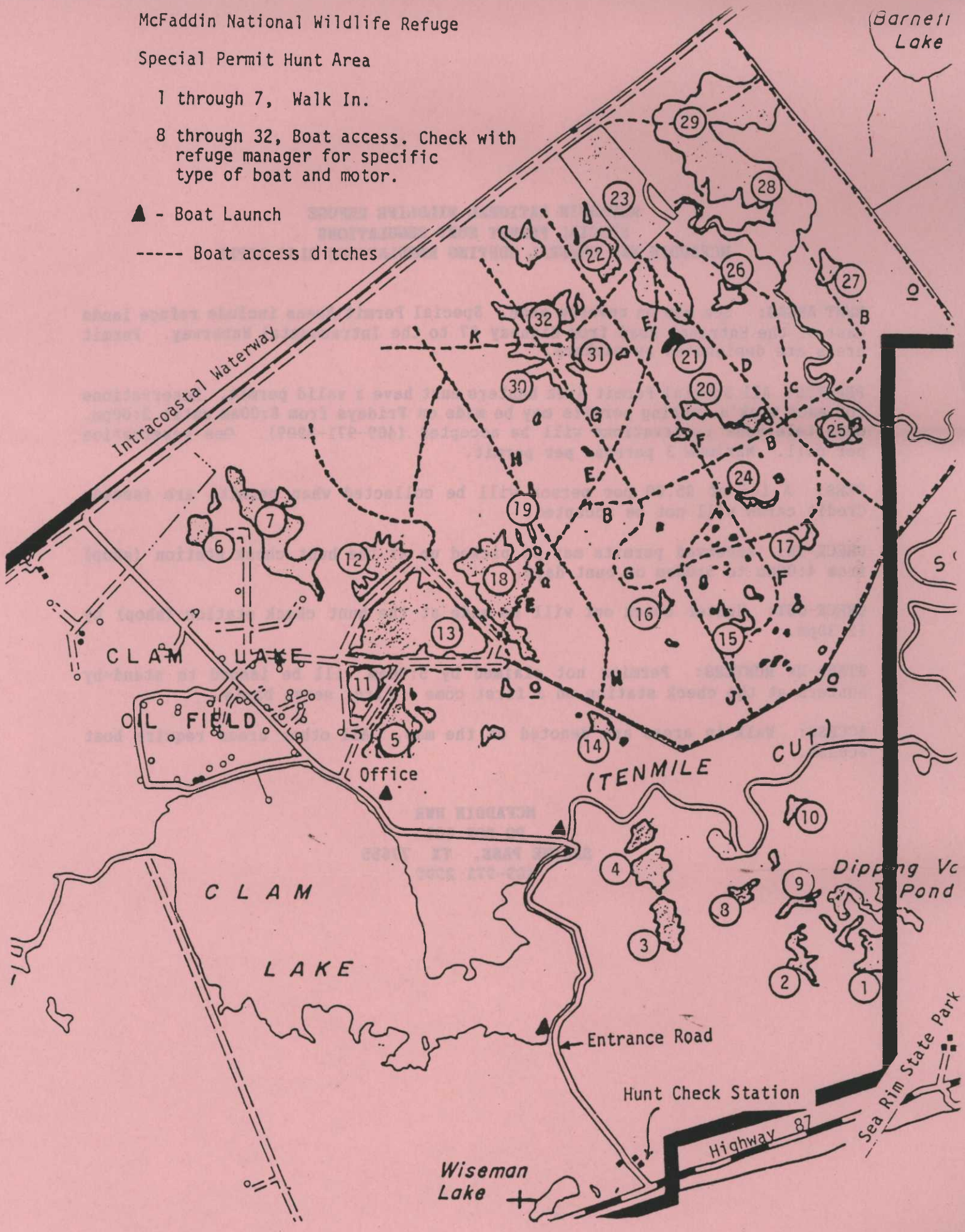
Special Permit Hunt Area

1 through 7, Walk In.

8 through 32, Boat access. Check with refuge manager for specific type of boat and motor.

▲ - Boat Launch

----- Boat access ditches



MCFADDIN NATIONAL WILDLIFE REFUGE
SPECIAL PERMIT HUNT REGULATIONS
MCFADDIN NWR GENERAL HUNTING REGULATIONS ALSO APPLY

HUNT AREAS: See map on reverse side. Special Permit Areas include refuge lands east of the Entrance Road from Highway 87 to the Intracoastal Waterway. Permit areas are designated by markers.

PERMITS: All Special Permit Area hunters must have a valid permit. Reservations for each week's hunting permits may be made on Fridays from 8:00am until 2:00pm. Only telephone reservations will be accepted (409-971-2909). One reservation per call. Maximum 3 persons per permit.

FEES: A fee of $5.00 per person will be collected when permits are issued. Credit cards will not be accepted.

CHECK-IN: Reserved permits may be picked up at the hunt check station (shop) from 4:00am to 5:00am on hunt days.

CHECK-OUT: Hunter check out will be made at the hunt check station (shop) by 12:30pm.

STAND-BY HUNTERS: Permits not claimed by 5:00am will be issued to stand-by hunters at the check station on a first come - first serve basis.

ACCESS: Walk-in areas are denoted on the map. All other areas require boat access.

MCFADDIN NWR
PO BOX 609
SABINE PASS, TX 77655
409-971-2909