A Proposal For

Comprehensive River Basin Development

A Project Measure

Developed By:
Upper Explorerland
Resource Conservation and Development Project
134 West Greene Street
Postville, Iowa 52162

For

Proper Land Use

and Treatment

and

Environmental Improvement

Prepared With Assistance From:
U.S. Soil Conservation Service
Extension Service
Iowa Conservation Commission
Local Soil Conservation Districts

September, 1973

Acknowledgements

Organizations which provided data, facts, ideas, and technical assistance in preparing this proposal are as follows:

Allamakee County Soil Conservation District

Clayton County Soil Conservation District

Fayette County Soil Conservation District

Howard County Soil Conservation District

Winneshiek County Soil Conservation District

Cooperative Extension Service

Iowa Conservation Commission

U.S. Soil Conservation Service

Without assistance of the above mentioned organizations the final preparation of this proposal would have been most difficult. We sincerely appreciate the fine cooperation received from those persons and agencies involved.

Edwin C Kirkestue

Edwin Kirkestue, Chairman
Project Measure 100 Committee
Upper Explorerland RC&D

FOREWORD

This proposal outlines the need and potential for a pilot demonstration project in environmental improvement and development for the Upper Explorerland area of Iowa. This proposal tends to show how the pilot demonstration for pollution control and environmental improvement in Upper Explorerland will benefit the state of Iowa and our nation. This proposal intends to show how work done in Upper Explorerland may be used in the model for action and activity which might take place in the rest of our country. With today's increased concern for providing the necessary food, fiber, and shelter that people of our country and the world demand, it is important that we take improved care of our natural resources.

It is important that we control the discharge of animal waste from feedlots and other facilities so that our underground water supply and our rivers, streams, and lakes are not destroyed for use by humans as well as our livestock.

To produce food and fiber demanded by people of the world, it is necessary to use fertilizer and chemicals in crop production wisely. It is also necessary to demonstrate that movement of these chemicals to our surface and underground water must be prevented by proper land use and treatment.

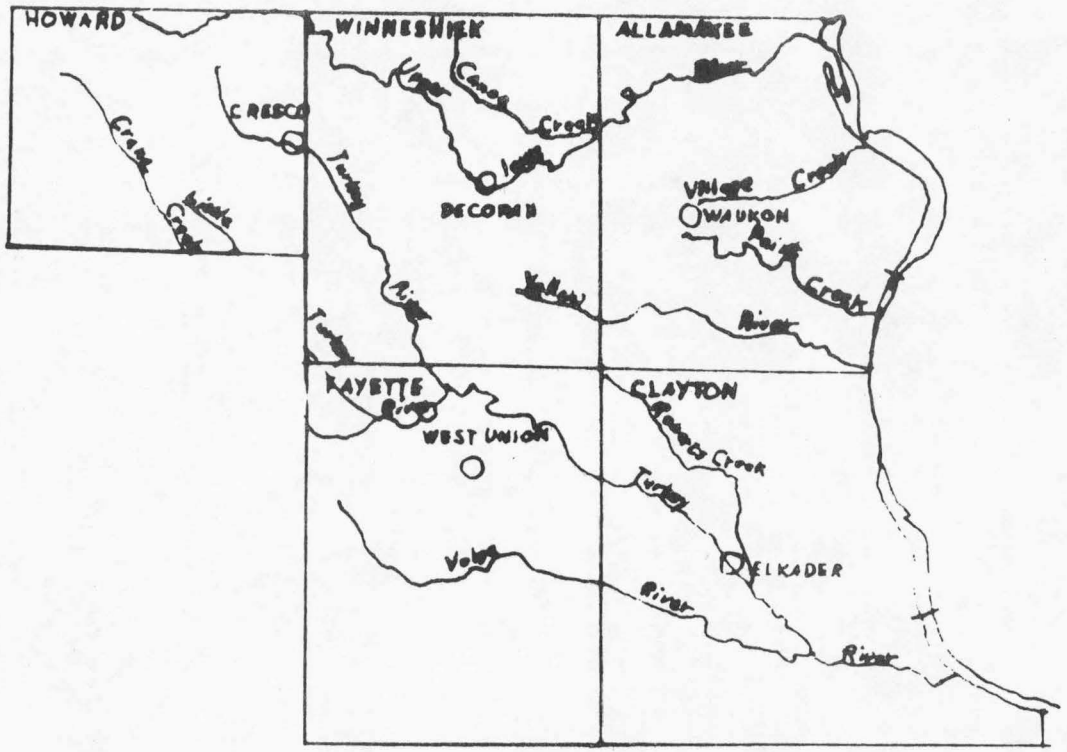
Since almost all rivers and streams which originate within our five county area outlet at the Mississippi River without leaving the area, our area provides a unique opportunity for demonstrating proper land use and treatment as well as monitoring the effects that these changes and improvements might have on our nation's environment, especially water quality. Our area contains all types of land use. It includes intensive row-cropped cropland, permanent pasture land, woodland, recreation land, as well as urban land. One can find all types of land use in any area of the region. By having many kinds of land use available for demonstration purposes, as well as having many different types of soil, topo-

graphy, etc., many types of demonstration experiments may be conducted within a relatively small land area -- our region of Iowa, Upper Explorerland. Upper Explorerland is in need of conservation land treatment on approximately 76% of the land area according to 1970 Conservation Needs Inventory. Due to the closeness of our surface soil to limestone and bedrock our area presents a serious potential for underground water pollution.

This proposal was developed through the efforts of the Upper Explorerland Resource Conservation and Development Project Land and Water Committee. Primary assistance was provided through the Soil Conservation Districts of the project. Ideas incorporated in this project measure have been developed after meetings and revisions of original ideas developed over a two-year period. Ideas presented herein have been developed by residents of Upper Explorerland.

The implementation of this proposal will serve to benefit our state and our nation as well as Upper Explorerland. It will serve as a model and as a testing ground for a comprehensive all-encompassing, coordinated effort in developing the natural resources of a region to preserve them and improve them for the welfare of people of our land.

PROJECT BOUNDARY MAP



UPPER EXPLORERLAND
RESOURCE CONSERVATION & DEVELOPMENT
PROJECT

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LOCATION AND SIZE

The project area is composed of five counties in northeast Iowa containing 2,114,560 acres of land. The area is bounded on the north by the State of Minnesota and on the east by the Mississippi River and the State of Wisconsin. The topography varies from gently sloping land with drainage problems to steep rocky land with severe erosion problems.

Land Area

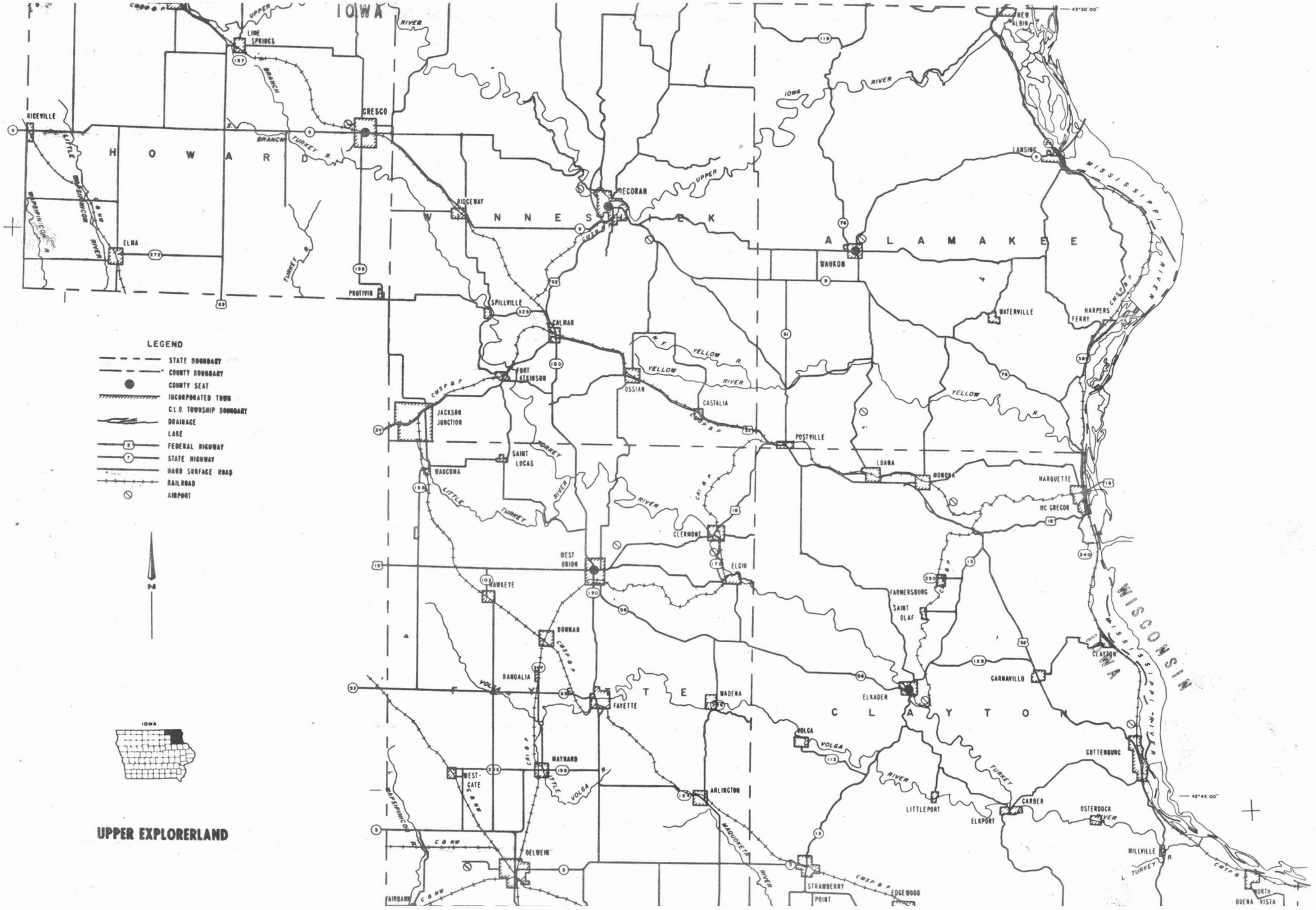
Counties	Acreage*
Allamakee	408,960
Clayton	497,920
Fayette	465,920
Howard	301,440
Winneshiek	440,320
TOTAL	2,114,560 acres

The area is based primarily on an agricultural economy with small manufacturing plants located in the larger cities. No one city dominates the business activity of the area. No city exceeds a population of 7,735 people. All counties are ranked in the low one-fourth of the state in per family income.

Distance to principal cities is as follows:

City	Distance in Air Miles
Des Moines, Iowa	150
Minneapolis, Minnesota	160
Madison, Wisconsin	130
Chicago, Illinois	230
Kansas City, Missouri	330
Omaha, Nebraska	270

*1967 Conservation Needs Inventory


IOWA
HOWARD
WINNESHIEK
ALLAMAKEE
CLAYTON
FAYETTE
RICEVILLE
LIME SPRINGS
CRESCO
ELMA
PROTIVIN
RIDGEWAY
DECORAH
WAUKON
LANSING
NEW ALBIN
SPILLVILLE
CALMAR
FORT ATKINSON
OSSIAN
CASTALIA
JACKSON JUNCTION
SAINT LUCAS
WAUCOMA
POSTVILLE
LUANA
MONONA
MARQUETTE
MC GREGOR
CLERMONT
WEST UNION
ELGIN
HAWKEYE
FARMERSBURG
SAINT OLAF
CLAYTON
DORCHAN
RANDALIA
WADENA
ELKADER
CARNAVILLO
VOLGA
FAYETTE
HAYWARD
WEST GATE
ARLINGTON
LITTLEPORT
ELKPORT
GARBER
OSTERDOCK
CUTTENBURG
MILLVILLE
DELWEIN
FAIRBANK
STRAWBERRY POINT
EDGEWOOD
NORTH BUENA VISTA
WATERVILLE
HARPERS FERRY
WATERVILLE
WATERSPHINCON RIVER
LITTLE WATERSPHINCON RIVER
TURKEY RIVER
BRANCH
UPPER IOWA RIVER
IOWA RIVER
YELLOW RIVER
MISSISSIPPI RIVER
WISCONSIN
VOLGA RIVER
MAQUOKETA RIVER
OSTERDOCK RIVER
LITTLE TURKEY RIVER
CRMSP&P
CRI&P
C&NW
43°30'00"
42°45'00"
LEGEND
STATE BOUNDARY
COUNTY BOUNDARY
COUNTY SEAT
INCORPORATED TOWN
G.L.O. TOWNSHIP BOUNDARY
DRAINAGE
LAKE
FEDERAL HIGHWAY
STATE HIGHWAY
HARD SURFACE ROAD
RAILROAD
AIRPORT
N
IOWA
UPPER EXPLORERLAND

RESOURCES

PEOPLE

There are 95,672 people living in the project area according to the 1970 Census. While the state population increased 2.5% in the last ten years, area population declined 4.0%. The percentage of older people is increasing while percentage of young people is decreasing. Young people are leaving principally due to lack of job opportunities. Many older people have returned to the area to retire after working elsewhere. In 1970, according to the 1970 Census, 26% of the families in the area received income from Social Security. The state average is 20%.

Of the persons over 25 years of age, the average educational level in 1970 was below the state average in all counties. Fayette County almost equalled the state average. The percentage of persons with a college education is increasing at a faster rate than it is for persons with a high school education or lower.

Many communities of the project area may be identified as being closely associated with parentage of one nationality or another. For example, Decorah contains a large number of persons of Norweigian descent. Spillville is composed primarily of persons of Czechoslavakian descent. Even in the rural areas, there are identifiable nationality settlements, though these are gradually blending with each other and are not as noticeable as they were at one time. The total percentage of persons of foreign parentage is below the state average.

All counties rank with the one-fourth of the state with the greatest percentage of persons meeting OEO guidelines for low income. Howard County ranks the greatest; Allamakee, second; and Clayton, fourth, in the 1971 report.

INCOME AND POVERTY STATUS FOR COUNTIES: 1970

Type of Income of Families

	All Families	Number With Soc. Sec. Income	Mean Social Sec. Income
Allamakee	3,653	1,159 (32%)	$1,493
Clayton	5,269	1,283 (24%)	1,466
Fayette	6,767	1,677 (25%)	1,673
Howard	2,958	829 (28%)	1,310
Winneshiek	5,013	1,232 (25%)	1,514
Project Area	23,660	6,180 (26%)	1,515
State of Iowa	717,776	149,802 (20%)	1,687

Source: 1970 Census of Population.

PROJECT AREA POPULATION

	1960 Population			1970 Population		
	TOTAL	URBAN	RURAL	TOTAL	URBAN*	RURAL
The State	2,757,537	1,462,512	1,295,025	2,824,376	1,616,405	1,207,971
Allamakee	15,982	3,639	12,343	14,968	3,883	11,085
Clayton	21,962	-	21,962	20,606	-	20,606
Fayette	28,581	10,833	17,748	26,898	10,359	16,539
Howard	12,734	3,809	8,925	11,442	3,927	7,515
Winneshiek	21,651	6,435	15,216	21,758	7,458	14,300
Total	100,910	24,716	76,194	95,672	25,627	70,045

* Urban defined here means incorporated places of 2,500 or more persons.

Source: 1970 Census

SEVERITY OF POVERTY

RANK ORDER[1/]

County	Income	Pop. Change	Welfare	Educ.	Housing	Health	Aging	Overall Severity
Allamakee	2	40	38	8	11	53	46	16
Clayton	4	42	27	17	15	27	51	12
Fayette	21	46	41	65	32	83	54	49
Howard	1	22	21	2	14	43	36	9
Winneshiek	15	77	67	11	13	67	62	33

1/ Ranking of 1 indicates the county with the greatest number of people that fall within OEO guidelines. Howard County has the most people with income within OEO poverty guidelines.

Ranking of 99 indicates the county with the least number of people under OEO poverty guidelines.

Source: Summary of the July, 1971, O.E.O. Report Entitled, "Profile of Poverty--A Report to the Governor."

CLIMATE

The climate is temperate with an average annual temperature of about 46 degrees. Extremes vary from more than 30 degrees below zero to more than 100 degrees above zero Fahrenheit. The number of freeze free days averages about 135-145 days per year. This time begins about the middle of May and extends to the middle of October.

The average precipitation totals about 32 inches per year. The wettest months are May and June. The driest months are January and February. Periods of dry weather in July and August often affect agricultural crop production by reducing yields.

GEOLOGY

The geology of the area is quite varied. The surface varies from glacial till and loess, to alluvium, to exposed limestone and sandstone. The topography varies from an almost flat surface in the west to a very steep landscape in the east, near the Mississippi River. The major drainage pattern is more defined as one travels from west to east. Limestone is found near the surface in much of the area, especially the eastern portion. In this area many limestone quarries are located. They furnish both agricultural limestone and limestone to surface roads. One silica sand mine is located near the City of Clayton. Material is shipped from this mine to points all over the world.

The geological formations have a very direct affect on the present and potential land uses of the area.

The central portion of the area is characterized by sinkholes which occur in the limestone terrain. During periods of heavy precipitation, much runoff accumulates in the sinkholes and seeps to the water table. When foreign material is placed in sinkholes it often is carried into the underground water system. Foreign material placed in sinkholes includes such items as dead livestock,

auto bodies, animal waste, chemicals, and trash. A portion of this material is carried underground with heavy water runoff, leading to contamination of underground water.

Due to the location of limestone near the surface in much of the area coupled with the location of a great many sinkholes, the geology of the area requires that there be proper care and treatment of surface water runoff to prevent contamination of underground water supplies.

SOILS

Soil associations vary from those composed primarily of soils formed in glacial till to those formed in loess soils. Soils formed in glacial till are found in the western part of the area and the loess soils in the eastern portion. Exposed limestone and sandstone are found as one approaches the Mississippi River from the west.

Soil associations are named by placing together the names of the principle soils occupying major areas within each association.

Allamakee, Howard, and Winneshiek Counties have published soil surveys. Field work has been completed on the Fayette survey. Field work began on the Clayton County survey in April, 1973. The U.S. Soil Conservation Service in cooperation with Iowa State University, Iowa Department of Soil Conservation, and Clayton County will be conducting the detailed mapping and report preparation. The cost of soil surveys is shared by local, state, and federal government.

The following are descriptions of the six soil association areas.

1. Kenyon-Floyd-Clyde Association: Nearly level to moderately sloping, (0-9% slopes), glacial till soils on ridges, sideslopes and drainageways (588,184 acres or 28.9% of the area).
2. Colo-Dorchester-Saude-Marshan Association: Nearly level to moderately sloping soils (0-9% slopes), on first bottom land and benches (85,791 acres or 4.2% of the area).

3. Fayette-Downs Association: Gently sloping to steep (2-25% slopes), loess soils on ridges and side slopes (515,925 acres or 25.4% of the area).
4. Rockton-Whalan-Sogn Association: Gently sloping to very steep (2-40% slopes), glacial till soils overlying limestone on ridges and side slopes (220,320 acres or 10.9% of the area).
5. Fayette-Nordness-Steep Rocky Land Association: Moderately sloping to very steep (5-40% slopes) loess soils overlying limestone on ridges and side slopes (389,359 acres or 19.2% of the area).
6. Downs Association: Gently sloping to strongly sloping (2-14% slopes) loess soils on ridges and side slopes (230,266 acres or 11.4% of the area).

Note from the soils descriptions that approximately 66% of the area is covered by soil associations which contain soils relatively shallow to bedrock. Soils shallow over bedrock are of special concern when relating surface water to underground water contamination and pollution. Feedlots and similar potential sources of pollution should contain measures to control waste discharge so underground water is not degraded to make it unfit for human or livestock consumption.

LAND AND WATER [1]

LAND

The predominate use of land is for agricultural crop production. Of the 2,114,560 acres of land in the area 1,844,751 acres were used for farm land in 1969 according to the 1969 Census of Agriculture. This is a decrease of 24,149 acres since 1964. Land is gradually being changed from Agricultural use to use for city expansion, highways, and rural non-farm residences. There has been a rapid increase in the number of cabins and mobile homes located in rural scenic areas near the Mississippi River and other rivers. More land is gradually going into governmental ownership. Most of this is being acquired by state and county government for use as public wildlife and recreation areas.

There is a need to convert 63,327 acres of cropland to a land use with a permanent cover. About 76% of land area needs some type of conservation treatment according to the 1970 Conservation Needs Study.

The use of land in classes IV and above for intensive cropland reduces net income of farmers. Usually these areas produce enough crop to little more than pay expenses of production. These areas are rowcropped since some farmers want to grow a crop that will require a short term investment. Rowcropping marginal areas allows soil erosion to occur at excessive rates. As a result, streams, rivers, and lakes become silted with the sediment deposited from cropland above.

Over one million acres of cropland needs some form of conservation treatment. About half this requires the application of stripcropping, terracing, or diversions Other requires only contouring, sod in rotation, or permanent cover. Sediment from cropland is a main source of sediment in rivers, streams, lakes, road ditches, etc. When rivers and streams are filled, then fish and wildlife habitat are destroyed or rendered less suitable than they were at one time. Thus, fish and

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[1] Prepared with assistance from Wayne P. Dietz, Extension Crop Production Specialist, Dubuque Area Office, Extension Service.

wildlife populations are reduced. When streams and rivers are filled with sediment, the rivers flood more frequently than they did before. Such is found in sections of the Upper Iowa and Turkey Rivers. Damage is caused to both public and private property. When road ditches are filled with sediment wildlife habitat may be destroyed and runoff water may be caused to overflow road grades due to reduced ditch capacities. Counties are affected directly by having to pay the cost of ditch cleanout. This is a direct expense to county taxpayers.

Lakes become filled with silt making them unfit for fish habitat. When they become shallow they are no good for boating and other water-based recreational activities, such as has occurred at Lake Oelwein in Fayette County. This area is not as desirable for people to use for camping or picnicking. This has also happened to a limited extent at Vernon Springs Mill Pond in Howard County. Backbone State Park, located just south of the project area, has been affected by untreated drainage in Clayton and Fayette Counties. The reduced attractiveness of water based recreational areas means fewer tourists using these areas. As a result, less money is spent in the area by tourists, lowering the general economy of the area. Local citizens must also seek other locations with recreational opportunities.

Trends* in cropland use can be evaluated from data which indicates that from 1960 to 1971:

Corn acreage has increased	5%
Oat acreage has decreased	39%
Hay acreage has decreased	6%
Pasture acreage has decreased	11%
Soybean acreage has increased	93%

NOTE: These are two years with a federal farm feed grain program. Today we have more acres of rowcrop than ever before.

*From Iowa Farm Census, 1960 and 1971.

Before conclusions about crop production trends are made, however, it should be noted that 1969 total farm acreage for the area has decreased about 3% from the 1959 acreage. Considering variable factors that influence crop acreage from year to year, it could be concluded that only the decrease in oat acreage and the substantial increase in soybean acreage represent major changes in land use.

Land Use Problems can best be evaluated by considering data from the 1970 Iowa Conservation Needs Inventory which is based on a statistical sample. This inventory is the source for data presented later.

It can be seen from the tables following that erosion control is a major need on 808,443 acres of cropland and on some pasture land. Drainage is an important needed treatment for some counties, especially Howard County and parts of Fayette and Winneshiek. The adoption of effective soil management practices is therefore a prerequisite to achieving optimum production levels and education in this area should have a high priority. Land use trends of the future will probably include a shift of some cropland to pasture, or less intensive row crop programs (especially those acres in capability classes 6e, 7e, 6s, 7s and 6w) if the new soil loss regulations provided for in the Iowa Soil Conservancy District Law are effectively enforced. This could increase total pasture and forage production at present yield levels, and an additional substantial increase could be obtained by the better use of forage production and utilization technology.

Potentials in land use possible with improved management depend to a major degree if and how the area non-cropland is utilized for livestock production.

Land use planning and controls are needed to preserve and protect many natural scenic areas near lakes, streams, rivers, etc. Many developers are coming to the area to purchase cabins or home sites in or near these areas. Broad scale cottage developments are planned and construction on a few has begun.

Broad-based land use planning is needed to provide for city expansion and the location of non-farm rural homes in rural areas. These developments should

be planned as far ahead as possible to allow for them, but at the same time not destroy all prime agricultural land for agricultural use.

Natural and scenic areas that should be provided for in land use planning are in the Upper Iowa, Turkey River, Volga River, and Mississippi River areas.

The project sponsors will work with local soil conservation districts and the regional planning commission in promoting proper land use and needed land use changes. They will aid in encouraging landowners to apply needed conservation land treatment and in helping secure funds to aid landowners to apply treatment. They will aid in securing needed technical assistance needed to accelerate land use changes and treatment as well as plan for proper land use.

In general, improper land use has resulted in reduced farm net income, reduced habitat for fish and wildlife, higher county expenses and taxes, reduced recreational areas, lowered economy of the area, and a down-grading of the soil resources of the area.

ACREAGES OF AGRICULTURAL CROPS

BY COUNTIES 1960 AND 1971

	Acreages-Soybeans For Beans		Acreages-Corn Harvested For All Purposes		Acreages-Oats		Acreages-Hay		Acreages-All Pasture	
	1960 acres	1971 acres	1960 acres	1971 acres	1960 acres	1971 acres	1960 acres	1971 acres	1960 acres	1971 acres
Allamakee	296	3,500	61,638	69,584	32,712	19,827	52,290	57,483	176,795	160,189
Clayton	290	2,749	100,852	122,941	53,008	32,750	63,807	63,914	179,721	162,295
Fayette	29,742	45,321	148,695	146,170	50,225	28,625	58,488	46,122	117,799	102,381
Howard	24,123	46,569	94,154	86,935	34,756	19,611	37,217	29,731	68,736	57,885
Winneshiek	3,407	13,870	109,848	113,819	55,108	36,745	64,597	63,740	135,944	122,335
TOTAL	57,858	112,009	515,137	539,449	225,809	137,558	276,399	260,990	678,995	605,085

A SUMMARY OF TOTAL CROPLAND AND PASTURE ACRES--1970
NO. ACRES WITH HAZARDS AND NO. ACRES NEEDING TREATMENT TO REDUCE HAZARDS 1/

County	Total Cropland Acres	Acres with Erosion Hazard		Acres with Excess Water		Acres with Root Zone Limitations	
		Total	Needing Treatment	Total	Needing Treatment	Total	Needing Treatment
Allamakee	196,425	174,269	135,901	4,024	1,229	1,384	692
Clayton	293,140	255,775	195,569	20,295	13,748	86,180	7,849
Fayette	351,379	241,540	197,913	75,227	64,756	13,615	9,887
Howard	238,924	100,502	91,351	102,879	93,514	17,377	15,758
Winneshiek	291,928	240,359	187,709	26,130	15,972	18,246	14,376
Area Total	1,371,796	1,012,444	808,443	228,555	189,219	136,802	48,589
	Total Pasture Acres						
Allamakee	53,016	30,957	14,832	4,819	185	12,235	6,488
Clayton	51,394	35,098	5,266	6,269	500	6,768	2,004
Fayette	46,974	27,828	23,014	15,584	13,007	2,226	1,882
Howard	32,604	9,898	9,317	17,080	11,451	4,269	1,940
Winneshiek	71,953	31,478	2,925	16,219	4,273	12,142	1,124
Area Total	255,941	135,259	55,354	59,971	29,416	37,640	13,438

1/ Data selected from 1970 Iowa Conservation Needs Inventory. Compiled by Wayne Dietz, Extension Crop Production Specialist.

AN INVENTORY OF AGRICULTURAL LAND BY USE
AND BY KIND AND DEGREE OF HAZARD 1/

CROPLAND

County	1	2e	3e	4e	6e	7e	2s	3s	4s	6s	7s	2w	3w	5w	6w	Area Total
Allamakee	16,748	24,689	133,512	15,814	254	--	--	--	891	--	493	1,397	2,373	254	--	196,425
Clayton	8,452	41,848	136,554	45,115	22,838	9,420	511	--	4,809	574	2,751	19,309	317	669	--	293,140
Fayette	20,957	150,401	70,640	12,876	6,085	1,538	5,943	1,556	4,609	201	1,306	75,026	--	201	--	351,379
Howard	18,122	89,684	10,163	655	--	--	10,563	1,275	3,806	--	--	102,685	154	--	1,333	238,924
Winneshiek	7,193	60,151	143,203	25,781	10,495	725	2,777	365	5,880	2,989	6,235	23,089	500	2,541	--	291,928
Area Totals	71,472	366,773	494,072	100,241	39,672	11,683	19,794	3,196	19,995	3,674	10,785	221,506	3,344	3,464	1,333	1,371,796

PASTURE

Allamakee	5,005	371	18,352	9,268	2,595	371	--	--	--	--	12,235	1,112	3,707	--	--	53,016
Clayton	3,259	502	14,540	7,521	10,028	2,507	--	--	752	752	5,264	3,761	1,254	1,254	--	51,394
Fayette	1,336	6,233	8,906	5,120	5,788	1,781	668	--		222	1,336	8,015	--	7,569	--	46,974
Howard	1,358	6,404	3,300	--	--	194	3,299	388	388	194	--	11,839	194	4,464	582	32,604
Winneshiek	9,219	2,698	14,167	8,994	6,296	2,248	--	--	2,923	2,248	6,971	10,568	3,373	2,248	--	71,953
Area Totals	20,177	16,208	59,265	30,903	24,707	7,101	3,967	388	4,063	3,416	25,806	35,295	8,528	15,535	582	255,941
Total Class I % of Total Cropland	5.2	26.7	36.0	7.3	2.9	.7	1.4	.2	1.5	.3	.8	16.1	.24	.25	.09	
% of Total Pasture	7.1	6.3	23.2	12.1	9.6	2.8	1.5	.15	1.6	1.3	10.1	13.8	3.3	6.06	.22	

1/ All data selected from Iowa Conservation Needs Inventory, 1970. e,w, and s indicate kind of hazard: e - erosion hazard; w - excess water; s - limitations in the root zone, ie. stoniness shallow to bedrock or low water-holding capacity.

Numbers 1,2,3, etc. indicate degree of hazard: 1-no hazard; 2-slight hazard, etc.; numbers 6 & 7 indicate hazards so severe that soils should not be cropped; some require intensive management if used for pasture.

Compiled by Wayne Dietz, Extension Crop Production Specialist, Extension Service, Dubuque.

LAND AREA 1958 AND 1967

	Total Land Area	Non-Agricultural Acreages								Agricultural Acreage	
		Federal Non-Cropland		Urban and Built-up		Small Water Areas		Total			
		1958	1967	1958	1967	1958	1967	1958	1967	1958	1967
Allamakee	408,960	11,196	11,196	10,622	10,753	-	-	21,818	21,949	387,142	387,011
Clayton	497,920	7,734	7,734	14,660	15,561	1,099	1,099	23,493	24,394	474,427	473,526
Fayette	465,920	-	-	18,744	18,744	-	553	18,744	19,297	447,176	446,623
Howard	301,440	-	-	8,766	9,924	-	-	8,766	9,924	292,674	291,516
Winneshiek	440,320	-	-	10,370	10,366	-	-	10,370	10,366	429,950	429,954
Total	2,114,560	18,930	18,930	63,162	63,348	1,099	1,652	83,191	85,930	2,031,369	2,028,630

Source: Conservation Needs Inventory: 1970.

WATER

Underground water supplies in most of the area are abundant. However, to reach this water, wells must be drilled to depths of from 100 to 1,000 feet or more. The quality of this water is of concern. Samples of well water of Allamakee and Fayette Counties were tested in 1970-71. The tests[1/] showed that between 48 and 63 percent were unsafe for human consumption due to the presence of coliform bacteria. Between 12 and 20 percent were unsafe due to nitrate content. Between 38.5 and 52.9 percent were unsafe for human use due to nitrate or coliform bacteria content.

Summary of Water Analysis from Two Iowa Counties

County	no.	safe	unsatisfactory	unsafe	% safe	no.	safe	unsafe	%unsafe nitrates	n safe for bacteria unsafe for nitrates	% unsafe for nitrate and/or bacteri
Fayette (356 samples)	348	220	46	82	36.8	179	155	23	12.8	9	38.5
Allamakee (291 samples)	277	113	38	104	51.3	158	126	32	20.3	12	52.9

A test of wells in Howard County conducted by the Extension Service in 1971 showed 22% of the wells unfit for human use in the spring and 34.7% unfit in the fall. Most wells were contaminated by bacteria content.

1/ Data from State Hygienic Laboratory by the courtesy of Dr. Robert L. Morris, Associate Director. Enumeration and statistical analysis by IGS staff. Data presented in speech by Dr. Samuel J. Tuthill, Director and State Geologist, entitled, Impact of Agriculture on Groundwater, dated 4-6 April 1972 - Cedar Rapids.

Sinkholes have a direct and immediate impact on groundwater. These factured limestone passageways provide a means for surface material to be transported to underground water with little hindrance in many instances. Literally thousands are located in the project area. Their importance is indicated in the instance where a cheese factory discharged whey.1/ It entered fractured limestone and appreared 15 miles away in almost undiluted form in a state fish hatchery.

The lack of lakes (including man-made) is related to the geology of the area. Due to the closeness of limestone, sand, and other similar material near the surface of the land, water holding locations are limited in number. The location of limestone with little cover over it is the most common restriction.

There are three man-made lakes in the project area. Each is about 35 acres in size and used primarily for recreation. They are: Lake Oelwein, near Oelwein; Lake Hendricks, near Riceville; and Lake Meyers, near Calmar. Larger recreation and multipurpose lakes are proposed near Fayette and Cresco by state and local organizations.

There are many miles of perennial flowing streams. Most are located in the north and east portions of the area where springs feed the streams. About 76% of the state's stocked trout streams are located in the area.

There are two watershed areas organized for Public Law 566 assistance for flood prevention and watershed protection. The English Bench Watershed Project in northeast Allamakee County is virtually complete. This watershed involves 4,720 acres of a tributary of the Upper Iowa River. The Sand Cove Watershed sponsors have an application approved by the Iowa Department of Soil Conservation

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1/ Reported in speech by Dr. Samuel L. Tuthill, State Geologist, in a speech entitled, Impact of Agriculture on Groundwater, presented at Cedar Rapids, 4-6 April 1972.

and is awaiting a planning priority. It involves 34,381 acres of land near English Bench. Its outlet is also the Upper Iowa River. Due to the lack of flooding damages in the area, there appears to be little potential for watershed projects.

The Mississippi River is the largest body of water in the area. It forms the eastern boundary of the area, along Allamakee and Clayton Counties. The water level is maintained by U.S. Army Corps of Engineers locks and dams. Two sets are located at Guttenberg and between Harpers Ferry and Lansing.

Work is needed in the watersheds of all major drainage basins to reduce soil, chemical, and waste movement into streams, rivers, and lakes. Streams and lakes are relatively clear between rains with the exception of the Mississippi River which has a relatively high sediment concentration at all times.

The following table indicates that of the major streams in the area, the Turkey River at Garber carries the largest amount of sediment annually.

Sediment Loads of Major Streams*

Stream & Location	Drainage Area sq. mile	Sediment Rate Tons/sq.mi./yr.	Equivalent Sediment Rate (100 sq/mi.) Tons/sq.mi./yr.
Upper Iowa, Decorah	511	160	197
Paint Creek, Waterville	42.8	930	840
Turkey River, Garber	1,545	1,000	1,390

* Upper Mississippi River Basin Study Report, 1972.

Local flooding occurs on the Upper Iowa, Turkey, and Volga Rivers. The Turkey has the most frequent and most damaging flooding. No major urban areas are affected.

The 57th Iowa Legislature passed a Water Rights Law. It declared all waters within the state as public. This includes both surface and underground water. The law became effective May 16, 1957. Water for ordinary household purposes, for poultry, livestock, and domestic animals and other beneficial uses is excluded

from regulation when the daily use is less than 5,000 gallons per day. Water from border rivers and that found within territorial limits of municipalities is excluded. When a municipality increases its water consumption by 100,000 gallons per day or 3 percent, it must obtain a permit.

Permits are required to divert, store, or withdraw water from surface supplies when these quantities exceed certain limits. The Iowa Natural Resources Council is the state agency designated the responsibility of promoting the policies of the Act codified as Chapter 455A, Code of Iowa 1958, as amended. The issuing of such permits are included in those duties.

The Iowa Drainage Law deals with the draining of underground and surface water and means for its disposal.

As previously discussed, the basic topography of the area lends itself to the construction of a number of water impoundment reservoirs. The geologic formations present, however, strongly influence construction costs and reduce the ability to hold water. Special treatment is needed, such as sealing with bentonite or other substances, to hold water at many impoundment sites. Several large impoundment sites have been identified in the Upper Mississippi River Comprehensive Basin Study as follows:

Potential Impoundment Sites*

River	Name	Location	Total Storage (ac-ft)	Surface Area (acres)
Turkey River	Eldorado	Nr. Eldorado, Fayette Co., Iowa	65,000	
Turkey River	Millville	Nr. mouth @ Millville, Clayton Co., Iowa	350,000	9,600
Volga	Elkport	Nr. Elkport, Clayton Co., Iowa	50,000	
Upper Iowa River	Upper Iowa River	Nr. mouth in Allamakee Co., Iowa		

* Source: Upper Mississippi River Basin Study Report, 1972.

AGRICULTURE

Agriculture is the primary industry of the project area. Most of the activities and businesses are based on it.

The number of farms in the project area decreased 24% from 1959 to 1969. The average farm size increased by 28% during the same period of time. The average age of farm operators remained about the same at between 47 and 48 years of age. The percentage of farm land operated by tenants varied from 34 to 46 percent in 1940. In 1969, the acreage of farm land operated by tenants varied from less than 12 to almost 19 percent calculated on a per county basis, according to the 1969 Census of Agriculture.

The number of farm operators has decreased while the amount of land in farms has remained relatively constant. Most farms have some livestock. In 1950, the percent of farms with livestock varied from 57 percent in Fayette County to 68.2 percent in Allamakee County. In 1969, the percent of farms with livestock varied from 82.9 percent in Fayette County to a high of 91.1 percent with livestock in Winneshiek County.

Soil capability limitations greatly dictate the type of farming operations. The farms found in the northern and eastern portions of the area have relatively large amounts of permanent grass, rotational meadow, and timber. The areas to the west have much higher percentages of land in rowcrop production. Soil capabilities dictate this.

From the information available concerning beef calves produced and dairy calves available for feeding there is an excess of potential feeder calves over the number of fed cattle reported in the 1969 data.

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* Prepared with assistance from Wayne P. Dietz, Extension Crop Production Specialist, and Wendell Ryder, Extension Livestock Production Specialist, Dubuque.

There is no question that the type of land in much of the five counties is responsible for some of the shifts in livestock populations. The increasing number of brood cows is certainly related to the fact that this is a heavy forage producing area and there need for ruminant animals to most efficiently harvest roughage material. In hilly sections, as the pressure continues for reduction of soil erosion and thus a possible reduction in rowcrop acres there will continue to be more emphasis placed in the field of ruminant animal production.

An evaluation of probably future trends in the utilization of hay crops or the utilization and/or marketing of grain crops in the area can best be made by utilizing production data presented. It can be seen that substantial increases in the volume of production of all crops except oats have been made during the 10-year period of evaluation. Improved technology has been basically responsible for these yield increases.

Most farmers in the area are making more efficient use of available corn production technology than of available soybean and hay production technology. Therefore, the potential for future increases in soybean yields and hay production is considerably greater. Whether this potential is realized depends in part on incentives provided by government programs, including land use regulation, economic factors and whether or not available modern technology is better understood and applied.

Trends in pasture use show that pasture acreage has decreased about 10%. No figures are available for pasture yields, but assuming 1959 reported pasture acreage represented largely unfertilized bluegrass, and that reported 1969 pasture acreage represented largely bluegrass, but also some improved pasture and legume-grass pasture an estimated pasture production figure of 2.0 Animal Unit Months (AUM) per acre for the 1959 acreage and 3.0 AUM for the 1969 acreage was used. Future trends in pasture production could include yield increases of 40 to 60% if profitable utilization of these increases is possible.

Certainly there is a need for increasing the availability of credit available to farmers. Cerdit is needed to expand livestock operations in particular. Funds must be available to purchase livestock as well as feed it and provide handling facilities necessary for normal operation.

The sponsors will work toward accelerating needed land use changes. This in turn will help expand livestock production of the area since it will help provide more forage needed for cattle production. Effort will be devoted toward expanding the availability of credit to farmers and livestock producers. The expansion and improvement of agricultural marketing facilities and programs will be constantly a matter for concern.

All this and more will be done in cooperation with existing agencies and organizations. Agriculture is still our most important industry.

BASIC LAND USE TRENDS (1959-1969 Basis)[1/]

No. and Size of Farms and 1969 Tenure

County	No. Farms			Acres/Farm			%Owner Operated	Average Operator Age
	1959	1969	Index	1959	1969	Index[2]	1969	1969
Allamakee	1860	1360	73.8	203	268	132.0	73.6	48.1
Clayton	2690	2070	76.8	175	220	125.7	66.5	47.1
Fayette	2770	2080	75.1	163	213	130.6	63.1	47.9
Howard	1580	1210	76.7	186	238	127.9	62.7	48.0
Winneshiek	2570	2030	79.0	168	206	122.6	69.0	48.1
RC&D Area Totals	11,470	8,750	76.0	179	229	127.9	67.0	47.8
State	186,983	136,640	73.1	187	247	132.1	52.5	48.5

1/ From: Iowa Annual Farm Census Report and Iowa Crop & Livestock Data 1954-1970, Vol. 6, Iowa and Dubuque Extension Area, Iowa State University Cooperative Extension Service, May 1972, Econ. Inf. 157 (Revised). Compiled by Wayne Dietz, Ext. Crop Production Specialist.

2/ Index is the percent the 1969 figure is of 1959 figure.

BASIC LAND USE TRENDS (1959-69 Basis)1/

GRAIN CROP ACREAGE

County	Corn Acreage 2/			Oat Acreage			Soybean Acreage		
	1959	1969	Index	1959	1969	Index	1959	1969	Index
Allamakee	62,845	57,156	90.9	34,666	23,932	69.0	303	2,781	917.8
Clayton	103,929	109,643	105.4	56,651	39,856	70.3	296	2,594	876.4
Fayette	149,228	125,077	83.1	59,644	31,934	53.5	18,432	46,885	254.4
Howard	102,942	69,240	67.2	45,184	24,912	55.1	17,287	45,008	260.4
Winneshiek	110,349	102,489	92.8	61,054	44,023	72.1	2,775	12,292	443.0
Total	529,293	463,605	87.6	257,199	164,657	64.0	39,093	109,560	280.3

1/ From: Iowa Annual Farm Census Report and Iowa Crop & Livestock Data 1954-1970, Vol. 6, Iowa and Dubuque Extension Area, Iowa State University Cooperative Extension Service, May 1972, Econ. Inf. 157 (revised). Compiled by Wayne Dietz, Ext. Crop Production Specialist.

2/ Includes corn acreage harvested for silage.

BASIC LAND USE TRENDS (1959-69 Basis) 1/

FORAGE CROP ACREAGE

County	HAY			PASTURE			
	1959	1969	Index	1959	1969	Index	Index
Allamakee	52,332	56,208	107.4	177,153	159,480		90.0
Clayton	62,382	62,444	160.1	183,019	167,201		91.4
Fayette	58,562	46,879	80.1	120,460	106,885		88.7
Howard	34,623	29,604	85.5	67,972	60,631		89.2
Winneshiek	61,334	64,374	105.0	137,691	128,145		93.1
Total	269,233	259,509	96.4	686,295	622,342		90.7

1/ From: Iowa Annual Farm Census Report and Iowa Crop & Livestock Data 1954-1970, Vol. 6, Iowa and Dubuque Area, Iowa State University Cooperative Extension Service, May 1972, Econ. Inf. 157 (Revised). Compiled by Wayne Dietz, Ext. Crop Production Specialist.

BASIC LAND USE TRENDS (1959-69 Basis)

Total Farmland Acres (1959-1969 Basis) and Percent of Total In Crops

County	Total Farm Acreage		Percent of Total Farm Acreage in Crops Listed											
			a)Corn		b)Oats		c) Soybeans		d) Hay		e)Pasture		Total	
	1959	1969	1959	1969	1959	1969	1959	1969	1959	1969	1959	1969	1959	1969
Allamakee	379,282	368,558	16.5	15.5	9.1	6.5	.07	.75	13.8	15.3	46.7	43.3	86.2	81.4
Clayton	472,070	456,037	22.0	24.0	12.0	8.7	.06	.56	13.2	13.7	38.8	36.7	86.1	83.7
Fayette	452,537	443,810	33.0	28.2	13.2	7.2	4.1	10.6	12.9	10.6	26.6	24.1	89.8	80.7
Howard	295,017	288,716	34.9	24.0	15.3	8.6	5.9	15.6	11.7	10.3	23.0	21.0	90.8	79.5
Winneshiek	430,572	417,328	25.6	24.6	10.2	10.5	.64	2.9	14.2	15.4	32.0	30.7	82.6	84.1
Area Total	2,029,478	1,974,449												
Area Percent	100.0	97.3	26.0	23.5	12.7	8.3	1.9	5.5	13.3	13.1	33.8	31.5	81.9	81.9

1/ From: Iowa Annual Farm Census Report and Iowa Crop & Livestock Data 1954-1970, Vol. 6, Iowa State University Cooperative Extension Service, May 1972, Econ. Inf. 157 (Revised). Compiled by Wayne Dietz, Ext. Crop Production Specialist.

FARM INCOME AND SALES: 1969 and 1964

Project Area

	1964	1969
Number of farms by economic class:		
Class 1 - Sales $40,000 and over	161	799
Class 2 - Sales $20,000 - $39,999	1,076	2,429
Class 3 - Sales $10,000 - $19,999	3,188	2,447
Class 4 - Sales $5,000 - $9,999	2,767	1,413
Class 5 - Sales $2,500 - $4,999	1,311	796
Class 6 - Sales $1 - $2,499	347	235
Parttime	527	534
Part retirement	444	212
Abnormal	4	3
Market Value of all agricultural products sold - $	$111,520,500	$170,491,421
Average Per Farm - $'s	$56,302	$94,595
Forest Products - farms	409	314
- dollars	$190,765	$292,836
Livestock, Poultry, and their products -		
- farms	(NA)	8,158
- dollars	$99,148,772	$148,742,433

Source: 1969 Census of Agriculture.

LIVESTOCK INVENTORY

FED CATTLE MARKETED

	1959	1969	Index 1959 vs. 1969
Allamakee	2,220	8,230	370.46%
Clayton	5,210	16,420	314.96
Fayette	10,250	31,850	310.63
Howard	4,650	10,090	216.88
Winneshiek	4,400	16,360	371.39
	26,730	82,950	

5 County Index 310.32% Iowa Index 177.10%

BEEF COW NUMBERS

Allamakee	12,660	20,890	164.96%
Clayton	8,820	17,410	197.48
Fayette	6,070	12,890	212.39
Howard	7,300	12,190	167.03
Winneshiek	10,760	21,110	196.27
	45,610	84,490	

5 County Index 185.24% Iowa Index 146.13%

PIGS BORN

Allamakee	211,500	205,700	97.25%
Clayton	343,200	333,500	97.17
Fayette	289,400	266,100	91.95
Howard	155,200	141,600	91.24
Winneshiek	321,600	319,100	99.22
	1,320,900	1,266,000	

5 County Index 95.84% Iowa Index 95.58%

FED LAMBS MARKETED

Allamakee	240	990	416.48%
Clayton	2,270	1,340	58.93
Fayette	3,470	3,240	93.43
Howard	1,430	2,930	204.51
Winneshiek	580	3,800	655.41
	7,990	12,300	

5 County Index 153.94% Iowa Index 53.88%

LAMBS BORN

	1959	1969	Index 1959 vs 1969
Allamakee	6,070	4,160	68.59%
Clayton	6,670	4,950	74.26
Fayette	4,810	4,120	85.65
Howard	4,910	3,880	79.07
Winneshiek	7,860	6,230	79.21
	30,320	23,340	

5 County Index 76.97% Iowa Index 60.45%

MILK COW NUMBERS

Allamakee	27,690	26,680	96.36%
Clayton	39,320	37,740	95.99
Fayette	34,780	28,510	81.99
Howard	16,340	14,540	89.01
Winneshiek	37,480	35,440	94.55
	155,610	142,910	

5 County Index 91.83% Iowa Index 61.60%

HENS AND PULLETS

Allamakee	210,080	124,880	59.44%
Clayton	406,310	157,680	38.80
Fayette	503,540	307,390	61.05
Howard	355,750	292,200	82.14
Winneshiek	480,310	253,900	52,86
	1,956,050	1,136,050	

5 County Index 58.07% Iowa Index 46.34%

HOGS MARKETED 1969

Allamakee	152,605
Clayton	274,291
Fayette	215,793
Howard	105,925
Winneshiek	232,577

SOW FARROWINGS RESPONSIBLE FOR HOGS MARKETED IN 1969

	Fall 1968	Spring 1969
Allamakee	11,325	13,371
Clayton	18,556	23,154
Fayette	14,775	16,495
Howard	7,977	9,236
Winneshiek	16,314	20,281

PIGS MARKETED PER SOW FARROWED IN 1969

	Number of Sows	Pigs Per Litter
Allamakee	24,696	6.17
Clayton	41,710	6.57
Fayette	31,270	6.90
Howard	17,213	6.15
Winneshiek	36,595	6.30

CALF CROP AVAILABLE FOR FEEDING

Beef Calves - Based on 80% calf crop with 16% of heifers saved for replacements

84,490 cows x 80% - 16% replacements = 56,578 available for sale as feeders

Dairy Calves - Based on heifer calves being saved for replacements and bull calves available for veal or feeder calf development. Mortality figured at 15% and gestation time at 13 months.

142,910 cows with 13 month calving interval produced 131,919 calves in 12 months. 131,919 x 15% mortality ÷ 2 = 56,066 calves available for veal or feeder calf development.

Possible Calves for Feeding

Beef =	56,578
Dairy =	56,066
TOTAL	112,644
Feeder cattle marketed 5 counties 1969	82,950
Difference	29,694

Many cattle feeders buy their feeder cattle outside the project area, thus the net difference between cattle fed in the area and the potential for feeding cattle in the area is much greater than the 29,694 difference shown between the number raised and the number fed.

Source: May, 1972, Iowa Crop and Livestock Data Report, data compiled by Wendell Ryder, Extension Livestock Production Specialist, Extension Service, Dubuque.

FOREST RESOURCES[1/]

There are 2,114,560 acres of land in the project area of five counties with more than 19 percent or 407,000 acres forested. The amount of forest cover varies from as little as 4 percent in Howard County to 32 percent in Allamakee County. Little change in forested acreage has occurred since 1952 with plantings keeping pace with land clearing. However, with the present trends of agriculture with larger cow-calf operations, a serious threat will be made to the existing forested areas. Nearly all the forested land is classified as commercial, which denotes it is capable of producing a crop of saleable timber.

Approximately 12,000 acres are owned by governmental agencies. At the present time, these agencies are instituting further acquisitions to expand and enhance the recreational facilities and to hold large areas in their natural state. Private land ownerships vary in size from less than five acres to over 2,000 acres.

Major forest species are: Oak, Hickory, Mixed Hardwoods, Northern Hardwoods, Bur-Pin Oak, Hardwood/Red Cedar, and Elm Ash Cottonwood. Species found in the area of major importance commercially are: Northern Red Oak, Black Oak, Northern Pin Oak, Bur and White Oak, Basswood, Hard Maple, White and Black Ash, Red and Gray Elm, Butternut, and Black Walnut.

Other species present but of lesser importance commercially because of quality, quantity, or accessibility for harvest are: Green Ash, Rock Elm, White and River Birch, Small and Large Toothed Aspen, Red Cedar, White Pine, Balsam Fir, and Hickory.

1/ Prepared with assistance from William Ritter, District Forester, Iowa Conservation Commission, Elkader, Iowa.

The area contains all five of the native conifers found in the State of Iowa. Oak is the most numerous species present with no serious management problems, except the presence of oak wilt. Good logging practices appear to be able to control it. Elm, although numerous and still important commercially, it is being seriously affected by Dutch Elm Disease which is reducing the number of Elm trees in existence.

Most of the timber stands range in size which may be used for poles to that which may be used for small or large dimension lumber. All species produce veneer quality logs.

At least 12 major sawmills process approximately 17,100,000 board feet of lumber produced in the area each year. This indicates the importance of the lumber industry to the economy. Several small custom mills also operate within the area. At least two Iowa veneer plants located outside the project area draw on the area's timber resources. Every major veneer company in the nation and buyers from foreign countries maintain active interests in the area. Although stave mills now draw on the area for timber, their importance is perhaps not as great as in other areas of the state. One pulp plant, located at Dubuque, Iowa, uses pulpwood produced in the area.

The forest resources of the area affect other aspects of the area's economy, such as recreation and tourism. Without the forest preserve resources, there would not be as many thousands of tourists each year who were attracted to Yellow River State Forest, Effigy Mounds National Monument, county and state parks, game management areas, as well as many private campgrounds and recreation areas, as well as trout stream developments. Demands on these resources increase yearly.

The third in rank of importance in forest use is that of watershed protection. Much of the area is a series of short steep slopes. Heavy runoff occurs where forest cover is lacking causing serious soil erosion and sedimentation of streams and lakes.

Forest growth each year is more than double that which is cut. There are timber resources available to allow for expanding existing industries or developing new ones compatible with existing industry.

Although the forest survey for the area indicates that the area will support a large plant, such as a pulpmill, caution is suggested in recommending this particular industry for the area. Disadvantages such as limited plant site locations, difficulty in controlling timber cutting, and possible harmful effects on the existing industries and on the recreation economy of the area, this type of development will be discouraged.

Major emphasis will be placed on developing industry which will complement existing industry. Examples would be pressure treating plants for poles, posts, studding; bark processing plants for decorative as well as bedding or compost purposes; pallet plants; solid hardwood furniture plants aimed at a discriminating market; veneer plants. A full listing of potential industries is on file with the District Forester.

Continued emphasis will be placed on planting or inter-planting of the existing hardwood forests to bring them up to a high productive level. Conifers will be planted where best suited to produce Christmas trees and improve wildlife habitat.

Special attention will be given to the grazing of the woodland acres of the area. Elimination of grazing where not practicable will greatly improve forest production. Either through special legislation or through the existing Forest Reserve Law, relief through tax incentives will help in holding the largest resource of the area on the land.

CONSERVATION TREATMENT NEEDS - FOREST (ACRES) - 1967

	Total Forest			
	Total	Treatment Adequate	Establishment and Reinforcement	Timber Stand Improvement
Allamakee	132,000	21,694	45,044	65,262
Clayton	120,000	18,875	12,475	88,650
Fayette	38,000	18,561	1,540	17,899
Howard	10,867	2,596	5,571	2,700
Winneshiek	56,000	16,660	30,769	8,571
Project Area	356,867	78,386	95,399	183,082

Source: Conservation Needs Inventory: 1970.

WILDLIFE*

Wildlife is an important part of our cultural heritage. With growing human populations, shorter work weeks, earlier retirement, and increasing life expectancies, the demand for future recreational hunting will be greatly increased. Opportunities for future generations to enjoy wildlife and to continue our hunting heritage can be a reality with modern wildlife management knowledge, and techniques

In northeast Iowa, as well as the rest of the state, (with its extensive agricultural lands) future wildlife populations will be dependent on economical development of wildlife habitat that is compatible with modern farming practices--HABITAT IS THE KEY TO WILDLIFE ABUNDANCE. Most wildlife species are relatively short-lived and cannot be stockpiled. Wildlife abundance depends upon environmental conditions that are conducive to maximum production and consist of the following: geology, soils, climate, vegetation, agriculture and the individual wildlife species themselves.

The long range objectives in wildlife management are designed to provide maximum hunting recreation through initiation and execution of programs on both private and public lands consistent with available resources, personnel and equipment. The Upper Iowa Wildlife Management Unit is currently engaged in an extension-type of wildlife program that will provide technical advice to the farmer or landowner in regard to wildlife management, or habitat development on his land. This is a free service.

Wildlife species of the Upper Iowa Wildlife Management Unit are here primarily because they were and are able to adapt to the environmental conditions of a highly complex wildlife community. Some species will increase in numbers while others will decline.

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* Prepared with assistance from Jim Ripple, Wildlife Management Biologist, Iowa Conservation Commission, Decorah, Iowa.

Recreational hunting (the biologically wise use of surplus game birds and animals) is big business in the State of Iowa. It provides at least some relief from the pressures of modern society. Last year approximately 358,806 hunters made over 5 million hunting trips (19 million man/days recreation) and harvested approximately 7 million game birds and animals, (state-wide figures). A list of major game species follows:

Whitetail deer (Odocoileus virginianus). Common throughout the unit.

Eastern Gray Squirrel (Sciurus carolinensis). Common in timberlands and along forested bluff slopes.

Eastern Fox Squirrel (Sciurus niger). Common in hardwoods throughout the unit.

Raccoon (Procyon lotor). Abundant throughout the unit.

Red Fox (Vulpes fulva). Common in most parts of the unit.

Gray Fox (Urocyon cinereoargenteus). Common on most forested slopes in the unit.

Coyote (Canis latrans). Occasionally noted with a trend for increasing populations

Bobcat (Lynx rufus). Rare.

Eastern Cottontail (Sylvilagus floridanus). Common to abundant in suitable habitat throughout the unit.

Whitetail Jackrabbit (Lepus townsendii). Common to the western portions of the unit.

Woodchuck (Marnota monax). Common throughout the unit.

Most furbearing animal species are common throughout the unit. Trapping the surplus of each species helps control predators and provides an industry important to the economy of the state. A listing of the Iowa furbearers would include the following:

Muskrat (Ondatra zibethicus). Abundant in streams, marshes over the entire area.

Mink (Mustela vison). Common over areas of permanent water.

Beaver (Castor Canadensis). Common in flowing streams of the unit.

River Otter (Lutra canadensis). Occasional along the Mississippi River and the lower portions of major streams. This species enjoys year round protection.

Striped Skunk (Mephitis mephitis). Common over most areas of the unit.

Spotted Skunk (Spilogale putorius). Common over most areas away from dense timber.

Virginia Oppossum (Didelphis marsupialis). Common over all areas of the unit.

Upland game birds provide a large portion of all recreational hunting. The Bobwhite Quail and ring-necked pheasant are of low population in this area.

Ruffed grouse hunting is restricted to northeast Iowa. This sporty game bird was hunted by 0.4 percent of all hunters. A total of 1,663 hunters harvested 3,880 ruffed grouse and were provided with 4,101 man/days of recreation.

Ring-necked Pheasant (Phaisanus Colchicus). Common to abundant in portions of the western portion of the unit.

Ruffed Grouse (Bonasa umbellus). Common over the eastern half of the unit.

Wild Turkey (Meleagris gallopavo). Rare. There have been two experimental stockings in Allamakee County, the eastern subspecies along the Upper Iowa River in 1969, and the Rio Grande subspecies in the Yellow River Forest in 1960-1961.

Iowa is at the southernmost border of the continental duck production area. The primary species produced in Iowa are the Wood Duck, Blue-winged Teal and the Mallard.

The canada goose, blue goose, snow goose, and white-fronted goose migrate through the area and are sought after by local hunters.

Waterfowl hunting is limited primarily to the Mississippi River and the streams and sloughs that are scattered throughout the unit. One artificial marsh (Cardinal Marsh) in Winneshiek County has been established as a public hunting are

Wildlife populations, as previously mentioned, are dependent upon the land and land use. There are certain basic habitat needs that are common to all wildlife species. They are: food, water, and adequate shelter. The amount and types of these needs will vary according to the requirements of the individual wildlife species. Whenever any of these habitat requirements are missing from the environment or are not present in adequate form, they become a limiting factor in maintaining desirable wildlife populations.

The responsibility for the survival and well-being of the State's wildlife resource is vested in the State Conservation Commission. The Upper Iowa Wildlife Management Unit, a field level division, will provide technical services to governmental agencies, farmers, private landowners, wildlife organizations and other interested parties to accomplish these goals.

The sponsors of the Upper Explorerland project will continue to support efforts of the State Conservation Commission and other agencies in promoting the wise use of wildlife resources. Emphasis will be directed toward assisting in development of new and existing wildlife management areas.

FISH *

Fishery resources in Upper Explorerland are both of coldwater and warmwater species. Generally, management of coldwater resources is expanding while warmwater resources have not been fully developed.

The Iowa Conservation Commission manages a "catchable" type trout program for recreational trout fishing. Trout are stocked in 44 principle streams from April through October. The streams total approximately 120 miles of trout water of which over 90 percent is in private ownership. About 76% of these are found in Upper Explorerland. Rainbow Trout from 10 to 14 inches in length and Brown Trout from 9 to 12 inches in size are stocked at an 80:20 ratio respectively. Streams are stocked weekly, or oftener. The time interval decreases as fishing pressure increases.

Warm water fishery resources in northeastern Iowa are largely undeveloped from the standpoint of management. Small lake development has lagged far behind development in other areas of Iowa. Farm pond development is acceptable. Management of our large inland streams is difficult and usually forsaken. The Upper Mississippi River is undoubtedly the finest fishery resource of Iowa, yet due to its vastness, fishery management impact is minimal in effect.

Smallmouth bass is of considerable importance as a sport fish in northeastern Iowa. Some of the principle streams that have exploitable bass populations are as follows: Wapsipinicon River, Upper Iowa River, Turkey River, Volga River, and Yellow River. Small tributary streams often contain marginal bass fisheries.

Channel catfish also are an important sportfish in some of Iowa's larger inland streams. Exploitable populations exist in the lower reaches of the Turkey, Upper Iowa, and Yellow Rivers. Generally speaking, stream fishing tends to be considered a less desirable pursuit by sportfishermen, consequently, channel catfish are typically a very underharvested resource.

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* Prepared with assistance from Gary Ackerman, Fisheries Manager, Iowa Conservation Commission, Strawberry Point.

Stream fishing for suckers and chubs is a pursuit of some fishermen. Their importance as a sportfishery is usually unrecognized although they are readily available in most streams.

Carp fishing is another underutiiized resource. Nearly all bodies of water have a harvestable surplus of carp. They are a sportfish that can be easily taken with natural bait and their eating quality is good when they are properly prepared.

The Upper Mississippi River is a fine warm water resource. It supports a well-developed commercial fishery. The more important sportfishes to be taken are crappies, bluegill, freshwater drum, and channel catfish. Important commercial fish species are buffalo, carp, catfish, and freshwater drum.

As mentioned, small lakes are slow in development. Some of the good manageable small lakes are as follows: Lake Meyers - Winneshiek County; Lake Hendricks - Howard County, and several smaller developments by private interest groups. Small lake development from 50 to 500 acres in size is very much in need especially near the larger metropolitan areas.

RECREATION AND TOURISM*

The Upper Exploreriand region has one of the greatest potentials for development of tourism in the state. The Mississippi River is a special attraction in this area. The richness of history of the area adds to this. The development of this industry is relatively untouched.

Upper Exploreriand visitors closely follow the national trends in recreation as noted by the Outdoor Recreation and Resources Review Commission report. People still place walking and driving for pleasure at the top of their most desired activity list and they very much enjoy water to view, fish and participate in and on for recreational activities.

Northeast Iowa is blessed with many fine streams for canoeing and trout fishing activities. The Mississippi River joins the eastern most edge of the area and provides ample opportunity for boating, fishing and water skiing activities. One of the most enjoyable activities also takes place on the Mississippi, the rental of houseboats or boatels as they are called. These can be rented by the day, week or month, also many are owned by residents and commuters to the area.

Four of the counties have County Conservation Boards. Allamakee does not have such a board. These have developed picnicking, camping, hiking and nature study facilities in their park areas. These receive very heavy use during the summer season as well as extended use more and more in the spring, fall and winter seasons.

Effigy Mounds National Monument at McGregor is the only national park facility in the area. There are no picnicking or camping facilities available. A very fine interpretive program is offered and hiking trails are developed in the monument to view the mounds.

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*Prepared with assistance from Charles D. Colvin, Extension Resource Development Specialist, Dubuque, Iowa.

Two state parks are located in the project area. Pike's Peak State Park is located near McGregor along the Mississippi River. Bixby State Park is located in Clayton County and operated by the Clayton County Conservation Board. Yellow River Forest is the only state forest. It provides facilities for camping and hiking. A number of private campgrounds are developed and more are planned to accommodate visitors.

During the fall leaf color change period a very large number of visitors come into the area to enjoy this most colorful spectacle. Another event is the Nordic Fest in Decorah during the summer which has a large number of visitors.

Two of the counties, Clayton and Fayette, have active recreation and tourism councils. A regional council is being formed which will include the five counties of the project area.

As more visitors discover the quiet charm of Upper Explorerland, many more people are coming. Along with the increased revenue from these sources are some problems. As facilities to handle visitors are increased, it will become necessary to improve the highways in the area and those feeding into the area.

Snowmobiling is an activitiy which is growing very rapidly and a need exists to accommodate this. Very probably private enterprise will be called upon to meet this need with expanded facilities and trails.

As might be expected, many local people resent the influx of visitors but they are coming in ever increasing numbers.

Many travellers come from the Cedar Rapids and Waterloo areas of Iowa. People from the Twin Cities of Minnesota; Chicago, Illinois; Madison and Milwaukee, Wisconsin, are coming in ever increasing numbers.

It will be necessary to provide adequate funding sources so that both public and private facilities can be provided for visitors to this most beautiful scenic area of Iowa.

In the future, effort will be devoted toward developing more recreational facilities, especially private ones. The multi-use concept of land will be accelerated.

With a properly designed and activated recreation and tourism program, tourism could be like a large new industry for northeast Iowa.

INDUSTRY AND BUSINESS

Most business enterprises are related to serving the agricultural sector of the economy. The percentage of employed persons in 1970 working in manufacturing in each county varied from 7.2% to 16.5%. The state average was 20.0%. The number of employed persons in white collar jobs varied from 26.6% to 37.4% by county. The state average was 42.9%.

There is a large concentration of earth moving and road building contractors in this area. It is one of the largest concentrations in the state. These employers provide only seasonal work since they do not operate in winter months.

New industrial developments are needed to provide additional job opportunitie in the area. There is potential for developing industry in many communities. The potential is greatest for small industries since more communities have facilities for such plants. Several communities are in the process of upgrading the quality of community services and developing industrial parks. Financial and technical assistance is needed to develop these parks.

Potential for new industries exists in using local resources. The possibilit of using marginal quality timber is being explored. This should be compatible with existing industry. A study is presently being conducted to determine the feasibility of locating a hog slaughtering plant in the area. Alfalfa dehydration is under investigation.

Industrial and business expansion is important to provide for full employment and an increased family income. New markets for local agricultural products and resources could encourage improved management of them as well as greater production and personal income.

Basic objectives are to expand industrial development through the attraction of new industry and expansion of existing industry. Along with this, the creation of new or expansion of old markets for local products will not be overlooked. The development of local businesses to meet the needs of the area is another important objective. Development of these resources is closely tied to development of others, as are all resources of the area.

COUNTY BUSINESS PATTERNS: 1971

	Number of Employees mid-March Pay Period	Taxable Payrolls Jan.-March ($1,000)	Total Reporting Units
Allamakee	2,351	2,728	334
Clayton	2,721	2,759	447
Fayette	3,884	4,613	542
Howard	1,139	1,234	253
Winneshiek	3,078	3,587	383
Total of Counties	13,173	14,921	1,959

Source: County Business Patterns 1971.

INDUSTRIAL EXPANSION 1960-1970*

	Branch Plants and Relocations	New Industries
Allamakee	3	2
Clayton	5	3
Fayette	8	3
Howard	3	2
Winneshiek	1	1
TOTAL	20	11
Iowa (99 counties)	533	304

* Testimony of Chad Wymer, Director, Iowa Development Commission, at Rural Development Hearings, May 3, 1971, at Sioux City, Iowa.

SUMMARY OF EMPLOYED BY OCCUPATION

Totals

	1940	1950	1960	1970
Professional, Technical	2,173	2,234	2,706	3,511
Farmers & Farm Managers	12,779	12,184	10,608	8,389
Non-Farm Proprietors	2,794	2,853	2,433	2,687
Clerical)	2,797	1,973	2,751	4,042
Sales)		1,965	2,677	2,098
Craftsmen	2,249	3,137	3,167	4,054
Operatives	2,168	2,929	3,685	3,192
Private Household Workers	1,102	459	618	700
Service Workers	1,338	1,839	2,428	4,315
Farm Laborers	3,511	2,311	4,195	2,327
Other Laborers	1,352	1,631	1,293	1,428
Not Reported	297	653	612	-
TOTALS	35,518	38,110	37,173	36,743

Source: Census data for respective years.

THE PROPOSAL

Introduction

This project measure proposes using the Upper Explorerland area of Iowa as a pilot demonstration area in environmental protection and improvement. It proposes using the area as a model which may be followed by other areas of our nation in making efficient, practical, planned, use of our natural resources, especially our soil to maintain its usefulness to provide the necessities of human life.

The proposal involves those measures which are required to insure sound land use, permissive levels of sediment losses, adequate disposal of sewage and solid wastes, proper incentives to enact land use changes and changes in whole-farm enterprises, and guaranteed cost sharing assistance to landowners within the project area to carry out needed conservation practices and other improvements to effectively reduce and therefore stabilize each river basin area at a level that will insure long term productivity of the land and bring about acceptable levels of pollution abatement in all other parts of the environment. This is important since use of resources in Upper Explorerland affects the rest of our nation. Protection of the natural resource base within the RC&D area, and improvement of the RC&D area as a place to live, work and play is the primary objective of this proposal.

OBJECTIVES

1. Use Upper Explorerland as a model in environmental improvement and natural resources development for other areas of our nation to follow.
2. Protection of the natural resource base for use by future generations.
3. Raise economy of the area's farmers.
4. Raise economic level of the area's agribusinesses by increasing the income of area farmers, thus allowing more money to be spent in local communities. This will allow for raising the standard of living of area residents.
5. Maintain productivity of the area's natural resources to provide food, fiber, and shelter for citizens of the country.
6. Provide for more efficient utilization of the area's natural resources to maximize crop and livestock production to help meet our country's needs.

PILOT PROJECT

River Basins

The river basins of the Upper Iowa River, the Turkey River, the Volga River, and the Yellow River are almost totally contained within the Upper Explorerland RC&D area. The Wapsipinican and Maquoketa rivers drain parts of Clayton, Fayette and Howard Counties. The fact that the majority of the run-off that originates in the RC&D area finds an outlet at the Mississippi without leaving the RC&D area provides an ideal situation to measure the effects of a comprehensive development and protection program on the river basins of the Upper Explorerland RC&D area.

In view of the fact that the attention of the public nationwide has been focused on the need for protection and improvement of the environment, it is logical to assume that the river basins within the Upper Explorerland RC&D area could be used as pilot projects to demonstrate effectively the impact that science and technology can have to reduce and control harmful and detrimental pollutants in the environment.

Investigations

This pilot project would begin with detailed investigation of water, air, and soil quality to determine the initial levels of pollution that are present prior to initiation of the pilot project. Tests should be conducted to detect in part:

(1) Sediment load in the rivers and tributaries

(2) Sewage effluent levels in rivers and tributaries from cities and towns

(3) Level of agricultural chemicals being transported by the streams

(4) Levels of nitrates and other toxic elements in underground water

(5) Levels of sulfur dioxiode, carbon monoxide and other pollutants in the air

(6) Effectiveness of the solid waste disposal systems in the area

(7) Level of organic wastes from livestock being carried by the streams

(8) Cumulative level of herbicides, pesticides, insecticides in various soils.

Actions Needed

The provisions of the Iowa Soil Conservancy Law should be enacted as quickly as possible to assure that critical sources of sediment are treated soon to protect our present soil and water resources and prevent damage to areas downstream.

A detailed inventory of potentially feasible Public Law 566 watershed protection and flood prevention projects should be made throughout the RC&D area. Those watersheds with a potentially feasible benefit-cost ratio should have applications submitted wherever the land-owners in the watershed are in agreement to do so. This action will accomplish a still greater degree of stabilization and flood protection than can be accomplished through upland conservation practices alone. In watersheds not feasible for Public Law 566 assistance upland land treatment is the only means of control available.

Municipal sewage treatment systems should be carefully inspected to determine if the present facilities function at an acceptable level. Twenty-one cities serving 3,506 people have no sewer systems. Those which are substandard according to current regulations imposed by the State of Iowa should be required to improve the facilities within a reasonable length of time. Long term low interest loans should be made available to those communities that need improvement in sanitary facilities to enable them to update their treatment plants as quickly as possible to eliminate the pollution and health hazards.

Long term, low interest loans should be made available to landowners in the project area for tile drainage on those soils presently used as cropland as

determined by local soil conservation districts to have minimum erosion hazard for crop production if the wetness problem was corrected. Class II and III wetlands having 0-5% slope should be considered in this category.

A solid waste disposal plan for the RC&D area should be developed as quickly as possible which will include provisions for disposal of solid wastes from the cities and towns and also the rural area. Burning of brush and trees as a result of storms or land clearing should be permitted. Solid waste disposal plans should include handling of dead animals and livestock that cannot be disposed of through rendering plants.

Each county should identify those areas which should be used for industrial development and future housing construction. Regulation in regard to construction practices that will control sediment losses from these sites should be enforced. Minimum standards for sanitary facilities should be formulated to pertain to future expansion and development.

Incentive Programs Needed for Land Use Changes

A. Cropland

Inventories to identify critical sources of sediment from each county would be helpful to identify not only those areas needing immediate attention in the form of erosion control practices, but also as a key to where proper land use would be most beneficial. Over 76% of the agricultural land in the project area needs additional conservation land treatment to control soil erosion, according to the 1970 Conservation Needs Inventory.

Cost sharing rates from either Federal or State sources should be set at 75-80% on those conservation practices which will have permanent pollution abatement benefits, such as: Terraces (including tile outlets), diversions, and grade stabilization structures. This will not only accelerate the application of these practices, but will also satisfy a definite need by landowners to finance the ever increasing cost of this type or construction.

Cost sharing should be based on the following conditions:

(1) Each landowner must develop a sound conservation plan approved by local soil conservation districts for all his land to qualify for cost sharing.

(2) The dollar limit of cost sharing assistance should be based on an annual needs basis rather than a fixed maximum amount.

(3) The conservation plan should guarantee cost sharing assistance throughout the duration of the contract.

(4) The conservation plan should constitute a contract between the landowner and the agency or agencies that will provide cost sharing for a period of up to ten (10) years.

(5) Elimination or intentional destruction of established conservation practices should require repayment of all cost sharing assistance expended on that practice or practices.

(6) If a farm is sold before the terms of the cost-sharing contract are completed, the new owner must either comply with the provisions of the existing contract, or prepare a new conservation plan and enter a new contract.

(7) If a farm is sold after the contract for cost sharing is completed, the planned land use program must be carried out or all, or part, of the cost sharing funds expended on that farm must be repaid at the discretion of the local soil conservation district.

B. Grassland

The best use for much of the marginal land in the five county area is for permanent pasture production for beef cattle, dairy cattle, and sheep. Over 53,000 acres of cropland should be converted to grassland or timberland. Much of the marginal land (12-20% slopes) is being poorly managed in rotation cropping systems, is seeded to bluegrass or permanent seedings, or is undergrazed for lack of adequate livestock numbers. Increased pasture production will provide additional income, help keep the family farm profitable and aid the economy of the RC&D area.

In order to achieve a better land use pattern, some rotational cropland should be converted to pastureland. As a result, the additional forage must be marketed either as hay, in pounds of livestock, or as milk. Livestock, widely distributed over the area, eliminates the concentration of livestock in large central lots which reduces the pollution hazard.

A pasture management specialist should be assigned to the RC&D area to plan and help manage pastureland to attain full season pasture production. Over 86,000 acres of pastureland needs improvement to reduce erosion to allowable limits. Technical assistance is needed in adopting adapted species of warm and cool season grasses and introduction of legumes such as crownvetch and trefoil into pasture programs. Advice should be available on when to graze each part of the pasture system. The year that permanent seedings are made, cost sharing for seed and fertilizer should be made available.

Some reorganization of the credit requirements of local lending institutions will be necessary to meet the demand for additional beef cows to establish cow-calf herds or to buy feeder cattle to graze the additional pasture acreage. Some low cost, low interest long-term loans for cow-calf herds will be necessary to attract younger farmers.

The feasibility of locating an alfalfa-dehydrating plant in the area should be investigated to determine if this could provide a market for alfalfa. An increase in alfalfa acreage would encourage land to be shifted from rowcrop production to permanent vegetation if a ready market for alfalfa was available.

Storage of high quality forage is essential to getting the best production for dairy cattle or beef cattle. One of the essential objectives of the RC&D project should be to keep as many of the farmers on the land as possible and this can be accomplished by helping them to stay competitive with larger producers. Low interest long term loans on silos or silo unloaders should be made available in order to allow the smaller producer to efficiently handle large

volumes of forage. These loans should be made available only where a farmer produces 51% or more of his livestock feed requirements on his own land. This will not encourage construction of large commercial feedlots.

C. Environmental Quality Monitoring

The initial tests of water, air, and soil quality should be continued on the rivers and streams to detect the effectiveness of upland treatment, land use changes, and other controls placed on the land. The results of this monitoring should be made public to demonstrate the need and effectiveness of environmental protection.

Constant monitoring could also detect those areas where environmental protection will have the greatest effect and identify those pollutants which have little if any effect on the environment. Monitoring will also detect new pollutants as they become evident and provide early corrections to these problems before they become serious problems nationwide.

D. Feedlot Runoff Control

New feedlots should be required to satisfy the requirements of the Iowa Water Pollution Control Commission for control of feedlot runoff before going into operations. All existing feedlots should be required to install runoff control measures before financial assistance is granted for expansion of the facilities.

To qualify for cost sharing for feedlot runoff control measures, the landowner must have an approved conservation plan in effect for all land that he owns. He must also raise 51% of the feed required for the livestock on his own land to qualify for cost sharing. No commercial feedlot should qualify for cost sharing under these provisions. If 51% of the feed is raised by the landowner on his own land, there will be an adequate number of acres for disposal of animal wastes. With a combined conservation plan and adequate feedlot runoff control measures the environment and the fertility of the soil will be preserved for future generations.

E. Grain Storage

Long-term, low interest loans should be made available to farmers for facilities to store high moisture grain. Increased storage of high moisture grain would do the following:

(1) Assist in keeping livestock feeding operations on the farms where grain is produced.

(2) Provides 8% more feed value than dry grain.

(3) Save fuel compared to that which is artificially dried.

(4) Save pressure on transportation systems since less grain will be shipped as grain.

(5) Assist in keeping more farmers in livestock feeding operations.

Increased high moisture grain storage will raise the general economy of the entire area.

F. Recreational Developments

The recreation potential for the five county area is rated high in terms of those things that are popular attractions to campers, travelers, and sightseers. Privately owned recreation areas should be encouraged by providing proper financial and technical assistance.

An area recreation specialist should be assigned to the area to assist and coordinate future recreational developments. His duties should be to advise, plan, and design private owned recreational areas in regard to location, size, and needed improvements. Short courses should be held to educate people how to operate and manage recreational developments.

Long-term low interest loans should be made available to landowners interested in developing recreational areas to provide water impoundments, bridle trails, hiking and nature trails, bicycle trails, boat docks, marinas, cross country ski trails, and camping areas. Financial assistance is also needed to provide advertising, equipment, and some hired help to get these enterprises started. Retirement of the loans should be geared to the ability to repay.

Recreational developments that involve whole farms or parts of several farms should be encouraged in order to assemble large enough units to afford profitable businesses. This could be accomplished through recreation associations which would be composed of several landowner members. Each member would provide part of the land and in turn assume responsibility for an appropriate part of the indebtedness of the association.

Additional recreation area developments would induce some necessary changes in land use on steep marginal land that should return to timber or grassland use. Most soils of the steeper slopes within the RC&D area have a high suitability rating for timber production which is complimentary to any recreational development

In the event that a recreational development which is open to the public on a fee-basis, is purchased by an individual for private use only, all cost sharing to develop the area should be paid back in full to the agency or agencies providing the cost sharing assistance.

A tract of land which is difficult to drain, or which has potential as marshland for wildlife, or which is planned by the landowner to be used as a wildlife area should qualify for cost sharing for development or long term low interest loans.

G. Establishment of Woodland

Marginal land (Class V, VI, and VII) may also be converted to timber production as its best use. Establishment of complete timber stands may also be a part of a recreational development on the same land.

Cost sharing should also be available for tree planting whereby sizeable acreages can be planted on a farm. This will be necessary since conversion of land to woodland use is a long term investment. The landowner should be required to keep the land as woodland for a minimum of 15 years to allow the trees to grow to a size that would be impractical to clear and return to crop production. Technical and financial assistance to improve existing stands should also be available.

Any contract or cost sharing on establishment of woodland should specify that wildlife food and cover plots be established and maintained as an essential part of the project. The Timber Reserve Act of Iowa should be retained.

H. Wildlife Habitat Development

In the potentially favorable pheasant areas, a project of long term land rental or lease of small tracts of land of suitable size in the center of each section should be undertaken to bring back the pheasant population. The pheasant population has declined, not from lack of food as much as from lack of cover. A project of this type, whereby the small tracts of land could be planted to various species of conifers, low growing shrubs, and native grasses, would bring back the pheasant population within a few years.

Areas which are difficult to drain could be developed as marshlands for ducks and geese and used as sump areas or outlets for adjacent crop lands where drainage can be accomplished with less difficulty. These areas should also qualify for long term rental or lease.

For upland game such as deer or grouse, technical as well as financial assistance should be provided to develop existing timber stands or small tracts of open land as wildlife food and cover plots. These areas could be a part of the game management program of the Iowa Conservation Commission which could also provide leadership in technical assistance and management.

SUMMARY

Upper Explorerland provides a unique opportunity to test a pilot project in proper land use and treatment. Almost all land within the area drains into streams and rivers that do not leave the region before outletting into the Mississippi River.

The area hosts all types of agricultural and urban land uses. The area contains a variety of soil types unequalled in Iowa.

Much natural resources data relating to the area has already been collected concerning: soils, geology, surface water, underground water, livestock numbers and land use.

The area already has county organizations, local soil conservation districts, and area organizations, the Upper Explorerland Resource Conservation and Development Project, and the Upper Explorerland Regional Planning Commission, to assist in implementing a pilot demonstration.