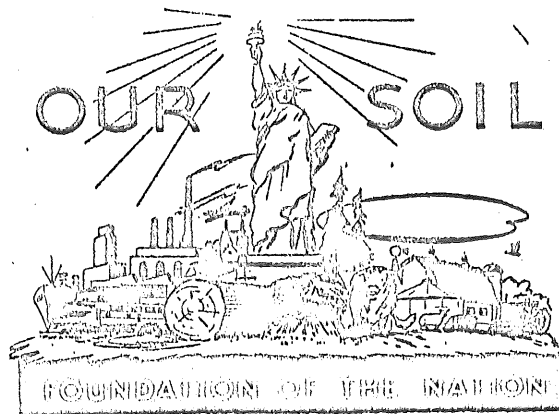


DAVIS COUNTY SOIL

CONSERVATION DISTRICT

LONG RANGE PROGRAM



(UP-DATED JANUARY 1990)

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P R E F A C E

The Soil Conservation District has responsibilities under state laws for carrying out a county-wide soil and water conservation program. Planning for the long-term conservation of our soils, water and related resources is not a simple task; but is a necessary process when orderly development and utilization of our natural resources is expected.

Davis Soil Conservation District recognizes that with constant change, an operating strategy can seldom be long lasting and needs to be re-analyzed periodically. The update of our long-range program will reflect our objectives and priorities as we plan to meet the land and water needs of our people.

This program is being provided by the Commissioners of Davis Soil Conservation District for all individuals, groups and units of government. It is an organized effort to develop and protect our soil and water resources for the benefit of all. Every citizen can and is encouraged to make a meaningful contribution towards implementing this conservation program. Only through cooperation by everyone can we hope to complete this most important task before some of our resources are irretrievably destroyed.

ORGANIZATION AND AUTHORITIES

Davis Soil Conservation District was organized at the request of local people interested in soil and water conservation. A charter was issued under provisions of the Soil Conservation Districts' Law, Code of Iowa, Chapter 467A, on September 29, 1944. The boundaries of the district and the county are the same.

The District is a sub-division of state government governed by five locally elected Commissioners, who are elected on the general ballot and serve six-year terms. District Commissioners are charged by the Iowa General Assembly with the restoration and conservation of the soil, water, and related natural resources of the county. The District receives support services from the State Department of Soil Conservation. Commissioners can appoint as many Assistant Commissioners as they deem necessary.

Additional authorities have been given the Soil Conservation District since 1952. Some of these additional authorities are:

1. Sub-districts (Chapter 467A, Sec. 13-41) of a soil conservation district may be formed for the purpose of carrying out watershed protection and flood prevention programs within the sub-district, but may not be formed solely for the purpose of establishing or taking over the operation of an existing drainage district.
2. The Commissioners of the Soil Conservation District shall adopt reasonable regulations (Chapter 467A, Sec. 42-53) to establish a soil loss limit or limits for the District and provide for the implementation of the limit or limits, and may subsequently amend or repeal their regulations as they deem necessary. Chapter 467A also provides for mandatory erosion control after due process.

3. The Soil Conservation District (Chapter 467B) advises and consults with counties, sub-districts and conservancy districts upon the request of any of them or any affected landowners, and is authorized to cooperate with other state subdivisions, or instrumentalities and affected landowners, as well as with the federal government or any department or agency thereof, to construct, operate, and maintain suitable projects for flood or soil erosion control.
4. Under Chapter 467C, the County Board of Supervisors can establish districts having for their purpose soil conservation and the control of flood waters. The establishment of these districts requires the approval of the Soil Conservation District along with the State Conservation Commission and the Iowa Natural Resources Council.
5. Conservancy Districts (Chapter 467D) are legal subdivisions of the State of Iowa. In 1971, the legislature divided the state into six major river basin watersheds for the purpose of developing a comprehensive management plan. Conservancy District plans will be developed in concert with soil conservation districts and other special purpose districts and will provide for their participation in carrying forward such plans for the protection of Iowa water and related land resources.

Davis County is part of the Des Moines Conservancy District and the Southern Iowa Conservancy District.

The District is authorized to request assistance from and enter into memorandum of understanding between themselves and other federal, state and local entities to carry out their assignment and leadership role in the conservation, development, and productive use of the county's soil, water related resources.

DISTRICT POLICIES

IT WILL BE THE POLICY OF THE DAVIS COUNTY SOIL CONSERVATION DISTRICT TO:

1. Provide technical assistance, as available in the planning, design, layout, adherence to specifications and the maintenance of conservation practices.
2. Provide resource inventory and evaluation data to units of government that have resource planning responsibilities in Davis County.
3. Coordinate with all soil, water and related resource programs in Davis County to insure and encourage maximum coordination of conservation programs.
4. Actively support and cooperate as sponsors to Pathfinders RC&D. We will continue to seek out opportunities that support the objectives of the RC&D area plan. We will lend support to the county RC&D council as they seek out worthwhile projects and help groups develop measure plans for these projects and help groups develop measure plans for these projects to benefit our district residents.
5. Provide assistance in the interpretation of the Davis County Soil Survey to all people involved in land use decisions.
6. Provide up-to-date conservation education materials to all people in Davis County. Emphasis will be placed on providing the area public schools with material that can be effectively used in the classroom.
7. Provide information to all forms of public mass media to insure that local citizens are kept well informed and up-to-date on new conservation programs, concepts and accomplishments.
8. Conduct a continuing comprehensive conservation education program that will insure awareness and concern for natural resources in Davis County.

DISTRICT POLICIES (cont.)

9. Give assistance on a priority basis as follows:

- a. Provide technical assistance and state cost-share funds (as funding will allow) to district cooperators in the Shelby-Seymour-Edina soil associations. Emphasis will be placed on the construction of terrace systems (on slopes no steeper than 9%) and on erosion control structures receiving first priority for the state cost share funds. Contour Strip cropping and conservation tillage will be in the high priority emphasis, too.
- b. Provide technical assistance and state cost-share funds to cooperators in the Weller-Lindley soil associations with major emphasis to be placed on conservation tillage and terraces on this soil (2nd priority for cost-share funds.)
- c. Woodland Management practices.
- d. Pasture Management practices.
- e. Practices that directly benefit wildlife.
- f. Animal waste management practices.

DISTRICT OBJECTIVES

Objective I

Assist landowners to plan for and adequately treat 60,000 acres of cropland in the next five years.

Actions and Goals

1. Provide technical and cost-share assistance, as available, to install 600,000 feet of terraces and 100,000 feet of Sediment & Water control basins.
2. Conduct demonstrations; tours; carry out an intensified information and education program; and provide assistance to landusers to convert 60,000 acres of row crops to a conservation tillage method in all soil association areas.
3. Encourage the application of subsurface drainage where needed in order to prepare the land for erosion control practices.

4. Provide technical assistance, as available, to landusers to construct 300 acres of grassed waterways.
5. Assist landusers in all soil associations to establish 2,500 acres of contouring.

Objective II

Assist landowners in planning for and adequately treating 25,000 acres of pasture and hayland in the next five years.

Assistand and Goals

1. Provide technical assistance, as available, to landusers to reseed or overseed 15,000 acres of pastureland to grasses and legumes that will provide adequate forage during the summer months.
2. Conduct an intensified information and education program, with assistance from the Davis County Extension Service, encouraging good pastureland management.
3. Place emphasis on good pastureland management when developing resource conservation plans with district cooperators.
4. Encourage the use of conservation tillage pasture renovation equipment on soils subject to erosion.

Objective III

Assist landowners in planning for and adequately treating 500 acres of woodland in the next five years.

Actions and Goals

1. Conduct an intensive information and education program explaining the benefits gained by improving and maintaining existing woodlands.
2. Provide technical assistance to landowners to plant 100 acres of trees.
3. Encourage landowners to use the services provided by the District Forester in developing management plans for their woodlands.
4. Provide planning and technical assistance to landowners to establish or

renovate 20 acres of farmstead windbreaks.

Objective IV

Assist landowners to plan for and develop 300 acres of wildlife habitat in the next five years.

Action and Goals

1. Provide technical assistance to landowners in establishing fifty acres of odd area plantings.
2. Provide assistance, as available, to the Davis County Conservation Board
3. Conduct an intensive information and education program promoting wildlife development and management. Work closely with the Iowa Conservation Commission, and other concerned agencies and groups.
4. Stress wildlife habitat needs when working with cooperators in developing their resource conservation plans and application of conservation practices.

AGENCIES AND DEPARTMENTS ASSISTING
THE
DAVIS CO. SOIL CONSERVATION DISTRICT

FEDERAL

Soil Conservation Service (SCS-USDA)

The Soil Conservation Service is the technical agency of the U. S. Department of Agriculture responsible for soil and water conservation matters. The service has entered into a supplemental memorandum of understanding with the Davis Co. Soil Conservation District. Under this agreement, the service makes available technical personnel and other facilities to assist in planning and carrying out a program of soil and water conservation in the district.

Some of the programs administered by the Service and available to the district include: (a) Conservation Needs Inventory, which provides data useful in planning for future resource development; (b) Public Law 566, known as the Small Watershed Protection Act, which provides technical and financial assistance to local sponsors of watershed projects under 250,000 acres; (c) Resource Conservation and Development Projects that accelerate resource programs in multi-county areas as a base for town and county economic development. (Davis County is presently a part of the Pathfinders RC&D Project); (d) Public Law 89-560 authorized SCS to make soil surveys in urban and agricultural areas. Davis County will start a standard soil survey in 1980; (e) Public Law 95-192, also known as the Soil and Water Resources Conservation Act of 1977, provides for the appraisal of our Nation's natural resources, developing a program for furthering the conservation of those resources and providing Congress an annual evaluation report.

Agricultural Stabilization and Conservation Service (ASCS-USDA)

On the state and county levels ASCS actively supports soil conservation districts by conferring with their state and district governing bodies on means of increasing the effectiveness of the federal government's Agricultural Conservation Program (ACP). County ASCS Committees have an established policy of giving preference to cost-sharing applications for practices to which soil conservation districts have given top priority.

Farmers Home Administration (FmHA-USDA)

FmHA loans money to landowners to apply needed soil and water conservation practices on their lands. The agency also administers other programs for the benefit of farmers and rural residents.

STATE

Department of Soil Conservation (DSC)

The Department of Soil Conservation is the state agency responsible for the administration of the Iowa Soil Conservation Laws. Duties of the Department are to organize and provide support services to soil conservation districts; offer guidance on election procedures for district commissioner's elections; encourage and promote better soil conservation programs in soil conservation districts; disseminate information between districts and also facilitate an interchange of advice and experience between districts; secure cooperation and assistance between federal, state and local agencies in the work of soil conservation districts; administer state appropriations to soil conservation districts; provide clerical and administrative assistance to districts; provide legal assistance to districts and provide training for soil and water district commissioners.

The Conservancy Districts Division of the Department has the delegated responsibility for non-point source pollutions under Section 208 of Public Law 92-500, the Federal Water Pollution Control Act.

State Soil Conservation Committee

The State Soil Conservation Committee is the governing body of the Department of Soil Conservation and each of the six conservancy districts within the State of Iowa. The committee establishes policies that govern the Department of Soil Conservation, the six conservancy districts and the 100 soil conservation districts which cover the entire state. The committee also approves or disapproves applications for assistance under the Federal Public Law 566 Watershed Programs, and reviews and make recommendations to the Governor for action on Resource Conservation and Development Projects.

Iowa Cooperative Extension Service - Agriculture and Home Economics

The Cooperative Extension Service has been active in the field of soil and water conservation. It has played an important part in the organization of each of the 100 soil conservation districts and has a memorandum of understanding with each district. Under these memorandums of understanding the Extension Service cooperates with the district in carrying out the educational phases of the district program.

State Conservation Commission

This agency is responsible for administering a wide variety of outdoor recreation activities. Within the framework of its authority, the State Conservation Commission plans for and carries out acquisition, development, management and maintenance of land and water areas for public parks, forests, preserves, refuges, and for hunting and fishing. The Commission, Department of Soil Conservation and the Davis Soil Conservation District cooperate in a coordinated effort to establish and maintain farm forests, wildlife areas, farm ponds, and watershed developments.

COUNTY

Davis County Conservation Board

The Board is responsible for the development and maintenance of county

owned wildlife and recreation areas. The Davis Soil Conservation District and the Board cooperate to provide assistance to the public and landowners in the development of wildlife habitat areas and the promotion of environmental education programs.

OTHER

Cities and towns; conservation and agriculture organizations; bankers organizations; loaning agencies; businessmen and industries; civic groups and clubs; churches; newspapers; radio and television.

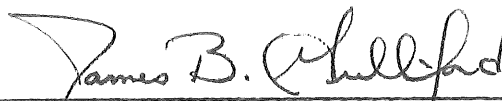
These organizations cooperate with soil conservation districts by helping them to promote soil and water conservation programs and activities which have the ultimate objective of benefiting local communities, the state and the nation.

Statement of Adoption: We, the Commissioners of the Davis County Soil Conservation District, adopt this program on the fourteenth day of April, 1983.



Robert H. Boatman, Chairman
Davis County Soil Conservation District

Statement of Approval: This updated program of the Davis County Soil Conservation District was reviewed and approved by the Department of Soil Conservation on APRIL 19, 1983.



James B. Gulliford, Director
Department of Soil Conservation

DISTRICT RESOURCE INVENTORY

Davis

SOIL CONSERVATION DISTRICT

Date Prepared: March 1983

Land Use (Pvt & State)	(Acres)
Irrigated Cropland	150
Non-Irrigated Cropland	180,795
Pasture & Hayland	93,704
Woodland	21,000
Wildlife Land	6,000
Recreation Land	1,500
Other Land	10,372
Non-Federal Urban Land, Roads & Railroads	9,019
Total Federal Land	0
Total State Land	2,181
Total Water Area	577
Total Land & Water	323,117

Water Erosion Sources Above Acceptable Levels	
Irrigated Cropland	0 Ac.
Non-Irrigated Cropland	144,756 Ac.
Pasture & Hayland	46,852 Ac.
Woodland	6,300 Ac.
All Other Lands	894 Ac.
Critical Wind Erosion	0 Ac.
Operating Units	1,215 No.
Operating Units	319,536 Ac.
Other Land Units	30 No.
Units of Government	4 No.
PL-566 Pre-application	3 No.
PL-566 Projects in Plan	
Development	0 No.
PL-566 Projects in Operation	1 No.

Memorandums of Understanding - Agency(s)

and Date(s)

Activity	Unit	Accomplished To Date	High Priority Next 5 Years
		Amount	Amount
RC&D Measures (801-877)			
C/S Measures Adopted	No.	2	5
C/S Measures Planned	No.	2	5
C/S Measures Completed	No.	2	5
Non C/S Measures Adopted	No.	0	2
Non C/S Measures Completed	No.	0	2

Activity	Unit	Total Needs	Accomplished To Date	Remaining To Be Done	Priority Next 5 Yrs.
		Amount	Amount	Amount	Amount
(100) Cooperators	No.	1,100	708	390	250
	Ac.	310,517	200,364	110,153	70,750
(108) Conservation Plans	No.	1,000	600	400	70
	Ac.	307,200	184,320	122,880	21,000
(110) Conservation Plans Needing Revision	No.	XXXX	XXXX	413	35
	Ac.	XXXX	XXXX	117,705	10,150
(141) Floodplains Delineated	Ac.	0	0	0	0
(184) Soil Surveys	Ac.	323,117	42,281	280,836	280,836
Conservation Practices --					
(760) Cropland Adeq. Pro.	Ac.	180,795	36,039	144,756	60,000
(761) Pasture & Hayland Adeq. Pro.	Ac.	93,704	46,852	46,852	25,000
(763) Woodland Adeq. Pro.	Ac.	21,000	14,700	6,300	500
(764) Wildlife Land Adeq. Pro.	Ac.	6,000	2,500	3,500	500
(765) Recreation Land Adeq. Pro.	Ac.	1,500	750	750	250
(766) Other Land Adeq. Pro.	Ac.	10,372	3,112	7,260	500
(770) Cropland Adeq. Treat.	Ac.	180,795	30,736	150,059	10,000
(771) Past. & Hayl. Adeq. Treat.	Ac.	93,704	37,482	56,222	4,500
(773) Woodland Adeq. Treat.	Ac.	21,000	14,200	6,800	400
(774) Wildlife Adeq. Treat.	Ac.	6,000	2,200	3,800	400
(775) Recreation Land Adeq. Treat.	Ac.	1,500	650	850	225
(776) Other Land Adeq. Treat.	Ac.	10,372	2,075	8,297	500
(329) Consv. Till. System	Ac.	118,430	17,973	100,457	60,000
(330) Contour Farming	Ac.	58,000	34,167	23,833	2,500
(342) Critical Area Plntg.	Ac.	6,000	1,200	4,800	500
(362) Diversions	Ft.	2,000,000	1,101,465	898,535	50,000
(410) Grade Stabl. Struct.	No.	2,870	624	2,246	150
(412) Grassed Waterway/Outlet	Ac.	5,100	2,729	2,371	300
(585) Stripcropping	Ac.	5,600	985	4,615	500
(600) Terraces	Ft.	16,025,000	4,376,362	11,648,638	600,000
(638) Wtr. & Sedmt. Control Basin	No.	1,000,000	526,800	473,200	100,000
(230) Private Rec. Devel. Estab.	No.	0	0	0	0
(312) Agric. Waste Mgmt. Sys.	No.	100	1	99	5
(378) Pond	No.	2,600	2,237	363	50
(512) Past. & Hayl. Planting	Ac.	68,685	30,873	37,812	15,000
(440) Irrigation System	No.	0	0	0	0
	Ac.	0	0	0	0
(449) Irrigation Wtr. Mgmt.	Ac.	0	0	0	0
(558) Recl. of Surf. Mnd. Land	Ac.	640	21	619	100
(606) Subsurface Drain	Ft.	1,500,000	492,662	1,007,338	790,000
(607) Surface Drainage	Ft.	1,200,000	84,200	1,115,800	50,000
(380) Farmstd. & Feedlot Windbrk.	Ac.	800	60	740	20
(612) Tree Planting	Ac.	4,000	496	3,504	100
(654) Woodl. Imprvd. Harvesting	Ac.	1,000	0	1,000	50
(666) Woodl. Improvement	Ac.	1,000	0	1,000	100
(644) Wildl. Wetl. Habitat Mgmt.	Ac.	50	6	44	10
(645) Wildl. Upl. Habitat Mgmt.	Ac.	20,000	11,415	8,585	300

WORKLOAD ANALYSIS FOR DAVIS COUNTY SOIL CONSERVATION DISTRICT
DAVIS COUNTY, IOWA

Developed April 1983 by Fred Hainline, District Conservationist

LOCATION AND GENERAL DESCRIPTION

Davis County is located in the southeastern part of Iowa. It is about seventy miles southeast of Des Moines. Its southern boundary coincides with the Missouri state line, and it is the third county west of the Mississippi river. The county is rectangular in shape and contains 15 civil townships, 5 of which coincide with the United States townships.

The total surface area of the county is 323,117 acres or 504.87 square miles. Within this area there are 577 acres of water surface which includes water bodies greater than or equal to 40 acres and perennial streams at least 1/8 mile wide. In addition, numerous water impoundments with surface area ranging from 0.3 acres to 15 acres are located throughout the county.

The general slopes of the land is to the southeast and east. Surface drainage is excessive over much of the county; run-off is rapid and much soil material is removed annually from the steeper slopes by erosion. Approximately the southern five-eighths of the county's surface area flows to the southeast, and the northern three fifths of the county surface flows northeastward. About 2.5 miles of the Des Moines river channel cuts across the extreme northeastern corner of the county. Major streams in the county are: Soap Creek, Chequest Creek, Fox River, North and South Wyacondah Creeks, Carter Creek and Fabius Creek.

COUNTY STATISTICS

Average annual rainfall = 34.56 inches.

Average annual monthly temperatures range from 23.1° Fahrenheit in January to 75.7° Fahrenheit in July.

Number of farms in the county (1980) = 1,100

Average farm size (1980) = 283 acres

1980 average yield of yellow corn = 105.5 bu/ac

1980 average yield of soybeans = 31.7 bu/ac

1980 average yield of wheat = 35.3 bu/ac

Other crops grown: oats, grain sorghum and white corn

Livestock and poultry produced: cattle, hogs, sheep, horses, chickens (eggs)

Note: Davis county is number one in the state in numbers of sheep. There are many sheep flocks throughout the county.

Farm operating units = 1,100

Average land value (1980) - \$1,100/ac -- range from \$500.00 - \$1,900.00

County Population - Data from 1980 census report

Total county population - 9,104

Bloomfield (county seat) - 2,849

Total urban population - 3,515

Minority groups: Black (16), Spanish American (27), Asian (4), Other (24)

Also, there are approximately 65 Amish (Mennonite) families residing in the county. There are an estimated 500 (total) Amish residents of the county.

SOIL DATA

The Cooperative Soil Survey is in progress in Davis County at the present time. The "First Acre" soil survey ceremony was held on the Iles Heady farm in July 1980. The last Soil Survey was issued in June of 1940 and is badly outdated. Information used in this analysis is based on the best judgement of the probable soil associations and acres of each by Jim Seaholm, Soil Survey Party Leader.

There have been seven (7) major soil association groups determined for this county, listed below:

1) Haig - Grundy - Arispie	= 2,910 acres
2) Pershing - Gara - Armstrong - Rinda	= 9,754 acres
3) Lindley - Weller - Keswick	= 92,605 acres
4) Bottomland soils	= 30,778 acres
6) Edina - Seymour	= 15,900 acres
7) Shelby - Clarinda - Seymour - Adair	= 113,270 acres
8) Gary - Armstrong - Kniffen - Rinda	= 57,900 acres

Total soil and water acres = 323,117 acres

SOIL LOSS ANALYSIS

Class 2W, 3W and Bottomland soils = 43,363 acres (90% cropland, 10% other)
Assumed soil loss factors: $S = 1\%$, $SL = 400'$, $T = 5$, $T/K = 13.5$
System C = 0.45, Tolerable C = 0.39, Average soil loss = 5.8 T
Excess soil loss = 0.8 T/Ac/Yr.

Soil loss can be controlled on these acres with a conservation tillage system which carries at least 2000# of residue on the surface with at least 1000# near the surface. These land classes are located mainly on the ridge tops and along the stream bottoms. These acres are normally farmed intensively with a soybean-corn rotation. There is approximately 2,100 acres of this area that is in pasture-hayland. Surface drainage is the main concern of the landowners who farm these soils. Wind erosion causes little problem, due to the small fields with woody growth surrounding them, plus the high clay content of the soils. Flooding occurs on the bottomland areas adjacent to the major drainageways.

These soil classes are eroding at 0.8 T/ac/yr above acceptable limits. These soils can be adequately treated before the topsoil is depleted, because of the low excess erosion rate. Therefore, these areas are of low priority for the short term, but shouldn't be totally ignored. The reason being, that if a farmer will practice good conservation on these soils, it will carry on to the more critical areas.

Class 2E soils - 873 acres (85% cropland, 15% pasture, hayland and other)
Assumed soil loss factors: $S = 3\%$, $SL = 3$, $T/K = 8.1$, none contoured
Average soil loss = 10.8 T/ac/yr., Excess soil loss = 7.8 T/ac/yr.

These soils are located adjacent to the 2W and 3W soils in the uplands, and are farmed in a straight row system. Landowners who have their farms paid for or have bought the land long enough ago that per acre costs and interest rate aren't critical to income, will rotate these soils occasionally. The majority of these areas are cropped annually with a corn-soybean rotation. Landowners suffer severe rill erosion on these soils because of the large quantity of water which builds up on the 2W and 3W soils and then begins its rapid, turbulent movement when it reaches these 2E soils.

At the present excess soil loss rate, the existing 10" of topsoil will be eroded to the critical 3" level in 130 years. A conservation tillage system will increase that time span to 500 years. This should give the landowners ample time to adequately treat these soils.

Class 3E Soils - 117,435 acres (75% cropland, 25% pasture, hay and other)

Assumed Soil Loss Factors: Slope, slope length, T value and T/K value are based on each specific soil type in this class. A common C value of 0.38 was used on all soil types.

Soil Loss By Soil Type

Arispe (23C) (582 estimated acres in county) S = 7%, SL = 200', non-contoured, T = 5, T/K = 15.6, tolerable C = 0.078
Topsoil = 8", Average soil loss = 24 T/ac/yr, Excess soil loss = 19 T/ac/yr.

Pershing (131B, 131C) (3,804 estimated acres in county)
S = 5%, SL = 200', T = 3, T/K = 8.1, non-contoured
Topsoil = (B = 10")(C = 8"), tolerable C = 0.062, Average soil loss = 18.5
Excess soil loss = 15.5 T

Weller (132B, 132C) (37,042 estimated acres in county) S = 5%, SL = 180, T = 3, T/K = 7.0 across slope
Topsoil = (B = 10")(C = 8"), tolerable C = 0.056, Average soil loss = 21 T,
Excess soil loss = 18 T.

Seymour (312B) (27,042 estimated acres in county)
S = 5%, SL = 200', T = 3, T/K = 8.1, non-contoured
Topsoil = 9", tolerable C = 0.13, Average soil loss = 8.8 T,
Excess soil loss = 5.8 T

Shelby (24D) (11,328 estimated acres in county) S = 11%, SL = 150', T = 5, T/K = 17.8
Topsoil = 4"(cult.)6"(other), tolerable C = 0.068, Average soil loss = 28 T, across slope, Excess soil loss = 23 T.

Adair (192C) (16,990 estimated acres in county) S = 7%, SL = 200', T = 2, T/K = 6.3, across slope
Topsoil = 5"(cult.)6"(other), tolerable C = 0.046, Average soil loss = 16.5 T,
Excess soil loss = 14.5 T.

Armstrong (792C) (11,580 estimated acres in county) S = 7%, SL = 200', T = 3, T/K = 9.4, across slope,
Topsoil = 5"(cult.)6"(other), tolerable C = 0.062, Average soil loss = 18.5 T,
Excess soil loss = 15.5 T.

Kniffin (531B) (8,685 estimated acres in county) S = 3%, SL = 200', T = 3, T/K = 8.1, non-contoured
Topsoil = 9", tolerable C = 0.13, Average soil loss = 9 T, Excess soil loss = 6 T

This class of soil has the greatest excess soil loss acreage. As economic pressure increases on the land owner, these soils are farmed more intensively. They are the type of soils that can be farmed, if certain conservation practices are applied. The productive life span in these soils under present cropping conditions, range from 26 years on the Shelby D soils to 150 years for the Seymour B soils. Even though the projected life of the Seymour is 150 years, it probably has one of the most severe rill erosion problems due to its location on the landscape. Most often it is located immediately down slope from the Edina soil unit. The large build-up of surface water concentrates and increases its turbulence when it reaches the Seymour soils. Most farmers are more concerned with the rills and gullies formed on the B and C slopes than the amount of sheet erosion that occurs. This, of course, is because they can see and "feel" them with their machinery.

Erosion can be reduced and productive life extended on these slopes with a conservation tillage system, but in most cases additional treatment will be needed. For example, on the Shelby soils the expected life of the remaining topsoil can be extended to 63 years. Conservation tillage has the same effect on the other Class 3E soils. Terracing is a popular practice on these soils to help control sheet, rill and gully erosion. Tile outlet terraces are the most popular type. The reason is that with the use of grass and broadleaf herbicides, it is very difficult to maintain an adequate waterway. However, there has been somewhat of a rebirth in waterway interest, because of the expense associated with terraces. The cost, at present, is running between \$400-\$500 per acre terraced. There is some interest in contouring and strip cropping on these soils, but there are fewer acres of each every year. The machinery used today makes it very inconvenient to use these practices.

Class 4E & 4W Soils - 93,102 acres (50% cropland, 50% pasture, hay and other)

Assumed Soil Loss Factors: Slope, slope length, T value, and T/K values are based on each specific soil type in the class. A common C value of 0.22 was used on all soil types.

Soil Loss By Soil Type

Armstrong (792D) (7,156 estimated acres in county) $S = 11\%$, $SL = 150'$, $T = 3$, $T/K = 7.0$, across slope, Topsoil = 4"(cult.)6"(other), tolerable $C = 0.027$, Average soil loss = 24 T, Excess soil loss = 21 T.

Rinda(223C) (6,862 estimated acres in county) $S = 7\%$, $SL = 200'$, $T = 3$, across slope, Topsoil = 4"(cult.)6"(other), tolerable $C = 0.047$, average soil loss = 14 T, Excess soil loss = 11 T.

Keswick (425 D) (13,891 estimated acres in county) $S = 11\%$, $SL = 150'$, $T = 3$, $T/K = 8.1$, across slope, Topsoil = 4"(cult.)6"(other), tolerable $C = 0.031$, average soil loss = 21 T, Excess soil loss = 18 T.

Shelby (24E) (28,317 estimated acres in county) $S = 16\%$, $SL = 150'$, $T = 5$, $T/K = 17.8$, contoured, topsoil = 4"(cult.)6"(other), tolerable $C = 0.037$, Average soil loss = 29 T, Excess soil loss = 24 T.

Clarinda (222C) (28,317 estimated acres in county) $S = 7\%$, $SL = 200'$, $T = 3$, $T/K = 8.1$, across slope, topsoil = 5"(cult.)6"(other), tolerable $C = 0.053$, Average soil loss = 12.5 T, Excess soil loss = 9.5 T.

Adair (192D) (5,664 estimated acres in county)

S = 11%, SL = 150', T = 5, T/K = 6.3, contoured, topsoil = 4"(cult.)6"(other), tolerable C = 0.031, Average soil loss = 12.3 T, Excess soil loss = 7.3 T

Gara (179 D) (2,895 estimated acres in county)

S = 11%, SL = 150', T = 5, T/K = 17.9, contoured, topsoil = 4"(cult.)6"(other), tolerable C = 0.09, Average soil loss = 12.3 T, Excess soil loss = 7.3 T

Five to ten years ago these soils were pasture and hayland, but have been brought into row crop because of two factors. First, the cattle profit picture has been very bleak during this time period. If a landowner had his land paid for and was a good livestock manager, there was potential for a modest profit. If the landowner had to borrow money to establish his herd, the likelihood of net profit was very small.

These soils are good for hay production. With the cutback in the number of cow-calf herds though, the demand for hay decreased. Also fencing is very expensive and requires a high labor input on the cow/calf operations.

The second factor is the rapid rise in the price of marginal land in this county. It is presently selling for \$700-\$900 per acre. Corn and soybeans will give the greatest net return per acre. Therefore, most of the land in the class 4E and 4W types have been converted to row crop to generate the maximum return per acre regardless of the soil erosion suffered.

These soils are difficult to farm on the contour because of the numerous drainageways that need to be grassed to provide outlets for the contour rows. Usually, if contoured, the waterways are ignored and gullies form in the drainageways.

Conservation tillage will help to control soil loss on these soils. The most critical soil type in this group is the Shelby on an E slope. If this soil type is farmed as it has been for the last couple of years, its topsoil will only last 18 years. This time span will be less if cropping is intensified beyond what it is now. Conservation tillage with high residue levels will extend this time span to 40 years. These soils are very fragile and topsoil cannot be maintained on a continuous row cropping system. These soils are difficult to bring under erosion control without extensive practice application. The best solution, from the economic and conservation viewpoint, would be to the rotation and use no-till when row crop is used.

No-till is a very good way to control erosion, but it has contributed to additional marginal land being brought into production in this county. Farm units that usually would only be farmed one or two years and then reseeded aren't. The use of no-till gives the landuser a way to crop this land and not have excess soil loss, he feels. If you calculate soil losses with a continuous no-till cropping system, very few of the Class 4E soils are within tolerable soil loss limits. The best solution is a "slow" rotation or return to hayland or pastureland. The economics of land value, interest rates, and livestock prices offer little to help improve the land use of the Class 4E and 4W soils in the near future.

Class 6E and 7E Soils - 68,344 Acres

In this workload analysis, it is assumed that these land classes are dedicated to hayland, pasture, woodland and wildlife. In some areas of the county, there has been quite a bit of land clearing on some of these soils. Generally, wheat is the only cash crop that is attempted to produce on these areas.

The majority of this area is "rough" timber pasture. Some landowners manage these areas to get maximum forage production, but the majority only take what is produced by nature. Some of these areas are severely overgrazed by cattle and sheep because of improper stocking rates. Production is retarded each year due to overgrazing the preceding year.

The livestock economics prohibit most landowners from improving these areas to provide maximum production. Even the cost share programs aren't much help, because the landowners, in a lot of cases, can't afford the percentage of cost share they are required to provide.

ABANDONED COAL MINE AREA

Numerous abandoned surface strip coal mining areas are located in northern Davis County. These sites are found predominately in the Lindley-Weller-Keswick soil association area, and along the Soap Creek Channel and its tributaries. These sites are usually composed of open pits, which range in size from 2-acre surfaces and smaller. There are stripping piles and gob piles located around or intermingled with these small pit areas. The majority of the sites range in size from 20 acres to 40 acres. Natural vegetation has reestablished itself on all but a few of the sites. On these sites, only the "hot spots" will not have some type of growth. The 2 priority 1 sites have been reclaimed in this county through the Rural Abandoned Mine Program. The rest of the sites are classified as priority 2 and 3 sites and probably won't be reclaimed in the near future.

FUNDING ASSISTANCE PROGRAMS AVAILABLE TO DAVIS COUNTY LAND USERS

WATERSHED DEVELOPMENT (PL566)

This is administered through the USDA Soil Conservation Service with local and state sponsorship.

The South Wyacondah (Big Wyacondah) drainage has a completed PL-566 Flood Prevention Watershed project and is in the operation and maintenance phase. Local sponsors were the Davis County Soil Conservation District and the Davis County Board of Supervisors.

The Carter Creek drainage had a watershed plan developed through the PL-566 watershed program, but local adversity to the project stopped it before final commitments were made and the Carter Creek Watershed Project never became a reality.

PL-566 Pre-applications have been submitted for the Soap Creek Watershed and North Wyacondah Watershed, but neither of these received a planning priority. There is need of additional land treatment in all of the watershed areas.

RURAL ABANDONED MINE PROGRAM (RAMP)

This program, which is administered by the USDA Soil Conservation Service, provides funds on a cost-share basis to reclaim abandoned surface coal mined areas. Funding is allotted on a priority basis, which is determined on the site conditions. Criteria used to determine priorities include: hazard to human life; hazard to health and welfare; environmental quality; aesthetic quality; water quality, etc. To date, two reclamation plans have been developed and federally administered contracts have been awarded to reclaim these areas. The first reclamation project on the Mrs. Roy Fisk property, has been completed and is in the maintenance phase.

The second site is in the earthwork and vegetative establishment phase, located on the Pamela Schulz farm, and should be completed in the spring of 1982.

SPECIAL LAKES COST SHARE PROGRAM

This program is administered by the Iowa Department of Soil Conservation and the Davis County Soil Conservation District. Lake Wapello State Park watershed has been designated as an area eligible for 75% cost share funding. These funds are made available through the appropriations to the Iowa Department of Soil Conservation Cost Share Programs. These funds are to be used to control excessive soil loss in watersheds that drain into the state lakes. There is a 4,989 acre drainage area in this watershed. It is located in Land Resource Area 109, the "Iowa and Missouri Heavy Till Plain". The principal soil association is the Lindley-Weller-Keswick, consisting of moderately to steeply sloping soils. An inventory of the watershed completed in February 1982 showed:

- 1) 21 landowners in the watershed.
- 2) 64% of the watershed exceeded tolerable soil loss limits.
- 3) Estimated permanent and temporary conservation practices needed.
 - a) Terraces \$20,000.00
 - b) Pasture Improvement 80,000.00
 - c) Grade stabilization structures 61,000.00
 - d) Water & Sediment Control Basins 20,000.00

STATE OF IOWA COST SHARE PROGRAM

Administered by the local Soil Conservation District Commissioners with funds allocated through the Iowa Department of Soil Conservation. Fifty percent cost-share is available to land users for temporary and permanent conservation practices. Approximately \$60,000.00 has been available in the last 2 - 3 years for this program. All funds have been exhausted and there have been additional requests the SCD Commissioners could not approve.

AGRICULTURE CONSERVATION PROGRAM (ACP)

This program is administered by the Agriculture Stabilization and Conservation Service (ASCS) Office. The locally elected County Office Committee sets priorities, cost share rates and eligible practices for this program. The Soil Conservation Service provides the technical services for this program. At present, cost sharing on temporary and permanent conservation practices has been set at the 50% rate. Annual average funds allocated to this program have been \$60,000.00. Funds are usually cost shared on seeding practices first, then the balance on permanent practices such as terraces, grade stabilization structures and farm ponds.

LONG TERM AGREEMENT (LTA)

This program also is administered by the ASCS agency. The technical support for this program is assigned to the Soil Conservation Service. This program provides cost sharing on a contractual basis over a specific period of time. The early LTA's were set up on 10-year work schedules. Recently there has been a shift to shorter term (3-5 year) LTA's. A plan is developed by the landuser with assistance from the Soil Conservation Service. The Soil Conservation District reviews the applications and sets a priority rating based on the conservation plan and the need of the landuser. The final approval responsibility is the ASCS County Committee's. SCS assists the landuser in the design, layout and checkout of the

planned practices. Also, SCS prepares an annual status review with the landuser, in which the status and progress in fulfilling the agreements terms are reported to the ASCS County Committee.

Presently there are 5 active agreements. Three (3) agreements have been completed.

CALCULATING THE TIME SPAN IN WHICH THE RESOURCE "MUST" BE TREATED

In considering the length of time in which a resource "must: be adequately treated, you must consider the many different types of soils and the resource management system applied to each. For example, in the class 3E soils, the "must be treated" time ranges from 30 years or less on the Shelby D soils to 230 years on the Seymour B soils. These soil losses are based on the common "C" factor of 0.38. If you would assume a change in the "C" value on the Seymour soils to a continuous rotation of corn-soybeans with a conventional tillage system. The "must be treated" time period would decrease to 158 years. The critical life span of the resource can be changed dramatically by a change in the resource management systems used from year to year.

Many factors can have an effect on why a landuser uses one resource management system and his neighbor may use another, even though both may have very similar types of soil. Perhaps one has a good background in the cow/calf operation and enjoys working with cattle. Maybe his neighbor hasn't the management ability for a livestock operation or just doesn't want to handle livestock or hasnot got the labor and available facilities, but is an extremely good cash grain manager. The life of the resource will vary greatly between these two operators simply because of their Resource Management Systems.

WHAT SHOULD BE ANNUAL RATE OF APPLICATION?

Conservation tillage systems will give the most immediate "slow down" of excess erosion in this county. Many local landusers are either trying some type of conservation tillage system or planning to in the next year or two. The District Resource Inventory estimates the total Conservation Tillage System acres needed in the county at 118,430 acres. There are approximately 17,973 acres in the county on which some type of conservation tillage system is being used. That leaves 100,457 acres needing this conservation practice applied. Therefore, almost 85% of the needed application has yet to be accomplished!

If we could get this practice implemented on those acres needing this treatment next year, the life span of the resource would be extended dramatically, as shown before. However, we would need to have control of many factors over which we do not. Some of these would be: interest rates, average farm income, weather, labor, risk, government programs, machinery cost, livestock prices, cost of feed, seed, fertilizers, chemicals, fuel and hundreds of other factors that affect how and when landusers apply conservation practices to the land.

Based on past application rates in the county and the needed treatment, the application rates, as set out in the District Resource Inventory, are considered to be acceptable at this time. (See attached District Resource Inventory) The 5-year priorities are a reasonable application rate. The rates are (in most cases) above the present application rate, but still within the capabilities of the staff.

WHAT IS LIMITING CURRENT APPLICATION PROGRESS?

- 1) Current depressed economic conditions in agriculture.
- 2) High interest rates.
- 3) Land cost and return to investment.
- 4) Landusers have higher priorities than conservation work.
- 5) Lack of concern for the need for conservation.
- 6) Cost share funds inadequate.
- 7) Short construction periods in spring and fall.
- 8) Shortage of earthwork and tiling contractors at peak workload periods.

LIMITING FACTORS FOR EACH CONSERVATION PRACTICE

The eight numbered items above probably affect application of all practices. The earthmoving practices - such as terraces, structures, waterways, etc. are affected more than the management practices.

The first three factors we do not have any control over. Numbers 4 and 5 can be overcome through the information, planning and followup programs. Probably we can have more immediate affect on the lack of concern than the priority factor. When the landuser realizes that there is a problem it will increase the priority of doing something about it.

The lack of cost share funds is considered a limiting factor. I feel it limits work in two ways. First, the landuser can be encouraged to do conservation work he might not do if there is the possibility of the "government" providing funds to help pay the expense. However, on the other hand, there are landusers who probably have the financial resources to apply conservation practices without cost share funds, but won't. Their viewpoint is that those dollars come from tax monies and they feel that they should receive a portion of this money, just like other cost share recipients. Landusers feel that they have a right to this cost share money because they are the tax payers from whom it comes. Perhaps there needs to be a concentrated information program to inform these landusers that cost share funds are distributed according to need -- not just because they are tax payers. Additional cost share funds are allocated to those counties that can obligate their funds and still have additional eligible requests. Therefore, it is a priority in this county for both the ASCS County Committee and Soil Conservation District Commissioners to obligate the funds provided to them as timely as possible. Then they may request additional funds to be used in the county. Hopefully over a period of time this county's original allocations will increase, due to the history of needs. Another method used to "stretch" cost share funds is approving a landuser for a set amount of dollars regardless of total proposed work. For example, a terrace project estimated to cost \$4000.00 could receive a \$1000.00 approval. The landuser will not receive 50% of the cost, but perhaps this is enough incentive to motivate him to go ahead with construction.

We have discussed the possibility of obtaining county cost share funds with the Board of Supervisors. The county's budget is in a financial hardship at present and the board doesn't feel that it can allocate funds at the present time. I do feel that this is a concern with them and they have participated in other projects to help the conservation effort. If the county budget conditions would improve, there is a good possibility that funds could be obtained for cost sharing and/or personnel.

Limiting factors 7 and 8 are a result in part to each other. The construction period can be extended through use of small grain crops which are harvested in July and the construction could be completed in the summer. We are encouraging landusers who are participating in the reduced acreage program to consider using these acres for construction. Also, both the state and federal cost-share programs give a high priority to practices on these reduced acreage areas.

The contractors do a good job of getting work completed in a timely manner. If the market place would support more full time contractors, they would be getting into the business. The law of supply and demand controls the number of contractors available.

Contouring and strip cropping are very good practices for this county. However, both require a good outlet for surface runoff. Waterways have become very hard to maintain because of the chemicals used to control vegetation in row crops. The strip cropping alternative works well for those who need forages. There are fewer cow/calf operations each year. The overall need for forages has decreased in this county as there is a swing to more row crop.

Conservation tillage is a practice that is becoming more popular each year. We are emphasizing this practice on all our contacts as a good way to control erosion, without a high output of cash. The major limiting factor with this practice is that landusers are hesitant to change to a system they aren't familiar with. As more and more neighbors begin to use these systems and have success with them, the hesitation will decrease and a majority of the landusers will be using some form of conservation tillage.

WHAT WILL IT TAKE IN DOLLARS AND PERSONNEL TO ADEQUATELY TREAT THE RESOURCE?

It is estimated that there is a present need of 350,000 man hours to adequately treat the resource in Davis County. This figure was developed from the remaining to be done column of the District Resource Inventory. Factors used in developing the personnel staffing plan in Iowa was multiplied times the needed units to get the total needed man hours. If the 350,000 man hours is divided by the available hours per individual (full time), that is 2080 hours per year, will give you a total man years need of 168.

Using an annual salary of \$20,000.00/man year, shows a need of \$3,360,000.00 to provide the staff necessary to apply the needed treatment. The present staff includes:

1 District Conservationist	2080 hours
1 Federal Soil Conservation Technician	2080 "
1 State of Iowa Engineering Aide	2080 "
1 WAE (400 man hours/yr)	400 "
	6640 man hours/year

Present staff time available equals 3.2 man years. With the present staffing level, it would take 52.5 years to provide the needed assistance to adequately treat the resource. With some soils having a 10 - 15 year life, it is very critical that the staff concentrate on the most critical eroding soil type units.

The dollars needed to encourage application of the needed practices could be calculated using the data in the District Resource Inventory.

If 50% of the remaining to be done practices required cost share assistance the cost would be as follows:

Conservation Tillage	100,457 ac. x .5 = 50228 ac. x \$5/ac =	\$251,140.00
Terraces	11,648,638 x .5 = 5,824,319 x \$2.50 =	\$14,560,797.00
		<u>\$14,811,937.00</u>

Already it is apparent that the costs of applying the needed treatment is astronomical. Under the current economic conditions, the necessary dollars and personnel to adequately treat the resources on time, isn't available. It doesn't appear that they will be in the near future either.

WHAT SHOULD THE PRIORITIES BE?

With the present set of circumstances, conservation tillage will give the most erosion control for the dollars and personnel available. Therefore, a high priority should be placed on information, demonstration, technical assistance and planning for Resource Management Systems that will promote this practice.

There will be a continuing need for terraces on many farming units to control excessive runoff and to decrease slope length. When technical assistance is provided to landowners for terraces, water and sediment basins, structures, etc., conservation tillage should be included as a part of the system. The followup program should encourage the landuser to carry out the planned conservation practices, but the conservation tillage alternative should be stressed.

A large number of the items limiting application is not within the control of this agency or the Soil Conservation District. The construction season can be lengthened by encouraging land users to use wheat ground to install practices during summer months. Acreage payments should be available to those who are willing to use a temporary cover crop on land units so that conservation practices can be installed. A priority for cost share funds should be given to those who will make special arrangements to accomplish earthwork during the "slack" construction period.

Management practices will reduce excess erosion dramatically but require an intensive selling effort from the staff and all associated with the soil conservation program in Davis County. Rotations need to be slowed down to incorporate more forages. Strip cropping can be a big factor in reducing erosion without a large outlay in funds. Contouring will reduce erosion levels by about 50%. This does create a need for waterways or the tile outlet terrace system. However, the terraces and waterways can be used in combination to help reduce some of the costs.

If profitability would return to the cattle and sheep industries in this county, it would do more to promote erosion control than all the people and dollars this agency could muster. This county is a livestock producing area, with some parts suitable for intensive row crops. Landusers have been forced into abusing their marginal land for the sake of survival during low cattle and sheep prices. The greatest impact on the soil erosion problem in Davis County would be a healthy, profitable livestock industry being revived.

STATEMENT OF ADOPTION: We, the Commissioners of the
Davis Soil & Water Conservation District, adopt this
program on the 4th day of January, 1990.

Chairman
Davis Soil & Water Conservation District