

**WALNUT CREEK NATIONAL WILDLIFE REFUGE - PRAIRIE LEARNING CENTER**

**Prairie City, Iowa**

**ANNUAL NARRATIVE REPORT**

**Calendar Year 1995**

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

**REVIEW AND APPROVALS**

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CENTER**

**Prairie City, Iowa**

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**Calendar Year 1995**

  
\_\_\_\_\_  
Refuge Manager      Date

 4/4/96  
\_\_\_\_\_  
ARD-Refuges & Wildlife      Date

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## **INTRODUCTION**

Walnut Creek National Wildlife Refuge - Prairie Learning Center is located in southwest Jasper County, approximately 20 miles east of Des Moines, Iowa. The project was established in September 1990, 30 days after release of an Environmental Assessment and signing of a Finding of No Significant Impact. Authority for establishment was the Fish and Wildlife Act of 1956 and the Emergency Wetlands Resources Act of 1986.

Authorized size is 8,654 acres. The core of the project was 3,622 acres formerly owned by Redlands Corporation, a subsidiary of Iowa Power and Light Company. The land had been purchased originally in the late 1970s and early 1980s as the site for a nuclear power plant cooling lake. The plant was never built and the land had been intensively farmed by tenants.

The rolling topography within the Walnut Creek watershed contains lands which are highly erodible with steep slopes draining into Walnut Creek. Land currently not restored or reconstructed to prairie includes approximately 36% corn and soybean acres, 7% pasture and small grain acres, 11% forest, 9% "other" and 37% unrestored CRP. Wooded areas are mostly oak savanna and riparian corridors along Walnut Creek.

The primary purposes for establishment are: "(1) to restore native tallgrass prairie, wetland, and woodland habitats for breeding, migratory birds and resident wildlife, (2) to serve as a major environmental education center providing opportunities for study, (3) to provide outdoor recreation benefits to the public, and (4) to provide assistance to local landowners to improve their lands for wildlife habitat."

A preliminary feasibility study done by the Service indicated a traditional waterfowl refuge was not viable nor in keeping with purposes for which this project was established. Reconstruction of the tallgrass prairie/savanna ecosystem, providing a major environmental education facility and providing an opportunity to work on private lands and Service lands within one discreet watershed; these are all new goals for the Service and as such, this project takes on a new and more critical significance.

## **A. HIGHLIGHTS**

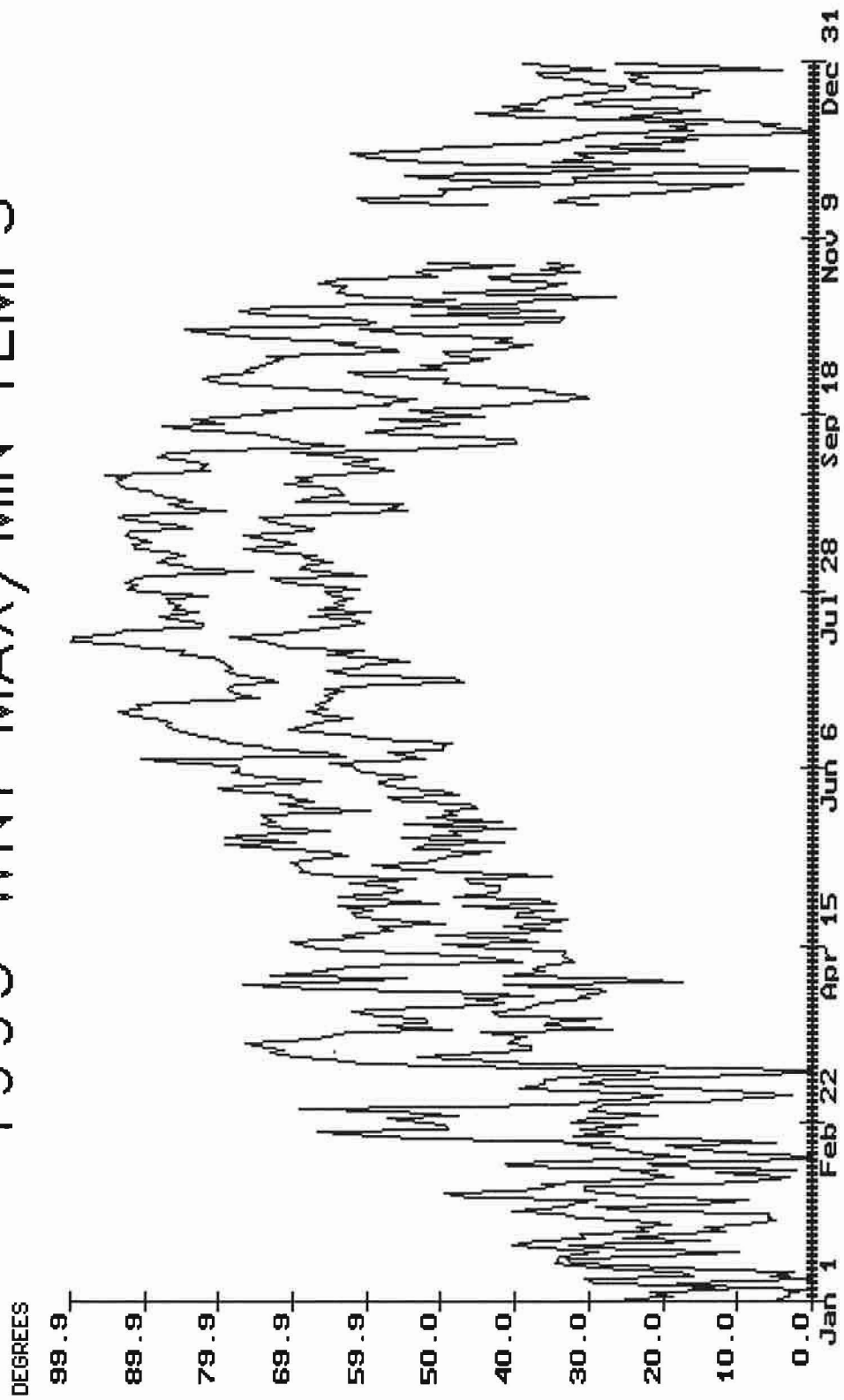
- To date, a total of **1,100 acres of prairie have been planted** on 37 planting sites on the Refuge.
- Walnut Creek organized and hosted Iowa's first **Junior Duck Stamp** competition. Judges, including two-time Federal Duck Stamp winner Maynard Reese, judged over 450 entries.
- **Over 6,000 teachers and students** participated in environmental education activities in 1995. This was done with a staff of 8; all maintenance and administrative staff joined biological and public use folks to provide customer service.
- The **Friends of Walnut Creek** flourished, with paid memberships doubling in 1995. By the end of the year, over 150 individuals and families had joined the organization.
- Over **1,000 people volunteered** their energies to the Refuge, nearly a **74% increase** over 1994. Donated hours also increased nearly 67% from the previous year!
- **The Basswood Interpretive Trail** opened in May, providing visitors with a high quality recreational experience while permanent trails and other visitor facilities are under construction.

## **B. CLIMATIC CONDITIONS**

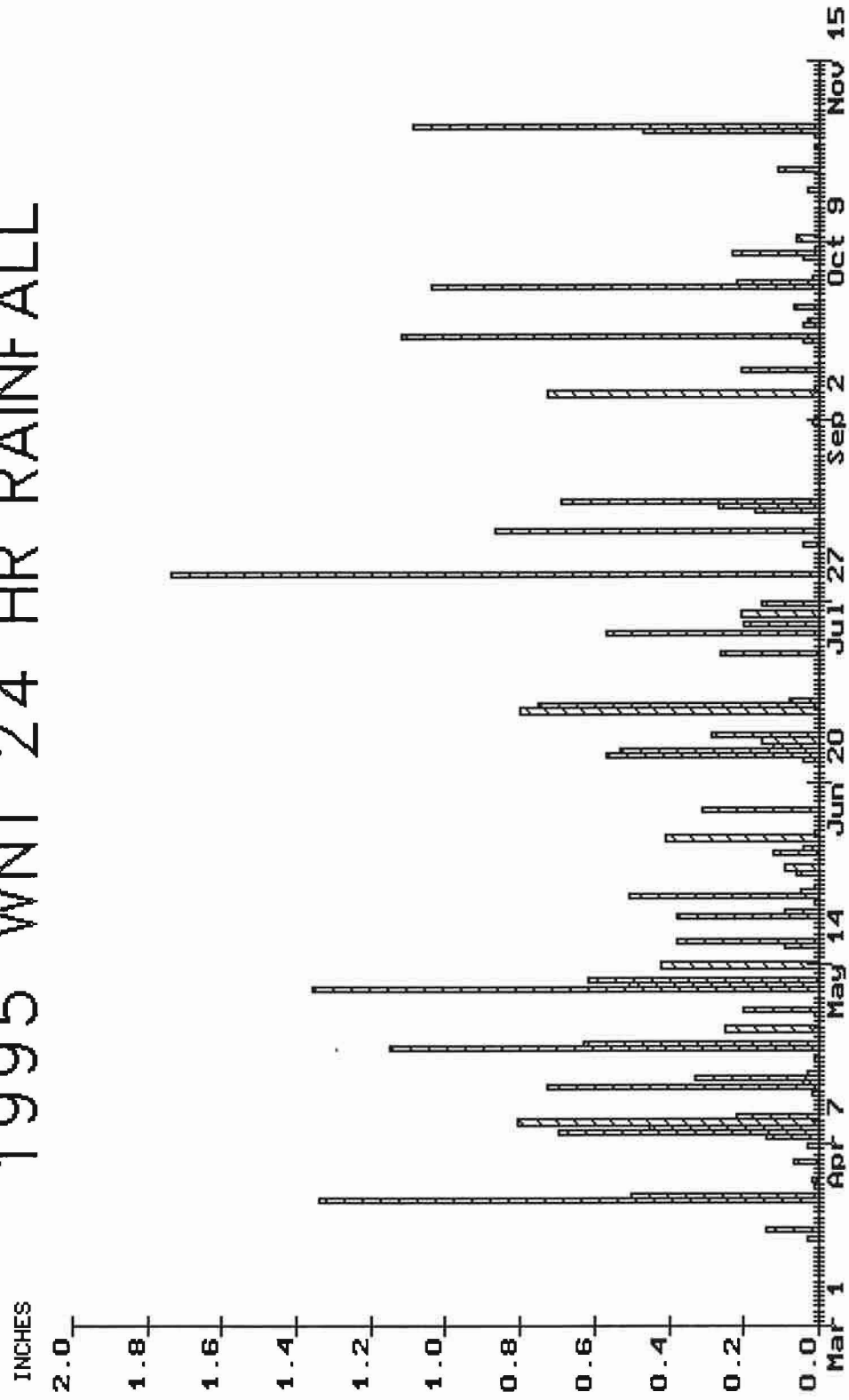
Iowa weather conditions during 1995 proved the saying "wait a few minutes and it will change" to be true. January temperatures remained below freezing until the 11th. The month of February was a see-saw month. It began with warm temperatures reaching almost 50 degrees but by mid-month we realized winter had not gone far as the mercury dropped below 0. We bounced back to 69 degrees on February 18. Temperature extremes in March ranged from a low of -4 to a high of 76 degrees. A wet April with rainfall falling on 16 days hampered Refuge burning activities and spring planting. Persistently cool temperatures continued through June. Once the heat began though, it was intense and high humidity along with above 90 degree temperatures kept most people indoors in the air conditioning. Area farmers kept close watch over their livestock, some loss resulted from the high temperatures. An early frost occurred in late September; the remainder of the fall months continued to be cool.

The following graphs were compiled from data taken from our Fire Weather Station. They indicate maximum/minimum temperatures; 24 hour rainfall and maximum wind speed for 1995. There is a period of 20 days in November when weather data was lost due to computer difficulties.

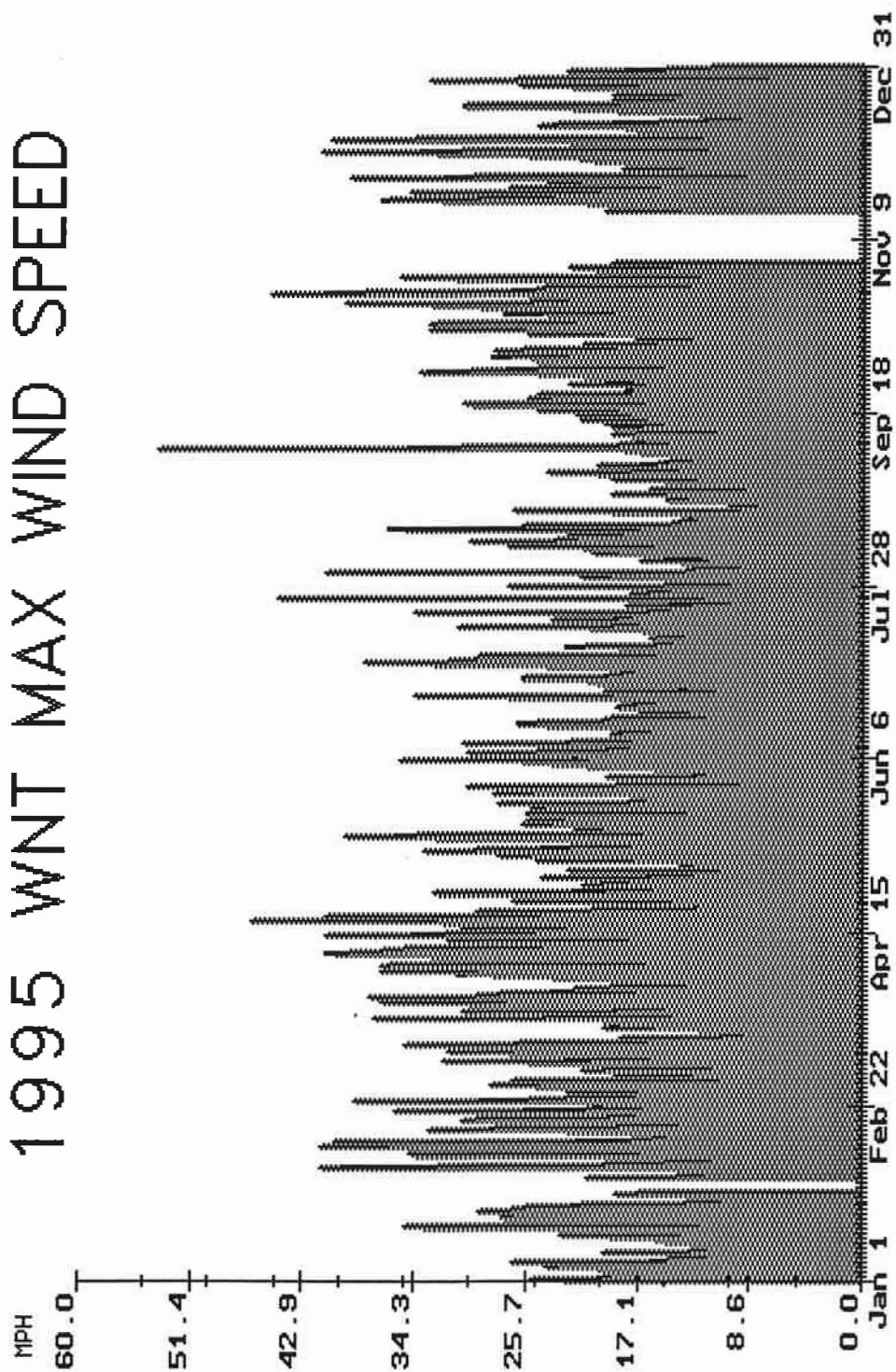
# 1995 WNT MAX/MIN TEMPS



# 1995 WNT 24 HR RAINFALL



# 1995 WNT MAX WIND SPEED



### **C. LAND ACQUISITION**

#### **1. Fee Title**

Efforts continued in 1995, several offers were made, two tracts of land, (#59-2.0 acs and #48-48.0 acs), were added to the land base. Don Kleven, continues as the Realty Specialist working for WNT. Don remains consistent in developing sound relationships with potential sellers.

Appraisals are still seen as being low by landowners. Locally, a few sales have taken place indicating a rise in prices. There continues to be a definite discount in land values south of U.S. Highway 163 compared to land with a comparable Corn Suitability Index (CSI) north of the highway.

Local custom traditionally divides offered price by total acres to arrive at the "price per acre." This skews the real value by not deducting the value of buildings and other improvements and makes comparison of one tract to another difficult. As always, our land acquisition remains a hot topic at the local coffee shop.

#### **2. Easement**

Nothing to report.

#### **3. Other**

Nothing to report.

#### **4. Farmers Home Administration Conservation Easements**

Nothing to report.

### **D. PLANNING**

#### **1. Master Plan**

The Record of Decision for the Environmental Impact Statement was signed in January, 1994.

The Master Plan itself was finalized and published in 1994. This remains the source of guidance for the initial development period of the project.



## 2. Management Plan

Specific management planning took place at many levels again during the past year. Refer to individual sections for details. At this stage in the development of the WNT project, stepping down from the Master Plan to specific on-the-ground details is very important and takes a great deal of effort on the part of all involved.



Refuge planning meeting - an ongoing task.

Fire plans for specific Prescribed Burn Units were written and approved prior to burning in the spring. An overall Refuge Fire Plan is still in draft.

The most inclusive and unique plan being developed is the Prairie Restoration/Reconstruction Plan. Work continues on this major effort, guided by DRAFT plans. As in most realms, everything works some time and nothing works all the time. At WNT, we strive to never let planning get in the way of reality.

## 3. Public Participation

The Refuge Manual calls for this section to "... Describe any refuge activities involving public participation in the planning or decision making process ....".



Activity at Walnut Creek National Wildlife Refuge - Prairie Learning Center is so replete with public participation, (it is after all a verb, not a noun), that to document any single segment or event would be meaningless. We have decided once again to skip this portion of the Annual Narrative in favor of including some of the specifics in appropriate sections.

4. Compliance With Environmental and Cultural Resource Mandates

Nothing to report.

5. Research and Investigations

The WNT Research Advisory Committee (Committee) consists of Project Leader Birger and Biologist Drobney, WNT; Jim Mattsson, RO; Dr. Bill Clark, Iowa State University; Dr. Dennis Keeney, Leopold Center for Sustainable Agriculture; Dr. Erv Klaas, Iowa Cooperative Biological Survey Research Unit; Dr. Carol Thompson, Iowa DNR; Dr. Jerry Selby, The Nature Conservancy Iowa Field Office; and Dr. Daryl Smith, University of Northern Iowa.



Outstanding in their fields. The Walnut Creek Research Advisory Committee includes (from the left) Jim Mattsson, Dr. Daryl Smith, Dr. Bill Clark, Pauline Drobney, Dr. Erv Klass and John Pearson

The Committee continues to work to meet the critical research and monitoring needs of ecological restoration at WNT. Service money to fund monitoring activities was not

available for most aspects in 1995, though independent researchers did proceed with research projects under the guidance of the Committee. An important part of 1995 Committee work was addressing the long term funding problems associated with conducting an adequate research program.

Projects conducted in 1995 were:

WNT NR95 "Summer Habitat Requirements of the Indiana Bat (*Myotis sodalis*) in Iowa" (30147-16)

Daryl Howell of Iowa DNR directed a study of the federally endangered Indiana bat with funding through Service Section 6 money. This study involved mist netting, telemetry work and habitat description of roost trees on WNT. Such work would be used to develop guidelines for identification and protection of summer habitat for Indiana bats (see Threatened and Endangered Species).



Biologist Pauline Drobney and volunteer Phil Klem extract a bat from a mist net.

WNT NR95 "Incorporating the Insect Community into Prairie Restoration Efforts: A Case Study of the Regal Fritillary Butterfly (*S. idalia*) at Walnut Creek National Wildlife Refuge in Iowa" (30147-17)

Dr. Diane Debinski of ISU and graduate student, Liesl Kelly, began an ecological study involving introduction of the regal fritillary (*Speyeria idalia*) and their larval host plant, the bird's foot violet (*Viola pedata*) to the Refuge. In addition to studying larval food preference, and reintroduction success, relationships between insect mortality and timing of prairie burns will be investigated.

During the summer, prairie violets (*Viola pedatifida*), a potentially critical larval host food for the regal fritillary was successfully introduced to WNT at four sites. In each site, a plot containing 200-300 plants each were established. Regal fritillary butterflies were captured from Iowa remnant prairies in an attempt to induce reproduction in the lab. The intent was to introduce lab reared butterflies into the field and track survival. This is the first year of a two year Master's project, and a long-term regal fritillary study, and as such, data is not yet available to report. However, researchers are modifying methodology to accommodate difficulties in successful lab rearing of the butterflies.

WNT NR95 Survey of Breeding Birds, Walnut Creek NWR, 1995 (30147-19).

This project funded by Regional non-game funding used the same methodology as 1994's survey to monitor activity of breeding birds. A report was submitted by Dr. Erwin Klaas, National Biological Service, Iowa Cooperative Fish and Wildlife Research Unit, Iowa State University and is available at WNT.

Walnut Creek Watershed Restoration and Water-Quality Monitoring Project: Walnut Creek National Wildlife Refuge, Jasper County, Iowa (30147-10) WNT NR94.

This study is an on-going project begun in 1994 that addresses issues of soil water availability, agricultural sedimentation, the velocity of the stream, water quality, and general water movement patterns throughout the landscape.

An initial collaborative effort in 1994 included WNT, the Service's Rock Island Field Office, IDNR-Geological Survey Bureau, University of Iowa Hygienic Laboratory, and the US Geological Survey - Water Resources Division. The effort resulted in establishment of a stream flow and sedimentation gaging station on Walnut Creek near the southern end of the Refuge. This equipment, installed in mid-August, electronically records daily stream flow and sedimentation levels. In 1995, a second gaging station was installed on the northern end of the Refuge at the point of entry of Walnut Creek into the Refuge. A third gaging station was established on a paired watershed, Squaw Creek, an intensively farmed watershed similar to Walnut Creek. No grassland restoration is occurring on Squaw Creek, and thus it will effectively serve as a control.

In addition to the gaging station, baseline water quality analysis occurred on five tributaries of Walnut Creek. Water samples were analyzed by the Iowa Hygienic Laboratory for ammonia, fecal coliform, and for the eleven most common herbicides in Iowa: Analyte, Atrazine, Bladex, Dual, Lasso, Sencor, Sutan, Treflan, Acetochlor, Desethyl Atrazine, and Desisopropyl Atrazine.

Data indicates high levels of atrazine in Walnut Creek, though this chemical has been banned from use on the Refuge since 1992. Data suggest that the source of atrazine is not totally due to inflow at the north end of the main stream, as a spike occurs on a tributary that is higher than the levels recorded at the north end in July.



Ammonium levels are higher on Walnut Creek than on Squaw Creek, due possibly to a cattle feed lot on the northwest edge of the Refuge at a tributary to Walnut Creek.

Fecal coliform and ammonium levels both peaked on Walnut Creek in July, and fecal coliform levels peaked again in September. These phenomenon are perhaps due to high rainfall events or times of application of livestock slurry to agricultural fields. It appears that Walnut Creek contains higher levels of fecal coliform than Squaw Creek during almost the entire water year.

As expected, turbidity is higher on the northern (inflow) end of Walnut Creek than the southern (outflow) end.

Other Notes:

In 1995, a volunteer made a potentially meaningful scientific contribution in the process of seed collecting for WNT. Rayford Ratcliff, a retired carpenter and keen ecological observer, noted that the gentian population he had harvested from last year and was preparing to harvest again this year had unusual looking individuals. He brought this information to the attention of Biologist Drobney, who visited the site. Drobney believes the unusual individuals may be a new state record for Iowa that is a hybrid of the creamy gentian (*Gentiana alba*) and the downey gentian (*Gentiana puberulenta*). The hybrid is named *Gentiana curtisii*.

6. Other

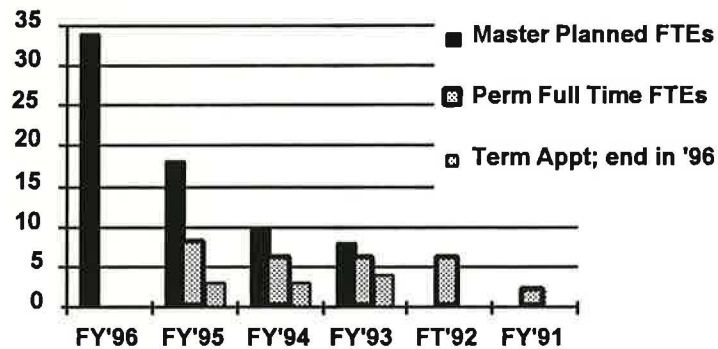
Nothing to report.

## E. ADMINISTRATION

1. Personnel

Two new staff were added to the project in 1995. John (Jack) Heisler, former Coop Education Student, entered on duty April 3 as Refuge Operations Specialist. Benjamin Chio transferred from Ottawa NWR as Program Analyst on August 6, 1995.

### Staffing History



From the graph it is apparent how grave the staffing situation is. When the project was begun, it was with the understanding that the Master Planned Base would be available to build and train a staff sufficient to operate the facility. This is not the current case.



Front row: Bernie Petersen, Michelle Sentyrz and Pauline Drobney. Second row: Doreen Van Ryswyk (Iowa Private Lands), Craig Olawsky, Brian Boot, Carla Dykstra and Dave Aplin. Third Row: Richard Birger, Gregg Pattison and John (Jack) Heisler. (Not pictured: Ben Chio)

2. Youth Programs

Nothing to report.

3. Other Manpower Programs

Nothing to report.

4. Volunteer Programs

The WNT Volunteer Program continued to grow in numbers and diversity. Over 1,000 people donated their energies to the Refuge, nearly a 74% increase over 1994. Donated hours also increased nearly 67% from the previous year! While a majority of the volunteer hours were occupied with restoration support, program hours of public use and administrative support grew to new record highs.

Several students from central Iowa high schools, colleges and universities volunteered their services in 1995. Database entry, word processing, GIS operations, graphic design, and volunteer coordination were large parts of the student assignments. Resource restoration activities included harvesting, recording, sorting and processing prairie seed.

Matt Milligan, a student at Upper Iowa University, volunteered as a Public Use intern during March and April. Matt assisted Refuge staff in the planning and development of the Basswood Interpretive Trail. Mr. Milligan also supplemented Refuge staff in numerous environmental education visits to classrooms K-6.

Ryan Buitenwerf, a local resident now attending Oklahoma State University, dedicated much of his spring break to the sorting and processing of native prairie seeds. Ryan spent long monotonous days cleaning more 10-gallon buckets of seed than he could count, but emerged from the experience with a smile and \$500 worth of rare seed ready for planting.

Molly Sohn, a PCM High School senior, assisted Refuge staff with the development of GIS datasets for 1994 prairie plantings. Molly helped both to digitize and analyze layers of planting information including previous ownership, site location, and date/method planted.

Numerous volunteers dedicated time to Iowa's First Annual Federal Junior Duck Stamp Contest. Over 400 entries were recorded, displayed, collected, sorted, and returned to the artists with the help of volunteer staff.

Twenty-six volunteers assisted Refuge staff with Sow Your Wild Oats IV, WNT's annual prairie planting celebration. They helped with tent and display setup, parking, interactive exhibits, organization of Junior Duck Stamp award-winners, and presenting models of the new Prairie Learning Center. Mr. LaVerne Collister, Refuge Volunteer of the Year for 1994 and a recognized National Wildlife Refuge System Volunteer of Merit, was honored in an awards ceremony during the day's programs.

Possibly the most impressive Volunteer Program effort at WNT in 1995 was the Prairie Seed Collection Teams. Hours dedicated to seed collection totaled 1350, a 19% increase from 1994. Participation in the collections jumped 25% from one year ago. One hundred ten people joined four Collection Teams that met weekly from September to November to hand-harvest prairie seeds from central Iowa prairie remnants. Harvesters collected, recorded, dried, cleaned, and delivered seed to WNT on specific seed receival dates held monthly. Seven Seed Collection Teams celebrated National Wildlife Week, October 10-14 with harvesting events. Over 400 students, K-post secondary, also worked to collect seeds from within Refuge boundaries.

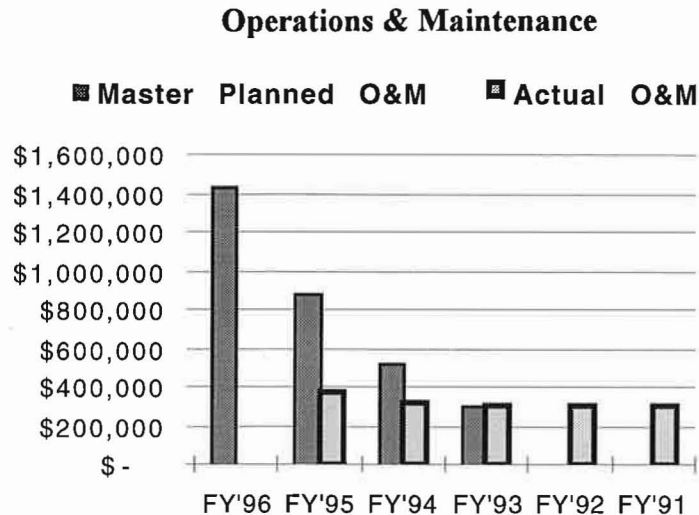
Volunteer-led Refuge bird surveys were scheduled to take place in late autumn and early winter, but were canceled due to government furloughs. Multiple seed collection and receival days were also canceled because of the shutdowns.



Refuge volunteers worked in front of road construction equipment in Wapello County to salvage valuable savanna plants. Fifteen truck loads were transplanted at Walnut Creek.



5. Funding



From the graph it is apparent how grave the funding situation is. When the project was begun it was with the understanding that the Master Planned Base would be available to operate the facility. This is not the current case.

6. Safety

Safety remains a high priority with Refuge staff. Only one minor incident occurred during the year when Maintenance Worker Boot lacerated his right index finger while cutting weeds. No lost time resulted.

Safety issues discussed included tornado evacuation procedures, heavy equipment operation, proper headgear during construction visits, and guidelines for hand seed collection activities during hunting season. Videos outlining proper clothing and techniques for handling pesticides were viewed by all staff.

Staff members participated in AIDS-Some Workplace Basics Training in January.

Maintenance Worker Boot successfully completed Tractor Power & Machine Systems Training in June. Boot, Ops. Spec. Heisler and Bio Tech Pattison received Commercial Ag Applicators Certification in December.

7. Technical Assistance

Nothing to report.



8. Other

Nothing to report.

**F. HABITAT MANAGEMENT**

1. General

An additional 300 acres of former cropland on 9 sites were planted using local ecotype seed in 1995. Building construction, landscape reconstruction, and road removal resulted in planting another 100 acres. Approximately 400 total acres were planted during the year. To date, a total of 1,100 acres of prairie have been planted on 37 planting sites on the Refuge.

Vendors offering machine harvested seed in 1995 were required to provide a seed analysis from an accredited lab for each lot. Also, harvest sites were required to meet WNT's local ecotype requirements. In 1994, a portion of purchased material was extremely coarse textured and difficult to feed through planting machines. In 1995, seed texture was required to be of a size that would feed through seeding equipment.

A list of species generated last year was used to guide 1995 seed purchase, (refer to 1994 Annual Narrative; Table A). Species included contained one or more of the following characteristics:

- seeds were known to establish well in early planting;
- readily recognizable or showy species important to educational goals of the Refuge;
- important members of the developing native landscape

A data base was used to track species, origin, collector's name, and weight of seed. Tetrazolium test results were recorded and used to indicate amount of live seed. Planting prescriptions were developed based on live seed estimates.

Hand collected seed was available through volunteer seed collection efforts and by purchase. Species, origin, collector's name, and weight of hand harvested seed was also tracked. Though bulk harvests provided the majority of grass planted, and served as a matrix to which hand collected species were added, hand collections provided additional diversity unavailable in bulk harvests.

**Planting -**

From January 26 to February 1; 6 sites (171 acres) were over-seeded using 135 bulk lbs. of grass and 503 bulk lbs. of forbs.

Twenty-four species of prairie forbs were planted in linear plots that were 435' by 5' in dimension. Planting on these seed production plots occurred between January 18-24.

Spring planting began May 20 and ended June 20. Planting in repaired gully, construction and road abandonment areas occurred throughout the entire season as final grading was completed.

Planting site preparation included herbicide treatment using Roundup and 2-4D in most cases. Oats and Canada wild rye were used as nurse crops. First year prairie plantings and many second year plantings were routinely mowed once or twice during the growing season to reduce weed competition for light and water and to limit weed seed production.

In some three year old plantings, mowing was used to limit success of a particular weed problem on the site. Site 17, for example, supported a heavy population of sweet clover. This biennial exotic species can be a severe problem in prairie plantings. This site was mowed twice at peak blooming and prior to seed set to reduce reproductive success of the sweet clover. Interestingly, a good stand of prairie dominated by little bluestem matured and was harvested despite repeated mowing.

#### **Fall Harvest -**

In 1995, volunteers hand collected approximately 100 prairie species, roughly equivalent to the 1994 harvest of 105 species. In 1993, volunteers collected 71 species.

Harvesting success depends on ecological conditions as well as the physical logistics of harvesting. Grass harvest seemed relatively poor in 1995, though WNT staff harvested approximately 2,000 pounds of seed, mostly grass, on 11 Refuge sites. Tetrazolium tests indicated these harvests of big bluestem, Indian grass, and Canada wild rye ranged from 80 - 95% viable. Little bluestem tests ranged from 30 - 32% viable, and drooping coneflower was 53% viable. Viabilities even lower than 30% were expected from little bluestem because this site was only three years old, had not been burned, and had been mowed twice during the season.

#### 2. Wetlands

Nothing to report.

#### 3. Forests

Woodland communities on WNT consist of oak savannas diminished due to fire suppression, grazing, and timber harvest. An interpretive trail designed to preserve oaks and avoid important herbaceous understory vegetation was cleared during winter of 1994-1995 in the Thorn Valley site. Several groups of school children, college students, and volunteers hand cleared small areas of this site. Woody stems were removed and burned, and stumps were treated with Garlon4 by WNT staff. During the summer, the cleared

area boasted an abundance of typical savanna species despite its apparent sparse condition prior to clearing. Though this vegetation was damaged in construction, we expect much of the savanna to respond in a similar way as wide spread clearing continues. The process of clearing is slow because of resource commitments to other needs, e.g. prairie harvest, planting.

Transplantation of savanna species to this site also occurred in 1995. In early spring, volunteers alerted Biologist Drobney of the presence of a good quality savanna remnant facing destruction due to Highway 23 improvement in Wapello County, Iowa. A segment of the roadside was preserved due to the presence of the state endangered species, false helebore. A combined effort of volunteers and WNT staff, resulted in 15 pick-up loads of plants (a rare species of spiderwort, showy orchis, Culver's root, blue-eyed grass, dwarf larkspur, creamy gentian, wild bean, Michigan lily, starry campion, and several other species) from a 3 mile portion of roadside being transplanted in spring and early summer. Iowa Department of Transportation permission was first obtained.

#### 4. Croplands

Cash rent continued as the method used for Refuge farming. The system is designed to allow the Cooperator a reasonable rent on the ground while giving the government a good return on the operation. Rent ranges from \$60 to \$75.00 per acre which is comparable to rents collected in the area for low quality ground. Rent figures were again derived by taking into consideration yield data for each tract within the Refuge, average price per bushel of corn, and the cash rent guidelines established by the Jasper County Extension Office. Rent was collected in two installments, 30% due in May, with the balance due in December. Final rent figures are based on the Report of Planted Acres report each Cooperator turns in to the NRCS. Deductions from rent figures include the cost of Crop Scouting, \$10.00 per acre, mowing costs for buffer strips at \$12.00 per acre, and any chemical application for ground being planted back to native plants by the Refuge.

During the 1995 crop year, Cooperators were allowed to use anhydrous ammonia in place of liquid nitrogen, required in previous years. The main reason was the short supply of liquid nitrogen. Use of liquid nitrogen will be on a year-by-year basis.

Crop Scouting was utilized for the third year as a part of the IPM program on the Refuge. The same company was used, Farmers Co-Op Exchange of Prairie City. The cost of this service was \$10.00 per acre, paid by each Cooperator, through deduction of the cash rent. Success of this program has been very good, giving both the Refuge and the cooperating farmers sound information and recommendations of the condition of the crops.

Row crops on the Refuge this year were 1,246 acres corn and soybeans, a decrease of roughly 50 acres from crops in 1994.

Spring weather conditions were very wet resulting in late planting. The wet weather subsided and a good harvest was gathered with few problems and slightly higher than average yields for this area.

5. Grasslands

**Prairie Reconstruction -**

In 1995, seeding was accomplished using Tye and Truax drills, Truax broadcast drill, and a mulcher blower. On the majority of sites, the most coarse material was applied using a mulcher blower, followed by application of finer textured material using a drill and/or broadcast seeder. This system delivers relatively large quantities of bulk material and works it into the soil surface.



A variety of planting techniques were used in 1995, including this Truax broadcast drill.

Despite the fact that this was the third wettest spring in recorded history, planting goals were reached by mid-summer. Unlike the summer of 1993 when record rainfall for the entire growing season was accompanied by low temperature, rainfall decreased in July and temperatures were warm. Hot weather and low rainfall during portions of mid-summer seemed especially favorable to germination and growth of some prairie species.

Within a month of a July planting on site 46, big bluestem was approximately 8 inches tall and forming noticeable clumps. This is sharp contrast to previous years in which such

growth did not appear until at least the second growing season. In many cases, even the second growing season seemed less vigorous than some of our 1995 plantings.

Differences in growth patterns among planting years could be caused by differences in seed quality, but certainly is influenced by weather patterns. In 1995, soil was saturated during the critical establishment period of the July planting, and hot weather accelerated growth. As such, despite all of our planning and effort, a degree of success is dependant on dumb luck.

By the end of fall, 8 sites planted in 1993 and totaling approximately 190 acres completed their third growing season. Despite sparse evidence of establishment and growth in 1993 and 1994, prairie species began to thrive this year. All sites with the exception of one produced seed of at least one prairie species to make harvest worthwhile. Additional harvest sites included a 1994 planting site and a small remnant population of Indian grass.

Harvest resulted in 950 lbs. of big bluestem, 450 lbs. of Canada wild rye, 300 lbs. of little bluestem, 20 lbs. of little bluestem, 300 lbs. of forbs/grass mixture, and 45 lbs. of partridge pea. The mix of prairie forbs and grass species was dominated by Virginia wild rye, Canada wild rye, drooping coneflower, mountain mint, black-eyed Susan, and wild bergamot. These weights represent bulk, partially cleaned harvests and are estimated to be approximately 50% pure seed.

In addition to vigorous growth, marked increase in biomass and ultimate seed production, plant species establishment patterns on these sites are interesting in comparison to one another. On most sites, the most visually dominant species are prairie grass species, especially big bluestem. Within a matrix of grass species, a diversity of forbs is present. Asters, goldenrods, black-eyed Susan, evening primrose, tick trefoil, mountain mint, and several other species are common species present in the matrix of dominant grass. Other species such as compass plant, purple prairie clover, white prairie clover, blue flag iris, pale purple coneflower and others are present but in relatively low numbers.

These observations may be deceiving or premature, however, as most of these sites were mowed once or twice in 1995 to accomplish weed control. Though grass species tended to grow vigorously by the end of the season, many forb species tended not to achieve their typical height, and most did not bloom. Long lived perennials producing only basal leaves at this stage, such as pale purple coneflower and compass plant, might not produce additional leaves. Other forb species lost apical dominance with mowing and branched, completing the season at a lower height than their counterparts in unmowed areas. We are taking a "wait-and-see" attitude toward forb establishment in these areas, especially as many species of forbs have a longer establishment time relative to flowering than do grass species.



Site 10, a high use area because the Tallgrass Hiking Trail crosses through, produced a very different species composition than other sites. Here forbs are dominant, and in 1995, black-eyed Susan, mountain mint, drooping coneflower and evening primrose produced a show in a matrix of grass species dominated by Canada wild rye, Virginia rye, and Muhley grass with some tall dropseed, Indian grass and big bluestem. Muhley grass appears to be establishing well and could be an important species in restoration work because of rapid establishment by rhizome and because of a relatively even leaf distribution near the ground. These qualities make it a good candidate for rapid establishment of a fuel matrix that also allows for establishment of other species.

On September 26, 1995, a ceremony on the crest of a hill overlooking the prairie remembered Haymie Christiansen, a Regional Office colleague and friend, who passed away during the year. A Regional memorial fund in her honor was used to establish a special prairie flower planting. A bronze plaque was placed on the new amphitheater.

#### **Prairie Restoration -**

Among the natural area remnants on WNT, there are several native prairies. Though a spring 1994 burn controlled sweet clover populations, without a spring burn on Coneflower Prairie in 1995, white sweet clover populations occurred in large dense populations on the northern, southern, and western boundary. Individual plants were occasional throughout the rest of the prairie. Patterns of sweet clover were similar to those seen in 1994, though not as severe. Prior to seed set, volunteers hand weeded the prairie.

A population of non-local ecotype switchgrass plants invading from the planting to the north flowered this season, and were grubbed from the prairie by volunteers. Removal of these plants was accomplished by inserting a narrow spade or trowel into the soil and slicing the roots just under the crown of the plant.

Several prairie violets (*Viola petadifida*) were planted on the site as a part of a research project involving introduction of the regal fritillary butterfly (see 5. Research and Investigations). It is hoped that this remnant could be a good reintroduction site for the regal fritillary because it is dominated by prairie species and species important for the butterfly should be relatively easy to introduce. In addition, a large population of whorled milkweed exists on the north half of the prairie, and the green milkweed (*Asclepias viridiflora*), and common milkweed (*Asclepias syriaca*) exists occasionally on the prairie.



Researchers from Iowa State University transplanted prairie violets in conjunction with a regal fritillary butterfly reintroduction project.

Overall, the condition of the prairie seems to be improving in quality over the past three years. Rough dropseed (*Sporobolus asper*) has increased in density and now is forming a substantial graminoid matrix along with other graminoid species. Forb populations in general seem to be expanding and increasing in vigor. This year was an especially floriferous year for 5 species of forbs on the prairie including pale purple coneflower (*Echinacea pallida*), whorled milkweed, black-eyed Susan (*Rudbeckia hirta*), flowering spurge (*Euphorbia corollata*), and compass plant (*Silphium laciniatum*). This prairie was an important seed source for all of the species mentioned except flowering spurge. Just prior to seed collection, drought became so severe that all flowers and developing fruit became shriveled and blackened and either aborted or did not mature.

A spring burn increased flowering in Buzzard Head Prairie. Of special note were vigorous populations of rosin weed (*Silphium integrifolium*), pale purple coneflower, drooping coneflower (*Ratibida pinnata*), and prairie coreopsis (*Coreopsis palmata*). Apparently, disease is decreasing the vigor of a smooth sumac population in this prairie, and burn singed the base. Despite the obvious stress to the smooth sumac population, we will continue to further reduce sumac populations.

This year, WNT took possession of a sedge meadow located in the southern section of the Refuge. Heavy grazing, drainage, and invasion by reed canary grass has severely diminished the area, but several sedge meadow species are abundant on the site and restoration potential appears to be good. This became an important volunteer collection

site in the fall for blue vervain (*Verbena hastata*), an important species in early establishment of prairies.

#### 6. Other Habitats

A five mile stretch of roadside on both sides of Highway 163 along WNT's northern boundary was planted in 1994 with funding from the Iowa Department of Transportation's Living Roadway Trust Fund Project. This project was cooperatively undertaken by WNT and the Jasper County Conservation Board.

Surveys of the area in late 1994 gave little evidence of establishing prairie species, perhaps due to dry conditions existing in the exposed subsoil conditions of the planting. In 1995, however, distinctive rows of grass species interspersed with prairie forbs were apparent. WNT and IDOT staff agreed plant establishment was satisfactory, but that mowing, interseeding and interplanting would more quickly develop the project and repair soil slump areas. Additional seed containing a significant forb component was drilled into roadsides by DOT personnel. Seedlings were especially concentrated in areas of poor previous establishment. In addition, approximately 400 local ecotype seedlings were planted in the roadside to increase visibility of prairie species. Among species planted were windflower (*Anemone cylindrica*), tick trefoil (*Desmodium illinoense*), prairie gayfeather (*Liatris pycnostachya*), mountain mint (*Pycnanthemum* sp.), sweet black-eyed Susan (*Rudbeckia subtomentosa*) and columbine (*Aquilegia canadensis*). Roadsides will continue to be enhanced in the future.

#### 7. Grazing

In 1995 we permitted the grazing of 20 acres of corn stubble. This was a newly acquired parcel of ground on which grazing had been allowed previously.

#### 8. Haying

During the 1995 season, haying took place on 20 acres of tame hay, mostly brome. This parcel was a new acquisition which the previous owner had used for hay in the past. In the future, haying will be handled on a case by case basis.

#### 9. Fire Management

Ten prescribed burns including 2,037 acres were planned to be conducted either in spring between March 17 and May 30, or in fall between October 10 and November 30. Unfortunately, fuel moisture levels were generally high throughout the spring burn season. Unfavorable weather conditions and limited staff availability precluded burns in all but two sites that included 1,203 acres. These burns were accomplished in the spring on Site 15-BH and 16-PLCA, though portions of each site were left unburned due to poor fuel conditions.





Wet spring weather kept fuel moisture levels high throughout the spring. Opportunities to burn were few and far between.

Site 15-BH consisted primarily of reconstructed prairie (planted in 1993), an oatfield that was converted to prairie in 1995, two prairie remnants, the largest of clearings amidst a canopy of woody species, and a reed canary and woodland border along a stream. Cool season grass species were actively growing in moist areas along the stream, but enough dried fine fuels existed to carry a fire in these areas. Except in areas where a wind carried fire uphill through relatively consistent fuels, fire was sluggish due to moist fuels. Clearings in the woody prairie remnant were ignited after fire had blackened the area surrounding them.

Despite the sluggish, patchy nature of the burn on this site, fire seemed to greatly invigorate both plantings and prairie remnants. Vegetation seemed generally more vigorous and seed production more plentiful than in unburned areas. A notable shift occurred from annual weedy vegetation to perennial species in plantings, possibly due to the process of maturing plantings and invigoration of perennial species due to fire.

Only a small portion of Site 16 PLCA was successfully burned. This planting located directly north of the Prairie Learning Center was planted in 1992, and overseeded in 1993. Fuels were patchy and again, the burn was sluggish. Fire moved more quickly and successfully in draws with more dense vegetation, and poorly in areas where prairie established poorly. The most noticeable effect of fire on vegetation seemed to be in natural drainage ways among hills where native graminoids existed prior to planting. These seem to be increasing in vigor and range.

Fire monitoring continues to be an important part of WNT's burn program. Despite difficulty, data continues to be collected to better understand the nature of fuels in reconstructed prairies.

10. Pest Control

Pest control took a great deal of the Operation Staff's time during the summer and early fall of 1995. Mowing occurred on 2,200 acres to assist in controlling undesired weeds, thistle, and invading brush. These acres were, for the most part, planted to native species or edges of remnant tracts, and former CRP acres. On the land planted to native species, we mowed to accomplish two things; to control undesirable weed species so the light would penetrate to the young native plants, and secondly to control thistles. All other mowing was performed as a control measure to prevent thistle, sweet clover, and mares tail from going to seed.



A new Patriot sprayer applies Round-Up and 2,4-D to a field of non-local switchgrass.

Herbicides also played a role in pest control. Approximately 400 acres was sprayed with Round-up and 2,4-D, both as a pre-plant burn down and as a control measure for thistle and other undesirable weed species. Late fall spraying of brome grass, Reed canary grass, and switchgrass was completed in an attempt to eradicate these problem areas. These areas will be surveyed in spring, 1996 to document the effectiveness of this method. If



this produced good results, planting of local-ecotype native species will be done, if not, another year of control measures will be taken.

There were no major weed or insect problems relating to the Farming Program. Very wet spring weather delayed planting but otherwise crop production on the Refuge was as good or slightly higher than in neighboring areas.

11. Water Rights

Nothing to report.

12. Wilderness and Special Area

Nothing to report.

13. WPA Easement Monitoring

Nothing to report.

14. Farmers Home Administration Conservation Easements



Morris Trenching & Hoe Inc. constructs a ditch plug to restore wetland hydrology on a 27 acre FmHA conservation easement restoration in Polk County.

Wetland restoration activities were completed on an 80 acre FmHA conservation easement in northern Polk County. ROS Olawsky worked with Polk County NRCS (formerly SCS) and Polk County Conservation Board personnel to implement restoration activities on the site. Two drainage ditches located within the easement area were plugged to restore hydrology. Approximately 27 acres within the conservation easement will be restored to wetland through these activities.

15. Private Lands

The Refuge received 11 requests for wetland restoration assistance and 14 requests for prairie restoration/reconstruction assistance in 1995. Seven of the wetland restoration projects were not feasible at this time. Due to WNT funding shortages, Union Slough National Wildlife Refuge agreed to provide funding for two wetland restoration projects in Guthrie and Boone Counties.

WNT was able to assist the Polk County Conservation Board with two wetland restoration projects totalling 10 acres within the Chichaqua Bottoms Greenbelt Project. Silt deposits resulting from soil erosion were removed. Water control structures were installed to restore hydrology to several miles of oxbows isolated by prior channelization.

Of the 14 requests for prairie restoration assistance, the Refuge was able to complete 4, totalling 94 acres in 1995. Three projects involved cooperative agreements where WNT provided local ecotype grass and forb seed or funding for prairie reconstruction on land owned by county conservation boards. The fourth project involved prairie reconstruction on private land. As part of the agreements, the Refuge will secure seed harvest rights for 10-15 years for future private lands projects. Completion of three additional projects on private land are expected in 1996, and will have similar cooperative agreements.

Wetland restoration activities were completed in 1995 for a 4.0 acre site resulting from a 1994 Wetland Mitigation Agreement with Pioneer Hi-Bred International, Inc. The restored wetland is located in a high visibility area of Polk County, and will provide an excellent local showcase for wetland restoration.

Several training sessions were attended by ROS Heisler and Olawsky during the year. In March, Olawsky attended the Private Lands Coordinators Annual Meeting and NRCS National Food Security Act Manual training. In May, Heisler and Olawsky attended 1995 Wetland Reserve Program (WRP) training. In the fall, Heisler attended Wetland Plant Identification training and Interagency Wetland Identification and Delineation training.

The 1995 Wetland Reserve Program (WRP) attracted less interest in the WNT local coordination area than in the previous year. In 1995, WRP was offered nationwide, while in 1994, the program had been offered in only 20 states. To be eligible for WRP, land had to meet the following criteria:

- the land had been considered planted at least one year between 1986 and 1990,
- the land had physically been able to be planted in 1992 or 1993,
- the site was at least two acres and no larger than 1,000 acres,
- at least 50% of the land was designated as farmed wetland, farmed wetland pasture, prior converted cropland, or a wetland farmed under natural conditions,
- the land had to be restorable to wetland.

Unlike 1994, which used both state and national ranking criteria, acceptance of eligible sites into the 1995 WRP was determined by state ranking criteria only.

1995 WRP intentions by county included: Boone (1), Greene (12), Dallas (3), Polk (6), Warren (4), Marshall (5), Story (4), Guthrie (4), and Jasper (1). Of the 40 sites examined, rankings and Preliminary Wetland Restoration Plans were developed for 23 sites.

Emergency Wetland Reserve Program (EWRP) site visits, as well as work on Preliminary Wetland Restoration Plans and Final Wetland Restoration Plans, continued into 1995. Heisler and Olawsky assisted NRCS personnel in developing planting prescriptions for upland portions of both WRP and EWRP sites. To be eligible for EWRP, sites had to meet the following criteria.

- the land had to have been flooded during 1993,
- at least 50% of the land had a cropping history
- the cost of the easement was less than the cost to restore the land back to crop production,
- the land had to be restorable to wetland.

1995 EWRP site visits were conducted by Heisler and Olawsky along with NRCS personnel in Marshall County (1), Guthrie County (2), Boone County (1), Dallas County (2), Warren County (2) and Polk County (6). Preliminary Wetland Restoration Plans were developed for all 14 EWRP sites. In addition, work continued on Final Wetland Restoration Plans and revisions for 5 EWRP sites which carried over from 1994.

ROS Heisler and Olawsky assisted NRCS with two wetland determination appeals and two minimal effect requests within the WNT local coordination area.

#### 16. Other Easements

Nothing to report.

### G. WILDLIFE

#### 1. Wildlife Diversity

Nothing to report.

2. Endangered/Threatened Species

**Indiana Bats -**

In 1995, an Indiana bat (*Myotis sodalis*) telemetry study was initiated by the Iowa Department of Natural Resource's Dr. Daryl Howell. He was assisted by Biologist Drobney and volunteers. Mist netting and telemetry work was conducted in July. Capture of a lactating female would have enabled researchers to potentially track the female to a nursery tree. Unfortunately, the only bat captured was a male. Information is not available regarding the relationship of male bats to nursery colonies in Iowa.

3. Waterfowl

Nothing to report.

4. Marsh and Water Birds

Nothing to report.

5. Shorebirds, Gulls, Turns and Allied Species

Nothing to report.

6. Raptors

Nothing to report.

7. Other Migratory Birds

A Christmas Bird Count scheduled for December 30th, was cancelled due to the federal government furlough of WNT staff.

A Breeding Bird Count was conducted between May 15 and July 6. A total of 88 species were recorded on 103 plots, six of which were not recorded during a similar study in 1994. These included: Belted Kingfisher, Ovenbird, Ruby-throated Hummingbird, Rufous-sided Towhee, Tufted Titmouse, and Woodcock.

8. Game Mammals

1995 produced a bumper crop of pheasants on the Refuge. General observation of staff and visitors concluded a tremendous increase in population over previous years. Information from the Iowa DNR indicated that overall there was a decrease in the population, however Refuge staff felt this was not a good survey due to the timing and weather conditions and a slight change in the route due to construction activities.

Other species of game animals fared well during the year. There was a slight increase in the numbers of Bobwhite Quail on the Refuge. This was documented by an increase in the number of calls heard in various locations. Visual sighting of Quail were also up, although numbers bagged during hunting remained the same.

White Tail deer numbers continued to be stable or rose slightly on the Refuge. With the changes in the habitat, there is an anticipated decrease in use of the Refuge. This does not seem to have been the case yet. Numbers taken during hunting, from Iowa DNR figures, have dropped since the first year. This may be due to the fact that most hunters in this area do not hunt deer in the grass areas and stick to hunting the timber areas. It has been noted by staff that an increase in numbers of deer utilizing the grass as cover occurred even when hunting pressure in the woods was heavy.

Wild turkey have seemed to increase on the Refuge with two broods of young birds reported to the office. Last year we had a report of a destroyed nest but no sightings of successful nesting were reported. Actual numbers of birds were not surveyed, however several anecdotal reports were turned in. There was one report in November of "several" birds being flushed near one of the prairie remnants in the northern portion of the Refuge. This was the first time a sighting had been made in this area.

9. Marine Mammals

Nothing to report.

10. Fisheries Resources

Nothing to report.

11. Other Resident Wildlife

Nothing to report.

12. Wildlife Propagation

Nothing to report.

13. Surplus Animal Disposal

Nothing to report.

14. Scientific Collections

Nothing to report.



15. Animal Control

Nothing to report.

16. Marking and Banding

Nothing to report.

17. Disease Prevention/Control

Nothing to report.

## **H. PUBLIC USE**

1. General

Staff continued to build support for the Refuge and its programs throughout 1995. Fifteen thousand people had direct contact with the Refuge and staff. That total included over 6,000 students and teachers participating in staff -led environmental education programs. Eight thousand members of the public enjoyed educational and outreach programming presented by Refuge public use, biological, and operations staff. These activities occurred while the intensive planning and construction phase of the WNT was underway.



The footprint of the 40,000 square foot Prairie Learning Center was visible by July.



### **Refuge Construction Activities in Full Swing**

The theoretical became real in December 1994. Taylor Ball Construction of Des Moines began construction of the 40,000 square foot Prairie Learning Center, trails, and amphitheaters. These facilities will be completed and opened in October 1996.

Nearly 70% of ORP Aplin's time was invested in development of interpretive exhibits and audio-visual programming for the Prairie Learning Center. An extensive value engineering exercise began in August to bring exhibit fabrication and installation costs within budget. The task group included designers from Joseph Wetzel Associates and X-Plus Exhibits (FWS Indefinite Quantities Contractors) and was led by WNT Development Team Exhibit Specialist, Lisa Friedlander. The exercise was necessary when fabrication costs for exhibit designs produced by Gerard Hilferty, Inc. dramatically exceeded budgeted funds.

Sea Studios of Monterey, California was awarded a 1.1 million dollar contract to produce and install audio-visual programs for the Prairie Learning Center. A formal protest to the GAO by an unsuccessful AV production firm delayed contract award 8 months. The protest was eventually rejected by GAO, but this delay caused Sea Studios and the Service to dramatically accelerate development and production of AV programs. Sea Studios worked throughout the spring to develop creative treatments for a 12 minute orientation theater program and a series of 1-3 minute vignettes to be presented in two mini-theaters. Birger and Aplin participated in the development of creative treatments and content for the AV production. Friedlander coordinated the activities of the exhibit fabricator and the AV production firm and oversaw resolution of technical and equipment issues.

### **Outreach and Education**

Refuge staff continued to build public understanding and enthusiasm for the project through 102 programs presented to 8,000 people of all ages with diverse interests and backgrounds. Highlights include:

#### **Iowa's First Junior Duck Stamp contest**

On April 28, Walnut Creek organized and hosted Iowa's first Junior Duck Stamp competition.

Five Judges including two-time Federal Duck Stamp winner Maynard Reese, Iowa DNR Director Larry Wilson, and Ding Darling Foundation President Kip Koss selected winners from over 450 entries.

Refuge Public Use staff organized a direct mailing campaign to 2,000 Iowa art educators and mounted an extensive media relations campaign when it became apparent that WO efforts to publicize the event were not effective. Winners were invited to an awards ceremony at the fourth annual Sow Your Wild Oats Festival.



A watercolor painting of a pair of canvasback by 17-year-old Benjamin Lake was selected as the winning entry of the 1995 Federal Junior Duck Stamp competition. Judges included Ding Darling Foundation president Kip Koss, Iowa Natural Heritage Foundation Education coordinator Anita O'Gara, Iowa Department of Natural Resources (IDNR) Information and Education Chief Ross Harrison, Wildlife Artist Maynard Reese, and IDNR Director Larry Wilson. Over 450 entries were submitted to Iowa's First Junior Duck Stamp Contest.

### **Eagle Video**

Walnut Creek represented the FWS in the multi-agency production of a 12 minute video titled "On the Wings of an Eagle". The project was designed to supplement the Lake Red Rock eagle watch program held each winter at the Army Corps of Engineers Lake Red Rock Dam and at the Pella, Iowa Community Center. The video emphasized critical habitat needs of wintering Bald Eagles. The project was co-sponsored by the USACOE, the Iowa Department of Natural Resources, Iowa State University Extension, and the FWS. The Regional Endangered Species office contributed \$2,000 toward the project.

**National Wildlife Week**

Five hundred people participated in Refuge events celebrating the First Annual National Wildlife Refuge Week. Events included:

- A Refuge field trip for 120 Prairie City Elementary Students.
- A presentation to the ISU Fish, Wildlife and Biology Club.
- A day-long Prairie Curriculum Workshop co-presented by ORP Aplin at the Midwest Environmental Education Workshop at Austin, Minnesota.
- The Friends of Walnut Creek Annual Meeting and moonlit hayride through the Refuge.
- A Refuge neighbors tour.

**Old Settlers' Days**

Refuge staff continued a five-year-old tradition by participating in Old Settlers' Days in Prairie City and Monroe. ROS Heisler chaired the float committee and coordinated the fabrication of a clutch of super-sized morel mushrooms. Shelly Sentyrz presented a program on Prairie Wildlife to over 100 children and parents at the Prairie City event.

**Sow Your Wild Oats IV**

The annual Sow Your Wild Oats event moved from the interim headquarters to a new location in 1995. The site overlooked the Prairie Learning Center construction zone. Events highlighted construction progress and also featured the now-traditional seed planting and dancing, as well as a talk by a raptor rehabilitator and the Junior Duck Stamp awards ceremony. A planned prescribed burn demonstration was scrubbed due to high winds.



Volunteers of all ages collected prairie seed at Seed & Feed IV.

### **Seed and Feed IV**

Refuge staff and 45 volunteers harvested seed from the A.C. Morris Prairie in Jasper County on September 23. The event began with a pot-luck meal, music, and games at Mariposa County Park. Well-fed participants then traveled the half mile to the 25 acre native prairie. Seeds from 13 species were collected.

### **Statewide Environmental Education summit**

Aplin helped organize and present a statewide Environmental Education Summit held on November 2.

Iowa Governor Terry Branstad welcomed over 100 participants to the conference. The main event was preceded by a series of focus groups held around the state to develop a common conservation education agenda for the next five years. Conference organizers made special effort to include groups not typically associated with Conservation Education, including business, agriculture and tourism.

## **2. Outdoor Classroom**

Six thousand teachers and students participated in environmental education activities in 1995. Highlights included:

**Earth Day '95.** Aplin, Sentyrz and intern Matt Milligan traveled to West Des Moines on April 19 to introduce 300 Stilwell Middle School students to the art and science of prairie restoration. Students scarified and planted prairie seeds after viewing a live demonstration via the school's instructional TV network. Field trips to the Refuge were scheduled after the day-long program.

**The Downtown School Garden.** Refuge Ranger Sentyrz presented a prairie program to students at the Downtown School (Des Moines) in May. Students later planted prairie species to be incorporated into a new park/playground located adjacent to their school. Seed from these plants will be returned to Walnut Creek for restoration activities.

**Iowa Mennonite School Stewardship Day.** In April, high school students from the Iowa Mennonite School in Kalona spent a day at Walnut Creek. Students learned about Iowa's prairie heritage and cleared brush and trees from the "Buzzard Head" prairie remnant.

**Prairie City Prairie Day.** The entire Walnut Creek staff became teacher/naturalists for the first annual Prairie City Prairie Day's Celebration. One hundred and eighty students from Prairie City Elementary School participated in five educational activities led by their classroom teachers and the entire WNT staff.



### 3. Outdoor Classroom - Teacher

**Project Bluestem.** A tallgrass prairie and oak savanna curriculum containing more than 400 pages specific to WNT's habitat was created. Fifty teachers and naturalists from around the state of Iowa participated in two-day Project Bluestem workshops at the Refuge. Informational sessions and mini-workshops reached an additional 200 educators from Monroe, Des Moines and other central Iowa school districts. Aplin and Sentyrz introduced Project Bluestem and WNT to teachers attending the Iowa Conservation Education Council's Winter Solstice Conference. The Friends of Walnut Creek took charge of printing and distribution of the guides and sponsored on-site workshops.

**Hoyt Middle School Partnership.** Walnut Creek NWR and Hoyt Middle School (Des Moines) became "Partners for Education" in 1995. Aplin and Sentyrz assisted Hoyt administrators and faculty in establishing an on-site prairie planting at the school. Refuge staff also participated in a prairie planting dedication ceremony, a school open house, and a partners' awards banquet. The Hoyt Middle School faculty toured the Refuge in August as part of its annual in-service.

**Prairie Workshop.** In October, ORP Aplin co-presented a day long workshop on tallgrass prairie at the Midwest Environmental Education Workshop in Austin, Minnesota. Other presenters included Dr. Craig Johnson of the School Nature Area Project (SNAP) of Saint Olaf College and Wayne Pauley of the Dane County (Wisconsin) Department of Parks.

### 4. Interpretive Foot Trails

**The Basswood Interpretive Trail** opened in May, 1995. The half mile long wood-chipped trail was developed by Refuge summer intern, Matt Milligan, to provide Refuge visitors with a high quality recreational experience while permanent trails and other visitor facilities are under construction. Milligan helped develop a brochure interpreting fifteen points of interest marked by numbered posts. The trail proved popular with casual visitors and school groups.

### 5. Interpretive Tour Routes

Nothing to report.

### 6. Interpretive Exhibits/Demonstrations

The Walnut Creek staff took the show on the road throughout 1995. Highlights included the **Midwest Naturalist Series**. Aplin and Sentyrz presented monthly interpretive programs based on natural history books at the Des Moines Barnes and Noble Bookstore. In March, Aplin demonstrated interpretive techniques to Iowa State University students.



7. Other Interpretive Programs

In August, Aplin and Birger presented campfire programs at USACOE Lake Red Rock. Sentyrz and Aplin led Refuge visitors on an Owl Prowl along the Basswood Trail under the October full moon.

8. Hunting

The construction zone south of 96th, between 129th and the east Refuge boundary, was closed to hunting in 1995-96. (Refer to Hunting Brochure in the information packet.)

Hunters were required to wear blaze orange while hunting on the Refuge. A new **Special Refuge Regulation** stated: "All persons engaged in gun hunting activities are required to wear some article of solid blaze orange outer-wear clothing or hat. When deer hunting with firearms you are required, per State of Iowa Regulation, to wear one or more of the following articles of visible, external, solid blaze orange clothing: a vest, coat, jacket, sweatshirt, sweater, shirt, or coveralls."

9. Fishing

Nothing to report.

10. Trapping

Nothing to report.

11. Wildlife Observation

Refuge Ranger Sentyrz served on the steering committee of the *Iowa Wildlife Viewing Guide* published in 1995 by Falcon Press. Walnut Creek NWR is one of the 77 wildlife viewing sites around Iowa featured in the 100 page guide.

12. Other Wildlife Oriented Recreation

Nothing to report.

13. Camping

Nothing to report.

14. Picnicking

Nothing to report.

## **I. EQUIPMENT AND FACILITIES**

### **1. New Construction**

Construction continued on the maintenance and storage/seed handling buildings and the visitor center. Heavy rains and an unusually wet spring delayed construction activities by about 3-4 weeks. The maintenance and storage/seed handling facilities were scheduled to be turned over to the Refuge in October. Problems with accessibility to the interior of the pump house and various fixtures in the maintenance building did not allow for this to happen.

Tree removal, gully and landscape contour restoration continued through the winter and concluded in the spring. Road obliteration also began in late spring with portions of W. 117th Street S., W. 119th Street S. and S. 102nd Street W. being obliterated and original land contours restored. This totaled approximately three miles. Pacific Ave., which is part of the entrance road, was rebuilt to conform to entry road standards and a new bridge was constructed over Walnut Creek.



The new maintenance complex includes a maintenance/storage building (left) and equipment/seed storage building.



Contractor repairing gully erosion at "refrigerator gulch".



A new savanna trail winds just outside the drip-line of mature bur oaks.



Walnut Creek bridge under construction.





Completed entry road and bridge.



Construction workers pour the west wall of the Prairie Learning Center.



Coconut fiber matting, silt curtains, and a planting of cool season grasses stabilize the soil in a reshaped gully.



West 119th Street South, August, 1994



West 119th Street South, after removal.



Drilling well fields for the earth-coupled heat pump at the Prairie Learning Center.



2. Rehabilitation

Nothing to report.

3. Major Maintenance

Twenty former farmstead wells were sealed according to State of Iowa specifications. Four farmsteads with buildings were restored. Three miles of vacated county road were restored to original contour and seeded to native vegetation. Almost 2,250 rods of fence line were removed and restored to original contours. Noxious weeds were treated on 640 acres of former CRP.

4. Equipment Utilization and Replacement



Patriot sprayer fitted with hose reel.

During 1995, the Refuge acquired the following pieces of equipment:

**Shop Equipment:** Husqvarna chain saw, Husqvarna weed eater with brush cutting attachment, miscellaneous wrenches and assorted hand tools.

**Restoration Equipment:** Massey Ferguson plot combine, Flail Vac seed harvester (transferred from Windom WMD), Federal rotary screen, Patriot self-propelled sprayer

(also used as a fire fighting unit), Ford 7' flail mower and two Tye native seed drills (10' and 5').

The following items were acquired from military surplus property listings: 6' Bush Hog mower and 15' Woods bat-wing mower.

**Law Enforcement/Fire Equipment:** We also received from military surplus property a small pumper unit with hose reel and trailer, hose reel and hose for the Patriot sprayer, foam proportioner, miscellaneous fittings and wrenches.

5. Communications Systems

Nothing to report.

6. Computer Systems

Computer hardware acquired was diverse. Early in the year, both Compuadd 386 machines became overloaded with new software application demands. Both required processor chip upgrades to run new windows-based office software provided by the Regional Office. Cyrix-brand 486 upgrade chips were installed by Refuge Ranger Sentyrz. Four megabytes of RAM were added to one machine.

Two Microcom Deskporte 28.8 modems were purchased, one modem replaced a slower 14.4 model, the second is being used for Internet access.

To convert the Compuadd work station into a multimedia and educational terminal, an NEC 2Vi double speed CD-ROM multimedia bundle was acquired. An outdated video card was replaced with a compatible Speedstar 64 video card.

A second Dell Pentium 100 desktop PC was provided WNT's GIS lab with end-of-the-year funding. This PC included a 3 1/2" floppy drive, tape backup drive, CD-ROM drive without multi-media bundle, 1.2 Gigabyte hard drive, 8 Megabytes RAM, and 15" SVGA .28 monitor.

Two Macintosh II desktop computers were received via transfer from the Regional Office. Although both Macs were complete with monitor and peripherals, they were simply too old to be of use. Machine parts were cannibalized to replace failing parts in more current Refuge Macintosh IICI's.

Six single-user site licenses of WordPerfect 6.1 for Windows were acquired in late summer. The program, although memory-intensive, is a definite improvement from WP 5.1. Text, graphics, and database applications that were once only available for WordPerfect for Macintosh users are now accessible to both operating systems.

Spry Internet Office was purchased and offers an assortment of Internet functions when connected through the FWS Denver Modem Pool.

A new Filemaker Pro software platform for Refuge Management Information System (RMIS) was installed and tested. Moving between menus of Filemaker Pro and the subsequent RMIS macro were found to be initially confusing, but program data was stored and retrieved readily in the windows-based format after a short learning curve.

### **GIS-SOFTWARE**

Refuge staff continued use of the GIS software Eppl-7 2.1 for the creation, management, and analysis of GIS datasets.



Refuge Ranger Shelly Sentyrz operating the Walnut Creek GIS system.

In May, WNT acquired a software evaluation agreement with ESRI, the most prominent of American GIS software companies. The arrangement provided a one-year site license for ESRI's ArcView and PC Arc-Info 3.4.2 GIS software. In exchange for use of the software, Refuge staff agreed to evaluate the programs and offer suggestions for software improvements.

Used in conjunction with WordPerfect for Windows and R-Base IV, the three GIS software packages offered numerous ways to combine and study spatial information. Eppl-7 was used to create and organize new GIS data. PC Arc-Info was unequaled in

manipulating established data sets. ArcView equipped Refuge staff with powerful display and output capabilities.

Requests for GIS output in 1995 were overwhelming. Most Refuge and Region III GIS needs were met, however, several requests from outside sources were postponed or denied. 1995 growing season data entry was not completed by December 31.

### **METADATA**

WNT GIS staff spent the better half of two months developing Metadata (data about data) for over 138 Refuge GIS digital datasets. Executive Order 12906, issued by President Clinton, required all Federal agencies to document the geospatial data they collect or produce according to Federal Geographic Data Committee (FGDC) standards. The Metadata were to be finished and available to the FGDC for inventory before January 1, 1996.

Ranger Sentyrz attended a Federal Metadata Training Workshop in July along with 65 other participants from various federal agencies. The intensive 20-hour course explained present and future plans for the National Spatial Data Infrastructure, including hands-on exercises in Metadata development.

Though tedious and time-consuming, the Metadata development was of great value to the Refuge and Region III, as well as to other agencies. For each Refuge GIS data set, there now exists a companion file describing the type, size, and contents of that data set. Metadata is extremely important when exchanging datasets, importing and exporting files to various software packages, and reporting the accuracy and precision of statistics generated with the datasets.

An inventory of WNT GIS data is currently available in PC files in WordPerfect 5.1 and WordPerfect for Windows formats. This inventory will be included in the Federal Geospatial Data Clearinghouse to be implemented on Internet in 1996. Parties interested in WNT GIS datasets should contact Shelly Sentyrz, Refuge Ranger.

### **APPLICATIONS:**

1995 Refuge GIS applications included the following:

- Digitizing the 1992 Refuge roads data set to reflect 1) the elimination of three portions of county roads within current Refuge ownership, and 2) construction of the new entrance road leading to the Prairie Learning Center.
- Modifying the updated Refuge roads data set to exclude depiction of private drives within Refuge acquisition boundaries. This modified line set was used in conjunction with a new GIS data set indicating Refuge areas open and closed during the 1995-96 hunting season. A combination of the two files produced the 1995-96 Refuge hunting brochure.



- Several alternative plans of a Bison and Elk Enclosure were digitized, manipulated, and analyzed by Refuge and planning staff. The line sets varied in size, location, and habitat content.

Acreage, perimeters, and resources available were calculated for each alternative to provide cartographic and numerical data for management decisions.

- Updated ownership datasets were combined with NRCS Soil Suitability Rating datasets to illustrate cropland values within and adjacent to Refuge acquisition boundaries. Specific land parcels were selected, producing a spreadsheet of comparative information on soils, crop suitability, and average yields of corn and soybeans. The spreadsheet information was then linked to detailed color maps that reflected NRCS crop suitability ratings. The GIS output was used by negotiations by FWS realty staff.
- In late November WNT acquired a complimentary copy of the *GIS World SourceCD*, a 1996 database of information on the GIS industry including publications, programs, companies, communications, products, and services. The CD-ROM is a reference for GIS novices and experts alike and offers a wealth of GIS contacts to be found around the world.

## GPS

In 1995 WNT procured a Plgr+ Global Positioning System Hand-Held receiver. The GPS unit is the same model used by military personnel in Operation Desert Storm, now offered to federal agencies by the Department of Defense. The receiver is superior to retail receivers currently on the market because of its accuracy without post-processing (post-processing being the application of mathematical functions to the collected data in order to increase data accuracy). Post-processing is oftentimes lengthy and very costly.

Preliminary experiments using the receiver reflected a positional accuracy of within 5 meters for most Refuge locations. Areas of dense vegetation decreased positional accuracy levels. Altitudinal receiver readings were not numerous enough to establish rates of accuracy.

The GPS receiver was first used to find known locations within Refuge boundaries. Construction sites, eliminated roads, and realigned roads were recorded with the receiver. Accompanying software and hardware connections allowed Refuge staff to transfer receiver data to a desktop PC and view the information in R-Base and D-Base. Transformation of the receiver data into a GIS map file has not yet been attempted.

## 7. Energy Conservation

Nothing to report.



8. Other

Nothing to report.

**J. OTHER ITEMS**

1. Cooperative Programs

Nothing to report.

2. Other Economic Uses

Nothing to report.

3. Items of Interest

Nothing to report.

4. Credits

ORP Aplin - Sections G 8; H 1-16, 18, 19; and selected photographs.

Project Leader Birger - Introduction, Sections A; C; D 1-4, 6; E 1-3, 5, 7, 8; J; and K.  
Birger also did the final editing.

Biologist Drobney - Sections D 5; F 3, 5, 6, 9; and G 1-7 and 9-17.

Administrative Technician Dykstra - Sections B, E 6 and L. Dykstra was also responsible for final typing, layout, proofreading and production.

ROS Olawsky - Sections F 14 and 15.

ROS Petersen - Sections F 1, 2, 4, 7, 8, 10-13, 16; G 8; H 17; I 1-5, 7 and 8.

Ranger Sentyrz - E 4 and I 6.

**K. FEEDBACK**

With so many changes going on in the Refuge System the temptation is great to make some smart ass remarks -- I will resist!