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DNR

Annual Report For Fiscal Year 1987



**Iowa Department of Natural Resources
Henry A. Wallace Building, 900 East Grand
Des Moines, Iowa 50319-0034**

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DIRECTOR'S MESSAGE

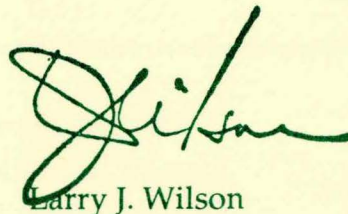
As part of Iowa state government reorganization, four agencies were merged in July 1986 to form the new Department of Natural Resources (DNR), resulting in a savings of 40 positions and more than \$600,000 in annual budget. These agencies (and the year in which they were created) were: Geological Survey (1892), Conservation Commission (1935), Energy Policy Council (1974), and Water, Air and Waste Management (1981). The organizational chart on the following page shows the structure of the DNR with seven divisions and 22 bureaus.

The two bipartisan policy-making commissions also were impacted by reorganization. The Conservation Commission became the Natural Resource Commission and the Water, Air and Waste Management Commission became the Environmental Protection Commission. I was appointed by Governor Terry E. Branstad and confirmed by the Senate to serve as the new Department's first director. During this initial year of reorganization, a "first things first" approach was taken: formulating the Department's mission and goals, putting the organization structure into place, preparing staffing plans and a new budget, making physical moves of employees and offices, and making certain all staff understood their job responsibilities.

The mission of the department is to ensure the proper management and protection of Iowa's natural resources while actively encouraging public use and enjoyment of the state's resources in a manner consistent with sound management principles. The historic purposes of the original individual agencies were continued to meet this mission. All of these purposes can be more fully realized under the DNR than when they all stood separately.

One of the most significant accomplishments of the year, the passage of the Groundwater Protection Act, is testimony to how the DNR can function more successfully on comprehensive natural resource issues than the individual agencies. A massive amount of technical expertise from all parts of the Department was required to prepare the Iowa Groundwater Protection Strategy - 1987, which paved the way for the act now recognized nationally as the most progressive groundwater law in the country. Working under the management efficiency of one agency, instead of four, we were able to pull together in the same direction on a clearly identified and agreeable goal, all to the benefit of the groundwater resource and to the people of the state.

It is a tribute to the employees of the DNR that services to the public and to the state's natural resources remained intact and of high quality in this year of major transition.

A handwritten signature in dark ink, appearing to read "Wilson", with a stylized flourish extending from the end.

Larry J. Wilson

Director, Iowa Department of Natural Resources

Highlights of Fiscal Year 1987

Reorganization of state government resulted in the creation of the Department of Natural Resources, as a result of the combination of the Conservation Commission, Geological Survey, parts of the Energy Policy Council, and the Department of Water, Air and Waste Management.

Groundwater Protection — Completion of the "Iowa Groundwater Protection Strategy - 1987" and its approval by the Environmental Protection Commission led to passage of the Groundwater Protection Act, the nation's most progressive and comprehensive state law dealing with groundwater.

Nearly \$43,000 in administrative penalties were collected as a result of violations of environmental regulations.

The Iowa Conservationist magazine increased from 24 to 32 pages, enabling it to carry more information from the new, larger department.

The sixth edition of Iowa Fish and Fishing was completed — a comprehensive rewrite and updated version of the popular book.

The first full year of income from the sale of park user permits amounted to more than \$1.2 million. Donations from individuals and organizations were more than \$54,000.

The Loess Hills State Forest, the state's newest, had grown to 2,032 acres with an additional 306 under option to buy on its way to the goal of about 14,000 acres.

Timber sales from agency properties topped \$180,000.

The School Energy Bank program was initiated with a goal of providing energy conservation improvement to school buildings to be paid for by school districts with funds actually saved through lower utility bills.

Department of General Services, Human Services and Corrections participated in the state building energy conservation project which will see \$300 million in building improvements, also to be paid for out of utility savings.

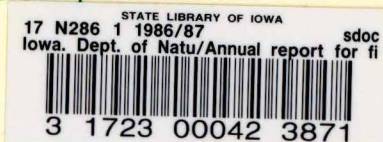
Land was acquired for Beaver Lake, a 34-acre impoundment to be built in Dallas County. Planning and public meetings were completed for additional new lakes sites: Shawtee (350 acres) in Fremont County, Deer Creek (40 acres) in Plymouth County, Whitewater (112 acres) in Dubuque County and Lost Grove (350 acres) in Scott County.

More than \$100,000 was collected as liquidated damages from fish and wildlife violators, almost twice as much as the preceding year and \$40,000 more than the 1984 record amount.

Received U.S. Environmental Protection Agency approval of a plan to significantly reduce air toxics in the future.

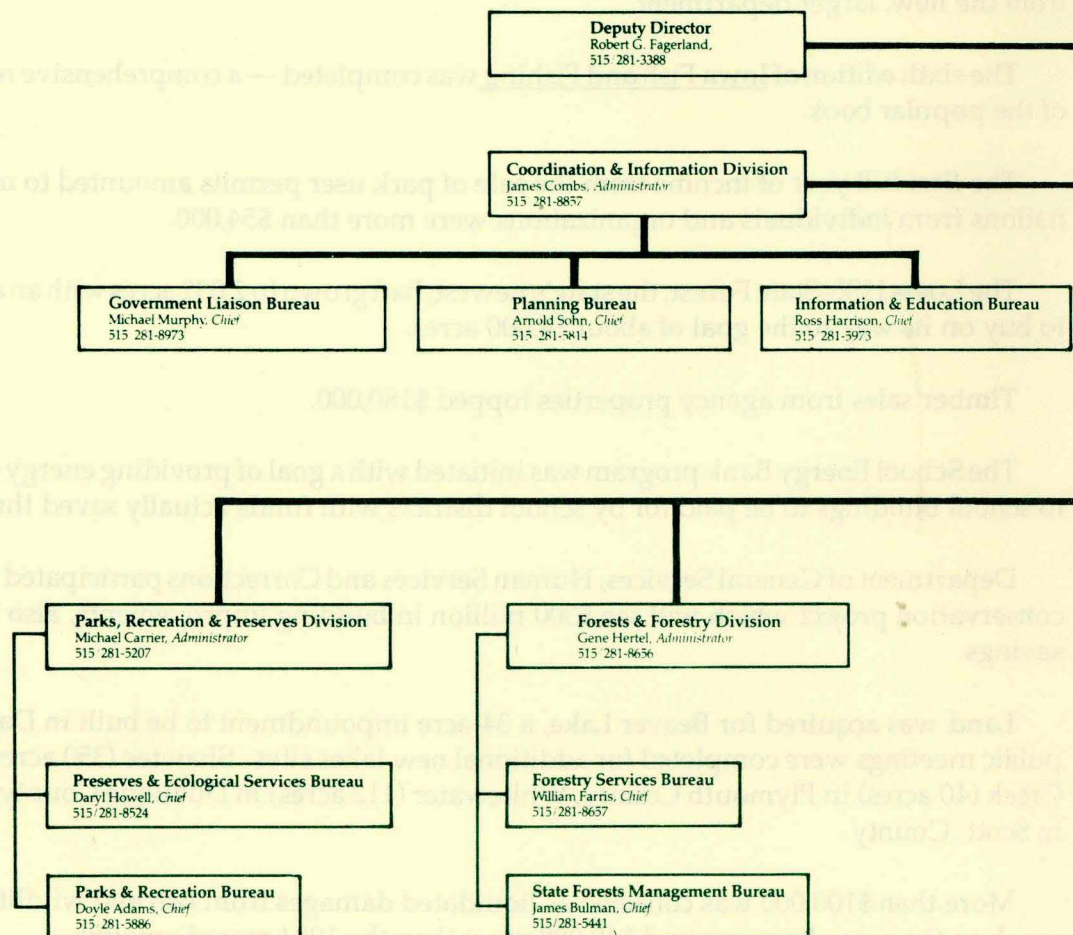
Cleanup was completed at the Aidex superfund site, near Council Bluffs, considered to be the most hazardous waste site in the State.

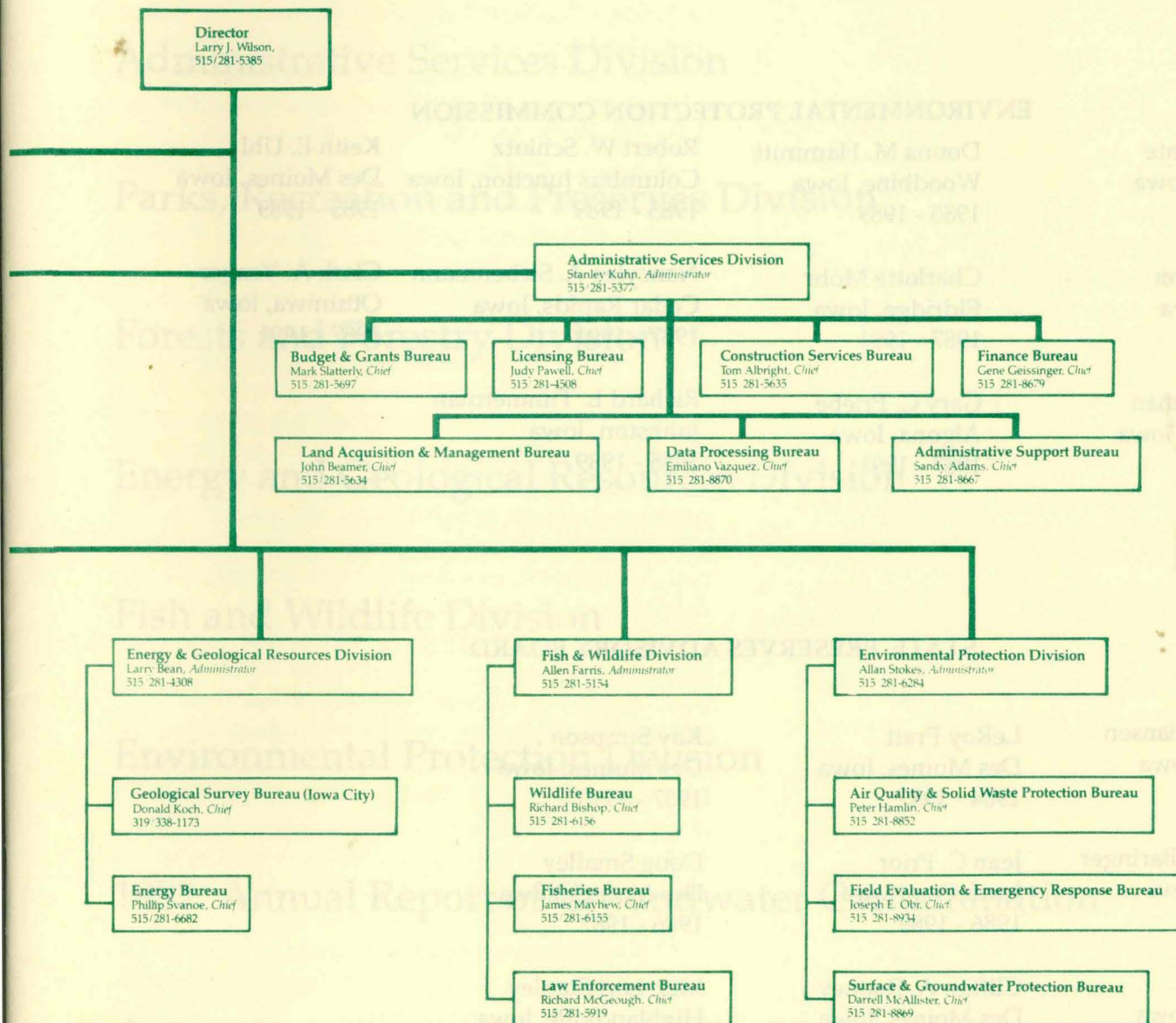
The first rules requiring monitoring of underground storage tanks were implemented.



IOWA DEPARTMENT OF NATURAL RESOURCES

Wallace State Office Building, Des Moines, Iowa 50319-0034 515/281-8666 or 515/281-5145





NATURAL RESOURCE COMMISSION

John D. Field
Hamburg, Iowa
1985 - 1991

Marion J. Patterson
Cedar Rapids, Iowa
1987 - 1993

Douglas R. Smalley
Des Moines, Iowa
1987 - 1993

Richard C. Young
Waterloo, Iowa
1987 - 1993

Baxter Freese
Wellman, Iowa
1981 - April 1987

Mrs. Marian Pike
Whiting, Iowa
1981 - April 1987

Thomas E. Spahn
Dubuque, Iowa
1983 - 1989

Sam Kennedy III
Clear Lake, Iowa
1985 - 1991

William B. Ridout
Estherville, Iowa
1983 - 1989

F. Richard Thornton
Des Moines, Iowa
1981 - April 1987

ENVIRONMENTAL PROTECTION COMMISSION

Linda Appelgate
Des Moines, Iowa
1983 - 1987

Donna M. Hammitt
Woodbine, Iowa
1985 - 1989

Robert W. Schlutz
Columbus Junction, Iowa
1985 - 1989

Keith E. Uhl
Des Moines, Iowa
1985 - 1989

Catherine Dunn
Dubuque, Iowa
1985 - 1989

Charlotte Mohr
Eldridge, Iowa
1987 - 1991

Nancylee A. Siebenmann
Cedar Rapids, Iowa
1987 - 1991

Clark A. Yeager
Ottumwa, Iowa
1987 - 1991

Wayne Gieselman
Morning Sun, Iowa
1982 - 1987

Gary C. Priebe
Algona, Iowa
1987 - 1991

Richard L. Timmerman
Johnston, Iowa
1985 - 1989

STATE PRESERVES ADVISORY BOARD

Paul A. Christiansen
Mt. Vernon, Iowa
1985 - 1988

LeRoy Pratt
Des Moines, Iowa
1984 - 1987

Kay Simpson
Des Moines, Iowa
1987 - 1990

Mrs. Dorothy Baringer
Woodburn, Iowa
1985 - 1988

Jean C. Prior
Iowa City, Iowa
1986 - 1989

Doug Smalley
Des Moines, Iowa
1986 - 1987

Ronald Kuntz
Des Moines, Iowa
1987 - 1990

Clifton A. Rooney
Des Moines, Iowa
1987 - 1990

Mrs. Lori Stanley
Highlandville, Iowa
1984 - 1987

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COORDINATION AND INFORMATION DIVISION

GOVERNMENT LIAISON BUREAU

County Conservation Coordination

This office coordinates programs in which the DNR cooperates with the state's County Conservation Boards.

During Fiscal Year 1986-87, action was recommended to the Natural Resource Commission on 33 projects including 15 land acquisitions, 10 area development plans and 8 management agreements. Of these management agreements, four were state access areas, two were wildlife areas and two were state parks facilities.

The total number of county conservation board areas was 1,152 encompassing 87,367 acres. The total budget of the 98 county conservation boards was \$17,520,000. The total staff of the counties was 339 including 95 directors and 45 naturalists.

A new program entitled the Roadside Vegetation Management Program was initiated. By the end of the fiscal year, committees had been established and early planning had begun.

In addition, the office coordinates a snowmobile trail program. During the 1987 fiscal year, there were approximately 4200 miles of groomed and developed trails cost-shared through county conservation boards by the Department of Natural Resources.

Legal Services

The Government Liaison Bureau also includes the Department's staff attorneys, who provide day-to-day legal advice to all units of the Department, coordinate rulemaking activities, represent the department in administrative legal proceedings, and assist the Environmental Protection Division in enforcement actions. During the first year of the consolidated DNR, this unit generated 216 administrative orders, as compared to 124 during the previous fiscal year, collected nearly \$43,000.00 in administrative penalties, and assisted in the referral of 26 environmental cases to the office of the Attorney General for prosecution of civil and criminal actions in court. This

unit also represents the Governor as a member of the Missouri Basin States Association and the Upper Mississippi River Basin Association.

PLANNING BUREAU

Special Projects Unit

Two major activities were completed by the Special Projects Unit of the Planning Bureau. The first of these was a "Plan For a Hazardous Waste Storage Facility in Iowa." This plan was mandated by law and was delivered to the General Assembly in January, 1987. The plan is the first of a number of steps necessary should Iowa decide to site a hazardous waste disposal facility. The plan provides a preliminary evaluation of the criteria to be used in both selecting the type of facility and a site for the facility.

Secondly, "The Iowa Groundwater Protection Strategy-1987" was prepared and delivered to the General Assembly in January, 1987. The strategy identified 13 of the most significant sources of groundwater contamination in the state and made specific recommendations on how to eliminate contamination from those sources. The Iowa Groundwater Protection Strategy served as the basis for the Iowa Groundwater Protection Act which was passed by the General Assembly and signed by the Governor on June 9, 1987. The Act mirrors the strategy and has received national recognition as an innovative and practical approach in environmental protection. Iowa's approach, based on the recommendations of the Strategy, is to focus its attention on education, demonstration and research in an effort to change human behavior and thus prevent contamination from occurring. Equally unique is the state's approach to funding the program. Fees on activities that may result in contamination of the resource are placed in revolving accounts. The resources are then used to offset the cost of alternative approaches to the activity. In addition, Iowa has used oil overcharge rebate funds to cover some of the cost of the program.

Outdoor Recreation Planning Unit

Following is a summary of outdoor recreation planning activities during FY87:

1. Statewide Comprehensive Outdoor Recreation Plan (SCORP) — The 1988 Iowa SCORP and the 1988-89 Action Plan were finished and sent to the National Park Service for final approval. The Bureau also participated in the annual Land and Water Conserva-

tion Fund project evaluation and selection process which determines how federal recreation grant monies are spent in Iowa.

2. Statewide Trails Plan — The DNR's trail plan was started in the spring of 1987, and was reviewed by the Trails Advisory Committee during the summer. In addition to working on the plan, bureau staff provided technical assistance in acquisition and development strategies of three proposed trail projects on abandoned railroad rights of way; Ely to West Branch, West Des Moines to Rippey and Waukee to Yale.

3. Des Moines Recreation River and Greenbelt—Bureau staff assisted the Corps of Engineers in preparing a plan for development of recreation, environmental enhancement and bank stabilization projects along 160 miles of the Des Moines River between Highways 20 and 92.

4. Mississippi River coordination activities continue to be a major role of the Bureau. Prominent coordination activities during this fiscal year included channel maintenance dredging, Environmental Management Program, and Lock and Dam 26 environmental impact statement activities.

5. The Bureau organized the Governor's Canoe Trip on the Boone River in recognition of Iowa Rivers Month. Landowners who had donated conservation easements in the Boone River PWA were given special recognition during the event.

INFORMATION - EDUCATION BUREAU

As a service bureau to the rest of the agency, the Information-Education Bureau provides public communications and educational services through a variety of established activities. The bureau is headquartered in the Des Moines office of the DNR, with field information specialists stationed at Clear Lake and Iowa City, and the Conservation Education Center located at Springbrook State Park, north of Guthrie Center.

The primary, public information tool of the I-E Bureau, the Iowa Conservationist magazine, increased from 24 pages monthly to 32 pages monthly at the beginning of FY87; subscription prices increased at the same time from \$4 a year or \$10 for

three years to \$6 a year or \$12 for three years. The additional pages are devoted to carrying the expanded message of the DNR, versus the historic "outdoor, fish and wildlife" topics. Subscriptions throughout the year averaged about 58,500 with about 10 percent being free subscribers.

Other public information activities are designed to deliver a consistent message about all of the programs and policies of the DNR. Over 160 brochures, maps, posters and fliers were generated, along with the bi-weekly news release packets. Considerable effort went into the updating and revision of the newest edition of Iowa Fish and Fishing, edited by James Mayhew. The bi-weekly TV video news program continued in popularity with ten stations. The weekly Conservation Capsule (five-minute radio show) is subscribed to by 43 stations. Two slide/tape productions were made, as well as five TV and radio PSAs on the Chickadee Checkoff, Turn In Poachers, hunters safety, hazardous spills and state parks.

The Springbrook Conservation Education Center continued to attract more than 15,000 visitors, including 2,110 days by teachers, 7,106 by schools and colleges, 1,590 by conservation groups, 3,213 by DNR programs and 1,175 others. The types of programs delivered at the Conservation Education Center include:

- environmental education workshops for teachers, conservation staff and other educators.

- outdoor activities on local ecology, conservation, and environmental issues for school and youth groups that generally stay two or more days.

- conservation programs for other groups.

ADMINISTRATIVE SERVICES DIVISION

LICENSE BUREAU

The License Bureau works closely with other bureaus in providing the licensing services for the entire department. This includes the responsibility for the design, ordering, and distribution of hunting and fishing licenses including deer and turkey licenses. Licenses are also processed for all types of miscellane-

ous activities, i.e.; commercial fishing, taxidermy, water well contractor, docks, game breeders, etc. As a result of reorganization the bureau assumed responsibility for three additional major licensing activities. Systems were designed and implemented to accomplish as smooth a transition as possible. The staff was able to quickly learn new policies and procedures and carry an extra workload with no increase in personnel. Water and wastewater treatment operators are tested and certified.

In 1987 the bureau sent out approximately 12,000 temporary storage tank annual registrations in order to begin implementation of the requirements mandated by the Groundwater Act. Over 7,500 applications for underground storage tank tags were sent out. The tags were designed and ordered and most tanks were tagged by April 1, 1988. Information returned from tank owners will assist the DNR in updating its data base to more accurately reflect the current status of underground storage tanks. Revenue generated from the activities of the bureau is in excess of 12 million annually. See Appendix G.

BUDGET AND GRANTS BUREAU

The Budget and Grants Bureau is charged with the preparation and monitoring of the Department's annual budget as well as the fiscal management of federal funds received. The bureau administers various grant programs disseminating funds to local governments for: sewage works construction, acquisition and development of park and recreation facilities, acquisition of wildlife habitat areas, development and maintenance of snowmobile trails and administration of the state's Green Thumb Program aimed at employment of senior citizens in conservation maintenance activities. A list of these grants can be found in the Appendix entries A-F.

CONSTRUCTION SERVICES BUREAU

The Construction Services Bureau has the responsibility for the design and construction of all capital improvement projects within the Department of Natural Resources. Work includes survey, design, contract administration, construction inspection, reports, studies and analyses.

The Bureau consists of design engineers and technicians and a survey party which operates out of the Des Moines office and field personnel located in six districts around the state.

On July 1, 1986, the Targeted Small Business (TSB) Procurement Program was established as a result of legislation passed by the General Assembly. The purpose of the program is to utilize certified targeted small businesses in procurement in state contracts. The bureau has one member on the TSB Coordination Committee which reviews, evaluates and makes recommendations regarding the program. During FY87 the bureau set-aside projects totaling \$102,017.14 to certified targeted small businesses within the state.

During this biennium, the bureau prepared contracts for 90 projects having a total value of \$4,214,500. The projects are listed in Appendix H.

LAND ACQUISITION AND MANAGEMENT BUREAU

The Bureau of Land Acquisition and Land Management is charged with the administration of Department real estate activities. These activities are divided into three broad categories: land acquisition, land rental, and land protection.

The land acquisition category concerns appraisals, surveys, legal requirements, relocation assistance, and property tax reimbursement. These services are provided to Department divisions, counties, and municipalities. This category includes the development and maintenance of land records and recording these records with the Secretary of State.

The land rental category includes agricultural leases, land leases, barge fleeting, sand and gravel permits, regional office rentals, lease payment collections, and lease termination.

Land protection is a category that deals with encroachment resolution, drainage districts, fencing agreements, access agreements, building demolition, and the Public Owned Lakes Program (a watershed protection measure).

A list of the bureau's activities is included in Appendix I.

DATA PROCESSING BUREAU

The Data Processing Bureau staff is located in two locations: At the Department's central offices in Des Moines and at the Iowa City field office.

The Data Processing Bureau (DPB) conducts programs in direct support to the management structure of the DNR and makes certain services available to other agencies; primarily to the U.S. Environmental Protection Agency through the data processing support provided to the Environmental Protection Division of the DNR.

The requirements of the department for systems design, programming, computing facilities, procurement of information processing goods and services, data communications, data design, and automation and editing, are developed jointly by the DPB staff and the end users throughout the department.

User applications and requirements extend over a wide range of end uses and complexity. However, regulatory and compliance projects, licensing and permitting programs, and research projects constitute more than 80 percent of the bureau's work. See Appendix J.

ADMINISTRATIVE SUPPORT BUREAU

The Administrative Support Bureau is primarily responsible for providing services to Des Moines and Iowa City offices which includes clerical activities, reception area, typing needs, incoming/outgoing mail functions, supplies, and records systems. The bureau employs 44 employees.

The bureau is comprised of 10 work units which include:

Administrative Support Stations (five including Iowa City)

Reception Area

Mailroom

Supply

Word Processing Center

Records Center/Library

In FY 1987, the bureau accomplished the activities listed in Appendix K.

PARKS, RECREATION AND PRESERVES DIVISION

PARKS AND RECREATION AREAS BUREAU

The Bureau of Parks and Recreation Areas is responsible for the management of 83 state parks, recreation areas, preserves, and historic sites.

During FY87, an estimated 9,685,000 individuals visited Iowa state parks and recreation areas. Camping activity was 429,000 guest days. Park User Permit revenues for FY87 totaled \$1,244,597, earmarked for the renovation and replacement of existing state park facilities.

FY87 user permit projects included construction of shower and toilet buildings at McIntosh Woods and Rock Creek State Parks and the Emerson Bay State Recreation Area. New campground electrical systems were contracted for the Emerson Bay and Marble Beach campground, as well as a new beach facility for Lewis and Clark State Park. Additional projects were initiated for contracting and implementation in later years.

Trail renovation efforts continued at Ledges State Park utilizing Park User Permit funds. The FY87 effort centered on the "canyon rim," highly visible from the scenic roadway below. A major trail construction project also took place at the Mines of Spain Recreation Area at Dubuque, utilizing Iowa Conservation Corps personnel with cost-sharing from the Iowa Department of Economic Development and the Park User Permit program.

Major facility development efforts proceeded during FY87 at Lake Manawa State Park and the Pleasant Creek State Recreation Area. At Lake Manawa, a shower and toilet building, modern rest rooms, and picnic shelters were contracted, as well as a new service/storage complex. At Pleasant Creek, a shower and toilet building was contracted, as well as a new beach facility, modern rest rooms, picnic shelters, a campground electrical system, and a service building. These major facility improvements did much to enhance our recreational opportunities at two very heavily visited outdoor recreation facilities.

As in past years, a major emphasis was placed on the provision of a variety of programs and special

grants. The development and operation of nature centers proceeded with excellent visitation at the E.B. Lyons Nature Center at Dubuque and the South Bluff Nature Center at Bellevue State Park near Bellevue. At Stone Park in Sioux City, park staff continued efforts to develop an extremely effective nature center. At Cedar Rock near Independence, over 8,300 individuals enjoyed tours at the beautiful residence and grounds designed by Frank Lloyd Wright.

A large number of special events were held in state parks and recreation areas in FY87; many in conjunction with State Park Week, June 14-20, 1987. Several major special events including the Fort Atkinson Rendezvous in late September, the Forest Craft Festival at Lacey-Keosauqua State Park in October and the Onawa-Lewis and Clark Festival in June. All of these events were heavily attended.

The Parks and Recreation Areas Bureau's donation program included 179 donations, totaling \$54,561 submitted for Natural Resource Commission approval. In addition, many smaller donations as well as volunteer labor were also received. These did much to enhance the ability of the bureau to accomplish needed projects and to implement important program efforts.

WATER ACCESS PROGRAM

During FY87 the Water Access Coordinator's Office underwent a considerable change in personnel and office responsibilities. A seven-month vacancy followed the retirement of the previous Water Access Coordinator. A new coordinator began work in June, 1987.

During this period, 26 water access cost-share projects were reviewed and 18 were approved, for a total approved project cost of \$585,697. Seventeen cooperative project agreements were signed and 10 cost-shared projects completed. In addition to the cost-shared projects, 12 DNR water access projects were initiated and 14 were completed.

The office also handled the administration of 23 dock management areas around the state and two state-owned marinas.

PRESERVES AND ECOLOGICAL SERVICES BUREAU

The Preserves and Ecological Services Bureau is charged with responsibility for several programs

which inventory, protect, and assist with management of natural communities, rare plants, and rare animals in Iowa. The bureau collects data on location and condition of these elements and maintains a data base to be used in protection efforts. The bureau works with the State Preserves Advisory Board, and helps the Department in implementing Preserves Board recommendations. Preparation and implementation of management plans for state preserves is supervised by bureau staff. The Endangered Species program for Iowa supervises intensive survey and protection efforts for a number of rare species found in the state. The bureau also coordinates inventory, management, and recovery projects with the U.S. Fish and Wildlife Service.

Field Projects

Fen inventory - An inventory of fens was started in 1986 and continued into 1987. To date, all or part of 18 counties have been inventoried, yielding over a dozen new fen locations. Over 40 new records for rare plants were found. Highlights included new sites for bog willow and narrow-leaved fringed gentian. A preliminary survey and analysis of fen butterflies was completed in 1986.

Prairie inventory - An inventory of publicly and privately owned prairies was continued as in past years. A special effort was made in 1987 to document and evaluate prairie remnants on state-owned wildlife areas.

Natural History Foray - The foray is a field trip for scientists, educators and DNR staff for the purpose of examining the natural history of individual areas. This year it was held in Clinton and Jackson Counties. Botanical discoveries included new locations for crowfoot clubmoss, slim-leaved panic grass, southern rein-orchid, and huckleberry, all state endangered. Other field work included butterfly collections, bird, mammal, fish, and herptile surveys, and natural community surveys.

Rare plant monitoring - A program was begun to monitor the population of western prairie fringed orchid at Sheeder Prairie Preserve. The known number of plants first thought to be 32, was actually discovered to be 378.

Endangered species

A draft of a booklet on endangered plant species was completed.

The following projects were funded by Federal Endangered Species cost-share money and administered by the Bureau.

A study of population dynamics and genetics of northern monkshood.

A survey of prairie bush clover on two state preserves. Monitoring studies will begin next year.

The final survey of the "Driftless area" for the Pleistocene snail was completed. No new sites were discovered.

A survey of golden saxifrage was completed.

FORESTS AND FORESTRY DIVISION

FORESTRY SERVICES BUREAU

This bureau provides professional forestry assistance and information to woodland owners and the forest industry.

District Forestry Program

The district forestry staff of 13 professional foresters continued to supply forestry services to Iowa's woodland owners. The Conservation Reserve Program (CRP) has provided an excellent opportunity for landowners to take highly erodible ground out of production and an opportunity to plant trees on portions of this ground.

A total of 4,423 acres of tree planting were planned by bureau foresters for Iowa private landowners. In addition, traditional services of tree planting assistance, timber management, harvesting assistance and public education assistance were performed by the district foresters.

To illustrate services provided by district foresters, Appendix L provides a district by district summary.

Forest Protection Program

The fire programs under the direction of the protection forester continue to provide cost-share assistance

to rural fire departments. Since 1975 over \$104,000 has been provided annually through the Rural Community Fire Protection Program for cost-shared assistance to rural fire departments in all 99 counties in the areas of training, training aides, protective clothing, breathing apparatus, conversion of excess property and wildfire equipment and protective clothing. The excess equipment program was also continued to provide loans of excess military equipment to fire departments.

The Insect and Disease Program continues to provide assistance to residents of the state by monitoring insect and disease populations on 236 plots in 93 counties. No major losses from pests were observed during the 1986-87 seasons.

Utilization and Marketing Program

The Utilization and Marketing Programs continue to assist Iowa forest industry. Sawmill studies and training sessions on areas of interest to Iowa's wood industries were stressed. The responsibility for administration of the timber buyers bonding law is also handled by the utilization section and continues to be an area of general interest.

Export marketing has become an exciting reality for the Iowa forest industry. Many of our mills and loggers have explored some direct export markets and many more are interested. Forestry utilization staff has attended training sessions on export marketing with the intention of providing training for Iowa wood using/producing industry in this expanding market.

STATE FORESTS AND MANAGEMENT BUREAU

Responsibilities of the bureau are operation of the State Forest Nursery and State Forest system and providing forest management service to other divisions of the DNR.

State Nurseries

The state forest nursery located at Ames and its satellite growing area at Montrose grew and distributed over four million seedlings in Fiscal Year 1987. See Appendix O. This stock is used to meet Iowa's goal of three million acres of forest land to provide wildlife habitat.

The nursery cooperates in production of hybrid poplar, walnut improvement (we have over one thousand grafted walnut seedlings) and root grading to increase survival.

State Forest

Iowa's newest state forest continues to grow.

The name "Loess Hills Pioneer State Forest" relates to the major soils found on the area and to the area's close association with the westward migration of settlers in the early 1800s, especially with the Mormon migration. Also, the forest that presently covers the hills is in what botanists call a pioneer stage of plant succession. As of June 30, 1987, 2,032 acres were in state ownership and another 306 were under option.

Iowa's other major state forests—the Shimek, Stephens and Yellow River—and several smaller areas continue to operate. Tables found in the appendix summarize several important functions of the state forest system.

Appendix L shows recreation use on the three major forests for 1986. Appendix M summarizes income, and Appendix N recounts activity in our inmate rehabilitation program.

The Division of Forestry has revised our state forest management plans which have been in effect since 1972. It is now felt that the division has the resources to bring a higher order of management to our state forest lands, and this revision will help us do so. The forest management system will be broad enough to cover forest management on state parks and wildlife areas as well as on state forest.

State Lands Management

In Fiscal Year 1987, income from timber sales on Department lands was \$182,616.87. Several good sized sales of quality trees and a strong walnut market coincided to help the Department exceed its goal of \$120,000. See Appendix P.

Management Planning

The forest management plan for state forests, parks and wildlife lands has been revised and has been implemented on state forests. Forestry planning will be based on an area concept, making it easier to develop and implement plans for state lands.

ENERGY AND GEOLOGICAL RESOURCES DIVISION

GEOLOGICAL SURVEY BUREAU

The Geological Survey Bureau (GSB) has the responsibility to collect, manage, and interpret geologic and hydrologic information and to disseminate that information to a diverse audience. Geological resources, including groundwater, are vital elements in Iowa's future. Iowa has significant water, mineral, rock, soil, and energy resources, but they are finite; they are distributed unevenly in terms of quantity and quality; and often they are vulnerable to contamination and misuse. Further, there are competing interests for their development and utilization. GSB provides technical information used in the resolution of many natural resource issues.

GSB is organized into five units: Management, Directed Projects Section, Environmental Geology Section, Geological and Mineral Resources Section, and Water Resources Section. GSB has a staff of 32 persons, including 27 geologists, three geological technicians, a research driller, and a driller's helper.

Water resources investigations, some of which are conducted under cooperative agreements with the Water Resources Division of the U.S. Geological Survey, constitute the major effort of GSB. An assessment of the shallow water resources of southwest Iowa is nearly completed, and a report on the Water Resources of the Ocheyedun-Little Sioux Aquifer was published. Water-quality monitoring in the Big Spring Basin and in Floyd-Mitchell Counties has continued as part of a long-term program to investigate the extent and nature of non-point contamination. The GSB participated in development of the Groundwater Protection Strategy - 1987.

An on-going, systematic analysis of Iowa's rock and soil material continues to contribute to economic development in the state. The information is used to site lagoons, sanitary landfills, hazardous waste facilities, industrial mineral operations, and to explore for metallic minerals and oil/gas resources. A small oil discovery was made in Washington County, and AMOCO Production Company started an exploration test targeted at 15,000 feet in Carroll County. Coal mine permit applications were reviewed for the Department of Agriculture and Land Stewardship, and work on restoration/preservation of under-

ground coal mines was continued. The value of Iowa's nonfuel mineral production in 1986 is estimated at \$248.7 million. See Appendix Q.

GSB maintains a library of drill cuttings and cores from more than 33,000 drilling sites. Drill cuttings were received from over 350 wells during the fiscal period. These rock materials provide the basis for developing and sustaining nearly all the investigative activities of GSB allowing the staff to provide unbiased, reliable information to all users. See Appendix R. For a list of contracts and grants provided by the bureau, See Appendix S.

ENERGY BUREAU

The Energy Bureau has a very diverse area of responsibility. It is divided into four sections: building energy management, special energy projects, energy resources, and conservation.

The energy resources section has been active in the coordination and development of environmentally safe alternative energy technologies. Energy production from biomass material such as agricultural waste (crop residue and animal waste), woody biomass materials and municipal solid waste hold promise for Iowa.

Several demonstration and feasibility projects were sponsored to determine the technical, economic and environmental considerations of alternative energy sources. Funded projects included the use of waste tires in cement production, landfill gas use for leachate control, the use of refuse derived fuels for schools, solid waste feasibility studies, and the study of oat hull gasification.

Building energy management is a major area of bureau commitment. The goal is to install all cost-effective energy management improvements in facilities operated at taxpayer expense by 1995. The DNR has initiated several programs using private financing in order to pay for the estimated \$300 million in improvements for government and nonprofit facilities.

State facilities are served by the State of Iowa Facilities Improvement Corporation which issues bonds to purchase energy improvements. Participat-

ing state agencies lease the improvements from the corporation and make payment from the energy savings until the cost of improvements is repaid. The Departments of General Services, Human Services and Corrections will together receive \$6 million in energy improvements in the Fiscal Year 1988. These improvements will save \$1 million in energy costs. The savings will be used to pay for the improvements.

In 1987, 700 public schools in 101 districts, three merged area schools and two area education agencies (AEA) received energy audits and now qualify for no-interest loans for engineering analyses. All Iowa public schools, AEAs and merged area schools qualify for free energy audits, a no interest loan for engineering analysis and low interest financing for improvements. The Iowa Hospital Association and the United Way of Iowa have also been given grants to develop a similar program for hospitals and nonprofit agencies.

The DNR continues to operate the Institutional Conservation Program (ICP) which is a 50 percent cost share grant program for schools and hospitals for the completion of engineering analyses and energy management improvements. This program provided \$620,000 to 30 schools and hospitals in 1987. Energy savings for the most recent grant cycle is projected at \$300,688.

This past year, the energy conservation section staff developed agreements with the Iowa Department of Agriculture and Land Stewardship, Iowa Department of Transportation and the Iowa Board of Regents for use of petroleum overcharge appropriations. This section administered 25 competitive grant projects which dealt with energy conservation. They included Decorah street light replacement which is showing a simple payback of less than three years; an innovative Linn County "Powerstat" project which requires homeowners to purchase electricity from a vending meter in their home; the connection of a solar pond to the "home of the future" at Living History Farms; and blower door tightening.

The energy conservation section also received and administered federal grant money for the State Energy Conservation Program (SECP) and Energy Extension Service (EES). The SECP has a \$137,800 budget for programs and demonstrations resulting in energy savings, while the EES received \$59,900 and provided an information dissemination service.

The energy projects section has been responsible for coordinating and administering special projects as designated by the Department of Natural Resources, General Assembly, and the Energy Fund Disbursement Council. Approximately \$26 million of petroleum overcharge money was allocated by the General Assembly in Senate Files 2305 and 517 for special energy projects.

As these projects are approved by the Energy Fund Disbursement Council and the U.S. Department of Energy, the energy projects section initiates the planning and implementation of these projects with the designated agencies or institutions. These have included the Departments of Transportation, Human Rights, Natural Resources, Agriculture, Economic Development and Board of Regents institutions.

The energy bureau administers its programs without annual appropriations from the general fund. Administration and federal grant matching costs are currently desired from a combination of oil overcharge appropriations, federal grants, private sector financing, and the Energy Research and Development Fund (unclaimed utility refunds and deposits).

Material available upon request from the energy bureau include:

State of Iowa Facilities Improvements Corporation- Summary of Energy Management,
Institutional Conservation Program Summary,
Institutional Conservation Program Cycle,
Oil Overcharge Competitive Grants Summary,
1987 Iowa School Energy Bank Audits,
Nine Grants.

Appendixes

Listings of 1987-88 Energy Bureau Programs -
Appendix T

1987 Iowa Net Outflow of Energy Dollars For
Retail Energy - Appendix U

Retail Energy Cost By Source - Appendix V

Gasohol Consumption - Appendix W

Iowa Coal Production - Appendix X

FISH AND WILDLIFE DIVISION

WILDLIFE BUREAU

Responsibilities

The Wildlife Bureau is mandated by law to protect, propagate, increase and preserve the wildlife mammals, birds, reptiles and amphibians of the state. The bureau is divided into two sections, Management and Research, so that it can more efficiently accomplish its goals and objectives. Bureau personnel conduct wildlife surveys and research to evaluate annual wildlife populations and recommend hunting and trapping resources as well as habitat management programs to benefit these species. Proper regulations and habitat management allow for maximum recreational benefits while maintaining wildlife populations.

Wildlife Management

The Wildlife Management Section is responsible for operating and maintaining all of the states public wildlife areas and wildlife refuges. Habitat manipulations of food and cover are performed. Parking lots, boat ramps, access roads and other public use facilities are also developed to permit convenient access to these areas by the recreating public.

The section actively manages 305 public areas totaling 233,711 acres. These areas are managed as wildlife management areas in accordance with Section 109.6, Code of Iowa. Additionally, bureau personnel assist with the management of other publicly owned lands:

—97 areas totaling 4,692 acres leased to county conservation boards

—16 state preserves totaling 2,506 acres

—Four state recreation areas totaling 12,662 acres assigned to the Bureau of Parks

—33,924 acres of general plan lands along the Mississippi River in cooperation with the U.S. Fish and Wildlife Service and U.S. Army Corps of Engineers

Public wildlife areas provide an estimated 3.5 million person days of recreation annually, including hunting, fishing and trapping, and nonconsumptive activities such as hiking, wildlife photography, primitive camping, nature study, canoeing, berry picking and cross-country skiing.

Wildlife areas include the following type of areas:

- 70 natural marshes
- 23 artificial marshes
- 35 natural lakes
- 14 artificial lakes
- Approximately 90 miles of cold water trout streams
- 35 wildlife refuges
- 3 "controlled" waterfowl hunting areas

Wildlife management biologists also provide technical assistance to landowners in an effort to enhance and create wildlife habitat on private lands. Bureau personnel are also requested to give several programs throughout the year on wildlife related topics and DNR programs in general. Some of the activities performed include:

—Made 4,122 personal contacts with landowners resulting in the preparation of 579 farm plans and the development or enhancement of 18,607 acres of private land as wildlife habitat.

—Certified 174 permanent wildlife habitat projects totaling 1,631 acres for cost-sharing assistance through the U.S. Department of Agriculture's ACP program.

—Prepared 146 TV/radio programs and 363 newspaper articles on a variety of wildlife related topics.

—Gave over 500 programs and formal presentations to sportsmen's groups, civic groups and schools.

—Administered two DNR cost-share programs in counties located north of Highway 30 resulting in the establishment of 58 shelterbelt plantings (8 to 14 rows each) and 19 winter habitat areas (food plots) which involved 837 acres and 153 landowners.

—Assisted law enforcement personnel on the opening weekends of the waterfowl, pheasant and deer hunting seasons. Wildlife personnel worked 1,155 hours resulting in 27 citations issued and contact with 4,643 sportsmen.

—331 wild turkeys were live-trapped within the state. This trapping effort involved 6,300 hours at a cost of \$68,555.00. 104 turkeys were traded to Kentucky in return for river otters. 65 turkeys were traded

to the states of Indiana and Michigan in exchange for ruffed grouse. 162 turkeys were stocked at 13 sites within the state.

—River otters received through trades with Kentucky and Louisiana were stocked at the Rathbun Wildlife Area (20) and in Clay County near Peterson (20). Ruffed grouse were released at the Iowa Army Ammunition Plant near Burlington (65) and at Stephens State Forest in Lucas County (120).

Wildlife Research

The Wildlife Research Section provides technical support to the Management Section, division administrators and the public by providing state-of-the-art information on best management techniques for wildlife populations and their habitat. This is accomplished through the design, coordination and analysis of wildlife population surveys, research studies and public program. Research and survey data are combined in the form of recommendations to division staffs wildlife managers and the public on the proper management of wildlife resources.

Statewide population and harvest surveys are coordinated by research biologists on ring-necked pheasants, bobwhite quail, rabbits, white-tailed deer, wild turkeys, waterfowl, and raccoons. Surveys are designed to detect annual fluctuations and long term trends in abundance and harvest of key species. Nongame biologist coordinate a statewide breeding bird atlas, bald eagle, winter surveys and bluebird nest survey. Surveys indicated that most species important to Iowa sportsmen were record high levels in 1987, or were recovering to higher levels than in the recent past.

Major research studies conducted in 1987 were:

-Evaluation of bobwhite quail populations and harvests on public hunting areas.

-Evaluation of the damage to agricultural crops caused by white-tailed deer living in a state park refuge.

-Impact of predation on waterfowl production on wildlife management areas in northern Iowa.

-Impacts of fur harvest on the survival, productivity, and dispersal of a heavily exploited raccoon population.

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FISH AND WILDLIFE DIVISION

WILDLIFE BUREAU

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Public wildlife areas provide an estimated 3.5 million person days of recreation annually, including hunting, fishing and trapping, and nonconsumptive activities such as hiking, wildlife photography, primitive camping, nature study, canoeing, berry picking and cross-country skiing.

-Survival, productivity and the impacts of full harvest on wild turkey in southern Iowa.

-Effects of landscaping on urban bird communities.

-Rapture migration patterns colony, the Mississippi River in northeast Iowa.

Research biologist also coordinate restoration programs designed to restore native wildlife populations that were eliminated during settlement of the state. Restoration efforts currently underway include river otters, prairie chickens and ruffed grouse.

Nongame research biologists reached over 14,000 people with special events days: Bald Eagle Day, Hawk Watch and Pelican Watch.

FISHERIES BUREAU

Iowa possesses two discrete fisheries, that devoted to sport fishing, which is participated in by nearly 900,000 citizens each year, and a commercial food-fish industry that supports 393 full-time and part-time commercial fishermen and 131 freshwater mussel takers. Sport fishing receives immense interest in the state; about 12.5 million activity days are expended each year and over 35 million fish are caught by anglers. The economic worth of sport fishing is considerable, estimated at \$185.5 million each year. Commercial fishing produced more than 3.2 million pounds of food-fish and the harvest of mussel shellers exceeded 1,200 tons. Combined value of these fisheries was well over \$1.5 million.

Fisheries Bureau programs are separated into three closely interrelated programs: fish management, fish culture and fish research.

Fish Management

Fish management projects during the reporting period placed emphasis on construction and development of five new fishing lakes, fish habitat improvement and protection, and the development of angling related facilities, along with public access to the water resources in the state.

Land acquisition was completed for construction of Beaver Lake, a 34-acre impoundment in Dallas County. Planning was completed, property take lines

delineated, and public information meetings were held for lake sites at Lake Shawtee (350 acres) in Fremont County, Deer Creek Lake (40 acres) in Plymouth County, Whitewater Lake (112 acres) in Dubuque County and Lost Grove Lake (350 acres) in Scott County.

Habitat improvement and protection projects completed in the period consisted of the construction of 10 fishing jetties at Lake Icaria, Bob White Lake, Hawthorn Lake and Storm Lake; shorelines were armored from erosion and wave action at Lake Icaria, Miami Lake and Silver Lake; and a sediment/nutrient dike was started at Lake Icaria. Trout stream improvement projects were completed on 2,160 feet of trout water at five locations. A fishing riffle was placed in the Raccoon River in Sac County near the Whitehorse Access site.

Lake aeration/destratification devices were installed at Lake Pahoja in Lyon County, Don Williams Lake in Boone County, and Clear Lake in Cerro Gordo County to prevent fish winterkill from oxygen depletion or thermal stratification in summer. Design was completed for installation of destratification units at Lake Lacey-Keosauqua in Van Buren County and Lake Geode in Henry County.

Major fisheries renovation projects were completed at Spring Lake in Carroll County and Bob White Lake in Wayne County. Fish populations were eradicated with a chemical and the lakes restocked with game fish species following detoxification. Partial renovation by either mechanical or chemical methods were completed at Loch Ayr Lake in Ringgold County, Lake Wapello in Davis County and Rock Creek Lake in Poweshiek County. Reduction in the fish population density was followed by the stocking of predatory fish species.

Thirty fish kills were investigated by the Fisheries Bureau staff during the reporting period. Twenty were diagnosed as the result of natural or unknown causes (pathogenic disease, lethal summer water temperature, toxic algae, etc.). Ten fish kills were pollution induced, mostly as the result of feedlot runoff or accidental spills of toxic substances into a water course.

Recovery of the monetary value of the fish killed was pursued in two instances and resulted in restitution of \$1,121.58 in one and a settlement of \$6,254.30 is pending in the other.

Fish Culture

Fish culture to replenish populations for sport fishing continued as a major bureau activity in the reporting period. Total production was over 107 million fish at the six full-time and two part-time culture facilities operated by the Department (see Appendix Y for all species). Nearly 110 million of this total was walleye and northern pike fry. Trout production at the three coldwater hatcheries was 407,416 rainbow and brown trout.

Major renovation and improvement projects were in planning stages or completed at three fish culture stations. Planning and design was completed for complete reconstruction of the Decorah Trout Hatchery in this period. A nitrogen degassing tower and oxygen injection system was completed at the Manchester Trout Hatchery and a similar installation along with a multiple-level water intake was planned at the Rathbun Fish Hatchery. Major roof repairs were completed at the latter facility.

Fish Research

Research efforts in the Fisheries Bureau were concentrated towards 18 projects. Seven projects were in fish culture, of which five were in staff and two at the Iowa Cooperative Fish and Wildlife Research Unit; one each in the Streams and Rivers Unit; two in each of the National Lakes and Mississippi River Units; three projects in the Small Lakes and Reservoirs Unit; two projects in the Large Reservoirs Unit; and two special projects.

CONSERVATION LAW ENFORCEMENT BUREAU

The Enforcement Bureau utilizes two classes of personnel authorized to assist the section with two separate part-time enforcement programs. Thirteen waters aides are employed during the summer months. They are assigned to the most heavily navigated waters in the state. Thirty-six fisheries biologist are authorized to enforce navigation laws May through August. While the fisheries personnel perform enforcement efforts incidental to other work, the water aides specialize in enforcement activity and devote 600 hours apiece to navigation enforcement.

The Enforcement Bureau also maintains two water patrol stations, one at Clear Lake in the north-

central district and one at Lake Okoboji in the northwest district. Extensive types of watercraft are used for navigation enforcement ranging from inboard/outboards and inboards to johnboats and canoes.

There are six full-time regional recreational officers who are responsible for snowmobile, boating and hunter education programs in their respective district. See Appendix Z.

ENVIRONMENTAL PROTECTION DIVISION

AIR QUALITY AND SOLID WASTE PROTECTION BUREAU

Air Quality

During this year several noteworthy accomplishments took place in addition to the regular responsibilities assigned to this section. The regular responsibilities include issuing permits, monitoring air quality, taking compliance actions when necessary and compiling reports for EPA. In addition to this the section:

1. Approved a proposal from Monsanto to reduce acrylonitrile emissions from 391 metric tons per year to 30 metric tons.
2. Gained approval from EPA for a multi-year development for the control of air toxics. This provides a good plan on how Iowa will significantly reduce air toxics in the future.
3. Submitted a request to EPA to partially redesignate Des Moines to attainment status for carbon monoxide. A significant portion of the previous non-attainment area was able to reduce CO emissions through local efforts. Only a very small area of downtown Des Moines remains in a non-attainment status regarding federal standards.
4. Secured EPA approval for the State Implementation Plan to issue Prevention of Significant Deterioration permits. This means that facilities wishing to construct major sources will only have to deal with the state to secure a permit.

and assuring dams are properly constructed and maintained; assure that citizens are supplied with safe drinking water; assure the surface waters of the state are free from contamination and suitable for fishing and swimming; provide financial assistance to cities for constructing wastewater treatment plants and assure that surface and groundwater resources are available in sufficient quantity and quality to meet the needs and demand of the State.

The Flood Plain Section acted on 240 flood plain development permit applications. Projects approved included levees, channel changes, stream bank stabilization and buildings located on flood plains. Four additional Iowa cities were delegated flood plain permitting authority, bringing the total to 112 Iowa cities and counties. In addition, the section began the dam safety inspection program. Under this program, various classes of dams are inspected at regular intervals, with the dams that pose the greatest potential for loss of life if they fail being given the highest priority. Forty dams were inspected with follow-up action taken where needed. As required by Iowa law, the 52 licensed milldams in the State were inspected.

The Water Permits Section processed 376 water withdrawal and water storage permit applications. This brings the total of current permits under department supervision to 5,210 and represents an annual water allocation of 2,413 billion gallons. Eighty-four percent of the water comes from surface water and the remaining 16percent is from groundwater. (See Appendix AA)

Two hundred ninety-six water systems construction projects were reviewed and approved. This included 42 new wells, 11 engineering reports and 15 project plans and specifications for correcting drinking water quality violations. Water supply system operation permits specifying the monitoring and reporting responsibilities for 936 water supplies were issued.

The Wastewater Permit Section completed the engineering review and issued construction permits for 119 projects involving either new wastewater treatment plants or major improvements to existing plants. Another seven permits were issued for minor modifications to existing facilities. One hundred forty-eight permits were issued for sewer extensions. Thirty-four new or replacement municipal wastewater treatment plants began construction in FY 1987

with nine of them assisted with federal and state grant funds. Twenty-two municipal wastewater treatment facilities started operation. Twelve of these facilities were assisted with state and federal funds. See Appendix BB and CC.

The Water Quality Planning Section developed mitigation procedures that provide for comparable resource replacement for resources lost or damaged by construction projects such as channel changes, and dredge and fill projects. The section made detailed reviews of stream use classification on several Iowa streams (See Appendix DD). Department rules dealing with animal feeding operations and onsite disposal systems were updated as were design standards for waste water treatment facilities.

"1987 Annual Report of Groundwater Contamination"

Compounds found in groundwater sources in 1987 were nitrate, pesticides and synthetic organic compounds (Tables 1 and 2). Approximately 100 public water supplies withdrawing groundwater exceeded the MCL level of 10 mg/l for nitrate (NO₃-N). Simultaneously, many more public water supplies had nitrate concentrations between 5 and 10 mg/l of NO₃-N. This however, does not represent the actual condition(s) of the aquifer(s), since the withdrawn finished water may be from several different wells and therefore mixed and/or diluted. Analysis of USGS raw water samples are better indication of aquifer conditions.

A total of 148 samples of raw water from different wells exceeded NO₃-N concentrations of 5 mg/l during water years 1982-1987. Forty-one wells had NO₃-N exceeding 10 mg/l during that period. The maximum concentration of nitrate found in public water supplies during 1987 was 40 mg/l of NO₃-N (Table 1). The maximum nitrate concentration of USGS raw water samples increased steadily from water year 1983 through 1987 i.e. 14.5; 17; 27; 26.6 and 53 mg/l NO₃-N.

Analysis of public water supplies examined by EPD, through one-time monitoring required by House File 2303 in 1987, indicated that a total of nine different pesticides were found in finished water of 62 public water supplies. Metolachlor (Dual) showed maximum concentration of 29 PPb (Table 1). Atrazine was the most prevalent pesticide present in about one-half of the impacted public water supplies. USGS analysis of raw water samples during water year 1987 showed maximum concentration of 200 PPb for Metolachlor (Dual) and 21 PPb for Atrazine (Table 1). These two were the most prevalent herbicides found in raw water samples analyzed by USGS during water years 1985-1987 (Table 1).

text continued on page 21

Table 1: Percent abundance and maximum concentration of different pesticides and nitrate (NO₃-N) for the EPD (Environmental Protection Division) and USGS (U.S. Geological Survey) groundwater samples.

Pesticides	Percent and maximum concentration (PPb)			
	EPD Data*		USGS Data**	
Atrazine	49%	13.0	57%	21.0
Alachlor (Lasso)	14%	9.0	12%	14.0
Cyanazine (Bladex)	9%	2.5	9%	3.0
Metolachlor (Dual)	7%	29.0	14%	200.0
Metribuzin (Sencor)	5%	2.5	7%	2.0
Dicamba	-	-	1%	2.3
2-4-D	13%	2.6	-	-
Furadan (Carboturan)	1%	1.0	-	-
Prometon	1%	2.7	-	-
Propachlor (Ramrod)	1%	0.9	-	-
Total # of detections	86 (100%)		139 (100%)	
Nitrate (NO ₃ -N) MCL = 10 PPM	40 PPM		53 PPM	

* Source: EPD (House File 2303, 1987). Pesticides and nitrate may be from a single well or several wells mixed.

** Source: USGS water years 1985-87. Detected herbicide(s) may be from the same well(s) sampled over years. Sample locations were not randomly selected. Maximum concentration is for the water year 1987 only but total number of samples and percentages are for the water years 1985-87.

About 10 percent of the public water supplies using groundwater contained one or more pesticides, exposing approximately 16 percent of an estimated 1,684,00 people using groundwater. Seventy-two different samples from a total of 355 raw water samples examined by USGS (20 percent) were detected to contain pesticides during water years 1985-1987. Eighty percent of those impacted water supplies and 73 percent of USGS raw water samples had only one pesticide, primarily atrazine, and the remaining contained two or more pesticides. The maximum concentration for each pesticide in raw water and finished water is reported in Table 1.

Eighty-six of approximately 735 (12 percent) of those public water supplies using groundwater had detections of synthetic organic compounds (SOC) in their finished water during the 1987 sampling required by one-time monitoring of House File 2303. This is a higher percentage than those public water supplies impacted by pesticides. No data on raw water samples of groundwater sources are available. The most common SOC contaminants and their maximum concentration found in public water supplies during 1987 are shown in Table 2.

Table 2: Major SOC contaminants and their maximum concentration (PPb) detected in public water supplies using groundwater during 1987. Source: EPD (House File 2303, 1987).

Aceton	95.0	PPb
Benzene	6.0	PPb
Carbon tetrachloride	5.0	PPb
Chlorobenzene	5.0	PPb
Dichlorobenzene	1.0	PPb
Ethylbenzene	4.0	PPb
Methylene Chloride	24.0	PPb
Methyl tertiarybutyl ether	34.0	PPb
Tetrachloroethene	13.0	PPb
Toluene	28.0	PPb
Vinyl Chloride	3.0	PPb
Xylene	18.0	PPb
1,1-Dichloroethane	1.0	PPb
1,2-Dichloroethane	2.0	PPb
1,1,1-Trichloroethane	4.0	PPb

APPENDIX

APPENDIX A BOATING FACILITY GRANTS 7-1-86 TO 6-30-87

Funds from the Marine Fuel Tax fund were made available to cost-share boating access development by counties and cities.

SPONSOR	AREA	COST
Clear Lake	South Shore Drive	\$ 11,686
Greene	Perrin Park	\$ 22,477
Lee County Conservation Board	Redwing Access	\$ 11,175
Muscatine	Muscatine County	\$ 41,278
Muscatine	Muscatine County	\$ 43,704
Davenport	Bause Landing	\$ 13,781
Bettendorf	Scott County Lock Park	\$ 95,432
Camanche	Swan Slough	\$ 42,675
Miscellaneous	Various	\$ 27,245
	TOTAL	\$ 309,453

**APPENDIX B
WILDLIFE HABITAT STAMP FUND**

Receipts from the sale of Wildlife Habitat stamps provide for a grant program whereby local entities of government (primarily county conservation boards) may receive assistance for the acquisition and development of land for wildlife habitat.

ACQUISITION

COUNTY	PROJECT NAME	DESCRIPTION	GRANT AMOUNT
Osceola	Devil's Ridge Management Area	160 Acres	\$ 48,000
Cerro Gordo	Toppin Marsh	37 Acres	\$ 13,800
Woodbury	Shagbark Hills Expansion	47.57 Acres	\$ 46,166
Louisa	Cairo Woods Wildlife Area	390 Acres	\$ 110,794
Worth	Johnson Property	74 Acres	\$ 23,071
Howard	Kneenor Wildlife Area	50 Acres	\$ 14,062
Palo Alto	Phalen Woods	49 Acres	\$ 5,250
Jackson	Clark Property	166 Acres	\$ 74,575
Kossuth	Patterson Wildlife Area	303 Acres	\$ 37,496
Mitchell	Otranto Wildlife Area	40 Acres	\$ 10,100
TOTAL			\$ 383,314

**APPENDIX C
RECREATION/TOURISM GRANTS
7-1-86 TO 6-30-87**

Recreation/Tourism Grants are funded through the Jobs Now Account of the Lottery revenue. Grants are awarded to county conservation boards for projects which provide jobs during development and after completion of recreational facilities. The following grants were awarded in fiscal year 1987.

COUNTY	PROJECT	AMOUNT
Cerro Gordo	Easy Access Trail	\$ 79,635
Grundy	Grundy County Nature Trail	\$ 45,000
Linn	Cedar Valley Trail Development	\$ 50,625
Van Buren	Indian Creek Lake	\$ 150,000
TOTAL		\$ 325,260

**APPENDIX D
SNOWMOBILE FACILITIES GRANTS
7-1-86 TO 6-30-88**

Grants are provided to cities and counties from the snowmobile registration fees for such items as pre-season trail preparation, high band radios and antennas, gate openings and bridges. During fiscal year 1987, \$20,081 was awarded to various county conservation boards and cities.

**APPENDIX E
LAND AND WATER CONSERVATION FUND**

STATE PROJECTS

PROJECT NAME	DESCRIPTION	GRANT AMOUNT
Mines of Spain	Lot Acquisition	\$ 50,000
Black Hawk Lake State Park	Road Surfacing	\$ 130,500
Marble Beach State Park	Road Surfacing	\$ 101,900

MUNICIPAL PROJECTS

CITY	PROJECT NAME	DESCRIPTION	GRANT AMOUNT
Granger	City Park Development	Comprehensive Park	\$ 24,625
Montezuma	Montezuma City Park	Play Equipment, Shelter/ Concession Building	\$ 9,187

COUNTY PARKS

COUNTY	PROJECT NAME	DESCRIPTION	GRANT AMOUNT
Madison	Middle River Picnic Shelter	Shelter	\$ 22,500
TOTAL			\$ 338,712

**APPENDIX F
GREEN THUMB PROGRAM
7-1-86 TO 6-30-88**

The Green Thumb Program is an employment program for senior citizens funded by General Fund appropriations. Grants are available to the DNR, county conservation boards, cities, and private nonprofit organizations involved in natural resources. The local (county conservation boards, cities and private nonprofit) side of the program received money for 55 positions providing a total of 51,220 hours at a cost to the program of \$81,230. The DNR received funds to provide 49 positions, totaling 17.77 FTE. The positions were divided as follows: Coordination and Information - 3; Administrative Services - 3; Parks and Recreation - 29; Forestry - 6; Enforcement - 1; and Fisheries - 7 at a cost to the program of \$112,813.96.

APPENDIX G LICENSES AND PERMITS

	1986		1987	
	Revenue	Licenses	Revenue	Licenses
Resident Fishing	\$2,368,774	294,312	\$2,318,010	287,478
Resident Hunting	981,752	121,640	1,075,807	133,394
Resident Combination	1,259,230	83,653	1,174,271	77,983
Lifetime Fishing 65+	69,364	8,640	64,366	7,997
Lifetime Combination 65+	56,130	3,749	70,703	4,682
Nonresident Fishing	338,368	38,705	363,237	41,945
Nonresident Hunting	1,289,588	28,159	1,659,858	30,080
Furharvester 16+	355,522	23,607	309,983	20,281
Furharvester Under 16	6,307	3,064	6,945	3,356
Nonresident Furharvester	43,700	291	50,737	338
Habitat Stamp	708,252	236,084	771,306	257,102
Fish, Fur & Game	1,766	63	230,381	8,207
Park User Permits	833,594	85,012	850,191	87,049
Park User Permits 65+	- 0 -	52,983	- 0 -	47,691
Well Driller	6,990	169	3,150	61
Water/Wastewater Operator				
Testing and Renewal	132,549	—	82,085	—
Duck Stamp	203,509	40,719	237,680	47,680
Trout Stamp	214,896	26,862	216,496	27,062
Deer, Bow and Arrow	456,726	23,394	521,128	26,685
Deer, Paid Gun	1,780,200	89,010	1,950,880	97,544
Deer, Landowner	- 0 -	27,639	- 0 -	29,058
Turkey	334,220	18,667	337,240	18,960
Commercial Fishing - Owner	40,894	1,826	48,498	196
Commercial Fishing - Operator	6,695	1,138	17,122	352
Boat Registrations -				
Biennial Registration	—	—	2,095,067	181,633
Snowmobile Registrations -				
Biennial Registration	563,577	42,462		
Boat Dealer Registrations	317	21	3,021	183
Snowmobile Dealer Registrations	1,817	105	2,089	116
Fur Dealer Licenses	46,801	202	47,212	208
Bait Dealer Licenses	11,900	470	11,535	454
Game Breeder Licenses	11,815	1,185	12,804	1,280
Mussel Licenses	8,159	220	18,662	135
Pilot Licenses	81	26	132	44
Wholesale Fish Market	630	54	N/A	N/A
Fish Peddler Certificate	167	24	N/A	N/A
Scientific Collector Permit	438	199	401	204
Private Fish Hatchery License	581	57	650	65

**APPENDIX H
CAPITOL IMPROVEMENT PROJECT
(CONSTRUCTION SERVICES BUREAU)**

COUNTY	AREA AND PROJECT DESCRIPTION	AMOUNT
Allamakee	Black Hawk Point; Boat Ramp	\$ 29,000
	Heytman's Landing; Boat Channel	\$ 12,400
Appanoose	Rathbun Lake; Boat Ramp	\$ 74,200
Boone	Ledges State Park; Residence, Water and Sewer and Pit Vault Latrine	\$ 123,100
Calhoun	Rainbow Bend; Parking Lot Reconstruction	\$ 6,700
Cass	Cold Springs Fish Station; New Floor in Building	\$ 4,700
Cerro Gordo	McIntosh Woods; Shower Building and Sewer Line	\$ 104,000
	Ventura Marsh; Boat Ramp	\$ 15,600
Clay	D.U. Marsh; Water Control Structure	\$ 36,100
Clayton	Guttenberg; Boat Ramp, Storage Building and Pit Vault Latrine	\$ 346,600
Clinton	Goose Lake; Water Control Structure	\$ 5,900
Delaware	Manchester Hatchery; Aeration Tower and Pole Storage Building	\$ 49,100
Des Moines	Tama Beach; Boat Ramp	\$ 14,200
Dickinson	Spirit Lake; Reroofing Hatchery, Storage Building, Fishing Pier and Underground Electric	\$ 211,900
	Emerson Bay; Boat Ramp, Campground Electric and Shower Building	\$ 148,900
	East Okoboji; Access and Parking Lot	\$ 28,500
	Arnolds Park; New Pier Design	\$ 11,700
	Marble Beach; Campground Electric System	\$ 42,400
	Tribune Beach; Fishing Jetty	\$ 9,900
	Gull Point; Water Patrol Station Renovation	\$ 47,700

APPENDIX H (continued)

COUNTY	AREA AND PROJECT DESCRIPTION	AMOUNT
Franklin	Beeds Lake; Water Pressure Tanks	\$ 14,400
Fremont	Riverton Area; Storage Building and Control Structures	\$ 178,600
Hardin	Pine Lake State Park; Boat Ramp and Jetties	\$ 73,100
Jackson	Bellevue; Building Addition and Water Well	\$ 62,800
	Green Island Wildlife Area; Channel Cleanout	\$ 27,800
Jasper	Rock Creek State Park; Shower Building	\$ 113,100
Johnson	Lake MacBride State Park; Sewage Lagoon Renovation	\$ 16,000
	Sutliff Access; Boat Ramp	\$ 13,000
	Hawkeye Wildlife Area Residence; Windows	\$ 6,000
	Olin Access; Boat Ramp	\$ 19,000
Linn	Pleasant Creek State Recreation Area; Shower Building, Rest Room, Service Building, Beach Facility, Shelters, Parking Lot, Campground Electric	\$ 572,200
	Palisades Kepler State Park; Boat Ramp	\$ 17,100
Lyon	Kroger Access; Boat Ramp	\$ 25,000
	Lake Pahoja; Lake Aeration System	\$ 23,500
Marion	Red Rock Wildlife Area; Observation Deck and Dike Reconstruction	\$ 15,400
	Elk Rock State Park; Bank Stabilization and Parking Lot Reconstruction	\$ 186,400
Marshall	Marshalltown Access; Fencing	\$ 2,000
Monona	Blue Lake; Fishing Pier	\$ 48,300
Pocahontas	Sunken Grove Access; Boat Ramp	\$ 20,100
Polk	Strasser Woods; Nature Trail	\$ 17,100
	Big Creek Lake; Fishing Jetties	\$ 77,200
	Hunter Safety Center; Target Holders	\$ 22,000

APPENDIX H (continued)

COUNTY	AREA AND PROJECT DESCRIPTION	AMOUNT
Pottawattamie	Lake Manawa State Park; Service Building, Storage Building, Fuel Station, Boat Ramp, Underground Electric, Beach Construction, Shower Building and Rest Room Facilities	\$ 507,700
	Lake Manawa; Water Supply for Lake	\$ 299,900
Ringgold	Mount Ayr; Pole Storage Building	\$ 16,100
Sac	Black Hawk Marsh; Culverts	\$ 18,400
	Black Hawk Pits; Boat Ramp	\$ 16,900
	Arrowhead Lake; Boat Ramp	\$ 20,000
	Whitehorse Access; Boat Ramp	\$ 31,600
	Whitehorse Access; Rock Rubble Dam	\$ 19,200
Scott	Princeton Access; Boat Ramp	\$ 29,600
Tama	Otter Creek Marsh; Ditch Construction	\$ 1,700
Union	Green Valley State Park; Boat Ramps and Fencing	\$ 21,700
	Twelve Mile Lake; Boat Ramp and Parking Lot	\$ 223,000
Washington	Brighton Access; Boat Ramp	\$ 28,000
Webster	Deception Hollow; Boat Ramp	\$ 37,400
	Skillet Junction; Boat Ramp	\$ 11,800
	Brushy Creek Recreation Area; Study for Dam	\$ 35,000
Winneshiek	Decorah Fish Hatchery; Renovation Design	\$ 155,000
Worth	Rice Lake; Water Control Structure	\$ 37,800

APPENDIX I
LAND ACQUISITION AND MANAGEMENT BUREAU ACTIVITIES
LAND ACQUISITION

COUNTY	ACRES	APPRAISED VALUE	COST
Cherokee	200	\$ 180,000	\$ 180,000
Jones	20	\$ 6,000	\$ 6,000
Linn	130.5	\$ 9,500	\$ 9,500
Dallas	15.5	Donation	
Dallas	120	\$ 40,000	\$ 40,000
Butler	218	\$ 60,500	\$ 60,500
Harrison	131	\$ 30,000	\$ 30,000
Guthrie	111	\$ 33,000	\$ 29,700
Emmet	191	\$ 53,000	\$ 35,000
Clay	18	\$ 9,000	\$ 5,565
Green	52	\$ 22,200	\$ 17,000
Dickenson	37	\$ 26,000	\$ 26,000
Winneshiek	64	\$ 17,500	\$ 14,000
Clay	2	\$ 5,000	\$ 5,000
Monona	876	\$ 307,000	\$ 245,000
Clay	5	Donation	
Clayton	Two City Lots	\$ 11,000	\$ 11,000
Dickenson	34	\$ 14,000	\$ 14,000
Jackson	50	\$ 20,000	\$ 20,000
Dickenson	15.75	\$ 350,000	\$ 350,000
Clay	150	\$ 70,089	\$ 26,000
Tama	108	\$ 105,792	\$ 105,792
Jasper	444	Donation	
Fremont	150	Donation	
Worth	7.47	\$ 5,800	\$ 5,800
Mahaska	40	\$ 12,000	\$ 12,000
Worth	37.18	\$ 36,500	\$ 36,000
Total	2,612.9	\$1,423,881	\$1,246,277

BARGIN SALES

\$177,604

LAND DONATIONS

614.5 acres

TOTAL ACQUISITION

3,226.4

DONATED EASEMENTS

4

CASH DONATIONS

\$130,000

APPRAISALS

Contracted 41

Staff 23

Reviewed 117

LAND SURVEYS

Contracted 1

Total Cost \$40,171.01

SAND AND GRAVEL PERMITS

Number of Leases 12

Income \$83,684.81

AGRICULTURAL LEASES

Acres 27,613

Income \$377,246.00

Number of Individual Leases 360

MISCELLANEOUS

Chapter 17 11

Chapter 18 15

Fencing Agreements 160

APPENDIX J

DATA PROCESSING BUREAU Allocation of Application Development Resources By Division or Function Fiscal Year 1987

DIVISION OR FUNCTION	NO. OF HOURS	PERCENT DISTRIBUTION
Environmental Protection	8109	27.0
Flood Plains	(287)	
Water Rights	(70)	
Wastewater	(850)	
Water Supply	(5902)	
Fish and Wildlife	380	1.0
Parks and Recreation	308	1.0
Forestry	20	0.1
Energy and Geology	4856	16.0
Energy	(730)	
Geology	(4126)	
Coordination and Information	144	0.5
Groundwater	1494	5.0
Geological Information System	900	3.0
Administration	6443	
Licensing	(4439)	21.0
Land	(61)	
Time Reporting System	(112)	
Other	(1831)	
Support/Training/Procurement/PC's	5406	18.0
Management and Supervision	2250	7.0
TOTALS	30,310	100.0

Note: All figures in parenthesis are non-additive and are already included elsewhere in the table.

APPENDIX K

ADMINISTRATIVE SUPPORT BUREAU ACTIVITIES

RECORDS CENTER/LIBRARY

Number of records in Records Center	3,437,700
Number of microfiche records	48,000
Number of books, reports and magazines in Library	9,144
Files Pulled	36,559
Documents Filed	34,162
New Files Created	3,054
Files Prepared for Microfilming	10,180
Library Volumes Accessed	1,165
Documents Retrieved from Off-Site	602
Equipment and Slide Show Checkouts	344

MAILROOM/SUPPLY

Pieces of Mail Received	472,572
Incoming Money Received in Mail	\$15,891,877.75
Certified and Registered Mail Processed in Mailroom	2,493
Pieces of Outgoing Field Mail	18,852
Stamp Orders Processed	445
Supply Orders Processed	906
Paper Orders Processed	438

RECEPTION AREA

Over-the-Counter Contacts	2,996
Telephone Calls Received	49,668
Items Sold Over-the-Counter	2,566
Items Sold Through the Mail	10,117
Outgoing Mail Processed	8,014

WORD PROCESSING ACTIVITIES

Number of Pages Typed	118,613
Original Production Percent	53
Editing Percent	33
Stored Document Percent	14

SUPPORT STATIONS ACTIVITIES

*Number of Telephone Calls Received	47,537
*Number of Telephone Messages Taken	26,416
*Pieces of Outgoing Mail Processed	43,245
*Certified and Registered Mail Processed	2,739
*Number of Letters Typed	1,040
*Number of Forms Typed	3,597
GSB Publication Sales	\$8,510.44
Number Topographic Map Sales	\$15,621.55
Number of Topographic Maps Sold	4,998

*Covers 1/1/87 through 6/30/87. Records for 7/1/86 through 12/31/86 are incomplete.

APPENDIX L

STATE FOREST RECREATION USE Calendar Year 1986

	Shimek	Stephens	Yellow River	Total
Visitor Days	29,267	16,090	24,973	70,330
Activity Days	46,601	21,241	42,885	110,727
Bicycling	267	15	227	509
Camping	5,691	2,926	15,063	23,680
Cross-Country Skiing	138	40	59	237
Driving for Pleasure	10,570	6,110	6,016	22,696
Fishing	4,298	820	5,810	10,928
Hiking	2,719	845	1,888	5,452
Horseback Riding	5,958	1,790	1,342	9,090
Hunting	5,109	3,450	4,580	13,139
Nature Study	1,273	25	264	1,562
Picnicking	1,675	1,135	2,557	5,367
Sightseeing	5,378	3,400	2,630	11,408
Snowmobiling	171	200	195	566
Special Group	501	380	1,042	1,923
Other	2,853	105	1,182	4,140

APPENDIX M

STATE FOREST INCOME Fiscal Year 1987

	Shimek	Stephens	Yellow River	Total
Crop Leases	45.00	1,990.92	6,811.75	8,847.67
Sales of Standing Timber	- 0 -	- 0 -	10,500.00	10,500.00
Fuelwood, Sawdust				
Fuelwood Permits	1,840.80	1,201.00	2,170.00	5,211.80
Wood Products to Public and Other State Agencies	1,673.47	- 0 -	8,106.30	9,779.77
Products to Other				
DNR Divisions	- 0 -	1,485.00	37,336.00	38,821.00
Camping Receipts	3,019.00	3,769.68	not reported	6,788.68
Park User Permits	1,392.00	- 0 -	- 0 -	1,392.00
Miscellaneous	8,032.51	8,481.60	65,072.97	81,587.08

APPENDIX N INMATE WORK REPORT Fiscal Year 1986

In cooperation with the Department of Corrections, the Forestry Division and other units of the Iowa DNR provide rehabilitation opportunities for inmates housed at the facility located on the Luster Heights Unit of Yellow River State Forest.

Inmates work at Yellow River State Forest or on one of two crews which travel to work sites at state parks, wildlife areas and other state forests within a 50-mile radius of the Luster Heights facility.

Inmates are supervised by DNR personnel on work such as the following:

General maintenance	As sawmill helpers
Fence construction	Trail building and maintenance
Tree planting	Prescribed burning of prairies
Timberstand improvements	Ft. Atkinson Rendezvous
Wildlife habitat improvements	

Inmate Days Used by Division, FY86

Forestry	1,981
Parks	972
Wildlife	273

APPENDIX O

STATE FOREST NURSERY SALES

Sales of nursery stock has shown an increase from the previous year. The sales breakdown by species is shown below. The increase was a direct result of the Conservation Reserve Program.

Total Plants Sold

SPECIES	PLANTS
Amur Honeysuckle	109,500
Autumn Olive	39,800
Bur Oak	42,100
Gray Dogwood	14,600
Green Ash	74,500
Jack Pine	61,400
Ninebark	2,300
Norway Spruce	57,000
Osage Orange	22,600
Ponderosa Pine	47,300
Red Cedar	133,100
Red Pine	182,300
Redosier Dogwood	99,700
Russian Olive	130,000
Scotch Pine	791,400
Silver Maple	60,300
Tatarian Honeysuckle	42,300
Black Walnut	610,300
White Pine	526,500
Wild Plum	66,900
Choke Cherry	145,600
Red Oak	287,200
White Spruce	49,100
Common Lilac	47,800
White Ash	118,000
Mixed Oak	98,200
Shagbark Hickory	88,200
Poplar	86,300
Siberian Crab	15,400
White Oak	77,200
TOTAL	4,126,900
Songbird Packets	261
Wildlife Packets	1,274

ground coal mines was continued. The value of Iowa's nonfuel mineral production in 1986 is estimated at \$248.7 million. See Appendix Q.

GSB maintains a library of drill cuttings and cores from more than 33,000 drilling sites. Drill cuttings were received from over 350 wells during the fiscal period. These rock materials provide the basis for developing and sustaining nearly all the investigative activities of GSB allowing the staff to provide unbiased, reliable information to all users. See Appendix R. For a list of contracts and grants provided by the bureau, See Appendix S.

ENERGY BUREAU

The Energy Bureau has a very diverse area of responsibility. It is divided into four sections: building energy management, special energy projects, energy resources, and conservation.

The energy resources section has been active in the coordination and development of environmentally safe alternative energy technologies. Energy production from biomass material such as agricultural waste (crop residue and animal waste), woody biomass materials and municipal solid waste hold promise for Iowa.

Several demonstration and feasibility projects were sponsored to determine the technical, economic and environmental considerations of alternative energy sources. Funded projects included the use of waste tires in cement production, landfill gas use for leachate control, the use of refuse derived fuels for schools, solid waste feasibility studies, and the study of oat hull gasification.

Building energy management is a major area of bureau commitment. The goal is to install all cost-effective energy management improvements in facilities operated at taxpayer expense by 1995. The DNR has initiated several programs using private financing in order to pay for the estimated \$300 million in improvements for government and nonprofit facilities.

State facilities are served by the State of Iowa Facilities Improvement Corporation which issues bonds to purchase energy improvements. Participat-

ing state agencies lease the improvements from the corporation and make payment from the energy savings until the cost of improvements is repaid. The Departments of General Services, Human Services and Corrections will together receive \$6 million in energy improvements in the Fiscal Year 1988. These improvements will save \$1 million in energy costs. The savings will be used to pay for the improvements.

In 1987, 700 public schools in 101 districts, three merged area schools and two area education agencies (AEA) received energy audits and now qualify for no-interest loans for engineering analyses. All Iowa public schools, AEAs and merged area schools qualify for free energy audits, a no interest loan for engineering analysis and low interest financing for improvements. The Iowa Hospital Association and the United Way of Iowa have also been given grants to develop a similar program for hospitals and nonprofit agencies.

The DNR continues to operate the Institutional Conservation Program (ICP) which is a 50 percent cost share grant program for schools and hospitals for the completion of engineering analyses and energy management improvements. This program provided \$620,000 to 30 schools and hospitals in 1987. Energy savings for the most recent grant cycle is projected at \$300,688.

This past year, the energy conservation section staff developed agreements with the Iowa Department of Agriculture and Land Stewardship, Iowa Department of Transportation and the Iowa Board of Regents for use of petroleum overcharge appropriations. This section administered 25 competitive grant projects which dealt with energy conservation. They included Decorah street light replacement which is showing a simple payback of less than three years; an innovative Linn County "Powerstat" project which requires homeowners to purchase electricity from a vending meter in their home; the connection of a solar pond to the "home of the future" at Living History Farms; and blower door tightening.

The energy conservation section also received and administered federal grant money for the State Energy Conservation Program (SECP) and Energy Extension Service (EES). The SECP has a \$137,800 budget for programs and demonstrations resulting in energy savings, while the EES received \$59,900 and provided an information dissemination service.

APPENDIX P

TIMBER SALES

(income from parks, forest and wildlife areas)

Forestry

Stephens - fuelwood	\$ 861.50
Yellow River - hardwoods	10,500.00
Stephe's - hardwoods	3,269.92
TOTAL	\$ 14,631.42

Parks and Recreation Areas

Preparation Canyon - walnut, storm damaged	\$ 6,953.00
Waubonsie - walnut	27,540.70
Volga - upland hardwoods	6,472.00
Pammel - hardwoods	250.00
A.A. Call - walnut	28,107.00
Walnut Woods - walnut	93,345.00
Wildcat Den - salvaged walnut logs	205.00
Wilson Island - fuelwood	150.00
TOTAL	\$163,022.70

Wildlife

Lakeview - fuelwood	\$ 25.75
Ottercreek - fuelwood	100.00
Dudgeon Lake - hardwoods	4,837.00
TOTAL	\$ 4,962.75

GRAND TOTAL

\$182,616.87

APPENDIX Q

NONFUEL MINERAL PRODUCTION IN IOWA, 1986

MINERALS	QUANTITY	VALUE (thousands)
Cement:		
Masonry thousand short tons	48	\$ 3,199
Portland "	1,819	86,984
Clays "	486	1,421
Peat "	14	381
Gypsum "	1,826	12,602
Sand & Gravel (construction) "	14,511	40,418
Stone (crusted) "	23,400	98,000
Gem Stones	NA	20
Combined value of other industrial minerals	XX	5,707
TOTAL	XX	\$ 248,732

NA, Not Available

XX, Not Applicable

APPENDIX R

FISCAL YEAR PUBLICATIONS

Howes, M. R., Culp, M. A., Greenburg, H., VanDorpe, P. E., 1986, Underground Coal Mines of Centerville, Iowa, and Vicinity: GSB Open File Report 86-2, 93 p.

Iowa Geological Survey 1986 Annual Report, Volume 56.

Iowa Geology, Number 12.

Thompson, C. A., 1986, Water Resources of the Ocheyedan-Little Sioux Alluvial Aquifer, GSB Open File Report 86-3, 90 p.

Thompson, C. A., 1986, Water Resources of the Ocheyedan-Little Sioux Alluvial Aquifer Data Report, GSB Open File Report 86-4, 115 p.

Thompson, C. A., 1987, Water Resources of the Rock River Alluvial Aquifer, GSB Open File Report 87-1, 109 p.

Thirty-nine County Topographic maps published in FY 1986:

Adair	Delaware	Louisa
Adams	Fayette	Madison
Allamakee	Franklin	Mahaska
Appanoose	Fremont	Marion
Audubon	Hamilton	Marshall
Benton	Hardin	Mills
Black Hawk	Howard	Osceola
Buena Vista	Ida	Palo Alto
Carroll	Iowa	Polk
Cass	Jasper	Poweshiek
Cherokee	Jefferson	Shelby
Clarke	Johnson	Wapello
Clay	Jones	Warren
Clinton	Kossuth	Wayne
Davis	Linn	Woodbury
Decatur		

APPENDIX S

CONTRACTS AND GRANTS IN FY 87

Contract Amount/ or Available \$

Contracts and Grants	\$ 32,538
Abandoned Mine Lands Inventory	
Abandoned Mine Lands Inventory & Coal Mine Data Base	75,800 9,000
Big Spring Stations	54,000
Big Spring Operations	37,740
Mississippi Pool	32,000
Floyd/Mitchell	41,000
Big Spring Basin Demonstration Project	9,000
Skunk River	10,000
Soap Creek	7,300
Forest Imagery	83,552
Integrated Farm Management	26,362
Coal Resources	43,314
Strategic & Critical Minerals	19,980
National Coal Resources Data System	

APPENDIX T

LISTING OF ENERGY BUREAU PROGRAMS 1987-88

Project Title	Funding Amount	Contractor
Municipal Street Lighting	\$17,469	DNR - Energy
PV Street Lighting	\$9,300	DNR - Energy
Local Government Training	\$4,000	DNR - Energy
Iowa Main Street	\$125,000	Dept of Economic Development
Non-Profit Energy Mgmt	\$147,900	United Way of Iowa
Alternative Fuels	\$20,000	DNR - Energy
Fleet Efficiency Training	\$5,000	DRN - Energy
Public Transit Grants	\$711,155	Dept of Transportation
Motor Vehicle Fuel Reduction	\$2,976,871	Dept of Transportation
Intermodal Transportation	\$750,000	Dept of Transportation
Hospital Energy Bank	\$87,200	IA Hospital Association
HHI Verification	\$2,500	D.M. Homebuilders Assoc.
Bldr/Lndr/Appr Consortium	\$10,000	D.M. Homebuilders Assoc.
Evaluate Weatherization	\$75,000	Meridian Corporation
Integrated Farm Mgmt Demo	\$416,485	Dept of Agriculture
IFMD - AG	\$1,500,000	Dept of Agriculture
IFMD - Big Springs	\$200,000	DNR - Geological Survey
IFMD - Leopold Center	\$300,000	ISU - Leopold Center
Iowa Solar Ethanol Demo	\$150,000	CIRAS
Ag Biomass/Wood Study	\$3,500	ISU
Ag Biomass/Wood Study	\$500	DNR - Geological Survey
Marketing	\$22,112	DNR - Energy

APPENDIX T (continued)

Project Title	Funding Amount	Contractor
IAEE Energy Conference	\$3,000	IA Assoc of Energy Eff.
Schools NG Minimization	\$40,979	Energy Strategies, Inc.
Telecommunications	\$29,700	DNR - Energy
Energy Education	\$20,000	Dept of Education
Iowa Coal Study	\$12,000	DNR - Geological Survey
Conservation & Economy	\$183,757	Board of Regents
Telecommunications Demo	\$250,000	Board of Regents
University of Iowa	\$635,000	Board of Regents
Heat Recovery - Bowen		Board of Regents
Heat Recovery - Oakdale		Board of Regents
Energy Optimization Program		Board of Regents
Iowa State University	\$169,785	Board of Regents
Energy Cons & IA Economy		Board of Regents
Using Corn as Boiler Fuel		Board of Regents
Heating Plant Control Opt		Board of Regents
Alternative Fuel Study		Board of Regents
Radiant Ceiling/Heat Pump		Board of Regents
Ag Bldg Energy Audits		Board of Regents
University of Northern IA	\$93,897	Board of Regents
Wind Generator		Board of Regents
Utility Generation/Distr.		Board of Regents
Energy Audits Update		Board of Regents
Ag Data Base	\$40,250	Central IA Power Coop
Energy Education	\$51,664	Dept of Education
Blower Door/Radon	\$97,768	Dept of Commerce
Volunteer Weatherization	\$7,489	United Way of Central IA
Solid Waste Study	\$19,485	Ft. Madison/Lee County
Decorah Street Lighting	\$0	City of Decorah
Landfill Gas to Elec	\$89,000	Des Moines Solid Waste
Biomass Combustion	\$5,004	University of Iowa
Low Income Assistance	\$13,577	Upper DM Opportunity
Ventilation System	\$17,600	Living History Farms
Consumer Control Study	\$10,000	Linn County REC
Degree Day Data	\$3,013	Dept of Agriculture
Solid Waste Study	\$6,000	City of Waverly
Retail Retrofit	\$11,200	New Hampton Chamber
Waste Tires for Fuel	\$19,999	Davenport Cement Co.
Power Stat Metering	\$10,000	Linn County REC
Lighting Eff Sm Business	\$50,000	IA Assoc of Mun Utilities
Hog Confinement HRV	\$30,800	Kirkwood Comm College
Street Light Replacement	\$21,977	City of Sioux Center
Biomass Conversion	\$40,000	State Men's Reformatory
Home Energy Rating System	\$100,000	Home Builders Assoc DSM
Energy Decision Opt Model	\$23,299	IA Assoc of Mun Utilities
Building Operator Video	\$45,000	Nat Energy Auditors Assoc
PILIRR	\$240,000	IA PILIRR/CAP Consortium
Iowa Energy Software	\$3,900	Laurent Hodges
Solar Pool Heater	\$83,000	Sioux City Comm School

APPENDIX T (continued)

Project Title	Funding Amount	Contractor
Fuel Quality & Ethanol	\$53,130	IA Corn Promotion Board
Energy Monitoring Compute	\$56,980	Heartland AEA
Commercial EA/Loan Prog	\$24,999	Osage Municipal Utilities
Marble Rock Lighting	\$20,000	City of Marble Rock
Hospital Energy Bank	\$249,042	Iowa Hospital Association
Commercial Water Heating	\$15,000	Energy Marketing Midwest
Schools Program 87	\$1,438,448	DNR - Energy
Schools Program 88	\$500,000	DNR - Energy
Schools O.O. Support	\$147,529	DNR - Energy
SECP Support	\$101,708	DNR - Energy
Schools O.O. Support	\$30,389	DNR - Energy
EES Support	\$108,517	DNR - Energy
Other O.O. Support	\$161,887	DNR - Energy
Schools O.O. Support	\$38,113	DNR - Energy
Other O.O. Support	\$17,499	DNR - Energy
Conservation Grants	\$1,500,000	Dept of Transportation
Motor Oil Recycling	\$30,000	CIRAS
Terrace Hill Demo	\$50,000	Dept of General Services
Low-Income Energy Con.	\$500,000	DNR - Energy
Unobligated	\$1,700,000	Dept of Transportation
Integrated Farm Mgmt Demo	\$30,000	Dept of Agriculture
Big Springs	\$500,000	DNR - Geological Survey
Ag Drainage Wells	\$100,000	Dept of Agriculture
Aquitard Hydrology	\$280,000	DNR - Geological Survey
Groundwater Monitoring	\$100,000	DNR - Environ Protection
Rural Water Assessment	\$560,000	DNR - Geological Survey
Grdwtr Hazard Mapping	\$100,000	DNR - Geological Survey
Curriculum Development	\$90,000	DNR - Information
Abandoned Landfills	\$250,000	DNR - Environ Protection
Biotechnology	\$500,000	ISU - Leopold Center
Biotechnology	\$120,000	ISU - ISWRI
Geological Survey	\$60,000	DNR - Geological Survey
Data Base	\$50,000	DNR - Administration
Information	\$30,000	DNR - Information
Unobligated	\$434,400	DNR - Waste Mgmt
Solid Waste Cogeneration	\$75,000	DNR - Waste Mgmt
Regional Solid Waste Mgmt	\$21,600	DNR - Waste Mgmt
Solid Waste Recycling	\$229,000	DNR - Waste Mgmt
ICP	\$620,252	DNR - Energy
State Buildings	\$12,053,541	DNR - SIFIC
Biomass	\$45,000	DNR - Energy
PILIRR	\$60,000	HACAP
Weatherization	\$175,000	Dept of Human Rights
Weatherization	\$936,934	Dept of Human Rights

APPENDIX U

1987

IOWA NET OUTFLOW OF DOLLARS FOR RETAIL ENERGY

Energy Type	Consumption	Amt. flowing out of state per unit	Total Amt. Flowing out of state
Motor Gasoline (gallons)	1,307,900,000	\$.65	\$ 850,135,000
Distillate (gallons)	688,360,000	.61	419,900,000
Propane (gallons)	191,000,000	.35	66,850,000
Residual (gallons)	238,000	.36	86,000
Aviation (gallons)	28,780,000	1.00	28,780,000
Natural Gas (Mcf)	178,730,000	3.10	554,063,000
Coal (Indus. Use) (Tons)	1,760,000	27.00	47,520,000
Electricity (Kwh)	22,541,000,000	.042	946,722,000
Total Dollar Outflow for Retail Energy in Iowa			\$2,914,056,000

APPENDIX V RETAIL ENERGY COST BY SOURCE

Energy Type	Year	Total Consumption	Average Price (per unit)	Total Energy Cost
Motor Gas (gallons)	1981	1,406,206,000	\$1.30	\$ 1,828,138,000
	1982	1,312,640,000	\$1.28	1,680,179,000
	1983	1,307,900,000	\$1.24	1,621,796,000
	1984	1,421,220,000	\$1.18	1,677,040,000
	1985	1,427,278,000	\$1.19	1,698,460,000
	1986	1,446,150,000	\$0.88	1,272,612,000
	1987	1,349,900,000	\$0.92	1,241,900,000
Distillate (gallons)	1981	580,470,000	\$1.20	696,564,000
	1982	572,420,000	\$1.10	686,904,000
	1983	631,483,000	\$1.10	694,631,000
	1984	699,044,000	\$1.11	775,939,000
	1985	679,800,000	\$1.10	747,780,000
	1986	705,550,000	\$0.77	543,274,000
	1987	688,360,000	\$0.80	550,688,000

APPENDIX V (Continued)
RETAIL ENERGY COST BY SOURCE

Energy Type	Year	Total Consumption	Average Price (per unit)	Total Energy Cost
Propane (gallons)	1981	295,060,000	\$.63	\$ 232,868,000
	1982	363,070,000	\$.62	225,103,000
	1983	274,965,000	\$.69	189,726,000
	1984	310,927,000	\$.65	202,103,000
	1985	336,763,000	\$.59	198,690,000
	1986	267,040,000	\$.53	141,521,000
	1987	191,000,000	\$.55	105,050,000
Residual (gallons)	1981	2,530,000	\$.79	1,999,000
	1982	590,000	\$.75	442,500
	1983	7,630,000	\$.65	4,959,500
	1984	772,000	\$.65	502,000
	1985	516,000	\$.60	310,000
	1986	770,000	\$.40	308,000
	1987	238,000	\$.42	100,000
Aviation (gallons)	1981	92,340,000	\$1.75	161,595,000
	1982	39,090,000	\$1.70	66,453,000
	1983	32,900,000	\$1.55	50,995,000
	1984	46,110,000	\$1.50	69,165,000
	1985	46,210,000	\$1.50	69,315,000
	1986	24,730,000	\$1.10	27,203,000
	1987	28,780,000	\$1.15	33,097,000
Natural Gas (Mcf)	1981	231,650,000	\$3.27	757,495,000
	1982	219,200,000	\$4.09	896,528,000
	1983	206,386,000	\$4.70	970,014,000
	1984	214,945,000	\$4.71	1,012,390,000
	1985	207,194,000	\$4.61	955,164,000
	1986	188,900,000	\$4.40	793,380,000
	1987	178,730,000	\$3.85	688,111,000
Coal Indus. Use (Tons)	1981	1,185,000	\$40.00	47,400,000
	1982	1,450,000	\$36.00	56,200,000
	1983	1,500,000	\$37.00	55,500,000
	1984	1,660,000	\$37.00	61,420,000
	1985	1,850,000	\$37.00	68,450,000
	1986	1,780,000	\$35.00	62,300,000
	1987	1,760,000	\$34.00	59,840,000
Electricity (Kwh)	1981	24,917,500,000	\$.053	1,320,628,000
	1982	22,879,550,000	\$.056	1,281,255,000
	1983	24,116,922,000	\$.061	1,471,132,000
	1984	21,833,306,000	\$.065	1,419,165,000
	1985	21,707,087,000	\$.066	1,432,668,000
	1986	22,362,000,000	\$.064	1,431,168,000
	1987	22,541,000,000	\$.063	1,420,083,000

tion Fund project evaluation and selection process which determines how federal recreation grant monies are spent in Iowa.

2. Statewide Trails Plan — The DNR's trail plan was started in the spring of 1987, and was reviewed by the Trails Advisory Committee during the summer. In addition to working on the plan, bureau staff provided technical assistance in acquisition and development strategies of three proposed trail projects on abandoned railroad rights of way; Ely to West Branch, West Des Moines to Rippey and Waukee to Yale.

3. Des Moines Recreation River and Greenbelt—Bureau staff assisted the Corps of Engineers in preparing a plan for development of recreation, environmental enhancement and bank stabilization projects along 160 miles of the Des Moines River between Highways 20 and 92.

4. Mississippi River coordination activities continue to be a major role of the Bureau. Prominent coordination activities during this fiscal year included channel maintenance dredging, Environmental Management Program, and Lock and Dam 26 environmental impact statement activities.

5. The Bureau organized the Governor's Canoe Trip on the Boone River in recognition of Iowa Rivers Month. Landowners who had donated conservation easements in the Boone River PWA were given special recognition during the event.

INFORMATION - EDUCATION BUREAU

As a service bureau to the rest of the agency, the Information-Education Bureau provides public communications and educational services through a variety of established activities. The bureau is headquartered in the Des Moines office of the DNR, with field information specialists stationed at Clear Lake and Iowa City, and the Conservation Education Center located at Springbrook State Park, north of Guthrie Center.

The primary, public information tool of the I-E Bureau, the Iowa Conservationist magazine, increased from 24 pages monthly to 32 pages monthly at the beginning of FY87; subscription prices increased at the same time from \$4 a year or \$10 for

three years to \$6 a year or \$12 for three years. The additional pages are devoted to carrying the expanded message of the DNR, versus the historic "outdoor, fish and wildlife" topics. Subscriptions throughout the year averaged about 58,500 with about 10 percent being free subscribers.

Other public information activities are designed to deliver a consistent message about all of the programs and policies of the DNR. Over 160 brochures, maps, posters and fliers were generated, along with the bi-weekly news release packets. Considerable effort went into the updating and revision of the newest edition of Iowa Fish and Fishing, edited by James Mayhew. The bi-weekly TV video news program continued in popularity with ten stations. The weekly Conservation Capsule (five-minute radio show) is subscribed to by 43 stations. Two slide/tape productions were made, as well as five TV and radio PSAs on the Chickadee Checkoff, Turn In Poachers, hunters safety, hazardous spills and state parks.

The Springbrook Conservation Education Center continued to attract more than 15,000 visitors, including 2,110 days by teachers, 7,106 by schools and colleges, 1,590 by conservation groups, 3,213 by DNR programs and 1,175 others. The types of programs delivered at the Conservation Education Center include:

- environmental education workshops for teachers, conservation staff and other educators.

- outdoor activities on local ecology, conservation, and environmental issues for school and youth groups that generally stay two or more days.

- conservation programs for other groups.

ADMINISTRATIVE SERVICES DIVISION

LICENSE BUREAU

The License Bureau works closely with other bureaus in providing the licensing services for the entire department. This includes the responsibility for the design, ordering, and distribution of hunting and fishing licenses including deer and turkey licenses. Licenses are also processed for all types of miscellane-

APPENDIX Y

FISH PRODUCTION (at Iowa DNR hatcheries in 1987)

	Number Produced	Total Weight (lbs)
COLD WATER SPECIES		
Rainbow Trout	365,868	202,990
Brown Trout	41,548	23,305
Subtotal	407,416	262,295
WARM WATER SPECIES		
Bluegill	1,587,700	1,257
Channel Catfish (Age 0)	1,313,610	14,429
Channel Catfish (Age 1)	8,929	446
Largemouth Bass (1.5")	742,874	1,238
Largemouth Bass (4")	110,962	2,936
Muskellunge (Fry)	599,850	unknown
Muskellunge (6")	2,681	41
Northern Pike (Fry)	10,750,000	unknown
Northern Pike (2")	13,280	26
Saugeye (Fry)	1,052,000	unknown
Saugeye (2")	81,140	90
Saugeye (4")	2,215	149
Tiger Muskie (Fry)	340,000	unknown
Tiger Muskie (6")	12,884	614
Walleye (Fry)	89,648,600	unknown
Walleye (2")	238,630	265
Walleye (4")	193,075	7,670
White Amur (8")	42,102	8,420
Subtotal	106,740,532	37,581
TOTAL	107,147,948	299,876

APPENDIX Z

LAW ENFORCEMENT BUREAU REPORT

BOATING ACCIDENT SUMMARY, 1987

Number of Accidents:	48
Number of Personal Injuries:	37
Number of Fatalities:	8

Single Boat Accidents: 32

DROWNING SUMMARY, 1987

Age	Sex	Male:	Female:	Swimability	
5 or under		1	0	Unknown:	8
6-12		4	0	Nonswimmer:	8
13-18		6	1	Average:	16
19-25		6	0	Excellent:	2
26-40		10	0		
41-60		5	0		
61-70		1	0		
Over 70		0	0		
		33	1		

APPENDIX Z (continued)

ATV ACCIDENT SUMMARY, 1987

Number of Accidents Reported:	22
Number of Personal Injuries	22
Time of Accident:	8 daylight 14 night (darkness)

SNOWMOBILE ACCIDENT SUMMARY, 1987

Number of Accidents Reported:	34
Number of Personal Injuries:	28
Time of Accidents:	15 daylight 19 night (darkness)

LIQUIDATED DAMAGES, 1987

TYPE	NUMBER
Deer	121
Raccoon	146
Fish	191
Waterfowl	77
Furbearers	30
Upland Game	47
Turkey	13
Rabbit	9
Squirrel	6
Other	4

A total of \$103,667.86 in payments was collected in 1987.

A total of \$971.96 in interest was paid on delayed payments in 1987.

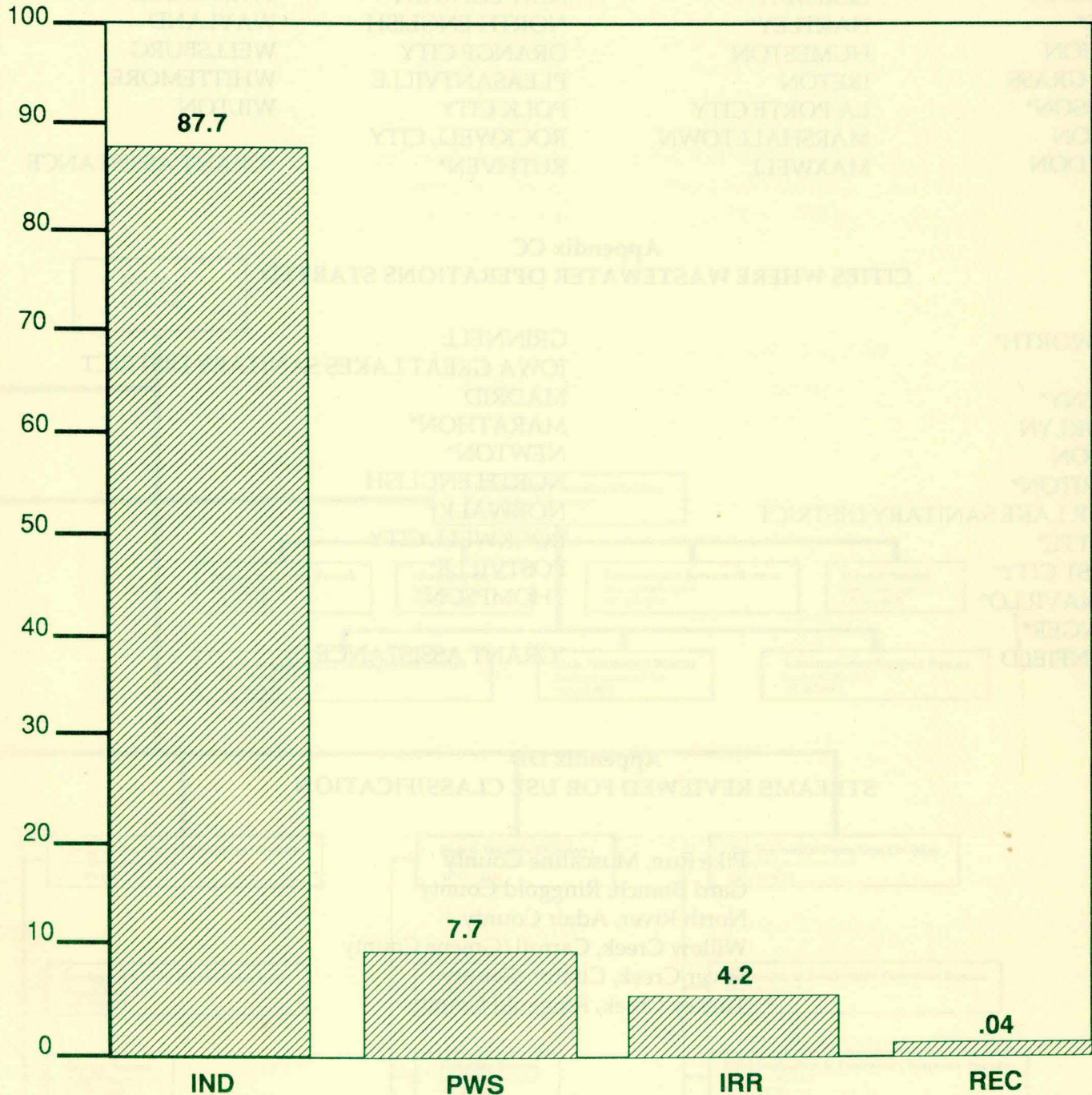
A total of \$490.50 was collected on the sale of confiscated furs.

Records of past years:

1986	\$ 55,625.85
1985	50,427.32
1984	62,579.86
1983	55,626.92
1082	14,269.00
1981	25,589.24
1980	32,111.81
1979	28,273.82
1978	26,050.50
1977	22,389.88

ANNUAL WATER ALLOCATION

2,413 Billion Gallons



TYPES OF USES

IND = INDUSTRIAL

PWS = PUBLIC WATER SUPPLY

IRR = IRRIGATION

REC = RECREATION

 = PERCENT ALLOCATED

Appendix BB CITIES WHERE WASTEWATER FACILITY CONSTRUCTION BEGAN

ALBIA	DES MOINES*	MOUNT PLEASANT	SHELL ROCK
ALTON	DE WITT	MYSTIC*	TITONKA
ALTOONA*	ELKHART*	NEW LONDON	TWIN LAKES*
AMES*	HARTLEY*	NORTH ENGLISH	WAYLAND
ANTHON	HUMESTON	ORANGE CITY	WELLSBURG
BLUE GRASS	IRETON	PLEASANTVILLE	WHITEMORE
BRONSON*	LA PORTE CITY	POLK CITY	WILTON
CARSON	MARSHALLTOWN	ROCKWELL CITY	
CORYDON	MAXWELL	RUTHVEN*	*GRANT ASSISTANCE

Appendix CC CITIES WHERE WASTEWATER OPERATIONS STARTED

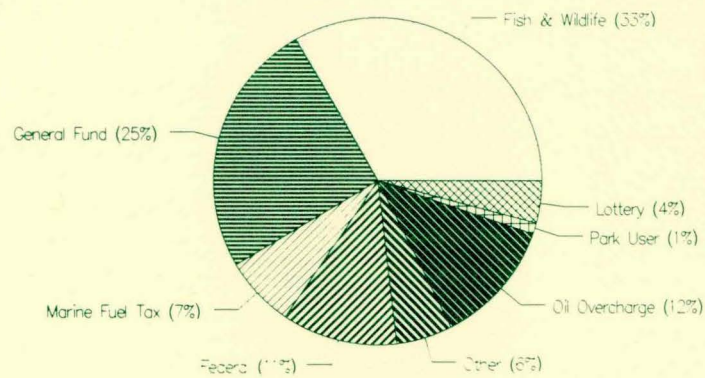
AINSWORTH*	GRINNELL
ALTA	IOWA GREAT LAKES SANITARY DISTRICT
ANKENY*	MADRID
BROOKLYN	MARATHON*
CARSON	NEWTON*
CHARITON*	NORTH ENGLISH
CLEAR LAKE SANITARY DISTRICT	NORWALK*
FAYETTE*	ROCKWELL CITY
FOREST CITY*	POSTVILLE*
GARNAVILLO*	THOMPSON
GRANGER*	
GREENFIELD	*GRANT ASSISTANCE

Appendix DD STREAMS REVIEWED FOR USE CLASSIFICATION

Pike Run, Muscatine County
 Gard Branch, Ringgold County
 North River, Adair County
 Willow Creek, Carroll/Greene County
 Silver Creek, Clinton County
 Turkey Creek, Ringgold County

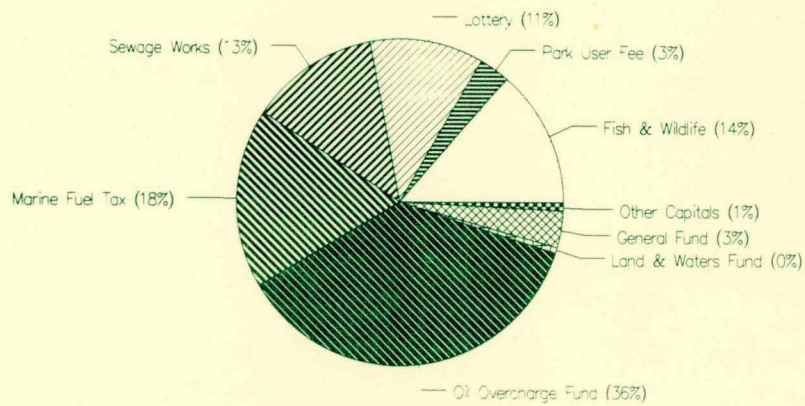
TOTAL RECEIPTS

\$48,124,383



CAPITAL EXPENDITURES

\$16,343,204



OPERATIONAL EXPENDITURES

\$31,781,179

