

REVIEW AND APPROVALS

DESOTO NATIONAL WILDLIFE REFUGE

Missouri Valley, Iowa

ANNUAL NARRATIVE REPORT

Calendar Year 1996

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Project Leader	Date	Asst. Reg. Dir., GEO III	Date

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ARD, Refuges and Wildlife	Date

INTRODUCTION

DeSoto National Wildlife Refuge is located midway between the farming communities of Blair, Nebraska, and Missouri Valley, Iowa, on U.S. Highway 30. The refuge is situated astride the Missouri River, 20 miles north of Omaha, Nebraska. It lies in Harrison and Pottawattamie Counties, Iowa, and Washington County, Nebraska.

The refuge was established in 1959 to preserve habitat for migratory waterfowl. Acquisition was authorized by the Migratory Bird Conservation Act and Migratory Bird Stamp Act. It serves as a seasonal resting area for up to one-half-million waterfowl, primarily lesser snow geese and mallards.

The 7,823-acre refuge lies in the wide, fertile plain of the Missouri Valley Basin on the former meanders of the Missouri River. Portions of the refuge are characterized by cottonwood bottomlands. Approximately 2,000 acres are biologically managed as croplands and grasslands under ten cooperative farming agreements. Warm-season native grasses have been reestablished on over 400 acres to provide additional diversity.

The focal point for both man and wildlife is a former oxbow of the Missouri - the 788-acre DeSoto Lake. Recreational demand for its use has remained high since refuge establishment. The refuge provided active recreation throughout its early history, including fishing, picnicking, boating, waterskiing and swimming. Approximately 16-million-dollars worth of facilities accommodated public demand by up to 500,000 visitors annually. Within the last decade, management emphasis has been redirected toward a more balanced program between man and wildlife, emphasizing wildlife-oriented recreation.

The 1968 excavation of the steamboat Bertrand, which sank in 1865, adds a major historical emphasis to the refuge program. The 200,000 artifacts in the Bertrand Collection provide one of the most significant assemblages of Civil-War-era artifacts in the Missouri River region. The collection constitutes a time capsule of regional and national attraction.

In 1981, the DeSoto Visitor Center was opened. The visitor center is the permanent home of the Bertrand Collection. The five-million-dollar, 26,000-square-foot building contains exhibits interpreting the importance of the Bertrand, and the historical development and ecological change that occurred within the Missouri River Basin. In addition to environmentally-controlled artifact storage and museum exhibit areas, the building houses a laboratory for artifact treatment, a collection records area, and a reference library.

The visitor center also provides exhibits depicting the natural history of the area and its wildlife. Viewing galleries overlooking DeSoto Lake provide excellent opportunities to observe waterfowl and bald eagles during the spring and fall migration periods. A variety of audio-visual equipment provide effective interpretation to an average of 160,000 visitors who pass through the center each year.

DE SOTO NATIONAL WILDLIFE REFUGE

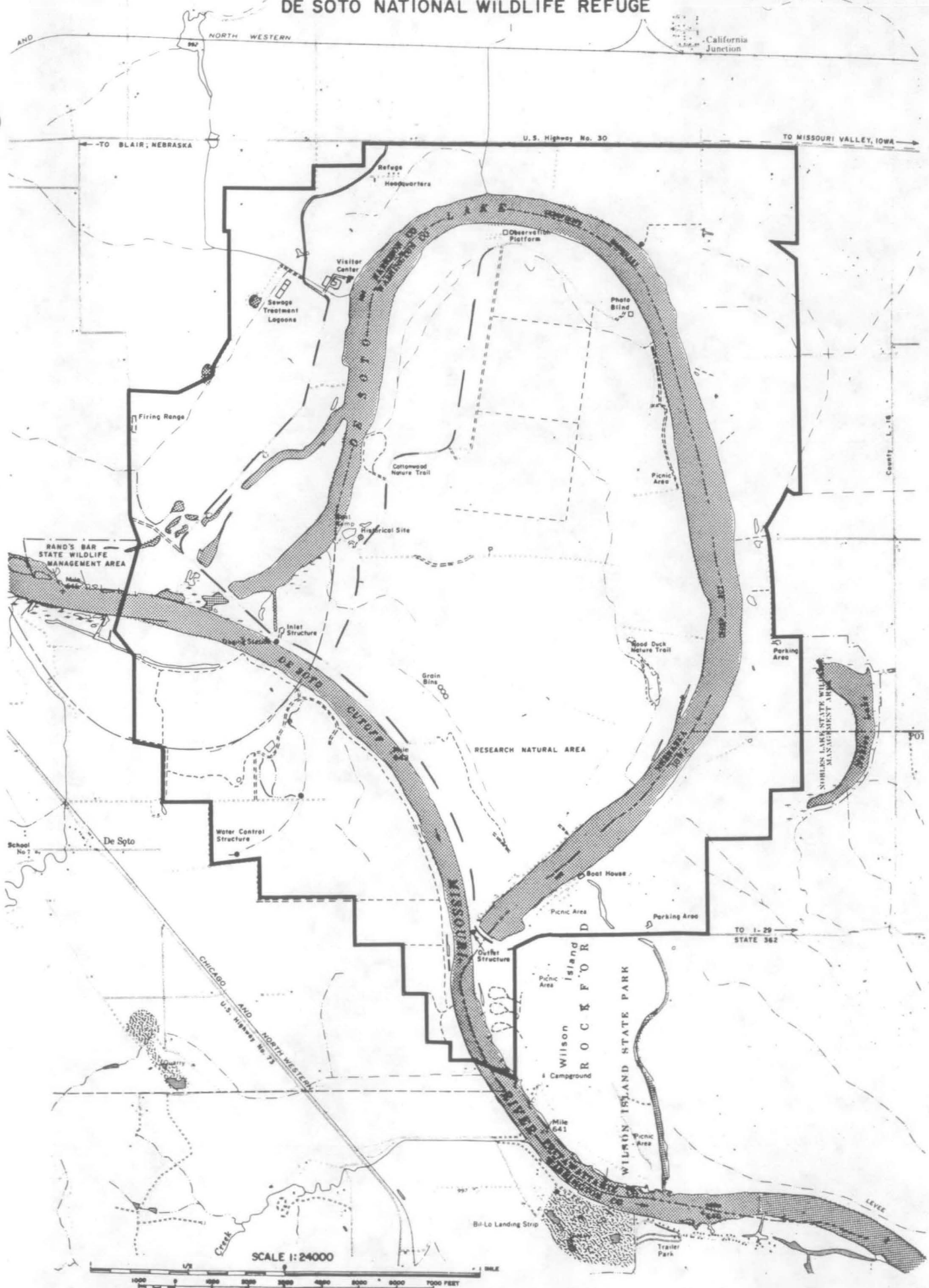


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A. HIGHLIGHTS

We didn't appreciate all the flooding, especially since it delayed our opening of Boyer Chute Refuge. Section B. and Satellite Section.

Although we've been conserving and interpreting the Steamboat *Bertrand's* collection for three decades, astounding new discoveries were made. Section D.4 and Section J.3.

A couple neat studies continue at DeSoto. Section D.5.

DeSoto Lake flooded to a record level, some five feet above normal, closing many public-use facilities. Section F. And Section H.

While many snow geese passed us by in early November, we still peaked at over 600,000 birds. Section G.3.

Public use dropped to the lowest level experienced since the early 1960's. Section G.3.

A deer was poached and a *Bertrand* bottle stolen.....and we are still offended! Section H.17.

B. CLIMATIC CONDITIONS

January snowfall and total precipitation was below normal. Temperatures fluctuated wildly throughout the month. Daily highs ranged from 1°F to 57°F, and nighttime lows ranged from -20°F to 31°F. The normal January thaw began on the 9th with a daytime temperature of 38°F, peaking at 65°F on the 14th, and finishing on the 18th with a temperature of 50°F. Ice deteriorated rapidly, and honeycombing was widespread. Ice fishing was closed on the 16th. Bitterly cold weather suddenly returned on the 19th, with a daytime high of 1°F, a temperature drop of 49 degrees in less than 24 hours, but it warmed back up to 40°F two days later.

February started out very cold, with daytime highs from 17°F to -4°F and nighttime lows from -11°F to -23°F (the low temperature for the year). Temperatures soon returned to normal and above normal throughout the remainder of the month, with daytime highs exceeding 50 degrees thirteen of the last 24 days. Precipitation was below normal. The fishery aerator was shut off on the 26th.

March was typical, a steady warming trend, with brief periods of sharply below normal temperatures. Precipitation was 61 percent below normal. There were only four days in which precipitation was recorded. During the last week, two snowstorms sent March out like a lion.

April temperatures, on average, were normal, although we experienced a record high of 94°F on April 12. Precipitation was normal. A dry spell during the last week of the month allowed farmers to start planting corn, and our planting of cool-season grasses was completed.

Significant rainfall occurred in May and June. May rainfall was 175% of normal, with 21 days of recorded rain. The Omaha Weather Service reported May as the fifth wettest month on record. Rainfall in June was 150% of normal. Above-average river flows were a constant problem. The above normal runoff in the upper Missouri River Basin forced the Army Corps of Engineers to substantially increase water releases from impoundments throughout the basin. High water and occasional flooding following rainfall events was a constant threat throughout the summer. June 21 produced the first major flood. Boyer Chute Refuge was heavily impacted, drowning out crops and covering new native grass seedings with silt. The Missouri River was 4.3 feet above flood stage. DeSoto Lake's water level was record high throughout the summer and fall, limiting access to boat docks, fishing piers, picnic areas, and eroding shorelines. Temperatures were normal. The high temperature (96°F) for the year was recorded on the 30th.

July and August temperatures, as well as rainfall, were normal, and distribution of rainfall events was remarkably uniform. This aided establishment of new grass seedings and crop development. Ultimately, corn and soybean yields would be well above the long-term average, largely due to the good rainfall distribution and the lack of heat stress. On July 17, a second rainfall event, upstream from DeSoto and Boyer Chute, produced a second flood. Six to twelve inches of rain fell within six hours over parts of Nebraska, South Dakota, and Iowa. Most of the runoff flowed past DeSoto, and over Boyer Chute. A third flood event occurred on August 5. Much of the area flooded was the same area affected by the first two floods. The only benefit from all this flooding was good cottonwood regeneration.

September and October temperatures were normal, to above normal, and rainfall below normal. The above normal temperatures and below normal rainfall, particularly in October, provided near perfect harvest conditions. Harvest was unimpeded for 27 consecutive days from late September through much of October. Snow geese starting arriving on October 30. However, many flocks overflowed the refuge, and continued south.

November temperatures were 10 degrees below normal. Precipitation was above normal. A true killing frost occurred on November 1. The first significant snow occurred on November 17. The lake started to ice over during the second week of November, and was completely ice covered except for a 10-acre hole near the visitor center by Thanksgiving. Ice was four to six inches thick by the 27th. All the snow geese were concentrated a short distance north of the visitor center, and provided a spectacular show.

December temperatures were 8 degrees below normal. An extended cold spell occurred in the last half of December. Precipitation was below normal. The lake remained iced over throughout December, with an open hole remaining off Prairie Lane, holding a small flock of ducks and Canada geese throughout the month.

1996 WEATHER DATA
DESOTO NATIONAL WILDLIFE REFUGE

Precipitation (inches)*				Average 1996 Temperature (°F)	
Month	1996	Average**	Snowfall	Maximum	Minimum
January	0.55	0.95	10.6	29	12
February	0.19	0.83		42	19
March	0.86	2.24	6	48	27
April	2.12	2.98		57	36
May	7.54	4.30		70	49
June	6.52	4.28		82	62
July	3.00	3.71		90	65
August	3.87	3.19		90	69
September	2.97	3.29		77	52
October	1.29	2.64		67	43
November	2.30	1.59	1.4	46	25
December	0.50	1.25	5.8	35	20
Totals	31.71	31.25	23.8		

*Includes snowfall **30-year average

C. LAND ACQUISITION

4. Farmers Home Administration Conservation

DeSoto's Private Lands responsibility includes 18 counties in western Iowa, as well as assisting Region 6 in several counties in eastern Nebraska. Only one new FmHA-inventoried property was reviewed during 1996. All recorded properties were visited during the year, with several receiving some additional attention, for one reason or another.

The following table is a listing of pending or completed 1996 FmHA easement activities within the refuge's district:

1996 FmHA Easement Status Report					
Former Owner	County	Date Proposed	Date Accepted	Action Taken	Acres
Flanigan	Monona	12/91	11/93	Transfer to CCB*	62.5
Schrodt	Taylor	10/94	01/95	proposed fence	25.9
Bruck	Harrison	01/91	05/91	new owner	33.0
Barry	Harrison	04/91	05/93	seeding plan	47.0
Thompson	Dodge, NE	11/88	06/89	grazing concern	69.6
Mullen	Adams	11/96	---	not proposed	80.0

*Transferred to Monona County Conservation Board.

The only new inventoried property reviewed this year was the 80-acre Mullen property in Adams County. There were over 50-acres of suitable wooded riparian habitat that would have been worth protecting. However, with the new FmHA easement rules regarding the protection of wetland designated acres only, there was very little to work with.

D. PLANNING

2. Management Plan

The cropland management plan was reviewed, received minor revision, but was not submitted for approval, because we foresee additional changes coming, due to a cooperator leaving the program, which will provide another opportunity for cropland manipulations and reduction.

4. Compliance with Environmental and Cultural Resource Mandates

The documentation and conservation treatment of **Bertrand** artifacts marches consistently onward, even with the loss of our museum curator in June. The museum specialist filled in for this position for much of the year, since the curator was out on sick leave with a series of eye operations and transferred in early June. Acting alone, the museum specialist and museum technician treated 6,989 objects. These included: ladies shoes, Howitzer spherical-case shot shells, lamp parts, bottle fragments, foodstuffs/liquors, and buckets. Two new projects of upgrading the storage, and conservation treatment of men's dress boots and candles were started. Seven specialized storage mounts were fabricated to house and/or support objects, along with the relining of 98 boot/shoe storage boxes. It should be noted that there are over 5,000 boots and shoes in the collection.

The treatment and storage upgrade of hobnail boots and matches were completed this year. Yea, matches! Well ... actually ... match sticks. Zillions of them.



N96-38, JO

Once again, Dr. Larrie Stone, a professor of microbiology at nearby Dana College, completed the survey of foodstuffs. This survey of 804 objects, resulted in the treatment of 22 objects, which were either contaminated or losing liquid preservative. His assessment and treatment of Bertrand perishables is an annual task, which fulfills mandates in our preventive maintenance plan.

In 1996, the museum specialist prepared and had published an article entitled, *Have You Checked Your Pocketknife Lately?* in the National Park Service's *Cultural Resource Management* periodical, Volume 19, Number 7. The article alerted museum professionals to the rarity, fragility, and conservation needs of Stanhope lenses.



N96-38, ST

This came on the heels of our discovery of tiny images and photographs (of a pornographic nature), which are housed inside the bolsters of pocketknives in the Bertrand cargo.

This revelation caused quite a stir, making numerous API newspaper articles, the local television news, and, even, an honorable mention in the nationally-syndicated column, "News of the Weird"!

Our Programmatic Memorandum of Agreement (PMOA) with the National Advisory Council for Historic Preservation and the State Historic Preservation Officers of Iowa and Nebraska, once again, required us to produce an annual assessment of our progress in realizing the 10-year Bertrand Collection Comprehensive Conservation Plan. This annual ritual resulted in a synopsis of the original plan, along with our yearly accomplishments. The PMOA is becoming quite voluminous, and reflects, as always, the phenomenon of "one step forward, and two steps back".

5. Research and Investigations

A Comparative Distribution Survey of the Herpetofauna at Schramm Park State Recreation Area, Mahoney State Park, and DeSoto National Wildlife Refuge

Thomas Becker, graduate student from the University of Nebraska-Omaha, started the survey this last summer. Sampling began in June, and continued through August. A number of representative sample sites at each study area were chosen, based on their consistent production of study individuals, and these sites were monitored regularly during all hours of the day and night throughout the study period. Individuals were manually captured or collected with a muslin sweep net, while being distracted with a headlamp. Care was taken to insure no physical harm came to the subjects during capture and inspection. Specimens were released where caught after inspection. No marking for recapture was undertaken. Observations recorded were firm identification, detailed descriptions of individuals, snout vent lengths, weight, and close-up photographs.

Anurans comprised the bulk of the study subjects. Preliminary results have demonstrated distribution and relative numbers of three species of frogs and two snake species at Schramm Park, five frog species, and one snake species at Mahoney, and eight frog and toad species, three snake species, and at least one species of turtle at DeSoto. Further field research is planned for 1997.

Herbicide and Algal Population Monitoring at DeSoto National Wildlife Refuge

The final report for a study assessing the effect of herbicides on algal populations in DeSoto Lake was published this year by Tracey Copeland, formerly of the Rock Island Contaminants Office. Herbicide and water quality measurements were taken in 1993 and 1994 in DeSoto Lake, Marquardt Pond, and Young's Ditch on the refuge. Previous studies had shown the presence of several herbicides in the surface waters of the refuge. Two commonly used herbicides, atrazine and cyanazine, are chronically present. This study was undertaken to determine if the concentrations of atrazine, cyanazine and metolachlor were harmful to fish and wildlife resources, specifically algal populations. Concentrations of these herbicides, except for the drainage ditch, were less than U.S. Environmental Protection Agency maximum

concentration levels or guidelines. There does not appear be any direct adverse impacts to algal populations from these chemicals, however, algal productivity may be suppressed by the presence of herbicides.

Detection Survey for the American burying beetle (*Nicrophorus americanus*: Silphidae) at DeSoto National Wildlife Refuge

A two-year detection survey to determine whether the American burying beetle, an endangered species, is present at DeSoto was completed this year.

Undergraduate biology students were recruited from nearby Dana College in Blair, Nebraska, to install and routinely monitor baited pitfall traps. Baited pitfall traps are used to attract and live-trap various insect species.



33-231-96, MB

In this study, the traps were baited with ripened beef or chicken liver, which is attractive to insect species that forage on carrion.

No *N. americanus* were captured, although a number of other carrion-feeding species were captured. These include three carrion beetle species (Family: Silphidae), *Oiceoptoma novaboracense*, *Silpha americana*, and *Nicrophorus tomentosus*; four scarab species (Family: Scarabidae), *Canthon viridis*, *Geotrupes splendidus*, *G. blackburnii*, and *Onthophagus hectate*; and two rove beetle species (Family: Staphylinidae), *Creophilus maxillosus*, and an unidentified species. A hister beetle (Family: Histeridae), *Saprinus assimilis*, also was captured. Hister beetles are common in dung, carrion, and decaying fungi where they feed on other insects, especially fly maggots, of which there were many. There were many accidental captures, those not necessarily attracted to carrion, which included ground beetles (Family: Carabidae) such as

Scarites substriatus, *Eumolops sodalis*, *Amara exarata*, *Harpalus caliginosus*, *Pterostichus honestus* and *Poecilus lucublandus*, and numerous field crickets (Family: Gryllidae), species not identified.

Effects of Prescribed Burning on Bird Density and Diversity in Tallgrass Prairie at DeSoto National Wildlife Refuge, Iowa

This three-year study was initiated in 1995 by Dr. Fred Van Dyke, biology professor at Northwestern College in Orange City, Iowa. Objectives of the study are to (1) determine changes in vegetation structure and plant species diversity following burning in tallgrass prairie habitats; (2) determine the response of grassland-dependent nongame birds to prescribed burning of tallgrass prairie habitats; and (3) relate changes in vegetation structure and plant species diversity to responses on non-game, grassland-dependent birds. The goal was to provide a greater understanding of the responses of plants and birds to prescribed burning in this habitat for possible management applications that can be beneficial to this species group.



Jamie Schmeling, from Northwestern College, was our researcher this year. She proved to be a very eager, self-reliant person. Jamie is the first student in memory who did not get her vehicle stuck, and it was a pretty wet summer!

33-230-96, MB

Results from the first two years indicate burned sites increased avian species diversity and total number of breeding territories. It also was observed that four breeding bird species used only burned sites, suggesting that prescribed burning of grasslands may enhance overall levels of biodiversity in grassland birds. This may be true even in small and highly-fragmented habitats, which are typical of DeSoto.

Unburned sites had less avian species diversity, but did have higher total numbers of individuals. These sites tended to be dominated by a few species, especially field sparrows and yellowthroats.

White-tailed Deer Vulnerability and Movement Characteristics in the Missouri Valley

Deer research activities at DeSoto are in full swing. Kurt VanCauteren, University of Nebraska Ph.D-candidate, is continuing the research he began in 1990 while obtaining an MS degree. Results from the first study have been used to improve deer management. They also have prodded many new questions, which we are currently seeking to answer.

Here, Kurt restrains Deer Abbey (No. 15) in a trap, prior to replacing her radio collar with a new one. The 10-year-old (plus) doe has been radio-equipped and studied since February, 1991.



Personal, KV

The deer population in our Missouri River Valley study area is made up of three types of individuals: residents, dispersers, and migrators. Some deer have been radio-tracked for more than four years which never leave the refuge, left the refuge never to return, or winter on the refuge and summer as far away as 20 miles. We are examining the home ranges, movements, and vulnerability of the three types of deer in this agricultural/riparian landscape relative to extrinsic and intrinsic stimuli. Stimuli that we feel play a role and that we are evaluating include: day length, seasonal change, population density, genetic make-up, agricultural activities, hunting activities, and protective cover. By studying individual deer on a landscape scale we will learn how different stimuli impact movement behaviors; thereby impacting local densities and populations. Results will highlight the importance of refuges for maintaining surrounding deer populations. They also will provide insight to improve management in riparian systems throughout the Midwest and Great Plains.

This research continues to provide DeSoto with positive exposure, both locally and nationwide. Results have been shared with

scientific and popular audiences through over fifty publications and presentations. The research also offers a unique opportunity to involve several entities with a wide array of objectives but the similar mission of improved management and appreciation of our white-tailed deer resources. Contributors include; University of Nebraska-Lincoln, U.S. Fish and Wildlife Service, Nebraska Game and Parks Commission, Safari Club International, Professional Bowhunters Society, Pope and Young Club, Nebraska Bowhunters Association, Missouri Department of Conservation, Iowa Department of Natural Resources, and the Nebraska Chapter of The Wildlife Society.

E. ADMINISTRATION

1. Personnel

<u>Name</u>	<u>Title</u>	<u>Grade</u>	<u>Status</u>
George Gage	Refuge Manager	GS-13	PFT
Howard Phillips	Sup. Refuge Op. Spec.	GS-12	PFT
Stephen VanRiper	Refuge Operations Spec.	GS-11	PFT
Bruce Weber	Outdoor Recreation Planner	GS-11	PFT
Marco Buske	Wildlife Biologist	GS-11	PFT
Melinda Sheets	Refuge Operations Spec.	GS-09	PFT
James O'Barr	Museum Curator	GS-09	PFT
(Transferred 6/8/96)			
Jeanne Harold	Museum Specialist	GS-09	PFT
Sarah Tuttle	Museum Tech (Registrar)	GS-07	PFT
Dean Wyckoff	Law Enforcement Officer	GS-07	PFT
(Transferred 2/17/96)			
Brent Taylor	Law Enforcement Officer	GS-07	PFT
(EOD 10/27/96)			
Mike Ellis	Bio. Tech (Wildlife)	GS-07	PFT
(EOD 5/12/96)			
Regina Martinez	Administrative Officer	GS-09	PFT
Wanda Harbottle	Administrative Technician	GS-05	PFT
Cindy Myer	Automation Clerk	GS-04	PFT
Joan Martin	Refuge Guide	GS-04	PPT
Barbara Nielsen	Refuge Guide	GS-04	PPT
David Kaiser	Maintenance Mechanic	WG-09	PFT
Mark Cunard	Heavy Equipment Operator	WG-08	PFT
Monty Storm	Automotive Worker	WG-08	PFT
Kenneth Marquardt	Maintenance Worker	WG-08	PFT
Susan Cooper	Tractor Operator	WG-06	PFT

Temporary

Christina Hall	Office Auto. Clerk(PSIS)	GS-02	TPT
(Terminated 12/13/96)			
Bradley Taylor	Biological Technician	GS-04	TFT
(Resigned 5/11/96)			
Tim Topitzhofer	Law Enforcement Officer	GS-05	TFT
(7/21/96)			



First Row: L to R: Sarah Tuttle, Regina Martinez, Barbara Nielsen, Joan Martin, Wanda Harbottle, Brent Taylor, Susan Cooper.

Second Row: L to R: George Gage, Chris Hall, Marco Buske, Steve VanRiper, Dave Kaiser, Bruce Weber, Ken Marquardt, Howard Phillips.

Missing: Mindy Sheets, Monty Storm, Mark Cunard, Tim Topitzhofer, Mike Ellis, Jeanne Harold, Cindy Myer.

Personnel Actions

Dean Wyckoff, Refuge Law Enforcement Officer, transferred to the National Park Service in North Dakota on February 17 to obtain a GS-09 promotion.

Mike Ellis, Biological Technician (Wildlife), came to us from the Morris Wetland Management District in Morris, Minnesota, on May 12.

Bradley Taylor, Biological Technician, resigned to become a "Mr. Mom" on May 12. His wife is a military person.

Jim O'Barr, Museum Curator, transferred to the Redwood National Park in California on June 8.

Tim Topitzhofer came to us as a Refuge Guide "emergency hire" on July 21 in a not-to-exceed one year appointment, stolen from Rice Lake NWR. Then, on September 14, he was converted into a Refuge Law Enforcement Officer position to help cover Boyer Chute's opening.

Brent Taylor transferred to us from Yosemite National Park as a GS-5 Refuge Law Enforcement Officer on October 21. It took seven weeks to get background information approval, despite the fact he had been carrying a gun for NPS for two years!

Chris Hall resigned in mid-December, as she graduated from nearby Dana College. She had been with us for five years as a President's Stay-In-School Office Automation Clerk. We will truly miss her computer and office skills, her quick wit, and friendly disposition. This position will not be filled again, since the PSIS enrollees now count against FTE's.

Two Biological Technician positions with law enforcement responsibilities were submitted on January 19th for Boyer Chute. When the position freeze lifted, Mike Ellis was selected from the Region's VPP list. However, we went through hell with the other position, trying to find qualified minorities and females, who wanted and could qualify for law enforcement authority. The position was finally filled after thirteen frustrating months.

Awards

Two-day Time Off Awards were given to several employees for their contribution in getting Boyer Chute National Wildlife Refuge ready for opening in September. Wildlife Biologist Marco Buske was given a five-day Time-Off Award for his contribution to the Boyer Chute opening, and for vision in major revisions of the farm program.

Travel/Training

Heavy Equipment Operator Cunard and Biological Technician Taylor traveled to Fort Leonard Wood, Missouri, to pick up excess property on February 1-2.

Refuge Operations Specialist VanRiper traveled to Chicago to attend OSHA training on February 12-16.

Refuge Manager Gage and researcher Kurt VerCauteren traveled to Waterloo, Iowa, to attend the Iowa Chapter of The Wildlife Society Workshop on February 13-14.

Refuge Operations Specialist VanRiper traveled to many Private Land sites throughout the year, throughout the District, and beyond.

Administrative Officer Martinez traveled to Denver, Colorado, to attend the Remote Data Entry Training on March 11-15.

Administrative Officer Martinez traveled to Jefferson City, Missouri, to pick up an excess Blazer 4x4 on March 4-5.

Wildlife Biologist Buske attended the North Central Branch Annual Meeting of the Entomological Society of America on March 24-27.

Heavy Equipment Operator Cunard and Biological Technician Taylor traveled to Fort Leonard Wood, Missouri, to pick up excess property on April 3-4.

Refuge Law Enforcement Officers attended the annual refresher training in Des Moines during the last week of March and the first week of April.

Project Leader Gage and Biologist Buske attended a tour given by the Cargill Company in Blair, Nebraska, on April 12.

Heavy Equipment Operator Cunard traveled to Fort Leonard Wood, Missouri, and Bennett Springs, Missouri to pick up excess property on April 17-18.

Outdoor Recreation Planner Weber traveled to Lincoln, Nebraska, to attend a Nebraska Arboretum meeting on April 19.

Outdoor Recreation Planner Weber traveled to Winnebago, Nebraska, for an Earth Day celebration on April 22.

Heavy Equipment Operator Cunard and Biological Technician Taylor traveled to Fort Leonard Wood, Missouri, to pick up excess property on April 22-23.

Wildlife Biologist Buske traveled to the Squaw Creek NWR to attend a Shorebird Management Workshop on May 2-5.

Refuge Guide's Martin and Nielsen and Office Automation Clerk Myer attended a training course in Omaha, Nebraska, entitled "Caring for your Collection", on May 16.

Wildlife Biologist Buske traveled to St. Paul, Minnesota, to attend a GIS Introductory Workshop on May 31.

Outdoor Recreation Planner Weber traveled to Lincoln, Nebraska, to attend an Internet training class on June 11.

The Museum Specialist Harold traveled to Norfolk, Virginia, to attend the AIC's 24th Annual Conference on June 11-15.

Office Automation Clerk Myer attended an Internet training class in Omaha, Nebraska, on June 12.

Administrative Technician Harbottle attended a Windows 3.1 training class in Omaha, Nebraska, on June 28.

Heavy Equipment Operator Cunard traveled to Mound City, Missouri, and Independence, Missouri, to drop off a boom-axe at Squaw Creek NWR and pick up an excess front-end loader from the Lake City Ammunition Plant on July 17.

Supervisory Refuge Operations Specialist Phillips traveled to Lincoln, Nebraska, to attend a training course on "How To Handle Multiple Projects, Meet Deadlines, and Achieve Objectives" on July 17.

Project Leader Gage traveled to Minneapolis, Minnesota, to attend the Project Leader's Meeting on July 22-26.

Outdoor Recreation Planner Weber traveled to Sioux City, Iowa, to attend the 28th Annual Meeting of the Lewis & Clark Trail Heritage Foundation, Inc. on August 5.

Museum Specialist Harold traveled to Des Moines, Iowa, to participate on a State Historical Society of Iowa museum review panel on August 6.

Outdoor Recreation Planner Weber traveled to Lincoln, Nebraska, to attend a board meeting of the Statewide Arboretum on August 8.

Gina Martinez, Steve Van Riper, Wanda Harbottle, Marco Buske, Susan Cooper, Jeanne Harold, Sarah Tuttle, Howard Phillips, Cindy Myer, and Barb Nielsen attended an Early/Mid-Career Financial Planning Class in Omaha, Nebraska, on August 28. Gina had set up this program, which was attended by 116 people from five agencies.

Museum Specialist Harold and Museum Technician Tuttle traveled to West Branch, Iowa, to survey/treat metal objects, and train the technicians in metals conservation at Herbert Hoover National Historic Site, from September 8-13.

Refuge Guide's Martin and Nielsen attended an adult education center course, entitled "Help! I've Never Used a Computer", given evenings in Council Bluffs, Iowa, from September 18-October 2.

Biological Technician Ellis left for law enforcement training at Glynco, Georgia, on November 13....and never returned?

Administrative Officer Martinez and Administrative Technician Harbottle attended a small purchasing class in Omaha, Nebraska, on December 9.

4. Volunteer Program

We had a total of 75 volunteers who contributed 1,185 hours. We spent very little for this activity in 1996. A half-dozen volunteers are the mainstay of our environmental education program, and remain active throughout the year as interpretive guides, both on the nature trails and in the visitor center. Volunteers were involved in a variety of specialized tasks, such as spring and winter bird counts, art and craft demonstrations, observation deck and entry kiosk assistants, and assisting in field investigations.

Boy Scouts continued to be helpful this year. Eagle Scout Mike Sandeen of Omaha organized his troop to carry out a tree-mulching project. Trees around the visitor center parking area were enhanced with wood chips to improve root moisture, and reduce the amount of lawn to be mowed. This was a continuation of the project begun by Eagle Scouts' Luke Miller and Russ Fude last year. Other scouts worked a day at Boyer Chute, performing wood chipping and general clean-up. Richard Fields also built and installed 13 bat houses at DeSoto and Boyer Chute as part of the requirements for Eagle Scout rank.

Certain staff members actively volunteered with scouts. Operations Specialist Van Riper serves as Assistant Leader in Cub Pack 558, and contributed 450 hours in weekly meetings and projects. Wildlife Biologist Buske volunteered 357 hours with scouts, working on their spring and fall camporees, troop committee meetings, and high adventure wilderness camping.....no, not at DeSoto.

Other volunteers did a variety of things to benefit DeSoto Refuge. Rudy Evans, a professional designer, continues to work on the illustrated Steamboat Bertrand book, The Bertrand Stores. (The end is in sight). Pat Jensen worked as a librarian, cataloging and converting books to the Library of Congress system. Deer researcher Kurt VanCauteren continues to study DeSoto's deer, and readily briefs the public about his research. Two Dana College students worked approximately two months surveying for the presence of endangered American Burying Beetle (none found). And, Northwestern College student carried out a grassland bird study as noted in our Research Section.

Omaha Audubon Society has adopted DeSoto for its "Adopt-A-Refuge" program for many years. Nearly three dozen Audubon Society volunteers joined our regular volunteers to contribute 217 hours during the spring and winter bird counts, and the weekly fall waterfowl counts. In addition, Audubon volunteers led nature walks at Boyer Chute during four Saturdays in September and October, a new effort for this new refuge, which opened over Labor Day weekend.

1996 Volunteer Services	
<u>Activities</u>	<u>Hours</u>
Special Exhibits	71
Education	55
Visitor Information & Assistance	160
Habitat Survey	44
Population Censusing	201
Library & Collections	178
Construction	244
Trail Work	17
Conducting Tours	195
Training	22
TOTAL	1,185

Our volunteer recognition luncheon was held on Tuesday, December 10. The overall volunteer program and its highlights were reviewed. Key chains and calendars were presented to each volunteer at the luncheon.

Our auspicious "Volunteer of the Year" award went to Pat Jensen, who contributed untold hours in our museum's library, updating our collection to a Library of Congress-compatible system.



N96-21, ST

This turned out to be a more complex and time-consuming project than she or anyone else realized. Although she had never used a computer before, she learned how to "surf the net"; searching other libraries's catalogs for call numbers we could use. Later, she learned the intricacies of a specialized library data-entry program when it was necessary to create original catalog cards for

the DeSoto holdings. We presented Pat with a beautiful DeSoto sweatshirt *in absentia*, for she was off wintering in Texas. Thank you, Pat, for your perseverance!

Lastly, voluminous quantities of information on **Bertrand** knives was provided to us by Mark Zalesky, a knife expert from Cedar Rapids, Iowa.

5. Funding

This refuge has recently been unfunded for certain basic services. It requires a higher level of sub-activity 1260 monies for operations. We did get the cleaning contract at the visitor center funded; however, the \$3,800 garbage contract wasn't funded. It becomes harder to cover these contracts with most staff vacancies FINALLY being filled; therefore, no salary savings to draw from.

Region 6 came through with \$120,000 and two FTE for Boyer Chute in FY96. However, FY97 figures only show \$90,000 of the \$120,000 getting funneled down to us. This is the second year of a "weening" process for Boyer Chute. As an incentive to take over the operation of Boyer Chute, the Papio Missouri River Natural Resources District gave the Service \$50,000 in the initial year (about the size of a 700 John Deere tractor), and \$25,000 for this fiscal year. A temporary employee, Refuge Law Enforcement Officer Tim Topitzhofer, has been performing the LE duties there until both biological technicians get through FLETC.

The following table details total DeSoto funding targets for the past five years:

Subject	1996	1995	1994	1993	1992
O & M	1,047,149 ¹	869,291	933,621	857,624	820,386
YCC	0	0	0	5,800	6,300
Other	39,200 ²	49,915 ³	31,000 ⁴	39,600 ⁵	36,780 ⁶
MMS	56,000	487,100 ⁷	71,000	248,400 ⁸	105,000
Vision Funding	0	16,500	N/A	N/A	N/A
Total	1,142,349	1,422,806	1,035,621	1,151,424	968,466

¹This figure includes start-up monies equaling \$90,000 for the Boyer Chute National Wildlife Refuge.

²Included in this is: \$19,000 - Private Lands; \$4,000 - Law Enforcement; \$3,200 - Migratory Birds; \$3,600 - Fire Management; \$5,500 - Cost Share (off-refuge); \$2,500 - NCRS/WRP; \$1,400 - Volunteer program.

³This figure includes \$900 for volunteer programs; \$7,600 for Fire Management; \$20,000 for Private Lands; \$6,415 for cooperative non-game bird studies; and \$15,000 for Watchable Wildlife.

⁴Funding for an \$8,000 matching-cost-share project for development of an interactive computer program; \$3,000 - Volunteer program; \$2,000 - Fire Operations; \$3,000 - 9120 Fire Pre-suppression, \$15,000 - Private Lands monies.

⁵This figure includes \$3,100 for Volunteer programs; \$7,500 - Fire Management; \$10,000 for Private Lands monies; \$5,500 - Challenge Grant; and \$5,500 - Watchable Wildlife funds.

⁶This figure includes \$5,200 - Volunteer money; \$17,500 - Fire Management; \$10,000 for Private Lands; \$1,580 - FmHA easement; and \$2,500 - Law Enforcement.

⁷Looks like a lot, doesn't it? Well, it didn't happen! Most of the money (\$225,000) was obligated for our energy retrofit at the visitor center, EN and CGS finally put it on the street, and the lowest bid came in at twice the estimate! See Section I.2 for more on this fiasco. We lost the MMS monies to other stations' high priorities.

⁸Includes \$130,000 - for VC roof replacement; and \$58,000 - for relocation of headquarter's utilities.

6. Safety

Monthly staff safety meetings and quarterly safety committee meetings were scheduled and held throughout the course of the year, to update and train personnel, and resolve any safety concerns that arose. Safety meetings are assigned to individual staff members, who are responsible for providing programs. Topics this year included: OSHA regulations, poisonous plants, tractor operation, fire safety, Halon fire extinguishers, boating safety, blood-borne pathogens, driving test, Hepatitis-B, back stress, and hunter safety.

Quarterly safety meetings/inspections were conducted, with concerns presented to the refuge manager. All concerns were addressed, with many corrected, some forthcoming, and a few needing further consideration (money). Material Safety Data Sheets (MODS) were updated as needed, with a new location designated for MODS's in the visitor center's storage and supply room.

The annual rehearsal evacuation drill for the nearby Fort Calhoun Nuclear Power Plant was held, after a one-year layoff, due to last year's furlough. The nuke plant is only 1.3 miles from the nearest refuge road, which means we are definately downrange during the summer's southerly winds. Therefore, we become involved in a lot of exercises.

Accidents reported in 1996 included: a fisherman fell through the ice into DeSoto Lake on January 16th; then, Tractor Operator Cooper fell while standing in the back of a fire truck and injured her tailbone and right arm on March 21st; then, on May 17th, Maintenance Mechanic Kaiser injured his left ankle and twisted his

left knee when his ladder fell away while he was roofing alone, whereupon he attempted to slide off the cabin roof he was working on; and, finally, a visitor fell when she tripped on the visitor center's carpet. No lost-time accidents were reported during the year.

On May 18, a fisherman visiting the refuge lost control of his vehicle (his foot slipped off the brake pedal) as he was backing his boat trailer down the ramp. No one was injured, but the vehicle was damaged when it filled with water. Other anglers in the area helped the man get his vehicle and trailer out of the lake, after the engine apparently flooded.

At least three deer were hit by vehicles, and at least one was killed.

All fire extinguishers were checked and either replaced and/or hydrostatically-tested, as needed, during the year. All vehicles and buildings were checked for proper first-aid kits and universal precaution kits, and updated when necessary. Refuge staff collected drinking water samples routinely, as required by law. Finally, all required physicals for fire and law enforcement personnel were arranged and provided.

The law enforcement staff attended a one-hour refresher on nuclear power plant safety and evacuation procedures pertaining to DeSoto, given by the Fort Calhoun Nuclear Plant training officers. Station docimeters and the supply Thyro-Blood potassium iodide tablets were inventoried.

Carbon monoxide detectors were installed in all three refuge residences, and an annual check on the residence's smoke detectors completed. Also accomplished during the year were baseline blood tests for all pesticide applicators, commercial drivers license physicals, review of procedures for Spill Prevention, Control and Countermeasures (SPCC) and Safe Drinking Water Act and Policy. And, then, there were all those law enforcement and fire-fighting requirements we tried to comply with.

Still, all the preparation in the world does not help you a damned bit when a fire pumper motor quits and two vehicles simultaneously get stuck on ephemeral wetlands. We had our first close call near the visitor center this year.



30-153-96, SV

In February, Station Safety Officer Van Riper attended the week-long OSHA 600 training course held in Chicago. A review of the refuge's safety policies was completed upon his return with regard to OSHA standards. New Lock-Out/Tag-Out and MODS stations were built and installed, as required.

A moment in time, but we were lucky! Nobody was on the Missouri Meander Trail on the July 4th weekend when an electrical micro-burst slithered down this willow and blew a hole in the concrete disabled-accessible trail.



21-101-96, BW

7. Technical Assistance

DeSoto staff responded to 128 technical assistance requests. Most requests dealt with wetland restorations, steamboat history, or museum conservation. Examples of other topics include: pesticide usage, cropland rotations, Lewis and Clark Conference planning, pocket knives, food stuffs, air-quality monitoring, and the "virtual field trip" for Iowa Public Television.

Museum personnel traveled to Herbert Hoover National Historic Site under a Memorandum of Agreement, where their instructions were filmed for future reference.



N96-34, ST

They performed conservation survey and treatment of artifacts from the blacksmith's shop, while instructing park staff on conservation treatment of metal objects.

The museum specialist also participated in the State of Iowa's Museum Review Panel, determining which requesting museums and organizations will receive state grant monies.

In the museum, technical assistance was extended to 90 researchers, and 6 interviews were given to various media forum. These requests were received from federal agencies (12), state agencies (9), local government's, colleges/universities (9), and the remainder from the private sector. Information about our artifacts (tools) also was included in an exhibit at the Atlanta History Center during the Summer Olympics. Articles which included information on the *Bertrand* appeared in *Destinations Magazine*, *Home and Away*, *Knife World*, and *Overland Journal*. Graphics from the *Bertrand* collection were loaned to the Boy Scouts of America to be included in their new merit badge booklet on archaeology.

Graduate student, Deborah Peek, earned her Master's degree. Her thesis focused on the architecture of the DeSoto Visitor Center as a museum case study. A new intern, Carolyn Ducey, from Indiana, has begun research on *Bertrand* textiles.

F. HABITAT MANAGEMENT

1. General

DeSoto holds on to a small fragment of the Missouri River Ecosystem of the past. From the channelized ditch of the once habitat-rich Missouri River, across the flat, wide Missouri River Valley, lies an immense new area dedicated to growing corn and soybeans. Modern agriculture allows no hedgerows, shelterbelts, wetlands, or even grassed waterways. Every square inch of ground must produce grain, and then is disced black, with little cover or food remaining by fall to sustain wildlife. This is the way of the Midwest.

The weather this year was challenging. Rainfall was much above normal in May and June, followed by essentially normal weather for the remainder of the summer and early fall. Above normal spring rainfall, with far above average runoff from snow melt in the upper Missouri River Basin kept water levels high. Missouri River flooding became common.



This kept natural wetlands full, and benefited the refuge's wetland restorations and moist-soil units. It also helped to disperse this fall's duck migration throughout the area.

25-143-96, SC

2. Wetlands

- a. DeSoto Lake - The management strategy for DeSoto Lake is a combination of waterfowl management, fishery management, and public recreation objectives. Winter levels are kept high, around 989.0 to 989.5 msl, to reduce the possibility of a sport fish winterkill. To accommodate spring runoff, elevations are brought down in the late winter. Desired optimum summer elevation is 989.5 msl, to make the best use of boat ramps, docks, and fishing jetties that have been constructed around the lake for fishing access. Ideally, water levels are reduced through mid-summer evaporation to 987.0 msl by mid-September. This level helps concentrate predator and prey fish species, and it promotes the growth of aquatic vegetation along the shallows. This lower water

level also exposes shorelines during the fall to provide loafing and gritting areas for waterfowl and shorebirds.

The only way to maintain desired levels is to seasonally retain water from the inflow ditches from adjoining farmlands, and to release water into the Missouri River by gravity feed when the river recedes. During the spring and summer, little opportunity usually exists to lower the lake, due to high river levels required by the Corps for navigation purposes. In contrast, good opportunities exist for water-level management during the river's winter drawdown and periods of low dam releases within the Missouri River Basin.

The aeration system was started on January 30th, and ran until the 26th of February. Drawdown began on February 22, with the lake at 997.4 msl, and continued until March 16th, when the lake was at 987.4 msl. Then, the Corps of Engineers brought the river down quicker than normal at the end of the year. This enabled us to begin to get rid of some water beginning December 2nd.

DeSoto Lake monitoring was conducted throughout the year to determine changes in water clarity, water temperature, and dissolved oxygen at specific depths and locations.



Neg-1-96, SV

Lake temperatures averaged 25 to 26 degrees C. in the summer, highs occurred in July with surface temperatures of 29 degrees C. Secchi disk readings were the best in July, with readings around two meters. They began to drop off only slightly in August, and held throughout the remainder of the year around one meter.

The constant rains of May brought the lake up. June followed suit. Water overtopped the small boat dock parking lot, the South Gate boat dock parking lots, and White-tail Drive. Eventually, the only place to launch a boat was the Middle Boat Ramp. Almost all the rock fishing jetties went under.



The new disabled fishing pier came close to succumbing to the rising waters, even though we had purposely built it five feet above operating level.

27-110-96, MS

Wood Duck, Missouri Meander, and Bertrand Trails were flooded and had to be closed for most of the summer.

The rip rap around the lake was overtopped. This is where we suffered the most damage. As the summer went on, the high waters began to erode the shoreline.



27-111-96, MS

Numerous trees and stretches of bank fell into the lake. Areas at the northern-most end of the lake and Lakeview Drive picnic area lost considerable amounts of shoreline.

Above-average flows on the Missouri River, also, caused problems. The Corps of Engineers had to keep water releases high to relieve impoundments throughout the Basin. On June 23rd, the first major flood occurred on the river. The old Missouri River Overlook went completely under. The new overlook suffered damage due to the swollen river. They were both closed throughout the summer. The Corps reported the Missouri at 4.3 feet above flood stage. Although July rains were slightly below normal, a torrential rain of up to 12 inches, north of DeSoto, caused the Missouri to once again burst her banks. Again, the two overlooks and all refuge lands between the lake levee and the river went

under. The lake also was affected by high river levels. Some seepage occurs through the levee, which added to the already high lake levels.



And, the truly amazing thing is that with each rainfall event upriver, we saw a new wave of flotsom in the river. This photo is from the Blair Bridge, well into the summer months. Where in the hell does it all come from?

27-109-96, MS

Wilson Island State Recreation Area, our neighbor to the south, which was severely flooded during the 1993 flood had just begun to recover, when it happened all over again.

The high lake levels did cut back the expanding cattails, American lotus, and phragmites patches. The latter plants have been taking over large sections of the lake. During the flood of 1993, and, again this year, they were held back near the shore, or were completely eliminated in some places.

- b. Managed Marshes and Potholes - There are seven managed wetland units. Spring and fall runoffs are utilized to the fullest extent possible.

The Visitor Center Ponds are comprised of three interconnected units; Coyote, Scoot's, and Osprey. These ponds can be recharged via Crisafulli pumping from the lake into Coyote Pond, and gravity feeding thereafter. Water levels can be individually controlled, as each pond is separated by stoplog structures. Osprey Pond also can be recharged via a feeder pipe connected to the visitor center's water cooling system. The system provides over an acre-foot of water per day during the peak of the cooling season.

Osprey pond has become choked with cattails. Efforts have been undertaken for the last several years to dry the pond, but with the wet springs we've had limited success. If the pond can be dried out, we will either keep it disced for two years or plant it to milo.

The upper two units required no spring pumping. Fall pumping totaled ten hours. Waterfowl use in Coyote and Scoot's was good again this year. Scoot's pond is especially attractive to Canada geese for brood rearing, whereas Coyote attracts the honkers in the fall.

Wood Duck Pond is a major focal point for environmental education, and a favorite nature trail for the public. Because of this, water is kept on the pond year-round. Buchardt Pond, which lies across the road from Wood Duck, is fed by pumping out of Wood Duck. Buchardt required no pumping.

Willow Pond is a hot-spot for nearly every species of waterfowl, and is another favorite for Canada geese to rear young. Botos Pond is filled by pumping water out of Willow. Willow is fed by pumping from the Lake. Neither pond required any spring pumping. Botos needed to be recharged in the fall. Lake levels were so high that we simply removed stoplogs from Willow, and let it fill on its own. Botos required 15 hours of pumping from Willow.

Young's Pond is a low-priority unit that has numerous problems. No pumping was done on this pond.

No management was conducted on the Missouri River Pond. The pond has very permeable soils and is located along the river. Due to the high river, the unit remained full the majority of the year.

- c. Moist-Soil Unit - The primary unit was being completely overtaken with cattails and woody vegetation. In 1992, plans were made to drain the unit in December so that it could be disced in the spring of 1993. However due to extreme precipitation, no work could be done in the unit. During the summer of 1994, the unit was dry enough to begin disking. Areas that were heavy with woody growth, were "shaved" off with the bulldozer during the winter, when the ground was frozen. However, the wet springs have kept any work from being done. When the unit does dry, it will be disced and planted to milo for two consecutive years.

The second moist-soil unit is 45-acres. This unit is very attractive to the migrating ducks. It also seems to be full of deer when it is not full of water. No spring pumping was required. Fall pumping hours totaled 48 hours.

3. Forests

The refuge continues to loose its native cottonwoods, with essentially no natural regeneration to replace existing stands. This problem had been addressed in a 1990 Forest Management Plan. Proposed forest management strategies included protection of existing mature cottonwoods as perching and roosting habitat for bald eagles, development of a forest management program to ensure a sustained source of roosting and perching trees for bald eagles, promotion of cottonwood regeneration in old grasslands targeted for this management, and systematic flooding of identified reverted croplands to promote cottonwood regeneration.

Experimental flooding has been done in the past with excellent results. Additional flooding is planned, but limited staff time and higher priorities have curtailed activity. As time and resources become available, regeneration on a small scale will be continued.

The headquarter's shelter belt did not require spraying for fungus this summer, although it has been a problem in recent years.

4. Croplands

Cooperative Farming - Ten local farmers farmed 2,308.5 acres of refuge cropland using two-third/one-third crop-share leases to provide food and loafing areas for migrating waterfowl, and food, cover, and edge for other species. Crops produced and acres in production are summarized below:

Crop	Biological Crop Rotation	Conventional Crop Rotation
Corn	582.2	218.3
Soybeans	474.1	155.5
Clover	478.4	0.0
Clover/Small Grain ¹	50.4	0.0
Alfalfa Hay	150.4	0.0
Grass Hay	0.0	53.7
Small Food Plots	145.5	0.0
New Alfalfa Seeding	0.0	0.0
Total	1,881.0	427.5
Grand Total	2,308.5	

¹ Oat or wheat nurse crop harvested for cash grain.

² Consists of a three-year rotation of sweet clover, milo, and winter wheat.

Overall acres in row-crop production decreased, with the reversion of two small food plots to non-cropland uses, and the reversion of a 25-acre field to native warm-season grasses. Also, a 53.7 acre-field of smooth brome grass hay is reported as hay that had not been included in previous annual narratives.

The refuge also reimbursed two cooperators for aerially seeding winter wheat on 145 acres south of the visitor center and on Center Island. The seeding was applied on September 16. Timing of the seeding was good, and rainfall (i.e., 1.41 inches in three rainfall events) within ten days after seeding allowed for good stand establishment, albeit somewhat uneven which is typical for aerial seeding.

The 1996 crop season had its challenges, but proved to be a very good year. March rainfall was much below normal and April rainfall was normal. This allowed farmers plenty of time to complete spring fieldwork prior to planting. Corn planting got an early start throughout the river valley. A large acreage of corn was planted during the last ten days of April. Then, the fifth wettest May on record interfered with fieldwork throughout the month. Although some corn and soybean fields were planted in May, planting lagged behind normal for this area. Although June rainfall was also well above normal, rainfall events were spaced far enough apart that planting was completed in a timely fashion. Throughout the remainder of the growing season, particularly the critical months of July and August, rainfall was adequate, and rainfall events were remarkably uniformly distributed. The distribution of rainfall events and lack of heat stress combined to produce above-average corn and soybean yields.

Year	Biological Corn	Conventional Corn	Biological Soybeans	Conventional Soybeans
1992	146.7	146.5	49.5	46.1
1993	129.0	88.8	40.9	34.7
1994	123.6	141.3	50.4	44.6
1995	78.3	67.1	33.3	36.7
1996	134.0	118.0	44.4	39.7
1979-96 Avg.	103.3	100.6	37.7	35.3

Field trials were established to evaluate the sweet-clover rotation effect (e.g., nitrogen contribution) to the following corn crop in the biological crop rotation. First-year results suggest the clover grown in 1995 with a minimum stand density of ten plants per-square-foot or greater did provide sufficient nitrogen to achieve optimum corn production in 1996. These results are based on the late-spring soil-nitrate test and visual leaf rating protocol to assess nitrogen deficiency.

Two refuge corn fields were planted into a combination of open-seeded sweet clover and sweet clover planted with a winter wheat nurse crop. Observations were made to determine if there were any differences in nitrogen uptake between the two clover management practices. The visual leaf rating protocol assessing nitrogen deficiency leaf symptoms was used to compare nitrogen uptake between the two practices. On average, there were no observed differences. However, variation between sample sites was quite large in one field, confounding interpretation. This investigation will continue next year with the sampling protocol modified to take into account potential variability of the field data.

Winter wheat also was aerially-seeded in the fall of 1995 in alternating strips as a nurse crop for the 1996 sweet-clover crop, to demonstrate the value of wheat as a potential cash crop in the biological crop rotation, and as a tool for weed control.

As shown in this field, the wheat strips substantially suppressed weed growth, whereas unseeded strips experienced heavy, uninhibited weed growth.



33-228-96, MB

However, some of our farmers question how much the wheat may effect the nitrogen value of sweet clover for the next year's corn crop.

Food Plots - Fourteen food plots (three less than last year), containing three cover types, and totaling 145.5 acres (1995 acres = 180.7), were custom-farmed by cooperative farmers, and left unharvested for wildlife use. Of these, 61.7 acres were in milo, 38.0 acres in sweet clover, and 45.8 acres in winter wheat. In addition, approximately 5 acres of corn were left standing in strips for concealment of hunting blinds for our annual Iowa controlled waterfowl hunting program. The primary objective of food-plot management is to provide food for resident and migratory non-game wildlife. This objective is accomplished year after year, with moderate utilization of milo and heavy utilization of corn by deer, upland species, and non-game birds.

Per the 1994 Station Evaluation, the number food plots managed on the refuge are being gradually reduced. Food plots without public-viewing value, and their location making them difficult to farm, are the criteria used to target plots for reversion to an alternative management practice.

In addition to small food plots, the refuge's share of field corn is managed to benefit resident wildlife, fall and spring migrating waterfowl. This has normally been done by chopping standing corn as the snow geese arrive in the fall. The corn is readily accessible by the geese. Managing the refuge's corn in such a manner habituates migratory waterfowl to the refuge, and provides the public with hunting and superior wildlife viewing opportunities. The spectacle of a half-million snow geese loafing near viewing stands and foraging in nearby refuge and private croplands is a major annual attraction at DeSoto. Corn has been managed in this manner at DeSoto since 1989.

However, in 1993 and 1994, snow geese, for many reasons, arrived later than normal, and did not remain long before continuing their southward migration. Foraging activity on private lands near DeSoto was limited. Hunting success diminished, prompting complaints from local hunters that the refuge cropland management practices were holding geese on the refuge. At the same time, snow geese have reached all-time high population levels, creating concerns among wildlife managers regarding degradation of their Arctic breeding grounds and/or a disease-induced catastrophic population crash.

DeSoto managers modified corn harvesting practices in 1995 in response to the above concerns. The refuge's corn share was selectively withheld from foraging snow geese. This was accomplished by (1) mechanically harvesting corn in fields used by snow geese, and not used extensively by other migratory or resident wildlife; (2) limiting access to the corn by snow geese in areas used extensively by other wildlife; and (3) maintaining past practices in fields strategically-located for public viewing. These changes reduced the number of excess corn acres available for snow goose foraging in 1995 and 1996. From 1989 through 1994, excess grain made available for waterfowl foraging provided, on-average, 29.8 percent of the snow goose flock's energy needs. With the new harvesting practices, excess grain provided only 11.2 percent of the flock's estimated energy needs in 1995, and 4.3 percent of estimated energy needs in 1996. Thus far, there has been no obvious change in waterfowl use of the refuge, and, shortly after arrival, geese have foraged afield daily.

Excess Grain - Each year, the refuge stores approximately 1,000 bushels of corn for potential depredation or disease management problems per existing management plans. Any additional grain stored in refuge bins is used to initially attract waterfowl to the vicinity of the visitor center during the fall migration, attract deer into live traps for an ongoing deer study, and for

the visitor center's bird feeders. When spring arrives, any held-over grain is used to reimburse cooperative farmers for early season custom work at the refuge or transferred to other stations.

Under the current crop-share system, the refuge's entire share of soybeans and some corn is harvested, and the monies used to reimburse cooperators (per the Iowa Custom Rate Survey) for refuge farming activities, such as planting and managing food plots. Any excess is made available for transfer to other refuges. In 1996, cooperative farmers were reimbursed a total of \$15,722.18. The remaining grain monies resulted in the following inter-elevator transfers to other refuges for their banding, feeding, or farming needs, on a first-come, first-serve basis:

Refuge	Dollar Value Transferred
Region 3	
Agassiz	\$6,750.00
Mingo	1,473.00
Necedah	1,200.00
Shiawassee	2,500.00
Swan Lake	21,986.36
Tamarac	1,500.00
Upper Mississippi	924.00
Region 5	
Blackwater	5,000.00
Erie	4,000.00
Great Swamp	2,050.00
Region 6	
Lake Andes	1,979.10
Kulm Wetland Management District	5,316.86
Fort Niobrara/Valentine	10,000.00
Medicine Lake	3,000.00
National Elk	34,864.09
Total	\$119,204.09

This year inter-elevator grain transfers were the highest dollar amount since this practice was started. This is due to reducing the amount of corn made available for waterfowl consumption, well above-average corn and soybean yields, relatively high commodity prices, and fewer custom services requested from the refuge's cooperative farmers.

5. Grasslands

Four units were planted to cool-season grasses, totaling 50.9 acres. One unit was 11.5 acres of former cropland located south of the visitor center sewage lagoon. It had been fallowed for two years, and prior to that time was in crop production. Soil texture is heavy and drainage is poor at this site. Soil was cloddy at planting time. The second unit, a former small food plot (5.4 acres), is located immediately west of the first unit. Soils are heavy to medium textured and poorly to somewhat poorly drained. Both units were planted on April 18 and 19 to Virginia wildrye (3.75 lbs. PLS/acre), and intermediate (4.75 lbs. PLS/acre) and tall wheatgrass (3.5 lbs. PLS/acre). The third unit was planted on April 19 to a sixty-foot filter strip (2.0 acres), located alongside a drainage ditch connecting Osprey and Coyote wetland units. The filter strip provides a buffer between the drainage ditch and a 16-acre crop field. Soils, although heavy textured, were in good condition for seeding. The fourth unit is located on the east side of the refuge, across the east dike road from a crop field which was formerly part of the controlled waterfowl hunt program. This unit (32 acres) was planted on April 22 to intermediate wheatgrass (7 lbs. PLS/acre) and tall wheatgrass (5 lbs. PLS/acre). Soil conditions at planting were good. Seedling establishment at all locations was somewhat spotty, but adequate.



Twenty-five acres of cropland at Prairie Lane on Center Island were reverted to native warm-season grasses. Soil at this site is medium textured, and generally well drained.

33-227-96, MB

It was planted on May 21. Soil conditions at planting time were excellent. However, heavy rainfall delivered 3.35 inches of rain between May 23 and May 29, leaving standing water in three narrow strips running across the width of the field. Grass seedlings failed to get established in these locations. The total area affected was approximately 1.5 acres. Seedling establishment was very good in the rest of the field. Seed mixture and seeding rate is listed in the table on the following page.

Warm Season Grass Species	Seeding Rate (lbs. PLS/acre)
Big bluestem	2.0
Little bluestem	2.5
Indiangrass	2.0
Switchgrass	1.5
Sideoats grama	1.0
Needlegrass	1.0

6. Other Habitat

Approximately 1,800 lineal feet of the former North Beach shoreline were disced once for vegetation control to promote potential nesting by endangered least terns and/or piping plovers.

8. Haying

This year, the refuge harvested, 150.4 acres of alfalfa and 53.7 acres of smooth bromegrass under contract with a local farmer. The most recent cash-rent contract expired on December 31, 1995. Subsequently, a new contract for the 1996 - 1998 crop seasons was released for competitive bidding. Six local farmers submitted cash bids. The winning bid was from David Geise of Logan, Iowa. His bid was \$32.28-per-acre for alfalfa and \$27.00 per acre for the smooth bromegrass. As in the past, the cooperator is limited to two cuttings annually, between July 15 and September 10, as well as other refuge-specific management practices.

Flooding destroyed a 58-acre alfalfa field on the west (Nebraska) side of the refuge, alongside the Missouri River. Although the farmer was able to salvage most of the first cutting, much of the second cutting was lost. Plant-stand reduction was significant, and the final stand was below an economically acceptable level. This field will be rotated to field corn for the 1997 crop season, and soybeans in 1998. It is targeted for permanent reversion to native warm-season grasses at the earliest opportunity, following the 1998 crop season.

A forage test-plot was planted on June 11 at Prairie Lane on Center Island. This plot was established to begin evaluating alternatives for the current hay program. The refuge currently manages its alfalfa crop using a two-cut harvest. The first cutting has high tonnage, but the forage value is low. The second cutting would be of normal tonnage and forage value. The first cutting, being delayed until July 15, avoids harvest disturbance of nesting birds and destroying nests. An alternative may be to

plant a combination of big bluestem and Indiangrass with a forage legume (i.e., such as a low seeding rate of alfalfa, Illinois bundleflower, partridge pea, etc.), and manage it as a one- or two-cut harvest. The warm-season grasses will not produce seedheads until late July or early August, thus forage value should be relatively high, and produce maximum tonnage. The addition of a legume is intended to improve forage value and provide at least a partial nitrogen source for the grasses. Stay tuned.

9. Fire Management

When the window of opportunity for prescribed burning opened up this spring, the conditions caused extremely hot fires.



32-244-96, MS

The humidity was extremely low, which is very strange for this area in the spring.



32-243-96, MS

However, this enabled us to get very good kills on the woody growth. We worked with the new foam unit, but even the foam disintegrated with the low humidity and the heat of the fire.

Even after the natives were well under way, the trees did not resprout. We did get 64 acres burned, even with mechanical problems on our old military 6x6 truck and pumper. Two new military

transport trucks were obtained from surplus. Hopefully, we can soon outfit these with tanks and pumpers to be used both at DeSoto and Boyer Chute.

We are always worried about flat tires during a burn, and this is the reason. All these antlers came out of one prescribed-burn field.



14-109-96, MS

10. Pest Control

The Region 3 1996 pre-approved herbicide list was provided to cooperative farmers to select herbicides for use on refuge cropland. In addition to the herbicides contained on the list, a pesticide-use proposal was submitted and approved for Accent (nicosulfuron). Historically, grass weed control in field corn grown on the refuge has been a difficult problem. The only grass herbicides labeled for field corn on the pre-approved list are Sutan (butylate) and Eradicane (EPTC). Both materials have significant limitations. Efficacy is poor in cool, wet soils, a common occurrence at DeSoto in the spring. Enhanced degradation (e.g., a soil condition where soil microorganisms that break down pesticides build up to high levels, accelerating pesticide degradation, and resulting in substantially reduced pesticide performance) is possible with repeated use of these particular herbicides. Application rates required to achieve control are very expensive, compared to other herbicides. Also, these herbicides are preplant-incorporated, in other words, their use is prophylactic, which is not consistent with an IPM approach to pest control. Cooperative farmers were allowed to use Accent on an as-needed basis.

In total, twelve herbicides were used by cooperative farmers to control giant and yellow foxtail, velvetleaf, common lambsquarters, common sunflower, common cocklebur, toothed spruce, pigweed species, and volunteer milo, wheat, and corn in agricultural fields. Giant foxtail and common sunflower are the major problem weeds in refuge cropland. Mechanical cultivation and mowing also was used extensively. No insecticides were allowed for control of crop insect pests.

The visitor center buffalograss turf was treated in the spring and early fall with 2,4-D and Dicamba to control a very heavy common dandelion, henbit, and white clover infestation. Making progress.

A one-percent glyphosate (Roundup) solution was experimented with this year to control Kentucky bluegrass infestations in the visitor center buffalograss turf. Spot treatments were made in Kentucky bluegrass infestations, and to a small area of uninfested buffalograss adjacent to the bluegrass. Ten paired comparisons were used to evaluate the efficacy of this practice. Applications were made on two different dates. The first application was on April 11. Buffalograss greenup was just starting, with about 10% of the plants exhibiting the first signs of spring growth. Plant height was 1/8 inch or less, and covered by residual vegetation. The second application was on April 25. Buffalograss greenup was 100 percent, and plant height was 1 inch, but still covered by residual vegetation.

Both application dates provided essentially 100% control of the Kentucky bluegrass. The buffalograss was much less responsive to the early Roundup application, than the later application. Turf growth and development was delayed by both application dates, and the turf-stand density was reduced by the later application date. However, by late summer, all treatment sites, regardless of treatment date, had recovered from the glyphosate injury and late season growth and development were the same as untreated areas. Our conclusion is the early season application of Roundup can be a very effective tool for controlling Kentucky bluegrass in a warm-season grass turf. Also, the application should be made as early as possible, not later than early April (at this location), to minimize turf damage.

Musk thistle infestations on refuge were mapped. Infestations clearly visible to the public were mowed after flowerheads emerged. Thistle infestations were scouted for the status of the musk thistle seedhead weevil, *Rhinocyllus conicus*.



Larvae of this insect were readily collected from locations (N=9) throughout the refuge. An average of 34.6 percent of the seedheads dissected were infested with larvae of this beneficial insect.

Last year, larvae were collected from eleven of twelve locations, with 15.8 percent of the seedheads infested. *Rhinocyllus conicus* is clearly well established, and apparently thriving at DeSoto.

Phragmites and American lotus infestations were mapped in DeSoto Lake to monitor the spread of these weed pests from established infestations. American lotus beds had not expanded from the previous year. New small infestations of Phragmites were observed near the Bertrand boat docks, and were treated with glyphosate (Rodeo) in August. Phragmites throughout the lake exhibited signs of early senescence, possibly a response to persistent high water levels throughout the summer.

DeSoto Lake, drainages into the lake, wetlands and moist soil units were scouted for purple loosestrife and Eurasian water-milfoil. Neither of these weed pests were observed within the refuge. However, biologists from the Iowa Department of Natural Resources reported an Eurasian water-milfoil infestation in a lake a few miles north of the refuge, at Snyder Bend.

The visitor center is routinely scouted for a variety of structural pests. Concentrated insect activity was observed in the administrative offices, library, and emergency exit from the conservation laboratory. These locations were successfully treated with an over-the-counter pyrethroid aerosol formulation.

Roundup and fosamine (Hyvar) was applied to gravel along entrance roads, bases of signs, and existing cracks on the paved roads, parking lots, and heavy equipment storage lot to control invading vegetation.

Roundup @ 2 quarts-per-acre and 2,4-D @ 1 quart per acre was used to control a heavy Canada thistle infestation. This infestation covered 3.5 acres in a 9-acre field on Center Island, which has been fallowed, pending seeding to cool-season grasses.

14. Farmers Home Administration Conservation Easement

The Monona County Conservation Board has been working with the local FmHA (now the FSA Office) and the Service to change the boundaries on the D. Flanigan property, to accommodate a small parking lot for public use activities, ie. hunting and wildlife observation. The Board received fee title of this 62.5-acre riparian/plaustrine emergent wetland in 1994. We have been providing technical assistance for habitat development and protection.

The 25.9-acre E. Schrodts property in Taylor County was to be fenced on the north side to keep cattle from grazing within the easement. This may still be undertaken; however, the cattle have been removed, at least temporarily, and no further action has been taken.

The five-year lease on the 33-acre R. Bruck property in Harrison County has finally run out, and the new owner, T. Lehrman, is working with our Private Lands program to improve wildlife values.

The R. Barry easement, which was sold in 1993 to B. Bothwell, is scheduled to be seeded in the spring of 1997 on a portion of its 47-acres.

While conducting annual inspections on all FmHA easements, it came to our attention that the 69.6-acre V. Thompson easement in Dodge County, Nebraska, was being overgrazed by a fairly large herd of cattle. This information was provided to the Service's Office in Kearney, Nebraska.

15. Private Lands

DeSoto's funding allocation for FY 96 for the Partners for Wildlife (Partners) program totaled \$19,000. We also received \$2,500 for salary and Service assistance to the Natural Resource Conservation Service (NRCS) for implementing the latest Wetland Reserve Program (WRP) sign up. An annual cooperative agreement with Ducks Unlimited has been written, and will go into effect in FY 97. This agreement will allocate additional funding for our Private Lands program, with Ducks Unlimited matching our contribution for wetland-restoration efforts.

This is the third year of the Service's funded cooperative agreement with the Carroll County Soil and Water Conservation District. Wetland Specialist Casey Sheley continued his second year of working with landowners interested in the Partners For Wildlife Program. Casey works out of the Carroll County NRCS Office, and has been involved with contacting landowners interested in wetland and/or upland habitat projects, coordinating partnership funding for habitat projects, and restoring wetlands and uplands. The funding for this position was made possible due to the WRP and Emergency Wetland Reserve Program's additional funding allocated the last couple of year's. Union Slough Refuge also continued to fund a portion of this cooperative agreement, which includes coverage for several counties in their District. If all goes as planned, we should have twelve or more projects completed.

The second year of the Golden Hills Resource Conservation and Development Inc. (GHRCD) cooperative agreement was again a success. This organization is funded by the NRCS and provides valuable services in grant writing, obtaining partnerships, and facilitating funds for resource-related projects. We have combined efforts to restore and protect several habitat-related projects during the course of the year.

The WRP and EWRP programs have slowed extensively this past year. There were several NRCS District Conservationists and landowners

that called needing technical assistance for development, planning, and funding assistance.

One such project was the J. Schwartz wetland in Pottawattamie County, which at design level will encompass two acres, co-funded with Ducks Unlimited and the East Pottawattamie Conservation District.



34-212-96, SV

Usually, the Service and the GHRCD equally cost-share the agreed-upon amount, with generally 50 percent cost-share coming from the landowner, or other donors.

Wetland and upland habitat restoration requests ran considerably higher than last year, with approximately 40 requests. With the changes in the WRP, i.e. continual sign-up and 30-year easements, the new CRP program; which has yet to be determined, the new EQIP and WHIP programs, and the new seven-year Farm Bill, the dynamics of the Private Lands program changes continuously. We had twenty-nine habitat projects inspected this year, in 14 different counties. Five have either been completed or are in some stage of completion or design. All others are either held up due to funding constraints or feasibility of the project.

One of the highly visible projects was the Iowa School for the Deaf's wetland habitat project in Pottawattamie County.



This photo shows what we were working with before excavation.

34-209-96, SV

And, after excavation with the addition of a boardwalk. The boardwalk was funded by outside sources.



34-210-96, SV

This highly visible wetland project is a good example of the type of exposure that can be accomplished by working with groups not normally interested in wetlands.

A potential large-scale Partners For Wildlife project that is in the early stages of planning is the Glenwood State Hospital wetland/upland restoration project located in the Loess Hills of Mills County. There are 1,000 acres of agricultural land that have been in fallow condition for some time, and has been grazed to a greater or lesser extent, which are available for major renovation. There are apparently a considerable amount of unexplored Indian sites that the University of Iowa will be excavating April, 1997. We will be working closely with the Hospital, University, and NRCS to develop and restore this Loess Hills prairie and riparian area.

Minimal-effect requests for channelization of small waterways continued to be a source of concern and a time consumer for Private Lands coordinators. With the recent changes in the Service's reduced role with minimal effects and wetland determinations the whole Swampbuster Program seems in a state of flux.

During the past year, Refuge Operations Specialist Van Riper has become part of Iowa's Wetland Function and Value Assessment Review Team. Meetings in Des Moines, sponsored by the NRCS and the Service, provided training on wetland minimal-effects, mitigation, and wetland function and value assessments. With this training, only those individuals in attendance were authorized to approve minimal-effect or mitigation through use of this process. Since that time; (November), three minimal-effect requests have come through for our review.

We have broadened our application of Partners For Wildlife funding here in western Iowa, especially with the high cost of restoring wetlands, by providing funding for native grass seeding on new CRP

contracts, which generally call for only switchgrass. With our emphasis still on wetland restoration and/or protection, we gear this program toward enhancing CRP wetlands with a quality mixture of native grasses.

Technical assistance requests have continued to increase each year, with interest coming from private landowners, city and county governments, businesses, and other federal agencies. The funding and technical assistance we offer through the Partners For Wildlife program is heard through conservation magazines, newspaper articles, and the many government agencies and landowners we work with. We also receive a considerable number of requests to speak about the Partners For Wildlife program from colleges, high schools, and conservation groups throughout the year.

Two Service challenge cost-share grants were applied for through the Wildlife Forever organization, and both were accepted. One was the Iowa School for the Deaf (ISD) prairie/wetland project, mentioned earlier, which received \$3,924. The other was for the Donald Bartlett wetland project in Crawford County, which amounted to \$6,000. The ISD project has since been completed, as planned. The Bartlett project was later rejected by the Bartlett family, when they decided to go it on their own.

The Natural Resource Conservation Service in Harrison County received a \$200,000+ Water Quality Incentive Project (WQIP) three-year grant in 1996 for improving the water quality of the 12,000-acre DeSoto Lake watershed. This is a voluntary project for farmers in the DeSoto Lake watershed. Shortly after receiving the WQIP grant, it was replaced with the new EQIP program, and lost a lot of its momentum. We currently have twelve landowners that are will be practicing either conservation tillage, nutrient management, or both practices, for the next three years, with an anticipated expenditure of \$68,600.

G. WILDLIFE

1. Wildlife Diversity

Small fragmented habitats, such as DeSoto and Boyer Chute, are remaining examples of what the diverse Missouri River bottomland ecosystem used to be. Work continues with federal, state, and local agencies, to try and tie these pockets of habitat together. If they can be linked together in a corridor, the past richness of this river ecosystem can truly be understood and appreciated.

(Picture) A variety of management practices maintain biodiversity on this refuge through: development and expansion of waterfowl breeding pair and brood habitat; placement of wood duck boxes and improvement of nesting habitats; shrub and tree plantings; native grass seedings; intensive cropland, grassland, and water management; moist-soil unit development; and other routine habitat

manipulations, which stall successions, reverse invasions, and add to the diversity which sustains our wildlife populations.

2. Endangered and/or Threatened Species

Only a few bald eagles were seen during January and into February. By the end of February, more had begun to arrive, and the spring peak was reached on the 27th of March, with 55 eagles present. By mid-April, they were gone. October 24th saw the first adult back on the refuge. The fall peak was 72 eagles, on December 4th. Our traditional way of counting them in their historic roost is becoming impossible. The majority of the birds used to sit in the cottonwood trees near the gravel road, and could be easily counted at sunset. During the last few years, they have begun to roost deeper within the large block of timber. There is one area where up to twenty-five birds were counted several times this year, but even this spot is about 200 yards from the road. The density of this woodland is declining.

Another T and E species that we are beginning to see on a more frequent basis is the peregrine falcon. The city of Omaha has been hacking birds off the Woodman Tower for several years. The city is only 25 miles away, so we assume the falcons we have seen are from that program.

Efforts continue to attract endangered interior least terns and threatened piping plovers. Roughly 1,800 linear feet of the former North Beach shoreline, 35 acres of the Sandbar area, and two acres of Sandbar point are usually maintained as potential nesting sites. The high water did not permit discing this season. Tern decoys also are placed on these areas to try to lure in the birds. Six least terns were spotted on the refuge on September 20th.

Of the listed fish species, pallid sturgeon are the only T and E species that are suspected to occur on the refuge. Studies on the Missouri River have, at least, shown that there are pallid sturgeon in our section of the Missouri.

3. Waterfowl

Winter Period (January - February)

A severe storm in early December (1995) drove the waterfowl south and quickly froze over the lake. No birds remained to sit out the long winter. But, within two months, there were 820 Canadas and 250 snow geese back. During the weekend of February 24th, the snow's pushed north en masse, and people were seeing them everywhere. And, while the late winter snow goose season was open south of Interstate 80 (Omaha/Council Bluffs), no recreational benefit could be derived this far north. The ice began to melt on the lake, and numerous holes opened up. Ducks and geese were

waiting to fill every open spot. On the 26th, we had over 20,000 ducks on the refuge, with lots of diving duck species.

Spring Period (March - May)

Temperatures dropped during the first of March, and much of the lake refroze. The waterfowl were concentrated in three holes at the South Gate Facilities and one at Prairie Lane. There were nine species of ducks, including 2,500 pintails, packed into this open water. Teal began to move into the area around the 12th of March. Canada geese numbers climbed to 2,800. Snow geese continued to move through during March, but no appreciable numbers ever used the refuge.

The Canada geese began nesting during late March.



The first brood was seen on the 24th of April. By May, only four broods had been observed on the lake. Many nests must have been drowned out due to rising lake levels.

3-067-96, MS

We have 65 wood duck boxes placed in the timber near the DeSoto Lake. The success rate this year was phenomenal, 100 percent. However, we only had seven nest boxes used! Again, this year, we did have quite a few screech owls using the boxes, (28 boxes with an owl or owl sign). But, this is even down from last year. Many of the boxes had no use by anything. DeSoto's mature cottonwoods are dying out. With numerous natural cavities to choose from, perhaps the ducks would simply rather use these.

Summer Period (June - August)

The four broods of Canada geese joined forces, and spent the majority of the summer near the South Gate Facilities. In addition to these broods, we had 15 adults that spent the summer on the refuge. Due to our low number of Canadas, the Iowa Department of Natural Resources decided not to mess with banding here this year.

Mallards, blue-winged teal, and even some shovelers were around during the early summer months. We normally see some mallard and

teal broods, but not this year. Some wood duck broods were spotted in the hidden areas around the lake, and in the wetlands. A very late brood occurred in the town of Missouri Valley. A hen nested in a backyard tree, just off main street, and brought her young off the 23rd of June. Only two woodies had escaped the neighborhood cats by the time we got there.

Fall Period (September - December)

In late September, Canada geese, mallards and blue-winged teal began to show up. By mid-October, about 200 Canadas were using the refuge, and the first small flock of snow geese was seen in the Loess Hills, east of the refuge. White-fronts also were seen in and around the refuge in small flocks.

October 30th brought in the first flock of snows to the refuge. A massive migration followed a front directly into Texas on the first of November. By mid-November, there were 250,000 snows here. Canadas peaked at this time, with 1,500 birds.

On November 20th, we reached a peak of 610,000 snow geese. The sight from the Refuge Viewing Gallery of the visitor center was awesome.

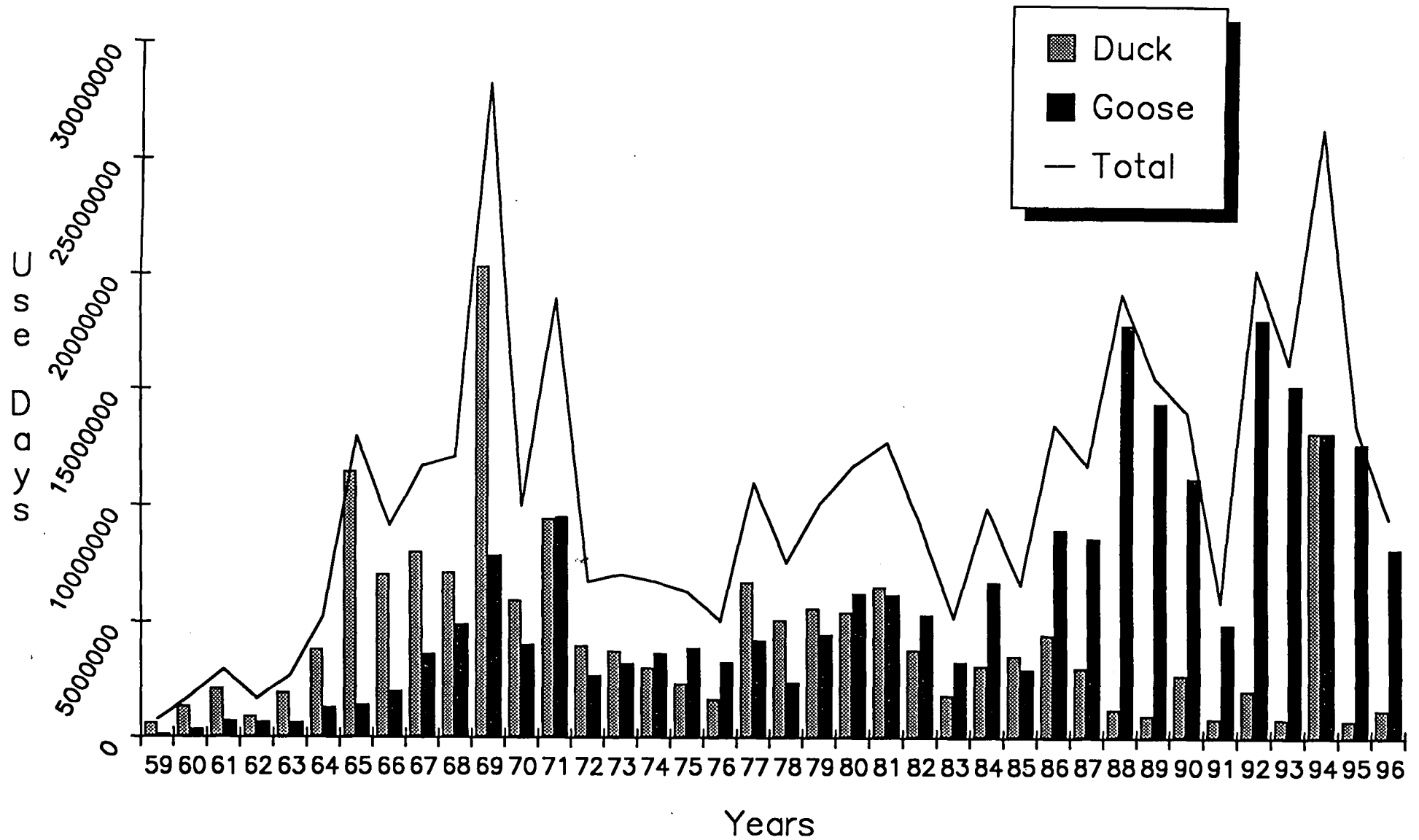


2-142-96, MS

But, late-November's below-normal temperatures began to quickly freeze over the lake. The geese were concentrated in one large hole near the Visitor Center. With snow on the ground and their open water shrinking, most of the geese headed south. By the 27th of November only 80,000 snows remained. By December 4th, we had less than 30,000; the following week only 18,000. It was then that avian cholera hit the remaining stressed birds.

On December 11th, we picked up 21 dead snows. On the 12th, ten snows and one scaup were found. Thirty-one snows, and one Ross' goose were picked up on the 13th. The 16th and 19th, took 8 and 3 birds, respectively. By the 20th, the hole the birds were using had frozen over. Only 5,000 birds remained, loafing in a field by the visitor center. The Canada geese and most ducks traditionally use the South Gate Area and Prairie Lane. These groups of birds suffered no avian cholera outbreak.

WATERFOWL USE DAYS





The new carcass incinerator, quickly disposed of the 75 birds. The incinerator was purchased this summer from Burn Easy Company, Decatur, Indiana, for \$2,070.00. We were anticipating a major die-off.

36-145-97, SV

By the end of October, duck numbers built to over 8,000, with 10 species present. Their numbers kept building until a peak was reached on the 20th of November of 47,000 ducks. The mallards made up the majority of this flock, at 45,000 birds. Twelve other species of ducks also were using the refuge during the fall migration, including; gadwalls, wigeons, pintails, blue and green-winged teal, shovelers, woodies, ring-necks, scaup, goldeneyes, buffleheads, hooded and common mergansers, ruddys, canvasback, and redheads. Duck numbers stayed high until the third week of November, when only goldeneye, bufflehead, and mallards remained. By the end of December, about 1,300 mallards, and 100 each of goldeneyes and common mergansers were keeping a hole open at Prairie Lane, along with about 400 Canada geese.

A tundra swan was observed for several days in early November. The bird did not stay to long, perhaps realizing he had made a wrong turn.

Duck use-days totaled 1,299,351, which was significantly below the five-year average of 3,700,072. Goose use-days were 8,241,940, again well below the five-year average of 13,587,045. Total waterfowl use-days for the year were 9,541,291, which was below the thirty-year average of 12,136,392. See Waterfowl Use-Day Chart on the following page.

4. Marsh and Water Birds

Pelicans sailed into the refuge like a squadron of World War II bombers during the end of March. Hundreds came and went. The easy going giants stayed around most of April, and then were gone. Several great blue herons and great egrets, along with many double-crested cormorants, also, made spring stops. An unusual tri-colored heron was seen on April 26th.

August saw the return of great blue herons. Several green-backed herons also were seen in the early fall. Pelicans returned in late September. A peak number of 480 pelicans was observed in early October. Over 300 double-crested cormorants began fishing the lake in late October. The cormorants stayed late this year.



11-141-96, BW

There were still over 200 birds here in late November, and some remained into December.

5. Shorebirds, Gulls, Terns and Allied Species

Ring-billed gulls were seen as early as February 26th. In late March, over 1,000 were bobbing around on the rough lake waters. When the cormorants showed up, the gulls were able to quit fending for themselves, and began to steal gizzard shad from these better "fisherbirds". Franklin's, Bonapart's, and a few herring gulls also were seen in the spring. A group of black terns were seen in July.

Killdeer were everywhere, as the weather warmed, picking out what they considered good nesting places. Nests in the middle of rock parking lots had to be rescued, as usual. Even though the rising water probably claimed some of their nests, they seemed to do well. Their silly young, with legs too big for their bodies, were scampering everywhere.

Numerous cattle egrets were seen on the refuge and in the surrounding area this spring, along with greater and lesser yellowlegs, Wilson's phalaropes, common snipe, short-billed dowitcher, willets, solitary sandpipers, white-rumped and least sandpipers. Spotted sandpipers were buzzing along the lakeshore throughout the summer.

On August 9th, two least terns were spotted. They were sitting on the No-Anchor Zone floats in the lake. And, another six least terns were spotted on September 20th.

The ring-billed gulls returned in October to take up fishing with the cormorants, again. They hung around until the cormorants began leaving in late November.

6. Raptors

Red-tailed hawks continue to be the most numerous species of raptor on the refuge. Several pairs nest here each year. Northern harriers also have become more numerous over the last five or so years. They are becoming a familiar sight, sailing low over the native grass fields. Other raptors seen during the year include: Swainson's, Cooper's, sharp-shinned, osprey, rough-legged, merlin, American kestrel, turkey vulture, peregrine falcon, and bald eagle.

Screech owls continue to inhabit wood duck boxes, so at least something is making use of them. Great horned owls are common, and nest here. An occasional barred owl is spotted now and then. We continue to watch for barn owls, but this bird does not seem to be gaining ground in our area.

The most unusual raptor this year was an immature golden eagle. The bird showed up in the fall and preyed upon the snow geese with the bald eagles.

7. Other Migratory Birds

The annual Spring Bird Count was held on April 27th. Many local Audubon members participated in counting 102 species. Unusual birds included loggerhead shrike, lapland longspur, and a palm warbler.

Windy storms with heavy rain over Memorial Day weekend blew many baby birds out of nests. It was a harsh, wet spring for the young.

Woodcock, common crows, belted kingfishers, bluebirds, northern rough-winged swallows, flickers, red-bellied and red-headed woodpeckers, were frequently observed during their respective nesting seasons. (Picture) A nesting colony, of northern rough-winged swallows, which had burrows on the northern most bank of the lake, lost the majority of their nests due to high water eroding the banks. On July 11th, a large flock of about 200 northern rough-winged swallows lit on the paved road near the headquarters. The birds sat there for over three hours. They would barely get out of the way of cars, and at least ten didn't get out of the way in time.

Red-winged blackbirds and yellow-headed blackbirds take up residence each summer in the wetlands.

The Christmas Bird Count was held on December 22nd. Again, the Omaha Audubon Club gave of their time and expertise to count 44 species of birds. It was a cold, rotten day, which attributed to the low count.

Three ravens frequented the east side of the refuge in late December, and were reported in Missouri Valley, as well.

A scissor-tailed flycatcher was observed several times by a local bow hunter this fall. The bird was spotted in a stand of timber by Loveland, about four miles east of the refuge, rarer than hen's teeth!

8. Game Mammals

The browse line, which has become more prominent the last few years, attests to the increasing white-tailed deer herd. These are the only resident big game animals on the refuge. Deer seemed to be everywhere this year. Large groups of 30 to 60 animals were seen daily, feeding out in the fields.

No aerial counts occurred this year due to insufficient snow cover. The usual spotlight count, before the muzzleloader deer hunt, was done on the 26th of November. This trend count is focused on the hunt area (Center Island). A total of 249 deer were observed with spotlights.

10. Other Resident Wildlife

Pheasant numbers continue to flourish. Northern bobwhite quail are not doing nearly so well. Broods are seen each spring, but in no great numbers.

Several new beaver lodges were observed around the lake. Areas on Sandbar and many scattered places around the lake are being cleared by these voracious chewers. Muskrats are thriving also, despite high water. Their mounds dot the shoreline.

More and more people are spotting mink. One even ran into the boat house, and checked out two of the staff working on the boat trolley.

Coyote numbers are very high. These adaptable creatures go from eating fawns in the spring, to mulberries in the summer, to snow geese in the fall. They are excellent at crawling up to the feeding flocks, and leaping up to grab a goose as they flush. The folks in the visitor center viewing galleries often get a super show.

From the 14 turkeys released on the refuge in 1986, we now have turkeys everywhere. Groups of 10 to 30 are a fairly common sight for visitors driving the refuge. Over 20 turkeys have taken up residence on the Nebraska side of the river, as well.

11. Fisheries Resources

DeSoto's fisheries program has been active again this year, with both good news and bad. The good news is that two large-scale habitat improvement projects were completed, which included the addition of considerably more structure (trees and pallets) added to the lake, that stocking of game fish continued, that commercial fishing efforts were down but still productive, and that our fall shocking survey was revealing. The bad news was that the gizzard shad population is growing, and that they may already be too large and voluminous to plan on white bass or other predator fish being able to control them.

During the refuge's annual electroshocking survey conducted in the fall of 1995, considerable numbers of 3-5" gizzard shad were discovered throughout the lake. These open, mid-water fish probably re-entered the lake during the flood of 1993, possibly migrating through our inflow agricultural drainages during the peak of the flood along the Missouri River. In an attempt to control these very prolific schooling species, we stocked 327 white bass in April, six to 14-inches long. It will probably take at least three years before these fish are large enough (1-2 lbs.) to have any positive impact on the gizzard shad population. The white bass stocked were netted from the Mississippi River. We should be receiving additional white bass in the next several years to supplement the initial stocking. Even with this early effort, we may not have caught the gizzard shad proliferation in time. Gizzard shad were one of the main species that took over the lake in the early 1980's. We are possibly looking at a similar scenario in the not-too-distant future.



For the third consecutive year, ROS Van Riper coordinated the building of 115 fish habitat structures for DeSoto Lake, with the help of 25 volunteers and our mobile crane.

18-255-96, HP

The volunteers are primarily BASS Club members from western Iowa and eastern Nebraska, who, this year, donated over 100 hours, while using some 400 pallets and 500 concrete blocks in building critically-needed fish habitat structures. All materials were donated from Omaha businesses, and all structures were eventually placed in water 8 to 10-feet deep. Mother Nature played a dirty trick on us this time around, however. The week after building all 115 structures, we lost our ice for transportation via ATV's.

Thanks to our innovative maintenance crew, use was made of an old pontoon boat to move the structures to their rightful resting place.



18-256-96, HP

With the shortage of aquatic vegetation in DeSoto Lake, due in part to the heavy sediment loads that deposit in the lake after significant rainfall events, these artificial structures will provide long-term shelter, as well as benefit the recreational angler. In the last three years, a total of 283 structures have been built, with over 340 hours of donated volunteer time. We have witnessed numerous stringers of crappies, and a number of large-mouth bass, that have come from this man-made habitat.



18-260-96, SV

A second habitat project was the completion of the cedar tree-habitat project that we started in the fall of 1995. A Sicorky S-58 helicopter was contracted to airlift the tree bundles and weights out to the 40-plus buoyed locations throughout the lake.

This project was completed on September 1st, funded primarily by the Service's recreational fisheries program. Efforts included the cutting, hauling, and placing of over 220 large (30-50') red cedar trees in DeSoto Lake at predetermined locations. The trees were then weighted down by 1,200-2,400 lbs. of concrete in two-four 55-gallon barrels, attached in pairs by cable.

The cedar trees used for this project will provide critically needed vertical structure for numerous gamefish species. Trees were made available from a timber-stand improvement project in the Loess Hills State Forest. Nearly all of the anchoring materials were donated by local businesses. Arrival of the majority of our snow geese last fall delayed the completion of this project until this fall.

Stocking efforts in DeSoto Lake included 327 6-14" white bass on April 30th, which were the first white bass ever stocked in DeSoto Lake. Also stocked were 2,240 four-inch walleye on September 19th, and 1,831 channel catfish (7" to 8") on September 24th. The white bass and walleye were delivered by Genoa Fish Hatchery, and the catfish were caught and delivered by the Iowa Department of Natural Resources.

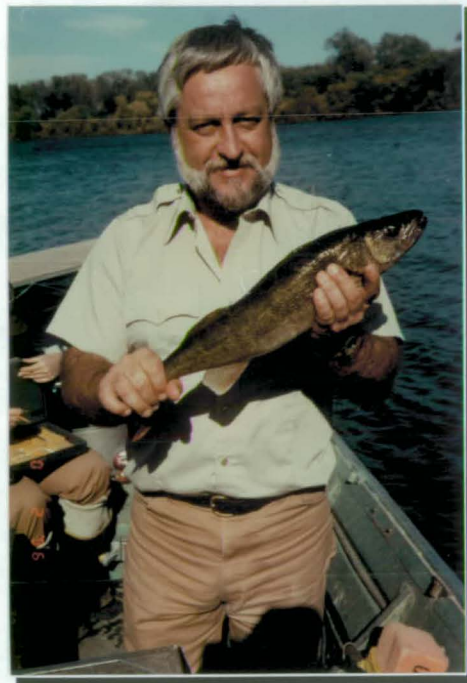
Commercial fishing permits were issued to two commercial fishing operators. Permits were issued starting on April 11th and running through September 17th. The total harvest for the year, including carp and buffalo, was 18,092 pounds. This is down considerably from last year's total of 34,028 pounds. The major commercial fisherman had health and help problems during the better part of the year, hence the lower numbers. The total for the preferred buffalofish was 16,447 pounds, and 1,645 pounds for the less marketable carp. A total of six dead bass, walleye, and northerns (combined) were recovered from the 3.5 inch trammel nets used by these commercial fisherman. This is negligible, compared to the nine tons of roughfish removed.

During the week of October 1st, FAO Project Leader Jim Milligan, his assistant, Joanne Grady, Iowa DNR fishery biologists and ROS Van Riper conducted the refuge's annual electro-shocking survey of DeSoto Lake. The purpose of the survey usually is to monitor fish species composition and relative abundance. Results may be skewed due to the very high water level. The pool stage was 994 msl, and normal operating level is 989.5 msl at this time of year.

The survey indicated that the lake is dominated by non-game and forage fish; primarily, common carp and gizzard shad. This is no surprise to anyone. Also, black bullhead and large-mouth buffalofish have continued to decline since 1994. This may in part be due to the reintroduction of flathead catfish, which feed on bullheads, and the commercial netting of buffalofish. Bluegill are still relatively small and stunted. However, there has been some increase in size from 1993 through 1996. Black crappie are undersized, and may be in competition with shad for zooplankton.

The white crappie are good sized, and are increasing in numbers. Common carp numbers are increasing, but their condition is poor. They have probably out-grown their habitat and available food supply. The gizzard shad population is continuing to explode. The white bass population will have a difficult time controlling the significant jump the shad have now, with three age classes since the 1993 flood.

The walleye population appears to be stable. Supplemental stocking surely helps. Electroshocking efforts don't effectively cover their normal habitat here. Once in awhile, one comes to hand. It would help if we could keep the fishery biologists from fondling them!



18-259-96, SV

The large-mouth bass population consists mainly of young fish, 75-200 mm in length. The larger fish are reproducing well; however, the young of the year are not recruiting into the population. Either the young fish aren't large enough to survive their first winter, or are being consumed by other fish, or piscivorous birds. Bass sampled were in good condition.

Conclusions from the annual electroshocking survey indicate that management needs to reduce the carp (16 to 21 inches) population, possibly by allowing slightly smaller mesh size on nets used by commercial fisherman; secondly, monitor bluegill, gizzard shad, and white bass numbers and competition; and, thirdly, continue efforts to increase fishery habitat.

On the 19th of August, a dieoff of roughfish, primarily buffalofish, was noticed along the DeSoto Lake shoreline, especially on the east side of lake. This dieoff of approximately 500 buffalofish, a few carp, and a bass or two, occurred without any advanced indications of unusually warm weather, or a heavy rainfall event that might have discharged agricultural chemicals into the lake, or even a noticeably large algae bloom. However,

there was a significant lack of oxygen below four meters in early August. Dissolved oxygen readings were less than one ppm at 4.5 meters and again at 5.5 meters. Actually, readings below 3ppm were evident in July, and ran through late August. This is not particularly unusual, but this relatively large dieoff is not a normal event.

Finally, on the 14th of May, commercial fisherman Jesse James caught the first shovel-nosed sturgeon taken from DeSoto Lake that we are aware of. It was released back into the lake.

17. Disease Prevention and Control

Avaian cholera was the only disease problem encountered this year. On December 11th, 18,000 snow geese were still keeping a hole open in the ice by the visitor center. Twenty-one snows were picked up that day. On the 12th, another 10 snows and one scaup were found dead. On the following day, thirty-one snows and one Ross' goose were picked up. During the 16th, and 19th, there were eight and three birds dead, respectfully. The open hole froze over on the 20th, but still over 5,000 birds remained, loafing in a field for several days. However, we did not see any signs of avaian cholera after the 19th. More than likely, the coyotes got to them.

A carcass incinerator was purchased this summer from Burn Easy Animal Carcass Incinerators in Decatur, Indiana. Toss them in and set the timer. No more standing around stirring smelly carcasses. It is well worth the \$2,070. There are even better ceramic-lined incinerators, if you have the big bucks they require.

H. PUBLIC USE

1. General

We had high water by April, and throughout the summer and fall as DeSoto Lake flooded---and, so too, the jetties, parking lots, and nature trails. And, although the geese arrived on time in November, they were not visible to the public for awhile, which also impacted visitation. The net result was that refuge visitation of 235,916 people was 22 percent less than in 1995. This is way below the 10-year average of 340,095 visits.

The DeSoto Visitor Center is normally open every day of the year, except for four holidays. The visitor center hosted 119,438 people this year, a 19-percent decrease from last year and our lowest use ever. This is mostly because we had five days of furlough closings in early January, and less than normal visitation in November and December, due to poor weather. The ten-year average for visitor center use is 152,694 visits.

Visitors were encouraged to come and participate in a full-range of wildlife-dependent activities. Interpretative visitation

remained at the 10-year average. Non-wildlife recreation remained low, because it is no longer encouraged. A decade ago, people used the refuge for a high level of sunbathing, swimming, power-boating, and waterskiing. The now refuge attracts visitors who genuinely appreciate it for passive wildlife observation and environmental education.

We have several consumptive uses on the refuge. The hunting programs consist of a controlled waterfowl hunt, a muzzleloader deer hunt, and two archery deer hunts. We had about the same number of waterfowl hunters this year, and a decrease in warm-water fishing use. Mushroom hunters decreased from 4,991 visits in 1995 to 3,743 visits this year, due to a dry period and few resultant morels.

Non-consumptive wildlife recreation decreased this year, to below the 10-year average. Wildlife observation, trail use, boating, photography, and related picnicking, declined due to flooded DeSoto Lake. Overall, however, the general trend has been a steady increase since the 1984 closure of DeSoto Lake to active (non-wildlife) recreation.

Summer visitation, through Labor Day, totaled 83,457 people; with 3,996 people on Memorial Day weekend, 5,538 on the July Fourth weekend, and 4,806 on Labor Day weekend. In the past, water recreation (swimming and boating) attracted up to 10,000 people on any of these holidays. Overall, this season's use was down 24 percent from last year, when we had 110,464 visits during the summer season.

Our public-use season was extended from September 30 through October 14 (like last year) to maximize the potential for fishing. But, use remained light during the period due to the extremely high lake levels, flooded jetties, and parking lots.

The snow goose migration was on time, despite concern that the waterfowl might bypass us. Many of the geese followed the harsh weather fronts of late October and early November on south. But, By November 14, we had 250,000 geese; 600,000 by November 20. However, the geese remained hidden from public view at Prairie Lane and Center Island fields for weeks. On November 20, they moved to the Bob Starr Wildlife Overlook and close to the visitor center. November is normally our busiest month of the year. The crowds came, though not so many as last year. Last year's visits to the refuge in November totaled 57,239 (and, we have had as high as 88,000). This year, only 28,803 came, a 49-percent decline; no doubt mostly because of bad weather.

November is often a nightmare of traffic backed out onto U.S. Highway 30, parking lots overflowing, with officers directing traffic all weekend, etc. This didn't happen this year. Generally, weekday visitation was well-paced, and weekends a bit busier. Everyone was pleased with the sights and sounds of our

snow goose spectacle after the birds finally moved to the west arm of the Lake around Nov. 20. DeSoto was hardly overrun with people. We peaked with 2,200 visitors on Sunday, Nov. 24. Quite a difference. Everyone was able to get into the visitor center. Refuge officers directed traffic at the Bob Starr Overlook; this was necessary even with this reduction in visitation.

The three-day Thanksgiving weekend attracted only 3,425 visitors, despite the presence of 600,000 geese. This was down 72 percent from last year. Part of the problem was probably public doubt about whether the waterfowl were even viewable at DeSoto. We spent much effort early in November telling the media the truth about how difficult it was to view the birds. Then too, there was doubt about whether federal agencies were really open, again following last year's government-wide furlough fiasco.

Comparative Visitation Data (Activity Hours)	Ten-Year Average	1996
Interpretation	440,189	424,977
Visitor Center	152,351	119,438
Environmental Education	10,515	9,174
Consumptive Wildlife Recreation	35,904	15,213
Non-Consumptive Recreation	263,276	221,566
Non-Wildlife Recreation	1,913	3122
Total Activity Hours	772,481	674,052

a. Entrance Fee System

This was the ninth year of entrance-fee collection. Convenient self-registration stations are located near both entrances and another is located in the visitor center. The daily fee is \$3 per vehicle. Commercial vehicles pay \$20 daily, or \$30-if more than 21 people are aboard. Compliance has been pretty good, and we usually make no special effort to enforce it, other than cursory checks.

"Pay here if you play here" is Service philosophy. It may be good for WASO, but the cost effectiveness of this program remains poor. A total of \$90,367 was collected in entrance fees and passes during the fiscal year, but collection cost the refuge over \$35,000. And, now the local kids have learned how to collect our fees, too! (See Section H.17). The refuge gets to keep 30 percent, but this nowhere near covers the cost of selling, collecting, double-counting, and doing the reporting. There has been no gain for the refuge, and it takes staff time away from more important wildlife and people management responsibilities. In addition to the time spent dealing directly with the receipts, the staff

also spends a great amount of time trying to explain the fee system and the variety of passes to the confused public. Without doubt, the fee booths cause traffic tie-ups during busy November weekends.

Fiscal year Entrance Fee Data				
Year	Refuge Cost	Receipts	Permits Issued	Refuge Visits
1988	\$19,483	\$60,534	30,267	382,003
1989	\$23,039	\$61,750	30,876	386,030
1990	\$20,145	\$56,087	28,044	390,929
1991	\$23,590	\$48,684	24,342	371,139
1992	\$26,167	\$54,317	27,159	313,584
1993	\$46,070	\$64,137	18,689	297,475
1994	\$35,751	\$76,398	20,888	302,727
1995	\$35,000	\$85,832	25,730	309,288
1996	\$35,000	\$90,367	24,275	270,998

Entry fees collected were up five percent this year, and we sold 6 percent fewer permits. Sales of single-day permits were up 7 percent, and sales of Golden Eagles were down 13 percent. Duck Stamp sales increased 36 percent. Golden Age Passes increased six percent, and we received 14 percent more group/commercial permit revenue.

Although the federal government now seems compelled to charge fees, we still believe our entry fees drive away many potential visitors. Iowa parks, such as the adjacent Wilson Island State Recreation Area, do not charge entrance fees.

Entrance Fee		
Type of Permit	Number	Receipts
Single Visit	22,719	\$67,525
Groups/Commercial	67	\$2,197
Golden Eagle	176	\$4,400
Golden Age	435	\$4,350
Golden Access	85	FREE
Federal Duck Stamp	793	\$11,895
Total	24,275	\$90,367

b. Public Information

The staff responded to 16,000 public inquiries, slightly fewer than last year. This includes 12,714 telephone responses, and 3,227 written responses. All of this keeps the phones ringing and the computers humming.

Forty-two news releases were sent to news media in Iowa and Nebraska, as well as major Kansas, Missouri, and South Dakota media resources. Our mailing list consists of 225 television, radio, and newspapers; this covers the major small towns in our two-state area. Special information was provided to the *Omaha World Herald*, *Blair Enterprise*, *Missouri Valley Times*, *Des Moines Register*, *Council Bluff's Nonpareil*, and *Lincoln Journal-Star* newspapers.

Twenty-six interviews were granted to newspapers, and 24 to TV/radio representatives. Topics included goose migration, art show, fishing, auto-tour, the *Bertrand* collection, and our special exhibits.

c. Public Relations

Most television and newspaper coverage continues to be focused on waterfowl. We had much coverage by local and regional stations and newspapers. In fact, it seemed at times, like a game of one-up-manship was underway, each company trying to do a better story than the other. Special arrangements and interviews involved considerable time from the refuge staff, but the net result was continued excellent coverage.



A highlight this year was the "Virtual Field trip" for Iowa school children, which was made possible by Iowa Public Television and the Iowa Communications Network.

N96-37, ST

Bruce Weber, Jeanne Harold, and Mindy Sheets hosted parts of a "live television broadcast" on November 20. This was a pioneering program to test the fiber-optic cable network

that links most Iowa schools. The program focused on snow goose and steamboat resources of the refuge, and allowed kids in fifty (Yep, 50!) classrooms to listen to an hour-long presentation, and interrupt with questions. The program was successful and effective, but also quite confusing, at times, when everyone wanted to talk at once. Iowa Public Television, which had a mobile tv station on site and eight staff, complimented us on the effort. So did the teachers in their program evaluations. More virtual field trips are certain to be in DeSoto's future.

Publicity brings new "friends" to the refuge from hundreds of miles away; ie. Denver, Sioux Falls, Kansas City and Davenport. We are a major regional attraction. Once they arrive for an event like an exhibit or the waterfowl spectacle, they usually get turned-on by the steamboat cargo collection and Missouri River history, also.

d. Off-Refuge Programs

The refuge film library loaned 31 films and videos, reaching a combined audience of 2,486 people, 50 percent more than last year. Films were loaned to schools, the Iowa Department of Natural Resources, scout groups, historical societies, senior citizen centers, and other national wildlife refuges.

Members of the staff gave 23 off-refuge programs. Examples of the diversity of the presentations: ORP Weber served as instructor at "H₂Omaha Riverfest", giving a program, on FWS-Missouri River involvement, six times to a total of 1,500 4th and 5th graders.

He also gave an Earth Day program to 400 youths at the Winnebago Indian Reservation in northeast Nebraska. Cute, Huh?



43-127-96, BW

ROS Van Riper set up a booth, and spoke with 100 students at Missouri Valley Middle School Ecology Fair, Steve also talked about fire ecology to 30 students at St. Patrick

School. Other programs were given to service clubs, history clubs, libraries, and schools, and ranged a variety of requested topics.

In what has become a yearly ritual, the museum specialist participated in Dana College's "Expanding Your Horizons" Conference, by sitting on a panel of professionals who encourage junior high and high school girls to pursue education and careers in math and science. It isn't easy to keep the attention of 700 13-year-old girls! This year, acting in the capacity of museum curator, the museum specialist also participated in the State of Iowa's Museum Review Panel, determining which requesting museums and organizations will receive state grant monies for improvements to their museums and collections.

e. Signs and Publications

We received numerous signs from the FWS Sign Shop in Winona. Wilderness Graphics Company began work with refuge staff to upgrade interpretation at the VC kiosk, and create waysides for "Native Grasses" and "Farm Program" themes, but these hadn't arrived by year end.

We reordered 60,000 entry fee envelopes from the Government Printing Office. This time around the envelopes were given series numbers, glue strips, a printed tear-line, and reduced slightly in size to fit the distribution box. Unfortunately, they did not come "folded" for the distribution box, as requested, so we contracted with Crossroads of Western Iowa (Missouri Valley) to have their clients manually fold the envelopes. This cost \$254.

We also reordered 65,000 standard DeSoto (map) brochures from the Government Printing Office. This cost approximately \$5,000. On this version, we added our fee information to the back page, doing away with the need for printing an extra insert. We made about 25 smaller changes. The big change was redefining refuge hours to "¼ hour before sunrise to ¼ hour after sunset", consistent with Boyer Chute.

We also photocopy numerous flyers: "1996 Events Schedule," "Student Wildlife Art Show," "DeSoto Art Show and Sale," and "Photo Show Information flyer" for limited distribution. By putting the information in two-sided "flyer" form, we save the multiple sheets of paper we formerly consumed. The computer and quality copy machine have been revolutionary in improving our special flyers. The public use office still lacks CD Rom, E-Mail, Internet, and adequate clip art.

f. Access For the Disabled Visitor

We get a large number of disabled visitors (ie wheelchair-confined, blind, hearing impaired etc.) and senior citizens. Disabled visitors generally get around, and have a good time. This is a pretty user-friendly refuge. However, we are always working to make things better for them. The automatic door openers installed at the visitor center men's and women's toilets last year, like the set installed at the visitor center main door, work well. We also have a wheelchair available, and have put the text of our films and audio messages in print for the hearing impaired. Out on the refuge, we now provide accessible porta-toilets whenever we seasonally rent toilets.

2. Outdoor Classrooms - Students

The refuge is active with students and classes most of the year. A total of 8,532 students (319 classes) were involved in environmental education programs. Teachers supervised many of their own classes at the refuge, and also borrowed films, slides shows, and videos to use back in their classrooms.

January through April brought 1,617 students to the refuge. May was, by far, the busiest month with 2,907 students (139 classes). During the summer, class visitation is low, and we had just 490 students. During September through December, we had 3,781 students (190 classes). Overall, the majority of our classes work on the "Artifacts and Lifestyles" cultural resources packet provided during their spring visit. As part of a full two-day EE program, the four, fifth-grade classes from Blair's Arbor School even got instruction in canoeing and cooking breakfast over an outdoor grill. In the fall, most students come to learn about "Birds in Migration".

"Prairie Appreciation Week" is held during the second week in September. This program teaches the students the historical importance of prairies. We have both indoor and outdoor lessons. A total of 219 students (four schools) were accommodated during the three-day program. The weather was marvelous and prairie grasses were at their peak. We conducted 16 separate sessions, and used the grasslands adjacent to the visitor center as the field site because it was lush, having been burned in April. Four volunteers conducted the classes, along with the outdoor recreation planner.

Because of limited interpretive staff, we must depend on refuge volunteers to help with most education programs. Volunteers are first assigned to new groups, and then to as many repeat-user groups as can be scheduled.

About a dozen college classes used the refuge, including Creighton College, Clarkson College, Dordt College, Westmar College, the

About a dozen college classes used the refuge, including Creighton College, Clarkson College, Dordt College, Westmar College, the University of Nebraska, Iowa State University, Iowa Western Community College, the University of South Dakota, Morningside College, Hastings College, and Northwestern College.

Outdoor Education - Fishing Clinics



18-257-96, SV

In observance of National Fishing Week, about 35 Omaha boys and 30 minority adult volunteers from inner-city Omaha enjoyed a day of refuge fishing and boating on Saturday, June 1.

Commercial fisherman Jesse James and volunteers from the Service, the Iowa Department of Natural Resources, Nebraska Game and Parks Commission, F.B.I., and U.S. Army Corps of Engineers assisted in providing everything from fish and reptile identification, to knot-tying and casting. Only half the expected number of participants showed up. Nevertheless, the day culminated with a fish fry, in which over 50 pounds of buffalo-fish and walleye were consumed. The kids also caught about 50 pounds of carp during the event. The youths received instruction in fish cleaning, and performed a litter clean-up.

On July 13, Manager Gage participated in a fishing clinic at the Omaha Indian Reservation, to help 80 Indian youth learn fishing techniques.



45-166-96, GG

Though it might seem strange, even though the reservation adjoins the Missouri River, fishing is not popular recreation for tribal numbers. Most of these kids had never held a fishing pole before. But, they caught fish!

A second refuge clinic was held on August 10, with 65 youths participating. On August 30, a third clinic was held in cooperation with New Zion Baptist Church, with 50 participants. Retired Special Agent Cleve Vaughn, (now retired U.S. Marshall for Nebraska), organizes these clinics, and does a fine job of sparking the outdoor interests of urban minority youth.

4. Interpretive Foot Trails

The four refuge foot trails were used by over 30,000 visitors. Volunteers performed 'trail patrol', picking up litter and pruning overhanging branches, plus periodically restocking the Wood Duck Pond and Cottonwood Nature Trail dispensers with interpretive leaflets. Guided tours of the trails were provided to 1,855 visitors (approx. 100 groups). Volunteers provided the majority of these tours - mostly for conservation-oriented tour groups that called ahead for reservations.

5. Interpretive Tour Routes

The Auto Tour usually runs from October 15th through November 30th. The current route ends at the new "Bob Starr Wildlife Overlook", and people return over the same seven miles of paved road. Generally, this route continues to be well accepted by the public, even though it means they are excluded from the unpaved (and dusty) gravel part of the road that continues the loop around Center Island.

As usual, the best overall snow goose viewing was from the visitor center windows. They became viewable from the visitor center in mid-November, after "hiding" for two weeks in the closed part of the refuge. What actually brought the geese around the bend? Two powerboats, which we "parked" on the east arm of the lake! Not much time was spent at the Bob Starr Overlook this year, even though the geese used this new, fenced structure last year. Goose photography and goose watching was really good after mid-November. The public had been warned (accurately) by the media that geese were tough to view this year. Unfortunately, this caused many potential visitors to stay home.

Cottonwood Trail's picnic ground was kept open during the auto tour, as was the Bertrand Excavation Site and the Missouri River Overlook. These sites help to disperse traffic during peak-visit periods. More than 35,400 people drove the tour route during the 47-day period. Compared to previous routes, this one reduces law enforcement problems, reduces the amount of special signing that

had previously been required, and eliminates traffic disturbance at the eagle roost, since it no longer passes nearby.

6. Interpretive Exhibits and Demonstrations

Rehabilitation of our interpretation facilities continues. Marvin Cook of Wilderness Graphics is contracted to solve interpretive needs in the visitor center, on the refuge, and, particularly, at the new Boyer Chute National Wildlife Refuge. Wilderness Graphics has done an excellent job of providing well-designed and durable interpretive panels for Boyer Refuge and DeSoto Refuge roadsides, and, in 1997, will update the visitor center's interpretive media. All this follows a 1994 station evaluation, in which a high priority was given to upgrading the refuge's interpretive message; including the 16 year-old visitor center exhibits and providing the Service's ecosystem message, (ie. the Missouri River story).

a. Self-guided Exhibits

Visitation at the DeSoto Visitor Center was 119,438, a 19-percent decrease from the previous year, and well below the ten-year average of 152,694. The early months of the year are cold and windy, and therefore sparse in visitation. Spring use of the center picks up, and, of course, fall use is usually very heavy. Half of our visitation usually comes in September, October, and November.

November drew 27,803 people to the visitor center, a quarter of the year's total. But, this November's visitation was 49 percent less than last November's 54,186. Since this was the peak of the waterfowl migration, it was a disappointment to the staff. This decline was due to a combination of poor weather and waterfowl that insisted on hanging out in the closed section of the refuge during the first half of November. "Where are the geese?" was all too frequently asked; especially by the media. Word got out. Fewer people came. We had 72 percent fewer visitors over the Thanksgiving weekend than last year. Thanksgiving is typically one of our best weekends. Instead of being "maxed out" (parking lots, fee collecting, and toilets), everything purred along nicely.

Either one of our two orientation films "Seeds of Change" and "Off The Beaten Path" are generally shown hourly during the week, and on the half hour on weekends and during heavy-use periods. A total of 20,025 people viewed these introductory films, in addition to all school groups. Our special weekend wildlife films were viewed by 2,833 people.

The DeSoto Visitor Center contains exhibits on cultural history, natural history, wildlife, conservation, and Service-oriented displays. Two galleries feature displays about the Steamboat **Bertrand**, which sank in 1865, and the

effects of westward expansion on the habitat and wildlife of the Missouri River Basin.

Various exhibits are displayed in the visitor center throughout the year. A wildflower photo book, a morel mushroom photo book, a bird reporting book and an information book on the FWS System are placed at the information desk during the appropriate seasons, and these are regularly updated.

The visitor-activated three-minute steamboat excavation video is viewed on a 21-inch monitor in a 'shipping crate' in the Cargo Viewing Gallery. The VCR and monitor generally work well in the 'crate'. In the visitor center lobby, we show a four-minute video of DeSoto's wildlife, produced by volunteer Bob Horton, who has captured hundreds of hours of our wildlife on tape. Both visitor-activated videos are popular, but tapes and machines need regular maintenance when they are viewed 15-20 times a day, throughout the year.

Also requiring increased maintenance are the three LaBelle 8-track audio interpretive systems, which operate 22 telephone handsets. After 15 years, tapes are wearing out, hand sets and cradles are breaking, and the LaBelle players themselves are developing irreparable buzzing problems. This year, we sent two LaBelles to North Carolina, the only shop in the nation where they are still serviced. This is now "old" technology, and we plan to eventually replace the machines with solid-state players. In the meantime, Lines of Communication Co. Omaha, came to the visitor center to repair 11 broken audio handsets (out of 22 total). It did a fine job of repairing these electronics, which we couldn't do in-house.

In April, the Sony multi-scan video projector in our theater failed, and we had it repaired by John Zimmerman of Audio Visual Incorporated of Omaha. The large-screen theater system continues to be a very effective way of interpreting to visitors.

Binoculars are available for free use in the visitor center. We use nine rubberized, Minolta 8 x 40s. This service is very popular with waterfowl and eagle observers. Damage to loaned binoculars is infrequent; we keep a driver's license as security. Watchable Wildlife funding provided five of our nine Minolta 'loaners' several years ago. The station also issues three copies of National Geographic's Birds of North America for visitor loan.

1996 Visitor Center Exhibits and Activities	
March 9 - 30	Student Wildlife Art Exhibit
April 5 - 29	Wildlife Art of Jack Vitito Exhibit
April 22-27	National Wildlife Week Exhibit (Suitcase for Survival)
May 4	Talk - "Loess Hills Natural History"
May 18-June 22	Annual Wildlife Photography Exhibit and Sale
June 15	Talk - "How Native Americans Use Wild Plants"
July 20	Talk - "Reptiles You'll Like"
July 1 - 31	Outdoors Writers of America Photography Exhibit
August 3 - 31	Lost Towns of Iowa Photo Exhibit
September 7-15	Prairie Appreciation Week Exhibit
September 28 - October 26	Annual Wildlife Art Exhibit and Sale
October 19	Talk - "Lakota Music and Stories"
October 15 - November 30	Wildlife Auto Tour
November 1 - December 30	"Birds in Migration" Taxidermy Exhibit
December 1-30	"Iowa's Wild Places" Photography Exhibit

DeSoto Visitor Center houses a variety of excellent special exhibits. The first generally is the Student Wildlife Art Show throughout the month of March. This year was the 13th annual showing. There were 169 works, from 50 classes in 15 Iowa and Nebraska schools (K-12). Award ribbons were provided, and all participants received a personalized parchment certificate. Judges were Professor Milton Heinrich (Blair), Tom Walker (Harlan), and Penny Christensen (Neola). Over 6,753 visitors enjoyed the exhibit in the center's multi-purpose room.

From April 5 to 29, we exhibited the wildlife art of Jack Vitito. He's from South Sioux City, Nebraska, and displayed a room full of his bird and feather carvings, as well as wild animal paintings.

From May 18 to June 22, the center hosted the 13th Annual Wildlife Photography Exhibit and Sale. The exhibit included 442 photos by

eight Iowa and Nebraska photographers. A fifteen percent commission and \$25 per photographer entry fee brought \$358 to the co-sponsoring Midwest Interpretive Association. A total of \$1,051 worth of local photography was sold. More than 10,000 people saw the show.

From August 3 to 31, we exhibited "Lost Towns of Iowa." This is an exhibit of John Deeson's black and white photographs, in which he records old towns that are quietly disappearing from the Iowa map. These pictures, made with an old wooden 8 x 10 view camera, portrayed nostalgic scenes of landscapes and lifestyles, and proved popular with our visitors. Co-sponsored by the Iowa Humanities Board.

During September 7 to 15, Prairie Appreciation Week was held. A multi-purpose-room exhibit of prairie grasses and wildflowers was set up for environmental education classes during the weekdays, and also was open to general visitors during the weekends.



Volunteers went afield with students to conduct prairie appreciation exercises. A total of 219 students (four schools), primarily fourth graders, participated.

45-160-96, BW

Sixteen separate sessions were given. While the exhibit was up, DeSoto hosted the meeting FWS Directorate meeting.

The 14th Annual Wildlife Art Exhibit and Sale was held during September 28-October 26. Some 235, two-and-three-dimensional works (paintings, carvings, and sculptures) by 27 Iowa and Nebraska artists were displayed. Sales totaled \$2,544. The Midwest Interpretive Association retained \$1,057, being the 15 percent commission and a \$25 entry fee. Nine volunteer artist/demonstrators were featured on weekends during the show, sharing their skills and personalities with visitors. More than 19,000 visitors saw this show.

From December 1 to 30, we hosted the exhibit "Iowa's Wild Places." This is a traveling exhibit of color photos by Carl Kurtz, highlighting Iowa's diverse natural beauty and wildlife. This

exhibit, seen by 5,500 visitors, was sponsored by the Iowa Natural Heritage Foundation.

In addition, we hosted several outside speakers for Saturday afternoon talks in our theater. Pam Cates, Harrison County Naturalist, spoke May 4 about "Loess Hills Natural History." Kay Young, Naturalist at Lincoln's Pioneer Park, spoke June 15 about "How Native American's Used Wild Plants." Kay wrote the book on this subject, published by the University of Nebraska Press. Chris Williams, Pottawattamie Conservation Naturalist, gave a talk July 20 on "Reptiles You'll Like," and brought specimens. Steven Stacy of the Sioux Tribe gave a program October 19 about "Lakota Music and Stories," sponsored by the Nebraska Humanities Board. Thirty to fifty people attended each talk.

b. Bertrand Museum

Curation. Initial contacts were made from the Mystic Seaport Museum in Connecticut, upon request of a loan of **Bertrand** objects. The museum is planning a three-year display, entitled, *America and the Sea Exhibition: Coastal/River Transportation: Traveling Around America*. The exhibit includes a re-creation of the **Steamboat Bertrand** cargo space, and is scheduled to open in the spring of 1998.

We continue to work with contractors at Nebraska Educational Television, who are producing a multi-media computer kiosk to be installed in the visitor center. Untold hours were spent entering catalog information and scanning artifact photographs. This data will allow visitors to access the Bertrand Collection catalog records for all objects on display. We also have continued to work with the Washington, D.C. office in making Bertrand Museum information available to the public on the Internet, with a Bertrand Collection Home-page.

Museum Display/Cargo Storage. Two new, large vitrines were installed over exposed objects in the theme galleries this year. The plow and mud drum are now safe from visitor abuse, airborne soils, and rapid environmental fluctuations. All objects in the theme galleries are now protected by secure cases or vitrines, thus mitigating another deficiency pointed out in the past I.G. audit.

In February, a Hostetter's bitters bottle was stolen from a display cube located in the entranceway exhibit area. The theft was perpetrated due to obsolete display cases, which had become loosened and insecure over time. The perpetrator simply pried the plastic lid off, probably with a pocket knife.

Five new, locking vitrine display cases were fabricated and installed as a result of the February theft of the bitters bottle.



N96-31, ST

A lengthy Board-of-Survey process of deaccessioning the object also resulted.

Museum staff continued to monitor the museum environmental parameters with digitized hygrothermographs. IPM procedures also were routinely performed. We had a banner year for mice in the center, with 79 caught! As the building ages and settles, new ports of entry arise, and must be constantly discovered and mitigated.



N96-1, JH

Housekeeping practices of cleaning exhibits, windows, the rotation of objects, etc. are a constant chore, but never neglected.

While replacing light bulbs in the model of the steamboat, museum staff meticulously cleaned the boat - swabbing the deck, in miniature! Hopefully, this should not have to be redone for several years, as the heavy vitrine covering is very difficult to remove and replace.

Using add-on monies from the RHPO, we acquired two fire-proof file cabinets for museum documents and photographs. We also purchased HVAC services and parts.

Interpretation. Six museum tours were given by the museum specialist to interested groups. These tours included in-depth interpretation of the **Bertrand**, and the conservation of the collection. Tours included such diverse groups as the USFWS Directorate, and personnel from Iowa Living History Farms. Stefan Dobert Productions filmed one of these tours, given to teachers participating in a class, entitled *Iowa, Eye to I*. This film may be used in future productions made by the Washington Office's Historic Preservation Officer.

The **Bertrand** Museum was one of the sponsored stops for participants in Iowa Archaeology Week. Special posters and information were available to visitors. The museum also was included in a new CD Rom detailing the nation's museums, as well as in the 1997 *Official Museum Directory*.

Research. Throughout the year, a knife expert from Cedar Rapids, Iowa, has been providing us with a wealth of information about the knives in our collection.

This summer, we discovered two new names to add to the **Bertrand** passenger list, a Mr. Donaldson, and Nicholas Bielenberg. We added these early references to our archives.

Once again, we were visited by elderly members of the Ehrenberger family, who had once owned the land where the **Bertrand** lay buried for 103 years.



N96-27, ST

The three brothers, and their childhood friend (from the booming metropolis of DeSoto, NE), offered us a wealth of stories and descriptions of the pre-refuge DeSoto Bend. We were informed by them, that the steam engine from the **Bertrand** was sold to a saw mill in the town of DeSoto after it was salvaged from the wrecked steamboat.

Archaeologist, Leah Rogers, conducted a field survey on the northern boundaries of the refuge, seeking evidence of a historic settlement. A report on her findings is due next year.

7. Other Interpretive Programs

The refuge continues to attract an impressive variety of foreign visitors. They came from Nepal, Czechoslovakia, Ecuador and 37 other nations. Our registration book also records people from all 50 states, and Puerto Rico. We gave tours to 20 Japanese exchange students who came in August, and 25 German exchange students who came in July. Many foreign visitors self-tour the refuge and visitor center, and therefore we discover they are foreign visitors only after they sign our registration book.

In August, we hosted 170 members of the Lewis and Clark Trail Heritage Foundation, who came to meet from throughout the USA. These Lewis and Clark experts came to DeSoto in four coach buses as part of a day-long tour of Lewis and Clark sites. Explorers Meriwether Lewis and William Clark likely camped here the day after their council with the Indians at "council bluffs". We are now an official site on the Lewis and Clark National Historic Trail and are doing more and more through exhibits, flyers, wayside panels, and programs to bring this to public attention.



In April, we installed a 24 x 42-inch Lewis and Clark (fiberglass-embedded) interpretive panel, at our Missouri River Overlook, funded by the Iowa State Historical Society.

37-169-96, BW

The staff presented talks and programs to a variety of groups, other than student groups. A total of 81 organized groups and bus tours, containing 2,703 persons, visited the refuge. Programs on endangered species, wetland, wildlife management, and the steamboat Bertrand were all subjects for numerous programs given to visiting groups by staff and volunteers.

"Special" Interpretive Programs given in the visitor center		
Date	Exhibit Title	Artist
May 4	"Loess Hills Natural History Talk"	Pam Cates
June 15	"How Native American's Used Wild Plants"	Kay Young
July 20	"Reptile's You'll Like"	Chris Williams
Oct. 19	"Lakota Music and Stories"	Steve Stacy
October	"Wildlife Art Show"	Various artists

The Weekend Wildlife Film Series was enjoyed by 2,833 visitors throughout the year. Many of the same local folks come each Saturday or Sunday to enjoy a film. Each feature is now shown three times, both Saturday and Sunday. The series included special programs for Earth Day, Prairie Appreciation Week, and Lewis and Clark weekends. Weekend films are discontinued in November, because of normally high public visitation and crowded parking lots during the peak of the waterfowl migration.

8. Hunting

- a. Waterfowl - The twenty-third consecutive DeSoto controlled waterfowl hunt ran from November 2nd through December 5th. The hunt was held four days per week; Sunday, Tuesday, Thursday, and Saturday; half-days only. A total of 265 hunters logged 1,206 hours this year. Seventy hunters did not show-up to claim their reservations, so 36 of these openings were filled by standby hunters. The hunters harvested only 84 geese and 24 ducks. The poor quality of the hunt is evident in the fact that it took an average of over 11 hours, and nine shots, to harvest a single bird!

There were 140 advanced reservations made, using the hunter's first and second choices. A total of 48 reservations had to be rejected, due to none of the hunters preferred dates being available.

Iowa's southern snow goose season ran from October 12th through January 10th. Daily bag limit for geese were 10 birds, with no more than two each of the dark geese. Shooting hours ran from one-half hour before sunrise to

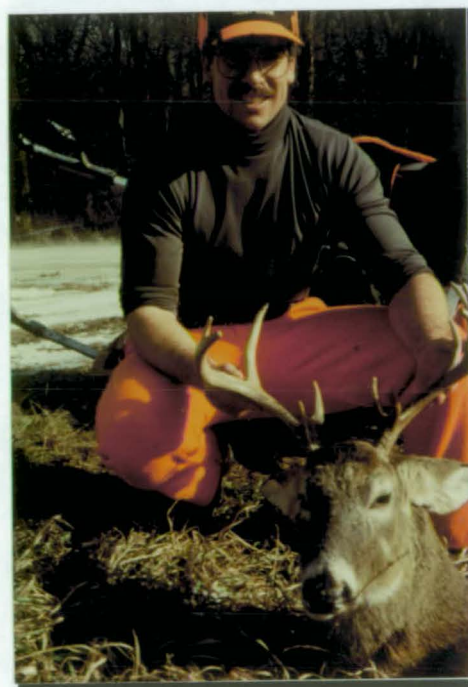
sunset. The Iowa southern duck zone season ran from September 21 to the 23rd, and from October 19th through December 4th. The daily bag limit was five ducks, which included no more than four mallards (no more than one of which could be a female), one black duck, two wood ducks, two redheads, one canvasback or one pintail.

By the last days of October, several thousand snow geese and 8,000 ducks had arrived on the refuge. Snow goose numbers had climbed to over 250,000 by mid-November. The peak number of snows was counted on the 20th of November with 610,000. Ducks peaked the same week, with just under 50,000 birds. Winter set in early, and began to drive the birds out by the end of the month. The last day of hunt was on December 5th, when only 30,000 snows and 3,000 ducks remained on the refuge.

While our hunting stunk, and the ducks never arrived in any real numbers, local goose hunters generally had a good season. Goose guide Jesse James and his hunters had a banner year, taking 617 snow geese around the refuge.

- b. Muzzleloader Deer Hunt - This year's hunt was a three-day hunt, which ran from December 7th through the 9th. A Scout Day was held on December 1st. A total of 81 hunters took the opportunity to look over the hunting area and erect tree stands. They spent 260.5 hours in the hunting area.

The Nebraska Game and Parks Commission handled the application process, and issued permits to 100 hunters. A total of 98 hunters participated in the hunt, and logged 1,871 hours to harvest 55 deer (34 bucks, 21 does). The success rate was 56 percent, a darn good hunt!



39-076-96, TT

1996 Hunt Data			
Categories	Saturday 12/9/96	Sunday 12/10	Monday 12/11/96
# of hunters	96	68	25
# of hours	1,078.5	606.5	286.0
# of deer	29	19	7

The weather was great this year, with temperatures in the 40's. There was some snow remaining in the timber. No problems were encountered with thin ice or deer becoming stranded on the ice. Researcher Kurt VerCauteran weighed and aged the harvested deer, as part of his continuing deer study.

- c. Archery Deer Hunt - The refuge hosts an archery deer hunt for both Iowa and Nebraska residents, during their respective seasons. The hunters are requested to voluntarily sign in, and report any deer taken or shot. Of course, not every hunter does this; therefore, our information is sketchy. The two hunts are very popular, and provide many people with a place to archery hunt who wouldn't be able to otherwise.



Mark Cormick of Fort Calhoun took two bucks on the Nebraska side. Note license number. A father/son team from Blair have each taken two deer there during the last two seasons. The son is now 16!

Personal, MC

Iowa hunters reported 1,001 activity hours and 20 deer taken, including 16 adult bucks. Nebraska hunters reported 691 activity hours to take 15 deer, including 9 bucks. So, at least, 35 deer were taken by archers, probably far more.

9. Fishing

The DeSoto Lake ice fishing season was sporadic, at best, due to the erratic weather and poor ice conditions. We opened for ice fishing for only two weeks in early January, before we were forced to close it on the 16th of January, due to weak ice conditions. A strong cold front then allowed us to reopen the west arm of the lake on the 19th, with accessible ice. We turned on the aeration system on the 20th of the month because of the extent of the ice and snow cover. Then, on the 31st of January we opened up the south end of the lake, as well. Finally, by the middle of February, we closed the ice fishing season, when warm weather started thawing and weakening the ice once again. Crappie and blue gill were observed in most angler's possession.

The general public-use fishing season opened, as usual, on the 15th of April, with the normal twenty five to thirty boats and anglers anxiously awaiting the first day of fishing. Ten area Bass Clubs registered for their yearly tournaments during the early bass season on DeSoto Lake. This is a catch-and-release program run through the State of Iowa. A total of 390 anglers spent 3,164 hours fishing and entered 169 largemouth of bass 15 inches or larger, with an average of 2.2 pounds per fish. A number of larger bass, weighing over five pounds were caught and released during the spring tournaments. One archery club caught 189 carp, averaging over 3 pounds each.

During the majority of the fishing season, high water some four to five feet above normal, dramatically limited fishing access and success. With the extremely high water, submerged-shoreline vegetation provided a more than adequate food source for gamefish species, and left local anglers with little to brag about. This was a complete turn-around from last year, when fishing success was good, with bass, walleye, crappie, and channel catfish all finding their way into anglers nets and stringers.

The summer/fall fishing season ended October 14th, with several small to medium sized northern pike being caught in the shallows. Also seen were a few channel catfish late in the season. On the whole, this was the slowest fishing season that we have observed in several years. Total angler visits for the year was 4,469 and their activity hours amounted to 13,094.

11. Wildlife Observation

Since DeSoto is within 25 miles of the Omaha-Council Bluffs metropolitan area, there are many people attracted to the refuge's natural habitats and wildlife viewing opportunities. Viewing from the visitor center is good in season, especially for waterfowl. The Bob Starr Wildlife Overlook, our disabled-accessible fenced concrete viewing platform, continues to function well. It can accommodate a lot more visitors at one time than the old North

Beach tower. In fact, we can accommodate visitors by the busload. The road remained open to the overlook throughout the year.

More and more, visitors today are seeing turkeys and coyotes, while viewing the refuge's several hundred white-tailed deer has always been popular. Quail and pheasant are usually visible along the roads. Many local people come out to the refuge toward the end of the day to simply drive through and see wildlife. There are even occasional sightings of mink, beaver, muskrats, raccoon, and opossum.

One of the most sought-after sightings is a bald eagle. Thousands of people come to the refuge in the fall and winter to get a glimpse of one. The eagles cooperate quite well. Not many visitors leave unhappy, even though the eagles are usually farther off than the close-up lenses of TV cameras lead the public to expect. Our Missouri River Overlook, through briefly flooded this summer, has increased opportunities for viewing eagles along the river, in season.

12. Other Wildlife-Oriented Recreation

a. Nature Trails

There are four fine nature trails. However, this summer and fall, only the Cottonwood Trail remained dry as the water of DeSoto Lake rose higher and higher.

The Missouri Meander Trail, adjacent to the visitor center, is "disabled-accessible", and usually the most used.

This short, paved trail is a draw even for the non-disabled, but, unfortunately, it was the paved part that remained flooded for eight months and remained closed.



21-108-96, BW

The Bertrand Excavation Site trail continues to be popular, but its use was reduced when a portion flooded near the floating bridge.

We also have two interpreted trails, the Wood Duck Pond Trail and Cottonwood Trail. Wood Duck Pond Trail was flooded in many places, and closed most of the year.

All the nature trails are looped, and cross bottomland terrain that is relatively flat, making it difficult for visitors to avoid wet areas.

b. Mushroom Hunting

Mushroom hunting is permitted on approximately half the refuge, from April 15 through May 31. The search is mostly for the tasty "morels." This popular activity, is akin to blueberry or blackberry picking in other refuges. People come from as far as Missouri to search our woods for morels. We recorded 1,177 visits this year, a significant decrease due to the drier spring weather. A morel mushroom information sheet was provided to reinforce public safety in this activity. It is important a topic that reporter Angie Brukew of the Omaha World Herald interviewed Manager Gage about mushrooming for the May 5 edition.

c. Boating, Canoeing, Sailing

Ironically, too much water in DeSoto Lake reduces our boat activity. The lake rose five feet above normal level. This limits access for boaters, and boaters are especially fearful of our stone jetties, which they couldn't see. Net effect was they stayed away from DeSoto.

Less recreational boating is recorded here each year. Three dozen boats might use DeSoto Lake on good days, half of that on others. It reflects the public's difficult time in catching fish, but hazards and obstacles (floating trees) are no less a discouragement. Fishing activity was pretty good during the spring, before the Lake became high. DeSoto Lake has a 5-mile-per-hour, "no wake" speed restriction, a discouragement to the powerboaters who once came to race around this seven-mile-long lake.

Canoeing and sailboating use were down, also. The lack of canoeists is unfortunate, because the lake has interesting diversity long its shoreline, which can provide an enjoyable day on the water. The Eastern Nebraska Sailing Association held its 5th annual regatta on Saturday, August 5. However, due to the flooded jetties, only seven sailboats participated. These boat owners don't want to risk damaging their expensive toys. Typically, sailboats set sail at the Bertrand Ramp about 2 p.m., maneuver through a bouyed obstacle course near the visitor center, and proceed to the South Gate Ramp, where members picnic and observe wildlife.

d. Bicycling and Walking

Many people enjoy bicycling on the refuge roads, particularly people camping in the adjacent Wilson Island State Recreation Area. They usually carry their bikes along in their recreational vehicles. But, Wilson Island was closed most of their season due to the flooding, too. We had 1,400 bicyclists between April 15 and October 15. Walking is done generally only along our four maintained trails, none of them over a mile long. We calculate 30,000 walkers, down from 45,500 last year. Walking on the Missouri Meander, Bertrand and Wood Duck Trails was down because of flooded sections most of the year.

14. Picnicking

Approximately 100 picnic tables are located throughout the refuge; 50 of these are located at the South Gate Picnic Ground. Most of the use occurs during the summer. The refuge accommodated over 20,300 picnickers, including family groups and school groups, about the same amount as last year. The picnic tables at Cottonwood Nature Trail are constantly used, especially by school children on EE outings, and are now kept open through the fall auto-tour period. In fact, after October 15, these dozen tables are the only ones available to visitors.

Two wheelchair-accessible picnic tables and pads are available, one each at the Cottonwood and South Gate facilities. Several picnic areas were reduced--in numbers and maintained area--to reduce the stations maintenance overload. We used to mow 95 acres of picnic grounds bi-weekly.

16. Other Non-Wildlife-Oriented Recreation

Non-wildlife-oriented use is practically non-existent today, except for the occasional business picnic, regatta, or walk-a-thon. A decade ago, it was normal to have half of our visitors engaging in active, water-oriented recreation: swimming and sunbathing, waterskiing, and high-speed power-boating ... and most people seemed oblivious to the refuge's wildlife and its habitat requirements.

About the biggest event in this category was the five-mile-long "Crop Walk for Famine Relief," attended by 50 people on Sunday, October 6. The Crop Walk is a relatively low-impact event.

A similar positive public relations gesture in our home community is the "Jaycees 10-K Fun Run" held Saturday, September 14. This was sponsored by the Blair and Fort Calhoun Jaycees. The 6.6 mile course "ran" on the paved road, from the Bob Starr Overlook to the Missouri River Overlook, and back. This was the first year and it attracted 25 runners, each of whom received a specially-designed DeSoto runner's shirt.

17. Law Enforcement

On January 16, Ed Chard of Waterloo, Nebraska fell through the ice while fishing on DeSoto Lake. Two other anglers, John Teye and Tom Lorentzen of Omaha, were fishing nearby, threw a rope to Chard, and pulled him out. Chard apparently received no injuries from his accident. He warmed up in his car, and drove himself home; stopping to film wild turkeys on the way. The accident occurred on a Tuesday morning following a three-day (holiday) weekend. Refuge staff had checked the ice thickness the Friday before and found it to be adequate, but unusually warm temperatures over the weekend apparently made the ice unsafe in places. The lake was immediately checked and closed to ice fishing following the report of the accident.

In February, museum staff discovered an artifact from the Bertrand Collection, a Hostettters Bitters bottle, was missing from a display case near the entrance to the visitor center. Investigation by museum staff and RO Sheets determined that the bottle had probably been taken sometime in late January. The perpetrator(s) apparently gained access to the bottles (nine in total) by simply prying the top of display case up. The bottles were arranged in three rows of three, only the middle bottle was taken.



The Harrison County Sheriff's Office dusted for prints, but to no avail. A suspect was identified (and was later arrested for stealing Indian artifacts from a museum in Sioux City, Iowa), but he was never positively linked to the Bertrand bottle theft.

N96-9, MS

RO Van Riper and Phillips responded to a fire alarm early in the evening of February 7 and discovered a fire in the laboratory HVAC unit had caused a halon dump (see I.2.).

On March 5, a refuge volunteer fainted on the side of the road near the Missouri River Overlook. RO Cooper determined that the man suffered from vertigo. She transported the volunteer to the visitor center and monitored his condition for awhile. Although his condition improved, Cooper transported the man home, since he was unable to drive.

Later in May, UNL researcher Kurt VerCauteran, discovered evidence of a deer poaching in a closed area. VerCauteran was attempting to locate a radio-collared doe. The muffled sound of the signal made VerCauteran think the doe had slipped its collar. However, after several attempts to pinpoint the transmitter with the telemetry equipment, VerCauteran started kicking at mounds of dirt.

Deer Researcher VerCauteran unearthed the collar and the severed head of doe #22 (ear tag still attached).



48-127-96, MS

Refuge officers searched the area, but no evidence of where the deer was killed, dressed, or taken was found. VerCauteran had located the deer, alive, on the morning of March 10. When he tried to locate the animal on March 17, he got the muffled signal. Local conservation officers and the Special Agent in Iowa were notified. This is our first known poaching since 1991.

In late April, the refuge received an anonymous phone call from someone saying that two individuals were stealing entrance fee envelopes from our fee boxes. The descriptions of the individuals and the vehicle involved were very vague. A few days later, a refuge employee reported that a friend of his had overheard two individuals, in nearby Missouri Valley, bragging about stealing up to \$200 at a time from the fee boxes. Again, the descriptions were vague. On May 11, RO Phillips found several fee envelopes littered along the road near the main fee boxes. The envelopes had been sealed, but were torn open, and empty.

On May 19, Phillips observed the driver of a vehicle (that matched none of the vague descriptions referenced above) insert an object several times into both of the fee boxes in front of the visitor center. However, no envelopes were removed (the fee boxes had

been emptied only a day or two before and whatever envelopes were in the boxes were probably too far down to reach). The action was repeated several times, with the driver even returning to the boxes one time after being disturbed by another vehicle arriving to pay the fee. The suspects were stopped, identified, and their vehicle searched. A long, folding Buck knife (probably the object being inserted in the boxes) was found, but no other hard evidence (like empty fee envelopes, etc.) was found. The suspect was released.

It was obvious we were losing money, lots of money! We experimented, and found that "mechanical fingers" worked fine in a quarter-inch slot. The envelope slots on all the fee boxes were later modified to make removing envelopes more difficult. Although visitor center staff continued to find numerous torn and punctured envelopes when counting fee collections from the boxes, no further evidence of theft was found.

Also, in May, the barbed wire fence at the South Parking Area of the Nebraska bow area was cut (and repaired) twice. Both times, vehicle tracks were found entering and exiting through the break in the fence. No suspects were identified.

In May, a report was received from the contractor handling refuse collection on the station. The contractor informed us that a nearby refuge neighbor was dumping household garbage in our dumpsters on the south end. RO Phillips contacted the neighbors and received assurance that it would not happen again. No charges were filed.

On July 21, while being issued a NOV for violating the no-wake boating limit on DeSoto Lake, a visitor discovered his pickup truck had been broken into. The visitor reported \$83.00 in cash and two rings were missing, but \$400 worth of money orders were left in the glove box.

In August, RO Phillips participated in a marijuana detection flight with the Iowa Air National Guard. No cultivated plots were located.

RLEO Wyckoff took a promotion with the Park Service early in the year (another refuge casualty of the 1802 pay structure). Temporary RLEO Topitzhofer arrived in late July, but his seasonal law enforcement commission was not issued until mid-September, primarily due to the required background investigation. RLEO Taylor entered on duty in late October, and we managed to get his commission; he was with the National Park Service) issued sometime, thereafter. Taylor and Topitzopher provided some much needed enforcement assistance in November. Taylor is scheduled to start training at FLETC in early January, 1997.

The number of law enforcement actions taken dropped this year. While we wish we could say it was due to better compliance, the

more likely explanation is 1) we did not have a full-time officer (1802) through most of the year, and 2) the remaining collateral-duty officers were split between DeSoto and Boyer Chute, following the satellite refuge's opening in late August. Officers close the gates at dusk on both refuges.

Below is a list of the violation notices and warnings issued on the refuge during the year. One of the cases (dumping refuse) was contested in court. RO Phillips watched the subject dump used motor oil from his vehicle in a parking lot. In court, the defendant admitted to dumping the oil, and was convicted, but the Magistrate reduced his fine from \$200 to \$100, because he was "forthright" in his testimony. In the cases involving antler-shed hunting, the two subjects from Missouri were also charged with trespass in a closed area. Together, they paid \$1,200 in fines, and did not go to court.

Summary of 1996 Violations		
Violations	Violation Notices	Written Warnings
Dumping refuse	1	0
Exceeding the no wake boating limit	4	5
Possession of wildlife parts (antler shed hunting)	2	0
Trespass (closed area)	3	18
Trespass (after hours)	2	6
Trespass (other)	2	2
Unauthorized pet	0	1
Swimming	0	1
1996 Totals	14	33
1995 Totals	37	63
1994 Totals	17	68

18. Cooperating Associations

The Midwest Interpretive Association (MIA) has completed its fifteenth year of operation, with a 2.1 percent decrease in sales compared to last year's receipts. The majority of this decrease came because of the lack of goose migration viewing and subsequent lack of visitors during what is usually a peak sale's period.

Taxidermy mounts of waterfowl and information on the flyways were set up in the fall. This was enhanced this year with the donation of the following mounts: pintail, goldeneye, canvasback, sandhill

crane, widgeon, Ross' goose, gadwall, Richardson's (Hutchin's) goose, giant Canada, and redhead duck. Betty Menze of Lisle, Illinois, donated these in memory of her husband Richard. He shot these, had them mounted, and unfortunately died himself at a young age.

Revenue received from the sale of a variety of educational books, artwork, photographs, t-shirts, postcards, and posters at the DeSoto Visitor Center totaled \$56,671.69. Bruce Barkley serves as the MIA's full-time Business Manager, a non-government employee, operating a \$107,000 business from the DeSoto Visitor Center. Along with DeSoto, the Association also administers outlets at Mingo, Squaw Creek, Swan Lake, Horicon, and at Lewis and Clark Lake, which is a facility of the U.S. Army Corps of Engineers, near Yankton, South Dakota.

A breakdown of MIA sales activities during the year follows:

Outlet	Gross Sales	% of MIA Sales	Monetary Contributions
DeSoto	\$56,671.69	52.7	\$3,564.62
Mingo	6,868.60	6.4	1,073.50
Squaw Creek	10,478.95	9.7	2,197.88
Swan Lake	2,440.94	2.3	115.88
Horicon	15,394.49	14.3	302.00
Lewis and Clark Lake	15,648.13	14.6	1,163.66
Total	\$107,502.80	100.0	\$8,417.54

Direct monetary contributions to the refuge totaled \$3,564.62. This included sponsoring both photography and wildlife art shows, printing of the Fall Auto Tour leaflet, sponsoring a tourism booth at the Iowa State Fair, providing funding assistance for the Service's retirement seminar, and assisting with the Service's Director's meeting at the refuge. The business manager also contributes to some of the above refuge's operational programs in a variety of ways, and in their interpretive programs, in person and through his computer skills. Contributed assistance to the refuges from the MIA totaled an additional \$4,039.00.

In April, the Association installed a donation box near the visitor center's information desk. These funds will be used to help the refuge's educational and interpretive programs. By year's end, over \$1,300 had been contributed. These funds were delegated to printing the revised fall auto tour leaflet. The refuge received over 12,000 leaflets for \$1,200.

In redesigning the visitor centers entrance area with Wilderness Graphics, consideration was given to relocating and expanding the MIA sales area. The sales area only has a meager 99.3 square feet of space currently, hardly enough to provide the basics. We are looking forward to increased space and expanded sales in the near future.

The Board of Directors are local business people. Refuge Manager Gage serves as the Executive Secretary of the Association.

I. EQUIPMENT AND FACILITIES

1. New Construction



31-101-96, HP

Construction of the disabled-accessible fishing pier at the South Gate Recreation Area was completed in April. The deck was completed last year. The hand rails were built this year and rip-rap was placed along the shoreline.

Keep Landscaping was contracted to pour an accessible sidewalk from the parking area to the southern end of the pier. The cost of the sidewalk was \$2,678, which included a retaining wall made of 6x6-inch timbers to hold soil in place beneath the sidewalk, adjoining the pier.



32-242-96, HP



NEG-2-96, HP

Aluminum carport covers were installed over the concrete pads, poured last year, beside the three residences. Allied Awning of Omaha did the work at a cost of \$6,825.

The carports are considered necessary because most families these days have at least two vehicles. The carports protect the second vehicle from hail, snow, and other extreme weather conditions often experienced here.

2. Rehabilitation

The visitor center energy retrofit contract continued to be a source of great disappointment. Again this year, no work was accomplished. No contracts were issued, due to fussy specifications and inadequate funding.

The original contract included replacing, upgrading, and computerizing the HVAC, water, and security/fire alarm systems in this multi-million-dollar facility. It was released for bids late in FY 95, and all bids came in at over twice the government estimate. In FY 96, the contract was split up into a water and a HVAC contract, and the alarm systems were omitted completely! The water system contract was released twice for bids, and both times the bids came in well over available funding. Likewise, the HVAC contract went out twice, and failed twice, due to ambiguous language in the contract modification.

The visitor center is over 15 years old and accounts for one of the largest energy expenditures in the Region, due to its inefficient heating and cooling systems. Ground water is pumped continuously to cool the building in the summer, using hundreds of thousands of gallons of water annually (the contract would install a chiller, acquired last year from the Madison Lab and still sitting idle, which would create a closed system and reduce water usage). The ground water here has high iron and other mineral concentrations, wreaking havoc on softeners, filters, and other system components.

Maintenance on the failing systems continues to drain already sparse station resources (dollars and manpower). Iowa DNR

officials continue to check us periodically, wanting to know when we will meet State safe drinking water standards at this facility. As systems go down and are being continually repaired, visitor center staff continue to suffer through periods of brown, smelly water; no or inadequate heat in the winter; and no or inadequate air conditioning in the summer. And, all the repairs that are being made, are on equipment that is scheduled to be replaced. This seems like a terrible waste of resources, until you remember how long they've been scheduled for replacement and we continue to wonder how long it will be until they actually are replaced. All in all - a very frustrating situation!

As in August and September of last year, the visitor center sewage lift station went down again in January. Maintenance Mechanic Kaiser diagnosed the problem as another dead short in the wiring running through the building to service the station. The contractors who replaced the wiring last year, OK Electric of Omaha, were called out, but found nothing wrong? As we looked into the situation more, the electrical problem turned into a major overhaul of the lift station itself. Both vacuum pumps were replaced (Skarda of Omaha, \$400), the two lift pumps were rebuilt (Industrial Electric Motors of Omaha, \$2,800), and both check valves were replaced (Smith and Loveless of Omaha, \$874). The pump impellers also were replaced. The steel plate supporting the pumps was wire brushed, primed, and painted. The work was completed by force-account in May, and no further breakdowns occurred during the year.

An uninterrupted power supply was purchased and installed on our Simplex Security System to prevent frequent alarm calls, which are due to ephemeral power bumps in our electrical service. Desensitizing the system has helped.

Two additional, free-standing humidifiers were purchased and installed in the theme gallery and library. Again, we await the HVAC renovation to mitigate the need for these time-consuming humidifiers. Portable humidifiers were used for the first time in the cargo storage areas, because environmental parameters were impossible to keep under control.

One Trane HVAC unit, in the visitor center had to be completely altered to cool only, without dehumidification, because of incapacitated refrigeration coils. It had to be "un-bypassed" once fall rolled around. We can get this fixed, but it would cost about \$5,000, and the units will be abandoned when (or, if) the renovation ever takes place.

Evidence of the dire need for HVAC rehabilitation work to proceed ASAP came in several forms this year. Perhaps, the most impressive of these was the February 7 fire and halon dump in the laboratory! The fire occurred in the lab's HVAC/humidifier unit.



N96-11, ST

Bob Parrott, a contractor who was called in nine times through the year to service and repair the lab and cargo storage HVAC units (\$6,500), blamed the fire on a clogged canister filter within the HVAC unit. The reason the canister was clogged, according to Parrot, was the poor quality of the water coming in for humidification. The energy retrofit contract would replace water softeners and other equipment, which would greatly improve the quality of the water in the facility, and a closed-loop system would reduce the constant payload of chemicals that the equipment is currently exposed to.

Following the fire, we tried to rejuvenate the media in the water softeners in the basement, using special chemicals, but the contractor thought the media was simply spent. To eliminate the problem (once and for all we hope) and avoid the catastrophic consequences of a fire and halon dump in the cargo storage areas, we installed a Futuramic Products F-9000 twin-tank water-softener (\$1,970), with a 5-micron filter, followed by a 1-micron filter, in the basement. These items service the upstairs HVAC units alone. This should provide near laboratory-quality water to the HVAC units... maybe.

If and when the energy retrofit contract becomes reality, and the current softeners are replaced, we will move the high-capacity twin-tank softener to the headquarters water system, where it will service the headquarters, shop, and all three residences. This will allow us to remove the softeners from the residences (two of which are rented). The softener we own from the residences will be used at Boyer Chute, in the cabin which is being rehabilitated.

The February halon dump also caused another problem - loss of automatic fire suppression capability in the laboratory. Fenwall 1301 Halon is now "banned", and available only in a recaptured state. It would have cost \$3,300 to replace the halon in the laboratory. As a better alternative, an environmentally-friendly (zero percent ozone depletion potential) fire-suppression system

that complies with current professional museum standards was purchased at a cost of \$7,800. The system is called FM200. It replaced the Fenwall 1303 Halon system in the laboratory, but not in the cargo storage areas. Due to the problems associated with halon and finding an acceptable alternative, funding constraints, and administrative delays, these fire-suppression capabilities were not restored in the laboratory until December, ten months after the fire.

More evidence of the need for the energy retrofit contract was found in the theme gallery and library, where paper curled and excessive humidity prevailed. High humidity in these areas forced us to procure two additional, free-standing humidifiers. Portable humidifiers were used for the first time in the cargo-storage areas, because environmental parameters were impossible to keep under control with the failing HVAC units. As noted elsewhere, one Trane unit had to be completely altered to cool only, without dehumidification, because of incapacitated refrigeration coils. So we wait, and watch, as our ability to control the environment in which the Bertrand artifacts are stored continues to erode away.

In addition to the water at the visitor center, Iowa DNR officials also have been checking on the water in the comfort station at the South Gate Recreation Area. Last year, they begrudgingly concurred with our contention that this facility does not meet their definition of a "public water supply", although one of their inspectors disagreed and was expected to be collecting public-use data this spring. However, the facility was closed most of the year due to problems with the water system, which kept the inspector at bay. We acquired several thousand dollars worth of materials to rehabilitate this water system near the end of the Fiscal Year and even began pulling out some of the old plumbing. But, higher priority work precluded any further progress.

In December, a scope of work was prepared to replace the kitchen sink drains in all three residences. This had been bid earlier in the year, but there were large discrepancies in the bids that were received. The whole thing was tabled as work at Boyer Chute took precedence, so, in the winter, we just started over. The impetus for the restart was the drain in Quarters 82 clogging up. Although a plumber from Council Bluffs, managed to open it at a cost of \$175 (and most of a day's work), it was apparent that these drains needed to be replaced.

The new drains will be PVC pipe, running close to the basement ceiling (the current drain is metal pipe, which runs under the concrete basement floor to a sump, where it's pumped up to the soil pipe). The drain in Quarters 81 was actually replaced, hurriedly, last year when a power snake broke while trying to unclog the pipe under the concrete. We decided to redo the job in Quarters 81 to make it function better. At year's end, no bids had been received.

In February, the exterior screens on 22 of the exterior "doors" at the VC were replaced by Blair Glass at a cost of \$4,200. The doors can be opened so that visitors may enjoy outdoor sounds (like thousands of snow geese flying over) as they view wildlife. Wooden louvers fill in the opening to keep arms, trash, small children, and other objects from going out, while allowing the sound to come in. However, many of the screens and louvers were being damaged by woodpeckers, squirrels, and other critters. So, this year, the damaged louvers were repaired or replaced (force account) and heavy metal security screens were installed.

3. Major Maintenance

The remainder of several tons of road rock procured late last year was delivered in January and February. Approximately 341 tons of 3/4-inch crusher-run rock were spread on roads at DeSoto. Approximately 114 tons of 3-inch stone also were delivered to DeSoto, with part of it (and part of the 3/4-inch rock) going to build up the service road leading from the visitor center staff parking lot to the center's basement entrance. This stabilization has been needed for some time, since a lawn and small agricultural tractor, used to maintain the center's grounds, are stored in the basement. Until now, the tractors could not be used in wet weather, because they would get stuck in the slick, "gumbo" soil coming up the hill.

The No. 2 air compressor of DeSoto Lake's three-compressor helixor aeration system broke down in January, as the system was started. This same compressor broke down last year, and was rebuilt by the station maintenance staff. This time, the unit was taken to Associated Technologies, Inc. in Omaha, where it was pronounced DOA (i.e. beyond repair). The inspection cost \$100. Dust or corrosion may have been responsible (the workings of these compressors have very close tolerances). A new compressor was purchased through Associated at a cost of \$1,750. It was installed in February.

A real mystery was solved in April. The outside lights (which come on automatically at night) at the Headquarters building have, for some time now, periodically gone out and come back on a short time later. At first, we thought it was the shop compressor kicking on and drawing the current down - wrong. Then we thought maybe it was the furnace kicking on - wrong. Then we thought maybe the ballasts, were too small - wrong. But, while checking the ballasts the mystery was solved: the contractor had placed 35-watt sodium bulbs with 50-watt ballasts. The bulbs were overheating, and going out, and coming back on after they cooled. How many government employees does it take to change a light bulb?

The old north beach concession building was torn down after all usable material was removed through a salvage contract during April and May. The site was leveled and seeded.

In April, a set of exhibit pilings at the Bertrand Excavation Site were stabilized. These pilings, reminiscent of the time when the Missouri River ran through the area, is a central figure in the interpretation of the site. The observation platform for viewing the excavation site is built around the pilings. The pilings had rotted at the base, making them wobble and creating a potential hazard for the platform and the visitors. The maintenance staff built a form and poured concrete around the base of the pilings, thus solving the problem.

Also, in April, the maintenance staff poured a concrete pad and erected the framing for a new Lewis and Clark interpretive wayside exhibit at the new river overlook. DNR officials installed the exhibit later in the month (see Section H.7.).

The Missouri River overflowed its banks three times this year, creating a profusion of maintenance problems. The floods occurred in late June, mid-July, and early August.



The two River Overlook parking lots were covered with mud and debris, and wooden vehicle barriers were swept away. The mud in the old River Overlook did not dry out enough for cleanup until September.

32-241-96, SV

The flood waters from the river did not go into DeSoto Lake directly, except for the foot of water that backed up into the electric fish barrier building. This water ran out under the door and into the lake. Because the outside gate of the outlet culvert had not been closed, the rising water backed into the culvert, met the gate which was closed, and had no where to go but up into the building. Although this was a minor amount of water running into the lake, watershed runoff was very high and filled the lake far beyond normal. Boat ramps, trails, and other facilities remained flooded.

The small boat ramp was closed completely and remained flooded and closed through the end of the year. A fishing jetty, the boat dock, and a wooden fishing pier disappeared.



32-240-96, SV

Initially, two of the four ramps at the South Gate Recreation Area were closed. The other two ramps, on higher ground, had to be closed later in the summer as the water continued to rise. Only the middle boat ramp remained open for the entire fishing season.

The high water also flooded sections of the Missouri Meander and Wood Duck Trails, and they were closed for the remainder of the year. The fishing pier at Bullhead Pond went completely under water, and it was closed in June, as were docks at the boat ramps (which are usually heavily used by shoreline anglers). Most of the rock jetties that provide fishing access also went under water. A low-lying section of Whitetail Drive flooded, forcing the road to be closed. Although Lakeview Drive remained open to the public, it suffered significant shoreline erosion, when the water overtopped the rip-rap placed there in the early 1980's. The lake peaked out at a record five feet above operating level.

In September, a leaky roof in the front vestibule of the visitor center was repaired. Ak-Sar-Ben Roofing, a flat-roof contractor from Omaha, made the repairs at a cost of \$540.

Prior to the arrival of RLEO Taylor and his family in October, several maintenance and repair items were taken care of at quarters 82, a 1965 residence. The double-pane picture window in the living room and a standard window in the garage had gotten moisture between the panes. Both were replaced. The company that made the picture window had gone out of business, so we had to pay for the new window, but the installation was free. Mark and Bill's Painting, of Council Bluffs, painted the interior of the house at a cost of \$1,015. The linoleum floor in the kitchen and bathroom was replaced by Hineline Furnishings, of Missouri Valley, Iowa, at a cost of \$1,591.

4. Equipment Utilization and Replacement

In March, we received a 1996 Dodge Ram-1500, 4x4, extended-cab pickup truck (\$19,000).

Because of the scheduled opening of Boyer Chute refuge, we had to make some adjustments to our law enforcement vehicles. The Chevy 1500 patrol truck had over 130,000 miles on the odometer, so we did not want to use it for traveling back and forth to Boyer. We initially had planned to use the Dodge Ram pickup, received in March, as a law enforcement vehicle, but due to its large size, and gas consumption, it was assigned to Engineering Equipment Operator Cunard, and his S-10 4x4 pickup was equipped for law enforcement work. This included installing a light bar, rotating overhead spotlight, a siren/PA, and a cellular phone. In September, we ordered another vehicle with an extended cab to replace this very cramped regular cab S-10 (it, of course, had not been received by year's end). When the Boyer biological technicians complete their law enforcement training, we plan to place the Chevy 1500 patrol truck at Boyer full-time.

In addition to these "high profile" law enforcement vehicles, we also equipped two other vehicles with "low profile" law enforcement equipment. The tan Jeep Cherokee and the Ford F-250 (assigned to Boyer) were equipped with visor lights, wig-wag headlights, and tail-lights, siren/PA's, and hand-held spot-lights.

We acquired (and transported) several excess military items to the station this year.



These included a full-size Chevy Blazer, with a diesel engine, from the National Guard Armory in Jefferson City, Missouri;

36-148-97, SV

a 2½-ton and 5-ton transport trucks from Fort Leonard Wood (these will be used for carrying fire pumpers, with large water tanks);



36-146-97, SV



and, an IH-886 farm tractor from Ft. Leavenworth, Kansas;

36-147-97, SV

a Jacobson mower deck from Whiteman Air Force Base; a table saw and air compressor from Fort Lennard Wood; a Gravely lawn tractor with attachments (including a blade, snow blower, and mower deck), a sand spreader from Allied Signal; and a Caterpillar tracked end-loader from the Lake City Ammunition Plant.

During the first flood in June, the community of Missouri Valley was threatened by a break in the Willow Creek levy north of the town. At their request, we loaned our river boat (on the trailer) to town officials on June 21. However, a second break in the levy occurred that night and reduced the potential hazard to the town. The boat was returned, unused, the next day.

We also loaned pumps and other equipment to Wilson Island State Recreation Area and the Pottawattamie County Conservation Board to help them clean up recreation areas after the floods.

The Regional Office funded a wonderful and desperately needed new Xerox 5322TAZ photocopier. It replaces a horribly old, non-clear

coping, non-collating, non-sorting, hunk of junk (Savin 9250) photocopier. We are once more an information dispensing machine!

5. Communication System

We finally installed a dedicated fax line into the headquarters building. Previously, we could only receive faxes when the telephones at the visitor center were manned.

6. Computer Systems

This was a slow year for ADP acquisitions. There were three new computers added this year and they were purchased at the end of the fiscal year. End of year monies from the Regional Office funded a Hewlett Packard V laser printer, two file servers (one for headquarters and one for the VC), and the cabling for the visitor center network. DeSoto bought the hub, software, network cards, uninterrupted power supply, and cables for the visitor center network. The VC network should be installed by the spring of 1997.

In addition to this computer equipment, two people were sent from the Regional Computer Support Team to install the file server and cc:mail router in the headquarters building. While they were here, they upgraded the LANTastic version from 6.0 to 7.0, and set up a shared modem. Probably the most significant change was setting up everyone in the headquarters building with a cc:mail address.

7. Energy Conservation

The conservation of energy in the new headquarters/shop has been amazing. These new buildings continue to use minimal amounts of energy. We could drastically reduce overall energy costs incurred annually, if only the energy retrofit contract, scheduled for the visitor center, for the last three years, could finally be awarded. HELP!!!

J. OTHER ITEMS

1. Cooperative Programs

Fire Agreements. The station's cooperative fire agreements were revised and signed with the Missouri Valley, Blair, and Fort Calhoun volunteer fire departments. A couple "new" military 6 x 6's will be fitted with large tanks and pumpers, as time and monies permit, to augment our prescribed burning needs.

California Bend. The old chute just above the Blair Bridge on the Nebraska side of the Missouri River had been the subject of an inter-agency scoping meeting and Corps/NRD open house in 1995. It was hoped that there would be public support for acquisition and

restoration of this wetland, with development of a flow-through channel, using the Corp's Section 1135 funds. We probably would have been asked to operate and maintain the property. However, the project met resistance by local industrial developers, who would prefer to develop a barging facility there. There was enough political influence that both the City of Blair and the Washington County Board of Supervisors passed resolutions to stop the Corps or NRD acquisition. The resistance joined forces with the Gateway Development Corporation to promote industrial development, county-wide, and will now serve as another stumbling block to wetland restorations where industrial potential exists.

2. Other Economic Uses

A Special Use Permit has been issued to Valdemars Deklavs from Blair for a couple decades to keep 25-30 bee hives on the refuge in three apiaries. The annual fee is fifteen dollars to cover administrative costs, and the bees provide us a valuable service.

Free Special-Use Permits were issued to two commercial fishermen to remove roughfish from DeSoto Lake. See Section G.11.

3. Items of Interest

Pornography. The 1865 images which we discovered in the Stanhope lenses in **Bertrand** pocket knives may become quite notorious in the foreseeable future. A prestigious author, Thomas Lowry, M.D., will be featuring the photographs in an up-coming sequel to his book about sex and the civil war, which was entitled, *The Story the Soldiers Wouldn't Tell*. After receiving written clearance from our Solicitor, we will be reluctantly providing the images for publication, as examples of "rare, definitively-dated, Civil-War-Era pornography"!

Another Find. While attending the American Institute for Conservation's annual conference in Virginia this past spring, our museum specialist visited the Mariner's Museum. She observed objects labeled as "slave collars" on display, which were identical to **Bertrand** objects that were being erroneously interpreted. After contacting the curator of the Black History Museum in Omaha, we have decided to leave the objects on display, and interpret them correctly, as "shackles". As the **Bertrand** sank toward the end of the Civil War, and the Emancipation Proclamation had already been made, it seems logical that business-minded consignors were shipping these obsolete objects out to the wild and wooly west to be used as shackles for outlaws, "unfriendly" Native Americans, or "infernal foreigners".

Shades of the Great Swamp! After much study and controversy in the Omaha area, the Fontanelle Forest Association finally opened their urban nature center to deer hunting under a very controlled situation this fall. A limited number of archers and muzzleloader hunters applied, and were allowed to hunt, after showing

proficiency. Negative press and the threat of protestors limited applicants. Only 28 deer were taken. About 25 protestors showed up, but the cold weather soon cooled their passion. The herd stands at about 70 deer per-square-mile on habitat that can sustain 15-30 deer per-square-mile. However, backyard feeding prevails.

Fontanelle Forest Association's Land Management Committee. This spring, Manager Gage was asked to join a "blue ribbon committee", which has been formed to develop a comprehensive land management plan for Fontanelle Forest Association lands. This group includes environmentalists from a full spectrum of professional natural resource agencies and academia. It is especially interesting to hobnob with professors of ecology. They tend to see things through refracted glass!

4. Credits

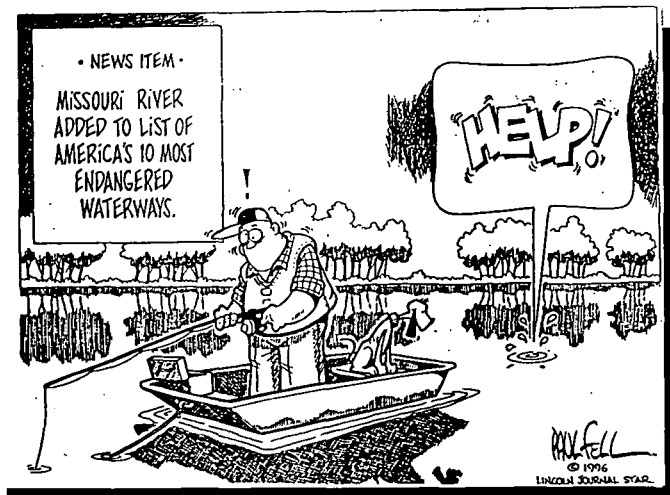
All managers, and selected personnel wrote segments of this narrative. All compilation and computerization was finalized by the administrative staff. Project Leader Gage edited the final report. Credits for the photos are shown under the photos. The Project Leader WAS NOT happy with the dark, scanned photos in last year's narrative, so, back to the "dark ages" we go! Ha, ha, ha!

K. FEEDBACK

The Missouri

Did you know that the Missouri River is the longest in our nation? Yep, over 2,500-miles-long.

And, did you know that the Missouri is classified as one of the 10 most endangered rivers in our nation?



Or, did you know that it has six major dams and 16 major oxbow bypasses (of which, DeSoto is one)? Maybe, that's why some call it a "Damned Ditch"?

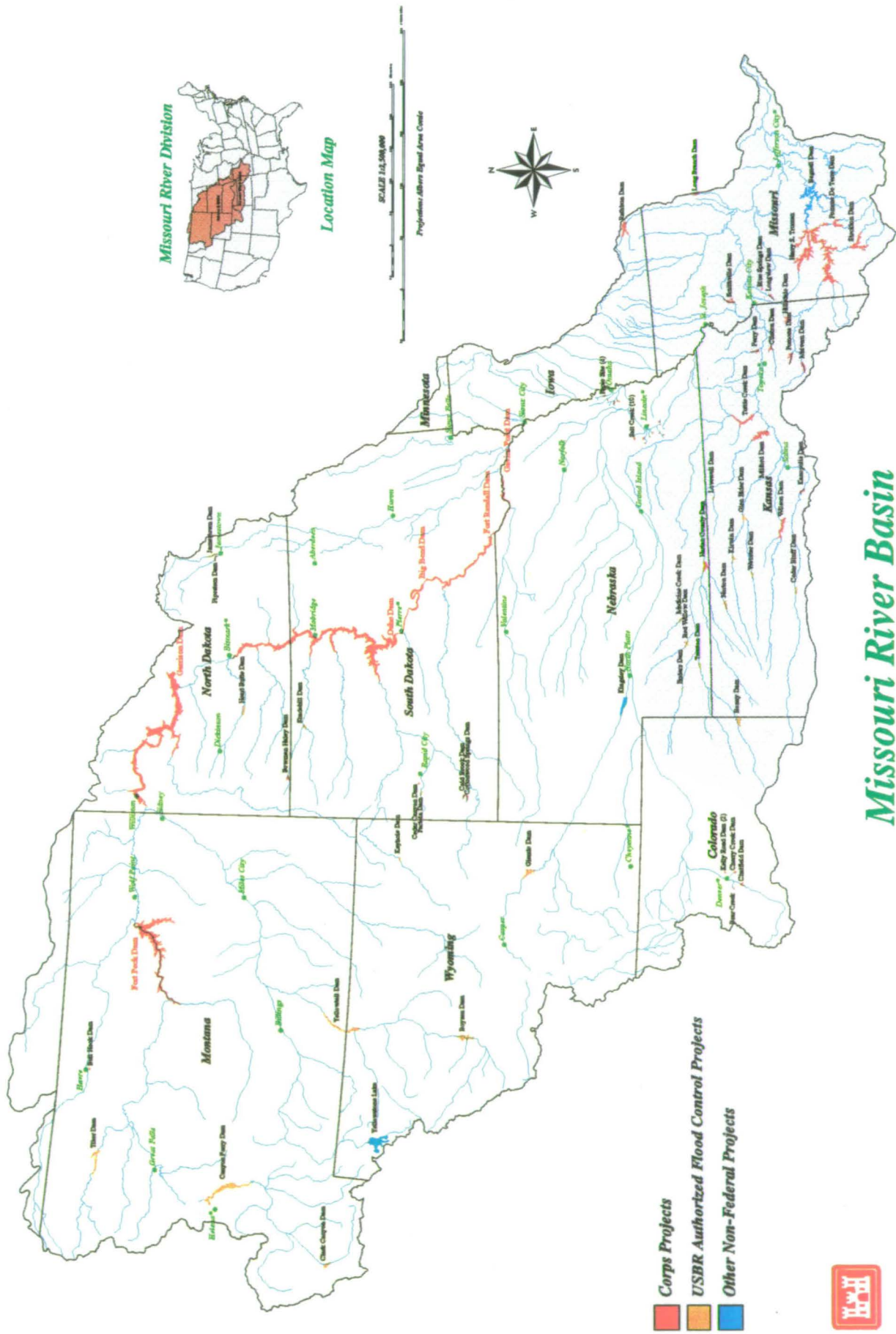
And, bet you didn't have a clue that the Missouri River is the fastest flowing of our large rivers.

And, did you realize that the Missouri spans 10 states and includes 9,700 square miles located in Canada?

And, of course, you couldn't know that this river basin has a total area of 529,000 square miles. That's a whole bunch! Take a gander at the illustration on the next page.

Now, THAT is an ecosystem!

-- The End --



Missouri River Basin





INTRODUCTION

The refuge is a joint federal and local conservation partnership to restore a portion of the Missouri River habitat that flows through a 2.5-mile-long channel, which parallels the main flow of the river. The site, consisting of nearly 2,000 acres, is located on the west side of the Missouri River, three miles east of the town of Fort Calhoun, Nebraska. It is eight miles north of Omaha, and is expected to attract day-use visitors from throughout the Omaha/Council Bluffs metropolitan area.

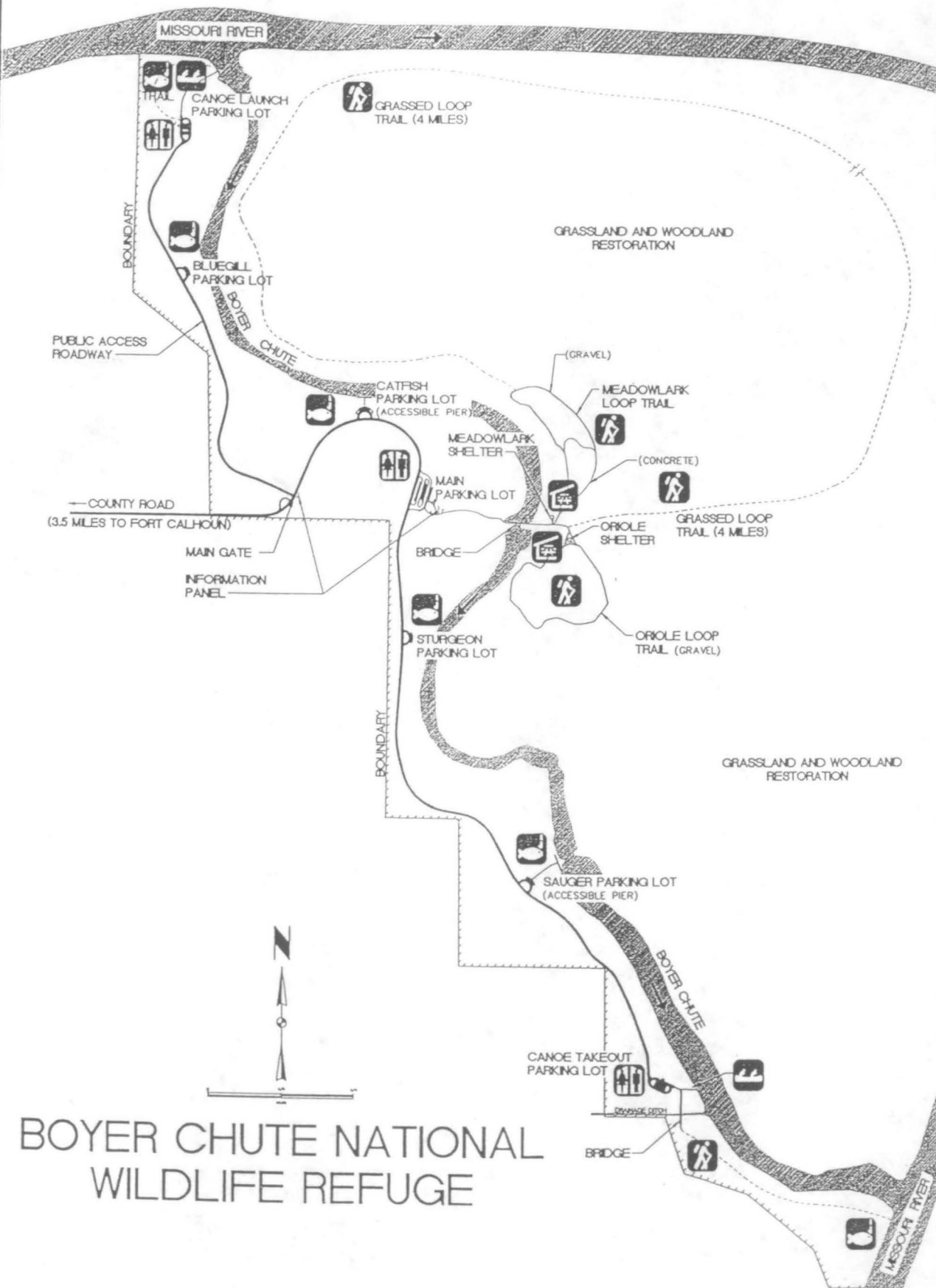
The purpose of the project, first and foremost, is restoring essential wildlife habitat, which became scarce when the Missouri River was improved for navigation half a century ago. Compatible recreation activities, like nature walks, picnicking, birding, biking, fishing, canoeing, and environmental education activities, allow people to enjoy the wildlife of the restored floodplain forest and adjoining grasslands.

In the centuries before European settlement, the Missouri River had multiple braided channels, and it meandered suddenly and unpredictably across its wide floodplain. River explorers--including Lewis and Clark, Audubon, Prince Maximilian, and Major Long--navigated through the area as they traveled up the river. Between 1820 and 1937, natural meandering moved the river three miles eastward from the Fort Calhoun bluffs (site of historic Fort Atkinson) to its present location. Boyer Chute was one channel of several that formed the Missouri River at this site.

The area we know today as Boyer Chute was originally an island of sand and sediments deposited in the Missouri River by Iowa's Boyer River. Gradually, the river eroded channels (chutes) through the sediment. Boyer Chute is named after the Boyer River, which got its name from a settler who hunted and trapped in the watershed before the time of Lewis and Clark.

Federal involvement here goes back six decades. In 1937, to build up the river's main navigation channel, the U.S. Army Corps of Engineers cut off the upstream end of Boyer Chute, constructing a river wall and shale dikes across the inlet. Midpoint down the chute, first a ferry, then a bridge carried a road across the chute and onto the 1,600-acre island, between the chute and the main river. However, floods frequently closed the inlet and washed out the bridge. Culverts were installed in the upstream cutoff wall to allow some water to enter the chute. But, sediment accumulated in the chute, vegetation began to grow, and a young forest gradually took hold within and along the chute. The Boyer Chute Restoration Project is part of the region-wide Missouri River Streambank Stabilization and Navigation project. It was accomplished by the U.S. Army Corps of Engineers and the Papio-Missouri River Natural Resources District. And, of course, the U.S. Fish and Wildlife Service will manage the 2,000-acre site as part of the National Wildlife Refuge System.

Major construction features of the current project include the Corp's 1994 excavation of the historic channel, building rock structures to



BOYER CHUTE NATIONAL WILDLIFE REFUGE

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5. Communication Systems.....	Nothing to Report
6. Computer Systems.....	Nothing to Report
7. Energy Conservation.....	Nothing to Report
8. Other.....	Nothing to Report

J. OTHER ITEMS

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K. FEEDBACK

control grade across the bed of the channel, returning soybean and corn fields to grassland and natural habitat, planting native vegetation, and the Corp's constructing a 121-foot concrete bridge to the "island" portion. Visitor facilities include two miles of graveled road, disabled-accessible parking areas, two picnic shelters, two looped nature trails, canoe launch and takeout sites, and disabled-accessible toilets and fishing piers. Landscaping followed a "natural" theme.



53-014-96, BW

This partnership project restores the area to near pre-channelization condition, without effecting navigation on the main stem of the Missouri River. The chute is once again a functional part of the Missouri River. Water levels fluctuate in direct relation to water levels in the main river.

Water flowing into the chute is generally less than 5 percent of the total river flow, and does not affect the commercial or recreational value of the main river.

Areas along the bank of the channel were planted with trees and shrubs native to the area, to re-create riverine habitat conditions. During 1993-96, areas not already in natural vegetation were seeded to a mix of native prairie grasses and forbs. Amid fallow crop stubble and grass plantings, some 9,100 trees, shrubs, and vines of 44 species were planted. These plants, mostly bare-root stock, ranging in size from 6 inches to 6 feet tall, were planted in random and curving rows to simulate natural growth.

Boyer Chute is intended to provide fish and wildlife habitat that will enrich the entire river ecosystem. The floodplain forest will be allowed to develop freely along the chute. This will allow birds to roost and nest, especially raptors, wood ducks, and kingfishers. It will allow beaver, raccoon, opossum, and other mammals to prosper; and provide some seclusion along backwaters that herons, waterfowl, and other wildlife need. Above all, it provides critical breeding habitat and a nursery for sport-fish species.

Acquisition by the Corps and the Papio-Missouri River Natural Resources District advanced rapidly as did project development. In a span of three years, the restoration and development public-use facilities was completed, at a cost of nearly seven-million dollars.

A. HIGHLIGHTS

Three summer floods taxed our cleanup capabilities. (See DeSoto Section B and Boyer Chute Section I.3)

The Papio-Missouri River Natural Resources District continued acquisition for Boyer Chute, and Region 6 began planning a major expansion of Boyer Chute. (Section C and D)

A gala media event occurred with Senator Kerrey's announcement of the Boyer Chute Refuge opening. (Section H.1)

The refuge finally opened to public use over the Labor Day weekend, recording 11,000 visits during the first month. (Section H.1)

Wilderness Graphics came through with interpretive signs in time for our belated opening. (Section H.6)

We got a little help from our friends in the Corps in designing another wetland restoration. (Section C.3 and J.1)

C. LAND ACQUISITION

1. Fee Title

Fee title transfer to the Service has not occurred, because the Papio Missouri River Natural Resources District (NRD) has been involved in court litigation with a couple previous landowners. A certification is required, and a simple matter of time! In the interim, the Service has been operating under a cooperative Memorandum of Understanding.

3. Other

While Senator Robert Kerrey had attempted to augment his "Back to The River Program" with identified Service funding for three years, this fiscal year (1997), he was able to line-item \$2 million, and Region 6 transferred another \$.5 million of available acquisition monies to the project. So, by mid-year, plans for expansion of Boyer Chute seemed realistic. Jon Kauffeld transferred into the Grand Island Field Office from the Rainwater Basins WMD, and was assigned to assist in realty assessments. By November, a three-phase acquisition plan was evolving, and Jon knew more of the local folks than the refuge manager! Appraisals, an environmental assessment, and an open house will follow during the winter.

The NRD purchased Nathan's Lake a year ago from a willing seller, Anton Jensen. He was given an additional season for farming and got most of his 150 acres of farmland planted to soybeans before the floods wiped them out. Some of his ground was classified as

"farmed wetlands". This purchase, and our wetland development proposal, drew the Corps like a magnet. See Section J.1.

The property is close to the Omaha District Office, so, at times, there were more surveyors and inspectors afield than we could keep track of. An inordinate amount of time was spent in planning for water control, something we would simply do as a matter of course.



53-27-96, SV

The 400-acre George Stratbucker property, which connects the Nathan's Lake and our Boyer Chute property was purchased by the NRD this year, using \$800,000 of mitigation funds derived from a U.S. Supreme Court decision in the ASARCO, Inc. Case. This company had been dumping lead into the Missouri River for decades, and, now, they are pouring money back into the Missouri River's ecosystem. The only bad thing about all this is the \$2,000/acre precedent set here. This was irrigated farmland. Everyone within the acquisition area will figure they are going to get \$2,000/acre. Won't happen!

Both of the above properties are destined to become part of the Boyer Chute National Wildlife Refuge, and will be turned over to the Service, fee title, within the next couple of years. In the meantime, they will be farmed under an NRD contract to control the pigweed, which invaded after the floods.

D. PLANNING

1. Master Plan

Boyer Chute had a mini-master plan developed by Region 6 four years ago, but "plans" have expanded, and, now, Boyer Chute could quadruple in size! A few months ago, we were planning on incorporating this refuge in a Comprehensive Management Plan, as a satellite to the DeSoto Refuge. But, its fate is unsettled. If there is significant acquisition involved and operational funds become available, Region 6 may want it back, and, supposedly, will staff it accordingly. This may not be the proper time for Region 3 to give this refuge too much planning consideration.

2. Management Plan

Compatibility determinations were developed for all considered economic and public uses. An interim management plan has allowed the continuation of a cooperative farming program, while a gradual reduction in farming operations and conversion to native grasslands and natural cottonwood regenerations is occurring.

Public-use strategies were developed and refined. It was decided that use would be limited to daylight hours only. Vehicle access was limited to the public-use zone, west of the chute's channel, and navigation will remain curtailed on the chute under state proclamation. No attempt would be made to curtail public use along the Missouri River bank, where anything from overnight camping on sandbars, to waterskiing, fishing, duck hunting, and yachting wiener roasts normally occur. We haven't got the time, personnel, or inclination to mess with all that!

A sport fishing plan, with all the attachments, state concurrence, etc., was submitted by early April, and the regulations finally were published in the Federal Register by early fall.

3. Public Participation

The expansion of Boyer Chute will be officially announced in February, 1997, along with an open house, but the word was out in December. One local paper carried a rather lengthy story, entitled "Boyer Chute to Expand Its Borders." Local landowner concerns began to be heard in our office.

4. Compliance with Environmental and Cultural Resource Mandates

In conjunction with the development of Boyer Chute's sport fishing plan, a compatibility determination, environmental assessment, Finding Of No Significant Impact, and a Section 7 evaluation had to be prepared. Phew! How significant can all this be? An estimated 10,000 fishing visits are anticipated, primarily for carp and* catfish.



53-017-96, BW

5. Research and Investigations

The Papio-Missouri River Natural Resources District has contracted Rivers Corporation, Inc. To conduct a five-year study to evaluate community-level composition and abundance of vertebrates (fish), and exposure to undefined urban effluents leaving the Omaha-Bellevue area via the Missouri River. Monthly sampling began in July, 1996, and will continue until 2001.

Of Primary interest to DeSoto will likely be the comparison made of fish species composition and relative abundance in the main channel Missouri River habitats with the fish species composition and relative abundance in Boyer Chute habitats. Three types of gear will be used to sample vertebrates: seines, winged trapnets, and electrofishing. Preliminary results during 1996 with small-mesh trapnets revealed 23 species of fish captured in the chute, and 17 species captured in the main channel. The \$216,000 in funding for this long-term study comes from the ASARCO, Inc. fine, levied by the federal court last year as a result of their long-term pollution of the Missouri River.

6. Other

The July, 1992, Memorandum of Understanding with the NRD was revised by the refuge manager to cover our operations until fee title to Boyer Chute is transferred to the Service. It was signed in May, and we immediately began the required posting, regulatory signing, and placement of interpretive signs.

E. ADMINISTRATION

1. Personnel

Covered under the DeSoto Narrative. Have 2 FTE's; got one biological technician on board, and one to go.

4. Volunteer Program

As mentioned in DeSoto's narrative, we got some help from the Boy Scouts at Boyer Chute, too. An Eagle Scout candidate, Joe Becerra, organized a service project for woodchipping all the shrubs at the seven parking areas, and the landscaped area at the main access.



53-021-96, ME



They also were involved in the flood cleanup. Here, they remove the mud from the deck of an overlook along the Meadowlark Trail.

53-022-96, ME

Each flood brought four to six additional inches of mud, which had to be manually removed.

Under our Adopt-A-Refuge Program, Omaha Audubon Society helped us with environmental education by providing member volunteers to give Saturday morning hour-long nature walks. Following an August 29 orientation with ORP Bruce Weber, Auduboners gave Saturday morning walks on September 7 & 21, and October 12 & 26. About 25 visitors participated each time.

5. Funding

Incorporated in the DeSoto section.

8. Other Items

A request was made early on to obtain an organization code, so that actual Boyer Chute funding costs could be identified, but, so far, our request hasn't been granted.

F. HABITAT MANAGEMENT

1. General

Boyer Chute is the latest large-scale Missouri River restoration effort to reclaim riverine habitat lost to agriculture and our society's engineering prowess. Developing this tract of land has been an experience. Significant progress has been made since the Service became involved with this partnership project.

Two quality wetlands were developed this fall, with more to come. Conversion of cropland to grasslands continues at a steady pace, although, dry weather last year, and flooding this year, have been significant obstacles.



53-37-96, SV

Above normal rainfall in May and June, and far above normal runoff from snowmelt in the Missouri River Basin kept water levels high all summer and fall.

The Missouri River just boiled, with releases from Gavin's Point Dam peaking as high as 49,000 in July, the second highest on record; and then, increasing to as high as 55,000 CFS in the fall. Flooding was a real problem following occasional big, sometimes massive, rainfall events upriver. Boyer Chute experienced three floods. They occurred on June 21, July 17, and August 5. A lot of time was spent just getting things out of the mud. Nonetheless, there was progress.

Regional pilot Foster flew the Boyer Chute area on August 13 and got superb aerial photography, which made a great comparison with the aerial photography obtained after the Great Flood of 1993. The duration of the 1993 flood was much longer and the damage more severe, even though we had three flood events this year. This photography will aid in identifying priorities for future acquisition, because it clearly shows where water flows and collects.

2. Wetlands

We began wetland development late this summer. The retreating floodwaters showed us where Boyer's wetlands lie. The unit with the greatest potential lies at the extreme north center of the interior island.



53-25-96, SV

The long, east-west running unit is comprised of several water depths. The small center portion is several feet deep, with both ends tapering. A second section lies behind the main body, and is very shallow, only several inches all the way across.

We were looking for an easy way to flood this large 40-acre unit. Normally, we flood by using Crissifulli pumps, which is labor intensive.

An irrigation wellhead, only 60 yards south of the unit, provided our water source. Most center-pivots in the midwest are capable of producing at least 1,000-1,200 gallons a minute.



53-26-96, SV

But, the wellhead was facing away from the unit. Having a crew come out and raise the wellhead to turn it would have been expensive. Instead, we purchased four 45-degree metal elbows, and made a gradual turn. We also bought a metal "Z" pipe, which then allowed us to go underground, to run eight-inch PVC pipe out to the unit. The PVC pipe was only a fraction of the cost of metal pipe. And, by burying it, we can still carry out prescribed burns on the native grass unit it is running through without meltdown. Luckily, the wellhead was two feet higher than the unit. This allowed the pipe to fully drain, so that the water would not freeze and break the pipe. Cost of the elbows, Z-pipe, connectors, and PVC pipe was \$2,700. This was all purchased from Nebraska Irrigation, Inc.

The only levee dirt work required were two small levees to keep the unit from draining down the old meander. We also had to haul some dirt to build up the dirt access road on the west end.

Most of this unit had historically held some water or was too wet to farm. Due to this, the wetland plants were already in place.

However, the second unit we developed had been in crops this year, before the flood, and looked extremely barren. This 18-acre unit is in the south central area of the interior island. The main oblong body runs north and south. A second smaller piece lays to the west, but was cut off from the main section. We went in with a grader and shaved out a shallow ditch to connect the two. Again, we used an existing irrigation wellhead. In this case, the well was much closer. Two 20-foot pieces of metal pipe, (one of which we had), and one 45-degree elbow, carried the water out away from the well. We then made a shallow 30-foot ditch to the unit. The pipe and elbow also were purchased from Nebraska Irrigation Inc. at a cost of \$230.50.



The main body of the unit held water well. Ducks were already using the unit this year, even with its bleak surroundings. The area will be seeded to natives, as soon as possible.

53-36-96, SV

The back piece is much shallower, and should be attractive to shore birds.

3. Forests

A mosaic of three major habitat types will evolve from reverted croplands. Cottonwood regeneration is one of the priority habitats. Natural regeneration as a result of recent flooding has been quite successful in establishing new stands of cottonwood. Three flood events this year, and an unusually long period of cottonwood seed dispersal, produced about 80 acres of new cottonwood saplings. Seed dispersal persisted throughout much of the summer, a very unusual occurrence. Time will determine the success of this new crop.

Refuge staff also experimented with a novel method for artificial cottonwood regeneration. A 60-acre tract of land serviced by center-pivot irrigation was managed to favor cottonwood regeneration. This site has heavy-textured soils, with poor internal drainage, and poor to somewhat poor external drainage. The cooperative farmer, who temporarily farms Boyer Chute croplands under a special use permit, disced the ground twice prior to cottonwood seed dispersal, and operated the center pivot during seed dispersal. The center pivot was turned on when assumed seed dispersal reached about 35% completion, and was operated as frequently as possible in an effort to maintain a continuous moist soil surface, from which the cottonwood seed could germinate. Although center-pivot irrigation and natural rainfall did keep the soil surface moist the majority of the time, it was not possible to operate the center pivot continuously over the target area. The problem was the system's mobile support towers would get stuck in the mud created by the standing water created from continuous operation. Consequently, the soil surface did dry out temporarily between rainfall events and center pivot operation. This was apparently enough to inhibit seed germination, and efforts were not met with a great deal of success. Only a total of 30+ cottonwood seedlings were recorded as having become established. The majority of regeneration occurred in low-lying areas where water stood for an extended period. Moisture from the center pivot (artificial rainfall) and natural rainfall was not sufficient in creating a favorable environment for cottonwood regeneration. But, it was worth trying while we still had the center pivots in place.

4. Croplands

Again, this year, cropland at Boyer Chute was farmed by a local farmer. This person farmed 506.8 acres of soybeans. The 1996 lease was cash-rent. The soybeans grown provide some natural nitrogen and weed control. We have a problem with shattercane on these lands, so the cooperator either chemically or mechanically controls shattercane seed production, as well.

Flooding destroyed all but 140 acres of soybeans. Fortunately, the farmer had crop insurance, which partially offset his loss of income



53-32-96, GG

Eventually, all cropland at Boyer Chute will be reverted to grasslands, cottonwood regeneration, and moist-soil units. This farmer assists the Service with fieldwork to prepare fields for reversion of cropland and manages a 40-acre food plot, and is reimbursed for custom services by a reduction in total cash-rent equal to the value of the custom work performed. Value of the custom work is determined by information contained in the annual Iowa Custom Rate Survey (FM-1698), published by the Iowa State University Extension Service. This year, custom services provided were valued at \$20,260.83.

5. Grasslands

A total of 189 acres were planted to warm-season grasses in four units at Boyer Chute, using DeSoto's standard mixtures, which are adjusted for soil type. Two of the units (44.2 acres) were seeded in 1994, but failed to establish. One unit is very sandy, and the other is mostly unconsolidated silt. Maintaining proper planting depth is difficult in these two units, if there has been any pre-plant tillage. This year, refuge staff experimented with an alternative seedbed preparation and planting methods for these two units. Seedbed preparation included a prescribed burn in mid-April to remove dead plant material. The darkened soil surface accelerated soil warm-up and weed seed germination. Once two giant foxtail flushes were observed (the primary weed pest), the units were sprayed (June 4) with Roundup @ 16-fluid-ounces per acre and 2,4-D @ 1-quart-per-acre. One week later, the units were no-till planted with a warm-season grass interseeder. The herbicide application eliminated pre-plant annual grass and broadleaf weed growth. Non-use of pre-plant mechanical tillage maintained a firm seedbed, enabling better seed placement. This procedure was quite successful. A high level of weed control was attained without disturbing the seedbed, and the established warm-season grasses being tolerant of low application rates of Roundup were not or were only minimally affected, with the possible exception of sideoats grama. Seedling establishment was very good, up until these two units were flooded on June 23, silting over the small seedlings.

Traditional seedbed preparation techniques (i.e., mechanical pre-plant tillage) were used on the other two units (144.8 acres). The soils in these units are heavier textured soils, with better soil structure.

Seedling establishment was good at all locations this year. However, the first of three floods reduced the initial seeding success. One-hundred-percent stand loss occurred in low-lying areas, which held water for any extended period, and where water flowed over the surface, depositing silt, fine sand, and other debris. This affected about 35 percent (i.e., 66 acres) of the seeded acres.



53-028-96, GG

Elsewhere, established natives and forbes looked vigorous. A variety of native flowers along Oriole Trail died back before it opened to the public, but we enjoyed them!

9. Fire Management

Boyer's first prescribed burn was completed on April 23rd on 44.2 acres covered with foxtail. By getting rid of the residue, it enabled our biologist to determine whether enough natives were coming up in the unit to either leave it or replant.

Two surplus military 6x6 trucks were obtained. When funds are available, they will be outfitted with tanks and pumpers, to be used for prescribed burning at Boyer Chute and DeSoto.

10. Pest Control

Roundup, Hyvar, and Pramitol were used to control vegetation in crushed-rock hiking trails, along concrete sidewalks, near pit toilets, parking lot islands, and barrier posts. Shattercane infestations in established grasslands were mowed in late July, just after seedhead emergence to control this difficult weed.

G. WILDLIFE

1. Wildlife Diversity

Boyer Chute, like DeSoto, will afford us a glimpse at our past natural heritage. And if these isolated areas can be expanded and brought together, a much truer picture of the once diverse Missouri River bottomland ecosystem will be seen, a mosaic of grasslands, bottomland timber, and wetlands, which will host diverse population resident and migratory species.

Boyer Chute is balanced between managing for wildlife diversity and public use. The interior "island" portion, is being taken out of agricultural usage and returned to a natural area of native grasses, old and new-growth cottonwoods. The "people" corridor

exists primarily along the chute on the west side of the channel, a couple hundred acres, with multiple public-use access points. Most of the interior will host an undisturbed population of wildlife.

2. Endangered and/or Threatened Species

Threatened and endangered species listed for Nebraska, include whooping crane, bald eagle, peregrine falcon, piping plover, least tern, black-capped vireo, pallid sturgeon, winged mapleleaf mussel, and Higgins' eye pearly mussel. Bald eagles were seen occasionally along the chute in the spring and fall. Pallid sturgeon were observed in catch and release studies along this section of the Missouri River, and we, thus, assume they may visit the chute. A flock of seven interior least terns and eight black terns were observed feeding over nearby Nathan's Lake on August 8 and 9.

3. Waterfowl

Boyer seemed to be under water the majority of the summer. After the flood waters had retreated, the trapped areas of water were attractive to ducks. When we could access the interior island mallards and wood ducks were seen scattered among the flooded areas. Teal showed up in early September.

The north and south moist-soil units were completed in the fall and were readily used by ducks. The north unit, which already had a lot of aquatic vegetation, was especially attractive. Pumping had barely begun when the ducks settled into the unit. Mallards, teal, shovelers, wood ducks, gadwall, and pintail were all observed in the wetland. Even though the unit was not finished until well into the migration, and it froze over in early November, use-days totaled over 2,000.

The south unit was not nearly as attractive to ducks. Since the wetland had been farmed this year, there was practically no vegetation in or anywhere near the unit. However, we did get a few mallard and gadwall using the pool.

Parallel to the Missouri River, there is a long chute that is extremely attractive to wood ducks. This is an old channel of the river, and it is surrounded by trees. Canada geese were heard down in the chute, but, due to the flooding, we could not get down to see how many were using the area. Wood duck boxes and Canada goose nesting tubs had been placed along this chute. Due to the high water, several tubs and boxes were under for most of the summer.

There are 15 wood duck boxes currently up at the Boyer Chute, placed during the winter. Seven of these did not receive any flooding. A wren built a nest in one of the boxes, the door was open on one, two had screech owls in them, and the remaining three

were being used by owls, as well. Boxes eight through fifteen all received varying degrees of flooding. However, box 12 got off all nine eggs before the first flood hit. This was the only box with wood duck activity.

Small flocks of 50-60 snow geese were seen on soybean fields on at least two occasions during the fall.

4. Marsh and Water Birds

With most of Boyer Chute and the surrounding area covered with trapped floodwater, we saw a lot of water-loving birds. It looked so strange to see great blue herons, cattle egrets, and great egrets standing out in the middle of flooded corn fields. They really looked out of place. Evidently, the pickings were good, with trapped fish and crawdads to choose from.

5. Shorebirds, Gulls, Terns and Allied Species

With all the receding water throughout the area, we had no shortage of shorebirds. Willets, greater and lesser yellowlegs, solitary sandpipers, Wilson's phalaropes, common snipe, short-billed dowitchers, and, white-rumped, spotted, and least sandpipers were seen feasting in the retreating waters.

Gulls also had no problem finding food. Walking through a thinly flooded area, you could not put your foot down without stepping on a crawdad or its burrow. The gulls were expert at grabbing these little guys on the wing. Along the edge of the water, we found claws scattered everywhere. The majority of the gulls were ring-billed, but we also saw Franklin's and Bonaparte's gulls.

6. Raptors

Raptors observed throughout the year included Swainson's, sharp-shinned, northern harrier, osprey, American kestrel, turkey vulture, and bald eagle. Red-tailed hawks are by far the most numerous in the area.

Ospreys fed along Boyer Chute in the fall.

Screech and great horned owls also were observed. We suspected barred owls to be here, but, as yet, no one has seen or heard any.

A great-horned owl nest was observed in the woods on the north end of Center Island.

7. Other Migratory Birds

Mourning dove nesting is quite common here.

Common crows, belted kingfishers, red-headed blackbirds, flickers, red-bellied, and red-headed woodpeckers, were observed during

their respective nesting seasons. We expect woodcocks to become a nesting species here, as well.

We also observed several common nighthawks during the summer. These birds were seen near the Oriole Picnic Shelter during the middle of the afternoon.

And, there must have been over 100 Virginia rails that dropped into flooded native grasslands on the northend of the island during their fall migration.

8. Game Mammals

The white-tailed deer is the only resident big game animal on the refuge. Deer were observed regularly throughout the year. Two deer were spotted escaping across the bridge as the water was rising during the second flood. The deer herd appears to be healthy, and several nice bucks were seen by the staff. We would anticipate that the herd will increase rapidly and limited control will be necessary within two or three years.

10 Other Resident Wildlife

Pheasants have been observed, but in no great numbers. With all the native grassland restoration and the area being closed to hunting, their numbers should explode.

Racoons, coyotes, and beaver also were seen during the year. A beaver took up residence in the north wetland. A fairly substantial lodge was built, and he began to remove many of the small, 8 foot, cottonwood trees. Beaver cuttings are all along the chute. Mink were seen several times, and an otter's track were present again this year.

A few turkeys also were spotted. One large tom decided Maintenance Worker Kaiser was pretty attractive. He is sort of alone in that! The turkey stayed around the cabin area while Dave was working on remodeling the building.

H. PUBLIC USE

1. General

At nearly 2,000-acres, Boyer Chute is Washington County's largest recreational development. Visitation to this new refuge began Labor Day weekend. Approximately 4,500 people came during that three-day holiday. Visitation for the rest of the year was 8,408 (September), 9,843 (October), 1,130 (November), and 682 (December).

Visitation will grow; and, it seems that 50 percent of our traffic will come up from the nearby Omaha metropolitan area.

Senator Bob Kerrey officially opened Boyer Chute National Wildlife Refuge at a gala press ceremony, Friday, August 23. Senator Kerrey is the principal sponsor of the "Back to the River" funding.



Becic, NRD



Becic, NRD

From 10 am to 1 pm, approximately 140 invited guests, mostly local officials and press, joined Senator Kerrey, DeSoto's Manager Gage, and Steve Oltmans, Director of the Papio-Missouri Natural Resources District, in a verbal orientation to the refuge.

Those present heard brief talks by various VIPs about Boyer Chutes potential for wildlife and people.

The crowd enjoyed the ceremony, the beautiful, sunny weather, and the sandwiches and beverages, which were provided under three Arabian-style tents along the chute.



Becic, NRD

As a national wildlife refuge, the following regulations are enforced to protect Boyer Chute's resources and visitors:

Hours - Daylight-use only; the refuge is open one-half hour before sunrise to one-half hour after sunset.

Fishing - Anglers are welcome; a Nebraska fishing license is required. Both state and federal regulations apply. Personally-attended hook-and-line fishing only. Bait digging, seining, and collecting frogs and clams are prohibited.

Boating - Only non-motorized vessels are allowed. The chute is strictly for canoes and similar floating craft, conditions permitting.

Fires - No grills are provided at picnic sites. Open fires are prohibited.

Camping - None; this is a day-use-only area. The entrance is locked at dusk.

Firearms - Fireworks, guns, air-guns, and all weapons are prohibited, except as authorized for refuge hunting programs. Bow-fishing is not allowed.

Pets - Pets are not permitted. They must be confined to vehicles.

Swimming - Swimming is not permitted, because of strong currents, objects in the water, and deep holes.

Trash and Litter - Visitors must pack out what they pack-in. To control trash and garbage costs, trash receptacles are not provided. We encourage visitors to leave the area cleaner than they found it.

Some other special conditions are enforced:

- a. Trespass into "closed areas" is prohibited.
- b. Destruction of plants and animals is prohibited.
- c. Disorderly conduct is prohibited.
- d. Possession of alcohol is prohibited.

4. Interpretive Foot Trails

The refuge has four nature trails, each of which is maintained about eight feet wide. Two trails, the Meadowlark and Oriole Trails, are interpreted, with short messages on fiberglass-imbedded panels. These are each a half-mile long. The Meadowlark Trail is concrete-paved, and passes through restored prairie. A third trail is a half-mile long, and extends along the tree-lined chute from the Canoe-Take-Out Parking Lot to the Missouri River.

This is one-mile round-trip. The fourth trail is a four-mile, looped trail that extends around the north half of the island portion. The flooding has repeatedly defeated our attempts to establish grass on this trail.



53-020-96, ME

Several thousand users came to explore these hiking paths. Most popular were the Meadowlark and Oriole nature walks. However, a surprising number of people ventured along the half mile route south to the Missouri River, and some along the four-mile trail, which is actually not completed.

5. Interpretive Tour Routes

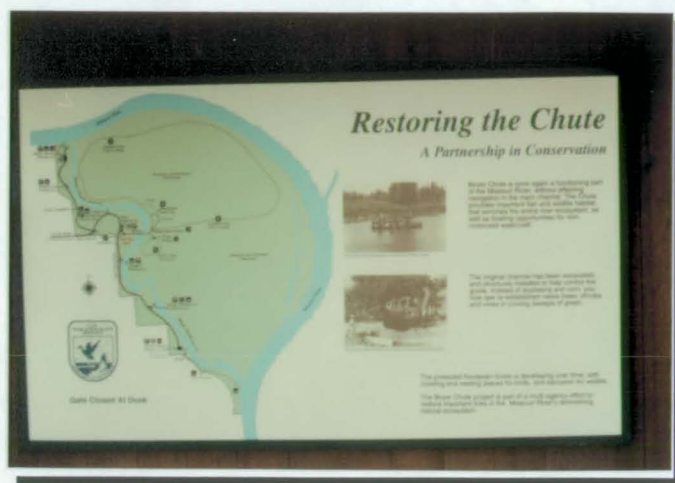
The entrance kiosk provides a basic orientation. Interpretation is off to a good start. Approximately \$25,000 worth of signage was erected by the staff in time for the Labor Day weekend opening.



53-013-96, BW

This included 295 signs, some of which are duplicates. The sign program was successfully accomplished thanks to enthusiasm of the staff, and a year of planning beforehand.

The canoe route has not been interpreted; but, a brochure was developed to caution users about the potential hazards. Of primary concern are the swift current, overhangs, and the low-head bridge. And, of course, we did not open the chute because of the flooding.



53-012-96, BW

The quality of our signage won praise from the public. Wilderness Graphics Company supplied 30 interpretive signs, costing \$12,110. These beautiful, durable signs are a mixture of sandblasted wood and fiberglass embedment.

Regulation and direction signs were also placed in time. Unicorn supplied 24 metal signs, costing \$989. Carsonite Company supplied 121 recreational symbols, costing \$630. The FWS sign shop, in Winona, Minnesota, created 120 wood vinyl-letter directional and safety signs, costing \$11,354. Real quality work, and timely!

A refuge map brochure, prepared in-house, orients visitors and clearly states regulations. The initial batch of 2,000 brochures was consumed so fast that we immediately reprinted 10,000 more in October. The brochures are distributed at both the entry and information kiosks, as well as at the DeSoto Visitor Center.

9. Fishing

With the opening of Boyer Chute on Saturday, August 31st, hundreds of anglers descended on the chute and the fishery resource available to them. A variety of fish species were found in anglers possession or reported as caught. Some of these were carp, buffalofish, gar, walleye, channel, and flathead catfish, goldeye, freshwater drum, walleye, quillbacks, bullheads, skip-jack herring, red horse, and white bass. For sure, the chute harbors a few paddlefish and sturgeon.



18-258-96, SV

One very large dark sturgeon was hooked and dragged halfway up the bank before it broke off. It had to be a lake sturgeon, since shovelnose sturgeon don't exceed 30 inches.

Boyer Chute was originally supposed to open to fishing in the spring, but the three-mile-long chute was flooded most of the summer. In fact, floods washed over most of the refuge in June, July, and August, leaving behind a variable layer of pasty Missouri River silt. This deposit, on roads, trails, and other facilities, took weeks to dry, before we could clean it up.

High water in the chute made it unsafe for canoes and other non-motorized vessels the rest of the year; however, the new refuge was used, especially by fishermen.

There are seven parking areas available for fishermen. All the fishing accesses have fish names, like Bluegill and Catfish. The funny thing is that our largely minority anglers exhibited a strong preference for the Catfish Parking Area, over Bluegill, Sturgeon, or Sanger Parking Areas, although they were arbitrarily named.

Once the first few weeks had passed, and the curiosity seekers had been satisfied, we still had sufficient anglers on weekends to get a fair handle on what type of angling success to expect from the chute. The majority of the repeat anglers were after flathead and channel catfish. A good number of 3-8 lb. flatheads were caught in October and early November, before the weather and reduced water flow restricted use and angler success.



53-016-96, BW

In July, a tributary of the chute which runs under the footbridge at the south end was visited by hundreds of small to fairly large shortnose gar and several 30-40 pound blue catfish. Numerous attempts to hook one of these big cats were futile.

Total fishing visits for the four months that we were open were 4,486, with 12,417 activity hours of angler use.

12. Other Wildlife-Oriented Recreation

An important question for FWS is future use of the chute by non-motorized vessels. The NRD originally envisioned the chute as an ideal opportunity for beginning canoeists. However, high water for two summers and the associated swift currents, make it hazardous, especially considering that there is no clearance for vessels under the bridge during high water.



53-018-96, BW

14. Picnicking



53-006-95, BW

There are four disabled-accessible tables at the main parking area. There are no other picnic tables, except those at the Oriole and Meadowlark shelters.

To get to these involves a lengthy quarter-mile walk, which will probably discourage most general picnicking at the shelters. The intent of these shelters (one floods, one doesn't) was primarily for school groups involved in environmental education activities.

16. Other Non-Wildlife-Oriented Recreation

Another unanswered question is how much canoeing and other non-motorized boating Boyer Chute might have. We also wonder how Boyer Chute will be used during winter months. Ice-fishing is unsafe in the chute and along the Missouri River. Cold north winds on the bottomland make winter walks unpleasant most of the time. Cross-country skiing and snow-shoeing are not locally popular, even if snow is suitable. Snowmobiling is not allowed because it tears up the trails. We experienced some, regardless.

17. Law Enforcement

Before the NRD and the Service got involved, the old chute was a good place to dump trash and practice shooting. It was the end of the road. Signs were regularly shot up. We initially saw gang graffiti, and quite a few rough-looking characters down there. The Bloods and Crips vie for turf and deal crack only eight miles away in North Omaha. We had a lot of trespass, and several thefts. Pospichal Construction had a major theft in 1994, and, periodically, still advertise a \$10,000 reward.

But, our high-profile preventative law enforcement presence seems to be working. We haven't had to go to battle, and vandalism has remained low since we took over operations.



53-015-96, BW

In August, RO Phillips participated in a marijuana-detection flight over DeSoto and Boyer Chute with the Iowa Air National Guard. No cultivated plots were located; although, one was reported near Nathan's Lake, and watched by the Washington County Sheriff's Office.

On August 23, Senator Kerry held his press ceremony along the chute, announcing the opening of the refuge the following week. NRD officials were concerned about possible disruptions of the event by a former landowner who is unhappy with the project. A couple of signs had been shot up, and a new approach sign ripped down. RO Phillips and Van Riper assisted Washington County Deputies with security at the event. No incidents occurred.

The refuge opened to the public on August 31, Labor Day weekend. We were short on law enforcement personnel so Refuge Manager John Guthrie, from Swan Lake Refuge, was asked to help us out, and he did. Although visitation was high, only one incident occurred. On Monday (September 1st), a visitor's vehicle was vandalized. An obscene phrase was spray-painted on one side of a new Acura. No suspects were identified.

Jeff Charboneau, motoring from Omaha, left his boat at the chute's outlet for a hike on our trails and had water skis, two ski vests, and two coolers stolen from his boat on September 11th.

Below is a list of the violation notices and warnings issued on the refuge during the year. One of the cases (fishing without the required state license) was contested in court. On the stand, the defendant accused the officer of threatening her with a gun, racism, lying, bad manners, and being from Mississippi! After being found guilty, the defendant promptly asked for a reduced fine, but the court denied the request.

1996 Summary of Violations		
Violation	Violation Notices	Written Warnings
Littering	1	0
Fishing w/o State license	2	1
Consumption of alcohol	0	3
Off road driving	0	1
Trespass (closed area)	0	2
1996 Totals	3	7

The totals for 1996 represent only about four months (September through December) since the station did not open until Labor Day weekend.

While preparing to open Boyer Chute to the public, we discovered that other refuges in Nebraska were prohibiting either the possession or consumption of alcoholic beverages (following the lead of Nebraska State Parks, which had recently banned consumption on their lands). We contacted several Nebraska refuges and found they were either turning alcohol cases over to local authorities, or had exceptional compliance and had not written any citations related to alcohol. To determine how we could fall in line with the other refuges in Nebraska at Boyer Chute, we sent a memorandum to the Solicitor in February and received an answer in late May. Their opinion was that we could prohibit **consumption** by erecting the appropriate signs and enforcing it under 50 CFR 28.31. Prohibiting the **possession** of

alcohol, they said, would be more complicated. Therefore, we erected signs prohibiting the consumption of alcoholic beverages, and included information about the regulation in the brochure. No NOVs were issued this first year, but three written warnings, and several verbal warnings were given.

Biological Technician Mike Ellis began his basic police training at FLETC in mid-November, and is scheduled to return in early February, 1997.

Although we are experiencing some littering, with the pack-in, pack-out policy, there have not been any blatant cases since the Service took over. Boyer Chute used to be a good place to dump trash, dump a body, or strip a vehicle.

The heavy gates and lighted entranceway have discouraged nighttime trespass. We did have some minor vandalism on the evening of December 28, when several trees and shrubs were damaged. Someone tried to gain entrance to the nearby Chip Davis estate (Mannihem Steamroller's conductor), and tore up the entry there during the same night.

I. EQUIPMENT AND FACILITIES

1. Construction

The signs say the Catfish and Sauger fishing accesses are supposed to have disabled-accessible fishing piers. The original, one-million-dollars-worth of public-use facilities provided by the NRD did not include them, because it was thought that the chute would not be stable enough to place them for several years. The Great Flood of 1993 solved all that. So, at the end of FY 1996, we used \$20,000 of available recreational fisheries monies to purchase sheet pile for the project, which had already reached a final design under an NRD contract with HGM Associates, the original Omaha design team used for all of the Boyer Chute facilities.

The first design was rejected by the refuge manager as too maintenance intensive (two piers, 45 and 65 feet in length, placed on concrete piles, with lots of wood). Beaver like wood. Wood floats! So, HGM went back to the drawing board, and came up with a more maintenance-free design (two piers, placed on sheet pile, angling downstream to deflect flotsam, much shorter, but protruding out over the channel on cantilevered beams).

The successful bidder on the project was Pospichal Construction, Inc. of Waterloo, Nebraska, with a low bid of \$120,000. The NRD is covering the cost. Construction had not begun at year's end.

2. Rehabilitation

In May, Omaha Public Power District (OPPD) began relocating the overhead power lines along the main entrance trail, and across the Center Island bridge. These lines, originally located overhead on the upstream side of the bridge, service the house and maintenance facilities located on Center Island. However, they created an extreme hazard when using heavy equipment to clean out river debris, lodged against the bridge.



After being delayed by three floods in June, July, and August, OPPD pulled the old overhead lines down, buried new lines, and attached them to the downstream side of the bridge.

53-24-96, SV

Although Manager Gage tried to get the electric company to "donate" the work, the project ended up costing the refuge \$14,403.

Work began this year on a long-term project to rehabilitate the small, two-bedroom cabin that was transferred with the land to the refuge. The building is located by the chute, on the west side. After renovation, it will be used for a satellite office, and for temporary housing for seasonal employees, volunteers, researchers, etc. The roof shingles on the cabin were replaced in May and June. Vinyl soffits and gables were completed in July. In August and September, the exterior walls were painted, gutters were installed, and the bathroom was gutted. Henton Trenching (Blair, NE) installed a new septic system in September, at a cost of \$2,400. In October, a temporary sand point was installed and the water lines running to the cabin were replaced. Wet insulation above one of the bedroom ceilings also was removed. In November and December, the shower drain was ripped out and replaced, a

shower stall was installed, and work on the water and electric in the bathroom began. Future plans include completing the bathroom and kitchen, insulating the interior side of all exterior walls, dry walling all interior walls, repairing windows, and replacing carpet, air conditioners, and appliances.

Work also began on the Center Island equipment shed. This is an old 30 x 85-foot farm equipment building that, like the cabin, came with the land. In May, cracked concrete along the edges of the floor was torn out and replaced. Later, the two dilapidated walk-in doors were replaced with steel doors, and the rollers and base plates on the two drive-in doors were replaced. The roof was patched, and gravel was used to fill in between the grain bin pads just outside the building to form an equipment parking area. Future plans include a complete electrical rewiring, installing a well (currently, water is pumped from the nearby residence well), building a high/dry self-contained (rodent-proof) storage room inside the structure, and installing an outside light.

The Oriole Loop Trail had to be rehabilitated before it was even opened to the public. The chute started cutting the bank on which a portion of the trail was located, and by early this year, was threatening to take out that section.



53-31-96, GG

In July, the NRD cleared a new section of trail we had marked through the woods further back from the chute. Dirt and vegetation from the new section of trail were piled at either end of the old section to block it off. The NRD then installed petromat and gravel to complete the new section of trail. A bench was damaged during the operation, so the bench from the old (closed) section of trail was used to replace it.

3. Major Maintenance

A clean-up day in April resulted in the removal of remaining dumps, two old vehicles and the burying of debris, which might be considered safety hazards. We shared this clean-up with the NRD, since they have all sorts of equipment and big dump trucks.



53-34-96, GG

Water, water, everywhere
..., but, not a drop to
drink! Heavy Equipment
Operator Cunard pumping up a
storm at the hand pump along
the main trail to the
bridge.

A big part of the maintenance work done this year was in reaction to the three floods that occurred in June, July, and August.

This is what the county road leading to the refuge looked like during the June flood.



53-30-96, GG

Each flood left sidewalks, roads, picnic shelter pads, and other facilities covered with mud that had to be scraped or shoveled.



53-24-96, GG

The road on either side of the Boyer bridge, shown here, was covered with debris and washed out, so more rock was brought in to repair it.

Because we did not have our crane/clam-bucket equipment ready this year (see I.4.), the NRD came in before and after the floods, and cleaned out the debris that had piled up against the bridge.



53-35-96, GG

Ever since it was installed, the maintenance staff have been dreading the opening of the Clivus composting toilet at the Main Parking Lot. This solar-equipped facility would use natural processes (composting) to break down the human waste deposited in the plastic tank beneath the structure (in what we call the "basement"). Sound good so far? Well, according to the manual, in order for everything to work properly the material in the tank would have to be stirred every day. There is no machinery to do

the stirring, so it gives a whole new meaning to phrase "I always get the sh__ jobs". The liquid effluent also would have to be removed weekly (the recommended tool ... a bucket). Hence, anxiety on the part of the maintenance staff. But, early this year, they began to experience a "flood of relief".



Actually, the Clivus Mulching Toilet has been flooded most of the time since mid-1993.

53-33-96, GG

Even in January, the basement of the composting toilet partially flooded from high ground water. The water lifted the plastic waste tank and pinned it against the ceiling. This broke the chutes coming from the restroom facility above, and bent the tank inward in one spot.

Although we had planned to repair the facility before opening in late August, the June flood filled the basement completely. We had the basement and tank pumped out in mid-August, but it immediately filled up again.



53-29-96, GG

The basement remained flooded throughout the rest of the year. The solar equipment located in the basement is surely destroyed. Consideration is now being given to converting the facility into a large pit toilet, by completely sealing in the basement (the maintenance crew absolutely supports this option!).



31-100-96, HP

Everywhere we went
... mud, mud, mud!
This boat access has
gravel somewhere down
there. In all, we
figure the cost of
clean-up from the
three floods exceeded
\$30,000.

The remainder of several tons of road rock procured late last year were delivered in January and February. Approximately 98 tons of 3/4-inch crusher run rock were spread on various sections of road at Boyer Chute. In July and August, more rock was placed on the driveway leading to the cabin, and a small parking spot was established next to the entrance kiosk.

All of the interior boundary was posted during the summer months, but floods kept us from posting the river boundary. It was decided that the entire southern half of Center Island would be closed to the public to provide wildlife a sanctuary area, and it was posted with closed area signs.

Quite a bit of maintenance time was spent erecting interpretive and regulatory signs prior to the late August opening.

Several signs cautioning visitors about the swift current were erected at access points along the chute. Warning signs for canoeists were installed along the chute before the bridge and before the canoe take-out area.



53-019-96, BW

Signs designating parking areas, trails, and picnic shelters also were placed. Interpretive signs were installed in the two kiosks

and along trails. A frame was built and a 5' x 10' regulation sign was installed at the entrance by the maintenance staff. A contractor wanted \$6,800 for essentially the same standard our guys built for under \$1,000.

To reduce maintenance costs (weed whipping), the ground immediately surrounding the pit toilets at the Canoe Launch and Canoe Take-Out Parking Lots was cleared, and petromat and gravel were placed. The vegetation surrounding barrier posts and benches in all seven parking lots and islands were treated with herbicide for the same reason, and will be graveled next year.

In addition to our work, the NRD continued to remove encumbrances. Two additional center pivots were advertized for sale. The refuge Manager was able to salvage one of the diesel motors for our use in future moist-soil management. The NRD also sold five large grain bins (18 to 48-foot diameter), one of which held 50,000 bushels of grain, located next to the Center Island equipment shed.

4. Equipment Utilization and Replacement

In May, we received a 1996 Ford F-250 4x4 pickup truck (\$19,880). This truck will be used primarily for maintenance work.



In July, we received a John Deere 7200 front-end-assist, cabbed tractor with a front-end loader attachment (\$49,651) from Skyland Equipment Company in Tuscaloosa, Alabama.

36-150-97, SV

We finally have a tractor that can be used in heat, dust, and other extreme conditions, without subjecting the operator to undue hazards and hardship. The NRD picked up the tab with contributed funds. This is the first new tractor we've seen since 1979.

DeSoto's Chevy 1500 patrol truck will serve as the "high profile" Boyer Chute law enforcement vehicle when the biological technicians complete their training and start conducting patrols from their station. The Ford F-250, received in May, was equipped for "low profile"/backup law enforcement work. Visor lights, wig-

wag headlights and tail lights, a siren/PA, and a hand-held spotlight were installed. A cellular phone also was installed.

In November, an excess clam bucket was acquired and transported from Holla Bend Refuge in Arkansas. The bucket will be modified for use with the 20-ton crane we obtained from Whiteman AFB last year.



36-149-97, SV

The primary purpose of this equipment will be cleaning out logs and other debris from the chute that become snagged against the bridge. At one point during the first flood, debris was backed up upstream from the bridge 60 feet!

J. OTHER ITEMS

1. Cooperative Programs

- a. Cooperative Agreement. A cooperative fire agreement was prepared and signed with the Fort Calhoun volunteer fire department for protection of Boyer Chute and adjoining public lands.
- b. Friends. There are few projects that have involved more partnership agencies and organizations than Boyer Chute. While the Corps and the NRD were the only agencies involved in the initial acquisition, our friends include Senator Robert Kerrey and his Back to the River Steering Committee, which includes no less than 11 agencies and organizations. The only agency with a Missouri River focus not on this Committee is the Iowa DNR. Other interested parties are American Rivers and the Missouri River Coalition.
- c. Deer Creek Diversion. Manager Gage, who was involved in the original scoping meetings for Boyer Chute and Nathan's Lake, had suggested to the Corps that available EPA monies (\$150,000 left over from the Great Flood of 1993) be used to design water-control structures and impoundments, which would aid in flood control in the Nathan's Lake area, while making better utilization of Deer Creek's natural water course. Everything had been drained into a levied ditch

years ago in an attempt to farm wetlands. Low and behold, it is happening!

The Corps surveyed about 100 acres of lowlands, and plotted a foot-contour map. They have designed three wetland restorations, covering approximately 60 acres, while diverting Deer Creek back through its natural drainage. The Nathan's/Mud Lake water structure would be a three-way concrete stoplog structure, and, although a bit over-designed, it should allow us to manipulate Nathan's and Mud lake independently, allow us to use backflooding to our advantage, sustain flood overtopping, and still permit nutrient, invertebrate, and fish passage under normal operation. Now, all we need is \$100,000 to \$120,000 to get this design placed. If all else fails, a good portion of this work could be accomplished by the NRD or refuge staff and equipment during a non-flood year.

- d. Modification of Chute. A former chute on the east side of Boyer Chute's island section holds some promise for a flow-through channel. Manager Gage has been prompting the Corps to modify (lower) rock dikes along this inside bend to provide flowage along this isolated old chute during high-water events; which might reverse the typical fill situation. Combined with a diversion dike and a couple grade structures, this could become a viable environment (and nursery area for fish) once again. The Corp's Planning Division is discussing various approaches at this point.

2. Other Economic Uses

Once the Boyer Chute property is transferred to the Service, we will "inherit" an apiary. The same individual who maintains apiaries at DeSoto has a permit with the NRD. A special-use permit and a small fee should cover his continued use at this refuge. A compatibility determination has already been filed.

3. Items of Interest

Refuge Managers' Gage and Kauffeld (Rainwater Basins WMD) traveled to Lincoln to have Governor Ben Nelson officially proclaim National Wildlife Week a Nebraska event.



Personal Picture, JK

Negative Press - The Missouri Valley Chapter of the Sierra Club are not happy campers. Chairwoman Isabel Cohen, who has rarely applauded anything that the Corps has been involved in, has been adamant, and all too vocal, about the Boyer Chute project, proclaiming it a waste of government funds and a step in the wrong direction. It's interesting that her Co-chairman is John Anderson, a Freshwater Specialist with the Corps. He had been an advocate of the Two Forks Dam and other environmental misfits that thankfully didn't happen. Yet, he has been very radical and vocal about this chute restoration, almost too vocal in his denouncement of this project, considering his employment. They are proclaiming the project a people refuge, not a wildlife refuge; yet, only a narrow band, along the chute receives over 90 percent of the public use, a few hundred acres. We consider this specific group strange, and "rad to the max"!

The proposed expansion of Boyer Chute is sure to bring more negative press. You can't take 5,000 acres out of agricultural production, and off the tax rolls, without negatively impacting individual livelihoods and school district funding. Washington County's Board of Supervisors is going to scream bloody murder, because over 6,000 acres have already been removed from their tax rolls by our Service for DeSoto and the existing Boyer Chute, devalued under the Refuge Revenue Sharing Act, and, then, only partially reimbursed on an annual basis. So far, they have received no reimbursement for Boyer Chute, because it has not been transferred from the NRD in fee title, yet. It won't matter to them that there are plenty of willing sellers, and that these marginal farmlands and farmed wetlands never should never have been cleared and drained in the first place.

On top of that, the people of Washington County are forced to contribute to the NRD's funding, one of six counties that support the NRD's \$18-million-dollar annual operating budget. Since the NRD has the power of eminent domain, and is planning a bikeway all the way through Washington County in conjunction with Senator Kerrey's Back to the River Program, there is more than handwriting on the wall. This, of course, breeds a certain degree of community animosity toward the Government, in general. We, in turn, need to maintain a high level of public service, along with our compassion and composure.

4. Credit

All managers, and selected personnel wrote segments of this narrative. All compilation and computerization was finalized by the administrative staff. Project Leader Gage edited the final report. Credits for the photos are shown under the photos.

DeSoto NWR

[illegible]