Lower Cedar River – 07080206
8-Digit Hydrologic Unit Profile

November 2009

The Lower Cedar River Rapid Watershed Assessment (RWA) provides initial estimates of where conservation investments would best address the resource concerns of landowners, conservation districts, and other community organizations and stakeholders. These assessments help landowners and local leaders set priorities and determine the best actions to achieve their goals to conserve and improve soil and water resources.

The Lower Cedar River 8-Digit Hydrologic Unit Code (HUC) watershed contains 703,060 acres *(1)*. Forty percent of the watershed is in Cedar County, 26 percent in Muscatine County, 24 percent in Linn County, 7 percent in Johnson County, and the remaining 3 percent is split between Jones, Louisa, and Scott counties *(1)*. Ninety-five percent of the watershed is privately owned, 1.3 percent is publicly owned, and the remaining 3.7 percent is split between municipal areas and unincorporated areas *(2)*.

Sixty-two percent of the watershed is in cropland, 16.2 percent is pasture or hayland, 10.3 percent is woodland or natural areas, 10.1 percent is developed urban areas, and 1.4 percent is split between water and wetlands *(3)*.

Elevations range from 570 feet to 1,028 feet *(4)*. The average watershed slope is 4.5 percent (5). The primary Land Capability Class in the watershed is class 2. The Land Capability Class (LCC) breakdown for the watershed is: 11.2 percent in class 1; 47.7 percent in class 2; 24.8 percent in class 3; 6.2 percent in class 4; 2.6 percent in class 5; 4.4 percent in class 6; 1.4 percent in class 7; and 1.6 percent as miscellaneous or non-classified (*6*). Rainfall ranges from 35 to 37 inches per year *(7)*. The HUC includes two interstate highways (35 and 80), three US highways (151, 30, and 6), and seven state highways (13, 1, 38, 130, 92, 70, and 927) *(8)*.

Conservation assistance is provided by seven Soil and Water Conservation Districts (SWCD) and Natural Resources Conservation Service (NRCS) field offices located in Anamosa, Davenport, Iowa City, Marion, Muscatine, Tipton, and Wapello. There are four Resource Conservation and Development (RC&D) offices that cover the watershed, including Geode in Burlington, Interstate in Milan, Illinois, Iowa Valley in Amana, and Limestone Bluffs in Maquoketa. An office locator is found at http://offices.sc.egov.usda.gov/locator/app

The Lower Cedar River HUC includes 43 NRCS conservation easements totaling 4598.1 acres. The easements include the Emergency Watershed Protection (EWP) program, Wetlands Reserve Program (WRP), and the Emergency Wetlands Restoration Program (EWRP). Eighty one percent of the easements are in Muscatine County, 12 percent in Cedar County, and 7 percent in Johnson County *(9)*.

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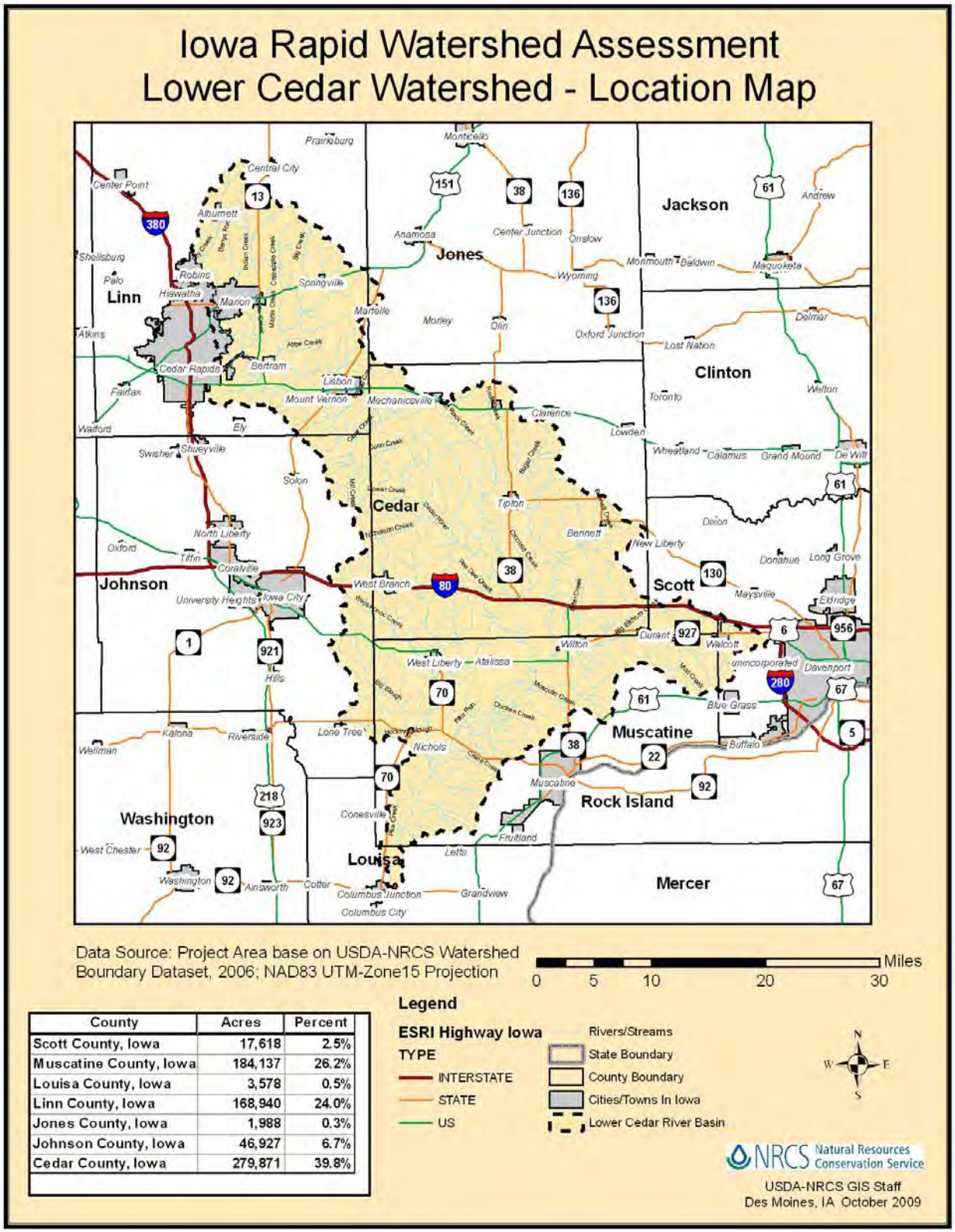
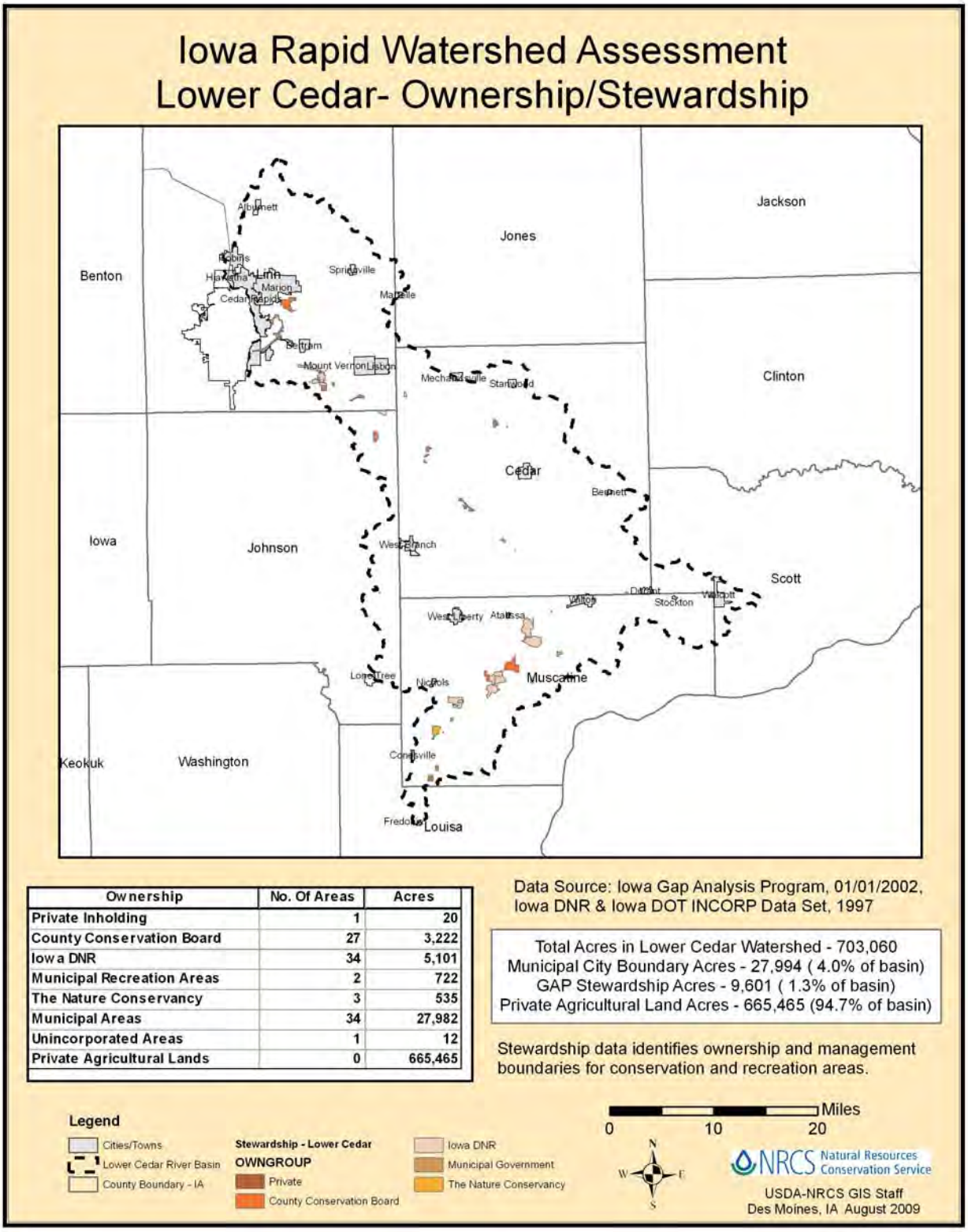
Physical Description



County	Acres	Percent
Scott County, Iowa	17,618	2.5%
Muscatine County, Iowa	184,137	26.2%
Louisa County, Iowa	3,578	0.5%
Linn County, Iowa	168,940	24.0%
Jones County, Iowa	1,988	0.3%
Johnson County, Iowa	46,927	6.7%
Cedar County, Iowa	279,871	39.8%

Physical Description (continued)



Ownership	No. Of Areas	Acres
Private Inholding	1	20
County Conservation Board	27	3,222
Iowa DNR	34	5,101
Municipal Recreation Areas	2	722
The Nature Conservancy	3	535
Municipal Areas	34	27,982
Unincorporated Areas	1	12
Private Agricultural Lands	0	665,465

Data Source: Iowa Gap Analysis Program, 01/01/2002, Iowa DNR & Iowa DOT INCORP Data Set, 1997

Total Acres in Lower Cedar Watershed - 703,060
Municipal City Boundary Acres - 27,994 (4.0% of basin)
GAP Stewardship Acres - 9,601 (1.3% of basin)
Private Agricultural Land Acres - 665,465 (94.7% of basin)

Stewardship data identifies ownership and management boundaries for conservation and recreation areas.

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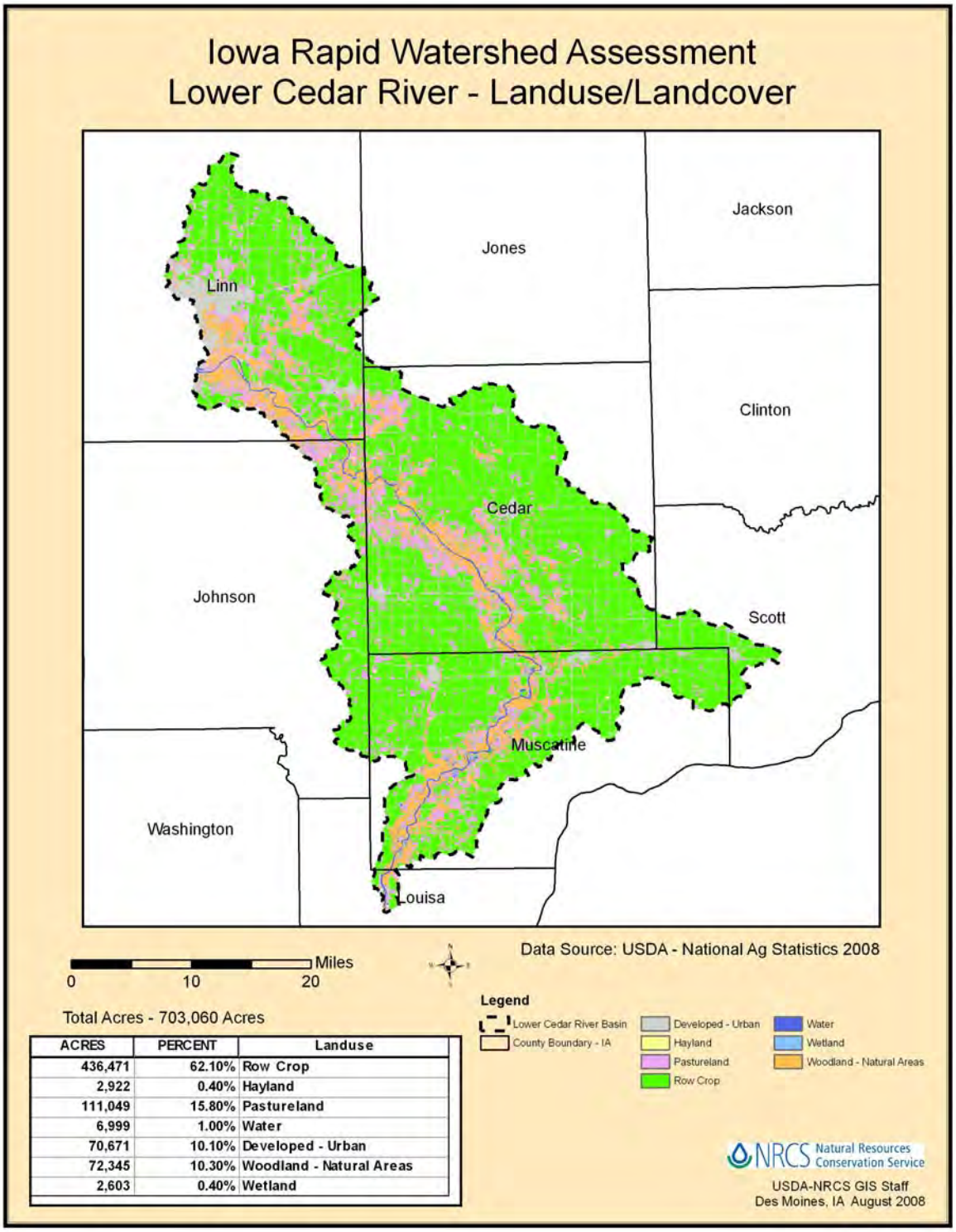

ACRES	PERCENT	Landuse
436,471	62.10%	Row Crop
2,922	0.40%	Hayland
111,049	15.80%	Pastureland
6,999	1.00%	Water
70,671	10.10%	Developed - Urban
72,345	10.30%	Woodland - Natural Areas
2,603	0.40%	Wetland

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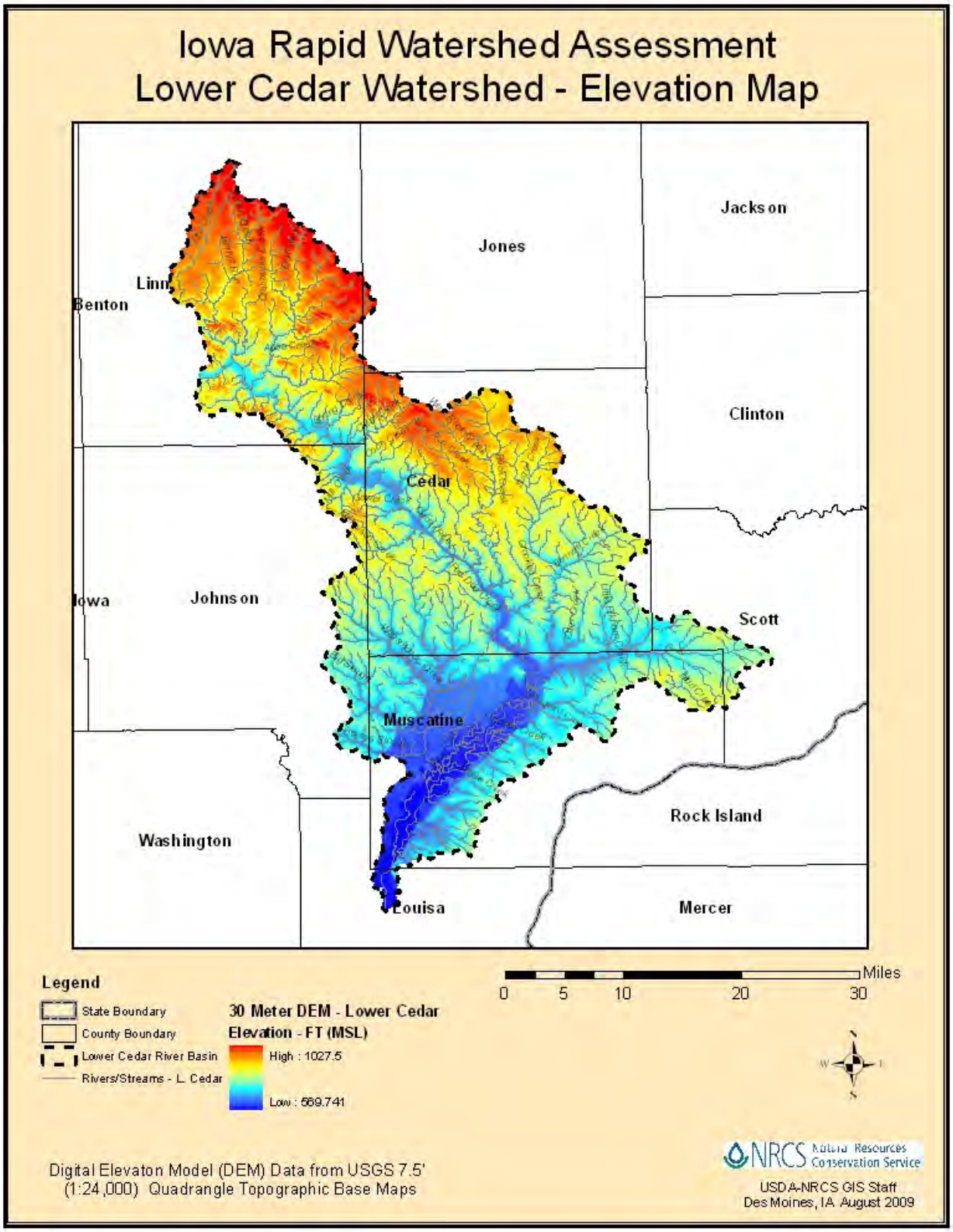

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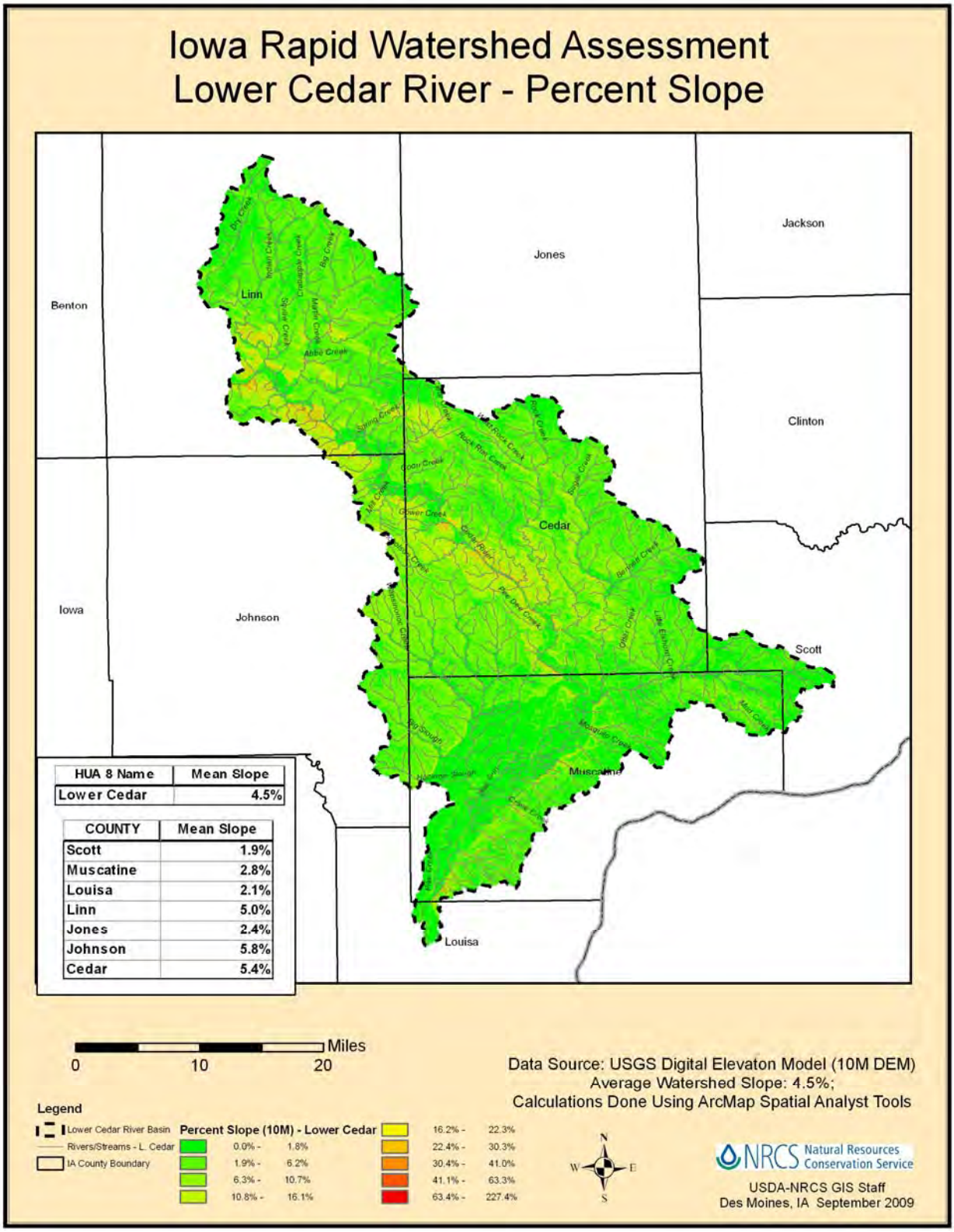

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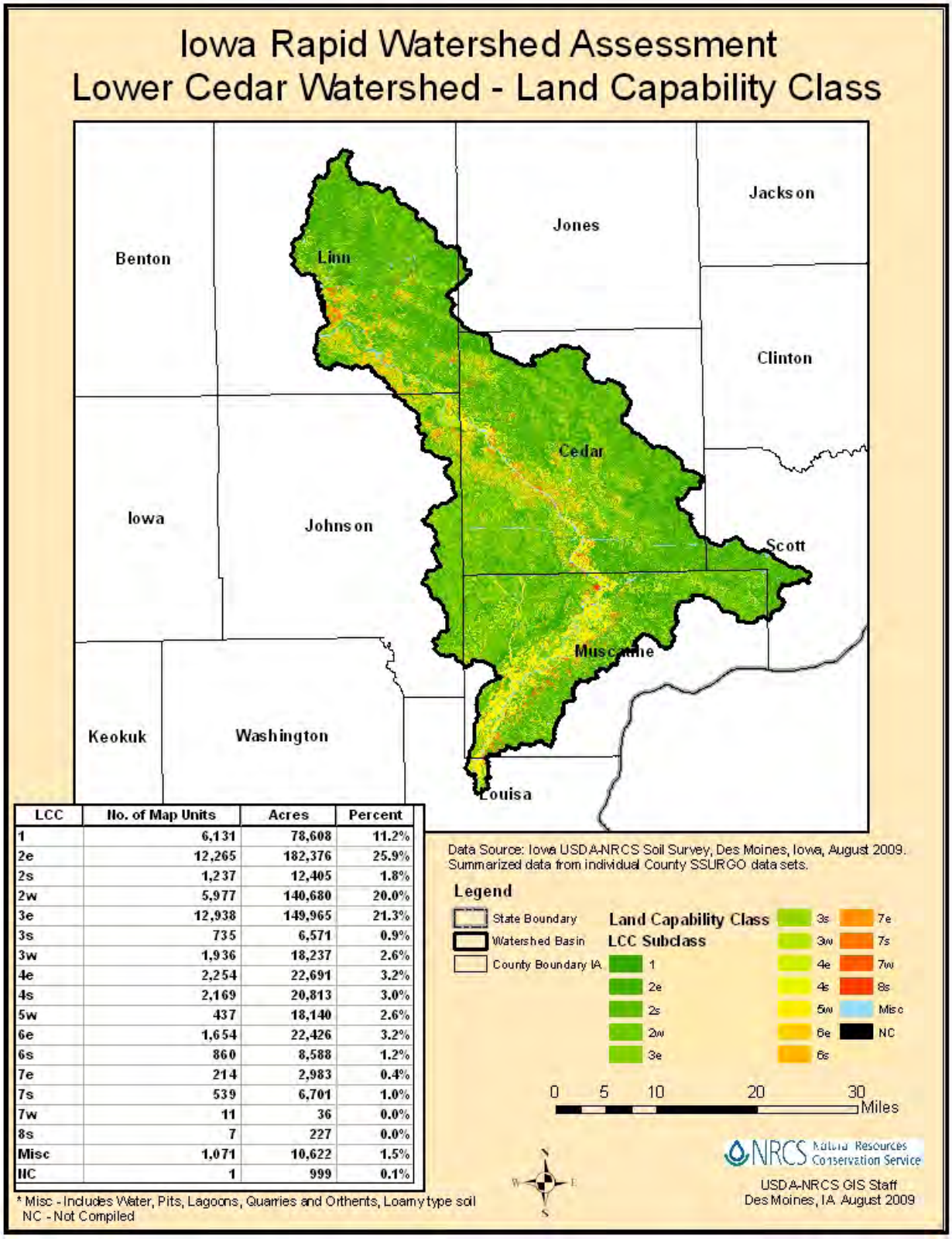
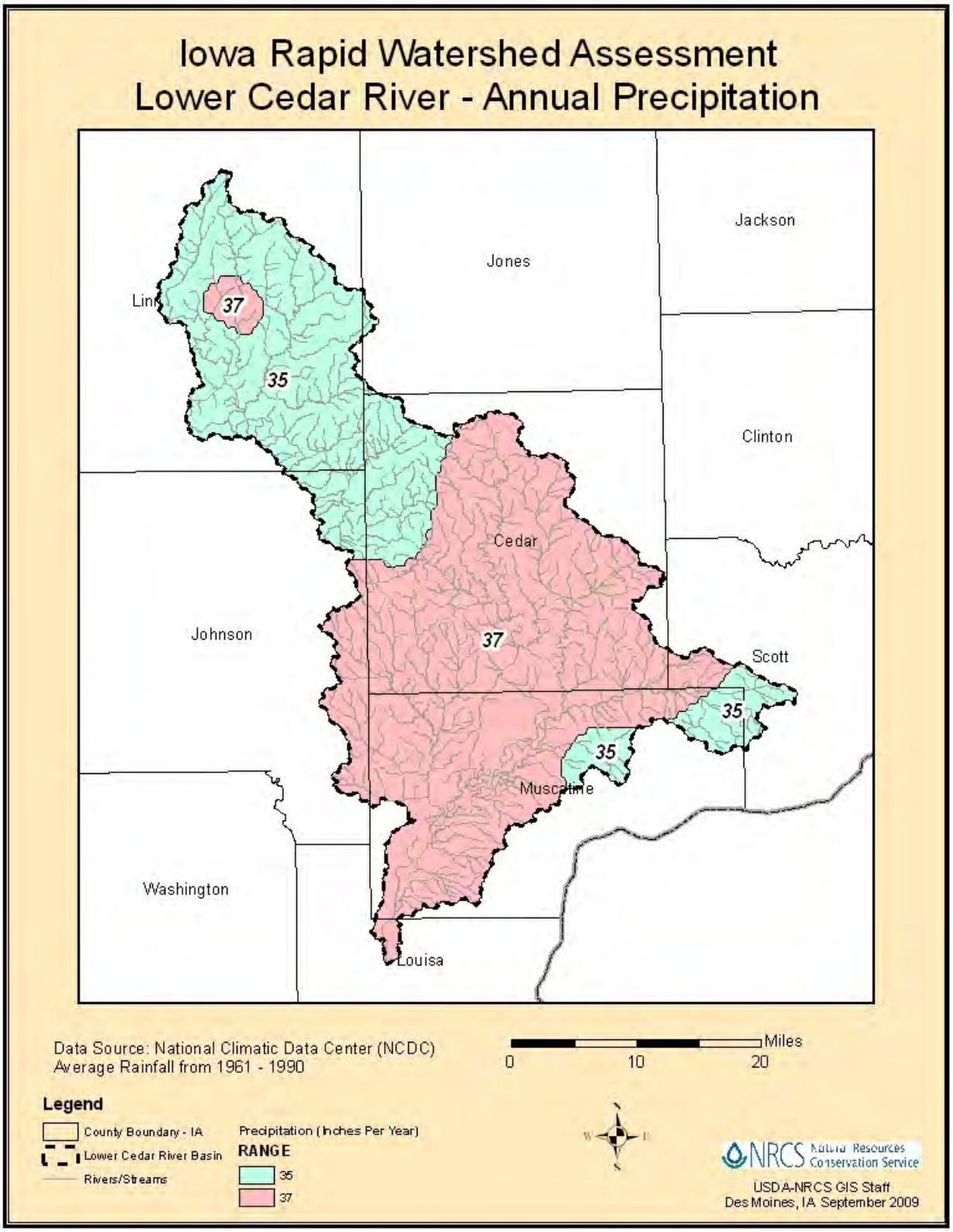


LCC	No. of Map Units	Acres	Percent
1	6,131	78,608	11.2%
2e	12,265	182,376	25.9%
2s	1,237	12,405	1.8%
2w	5,977	140,680	20.0%
3e	12,938	149,965	21.3%
3s	735	6,571	0.9%
3w	1,936	18,237	2.6%
4e	2,254	22,691	3.2%
4s	2,169	20,813	3.0%
5w	437	18,140	2.6%
6e	1,654	22,426	3.2%
6s	860	8,588	1.2%
7e	214	2,983	0.4%
7s	539	6,701	1.0%
7w	11	36	0.0%
8s	7	227	0.0%
Misc	1,071	10,622	1.5%
NC	1	999	0.1%

* Misc - Includes Water, Pits, Lagoons, Quarries and Orthents, Loamy type soil
NC - Not Compiled

Physical Description (continued)



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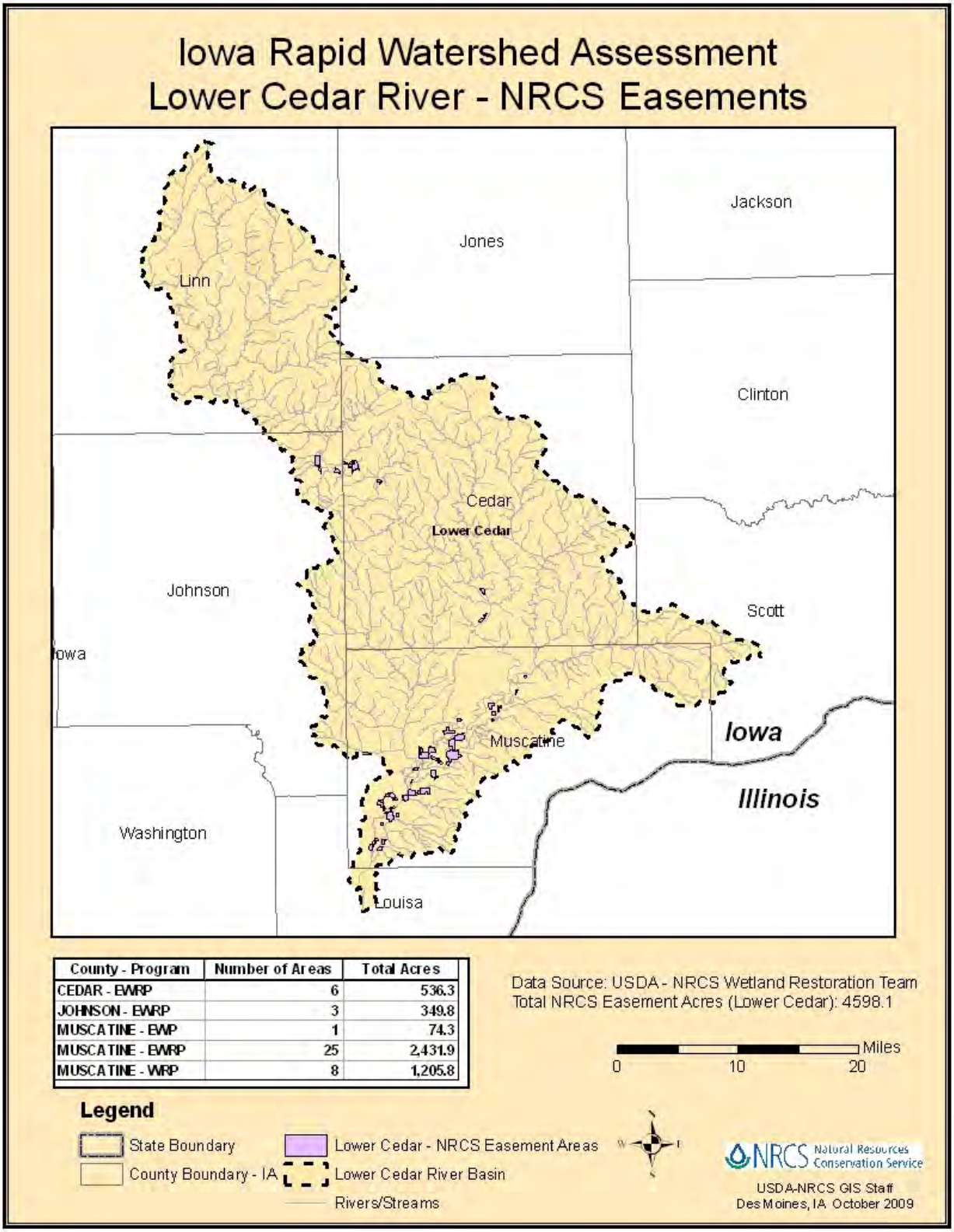
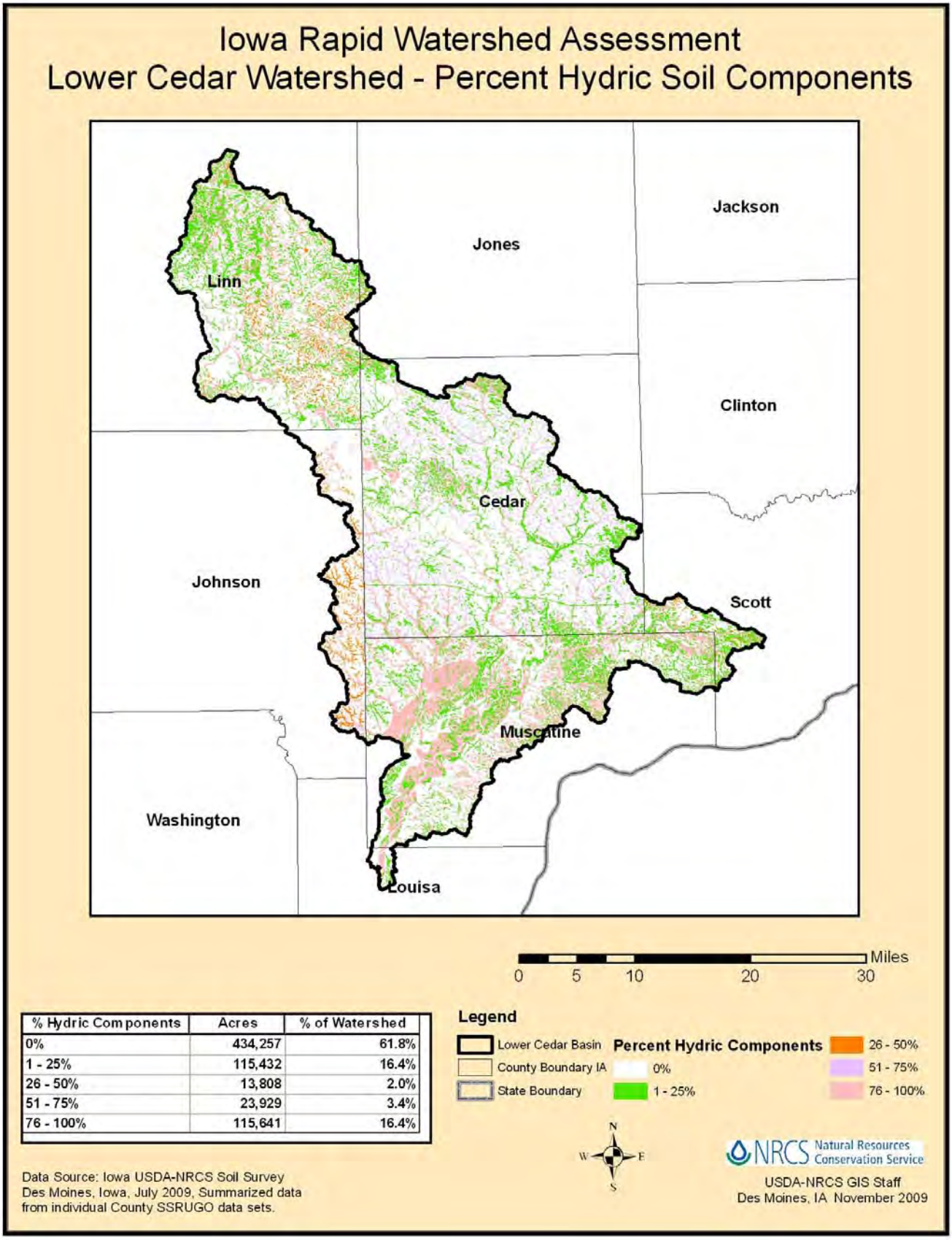


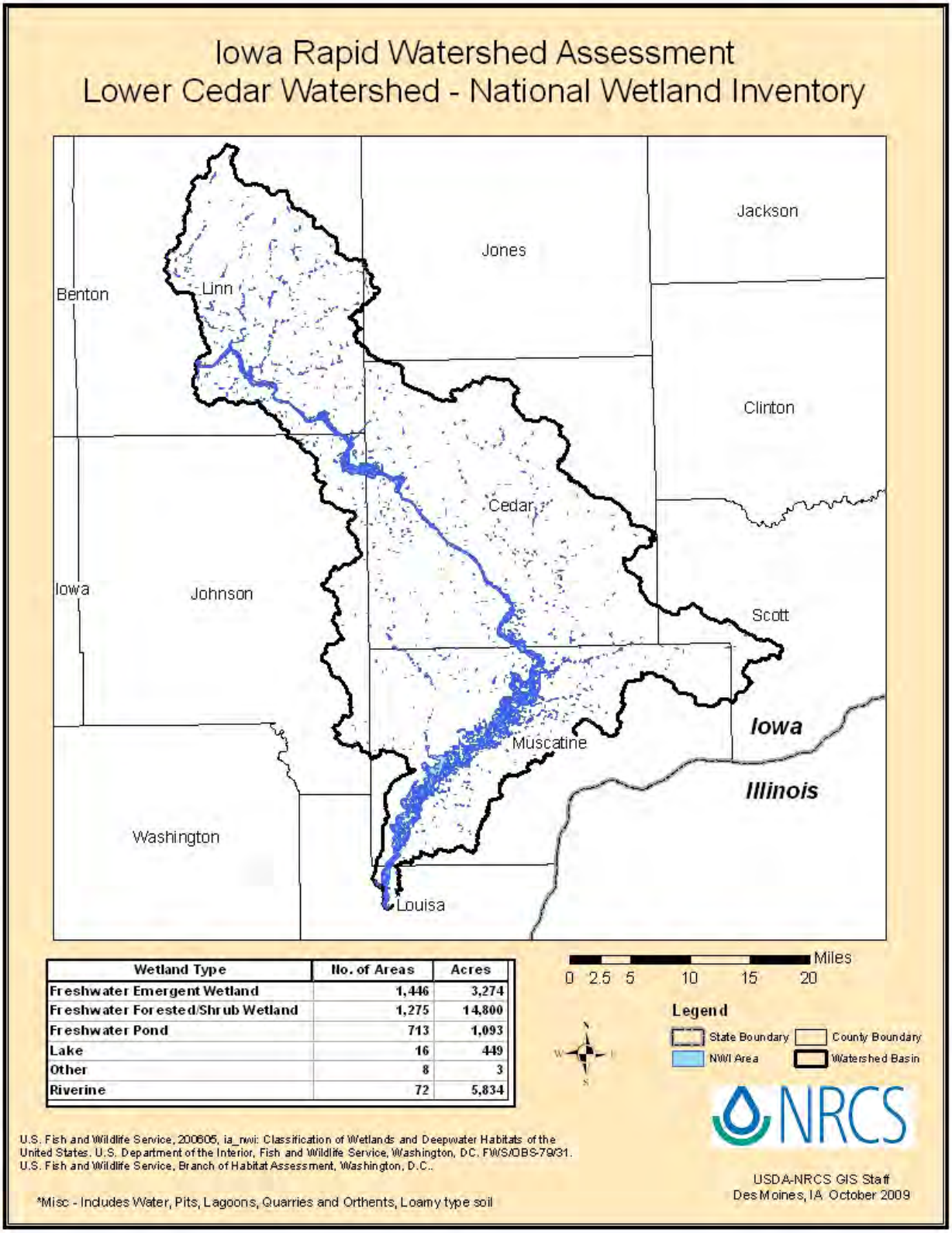
County - Program	Number of Areas	Total Acres
CEDAR - EWRP	6	536.3
JOHNSON - EWRP	3	349.8
MUSCATINE - EWP	1	74.3
MUSCATINE - EWRP	25	2,431.9
MUSCATINE - WRP	8	1,205.8

Physical Description (continued)



% Hydric Components	Acres	% of Watershed
0%	434,257	61.8%
1 - 25%	115,432	16.4%
26 - 50%	13,808	2.0%
51 - 75%	23,929	3.4%
76 - 100%	115,641	16.4%

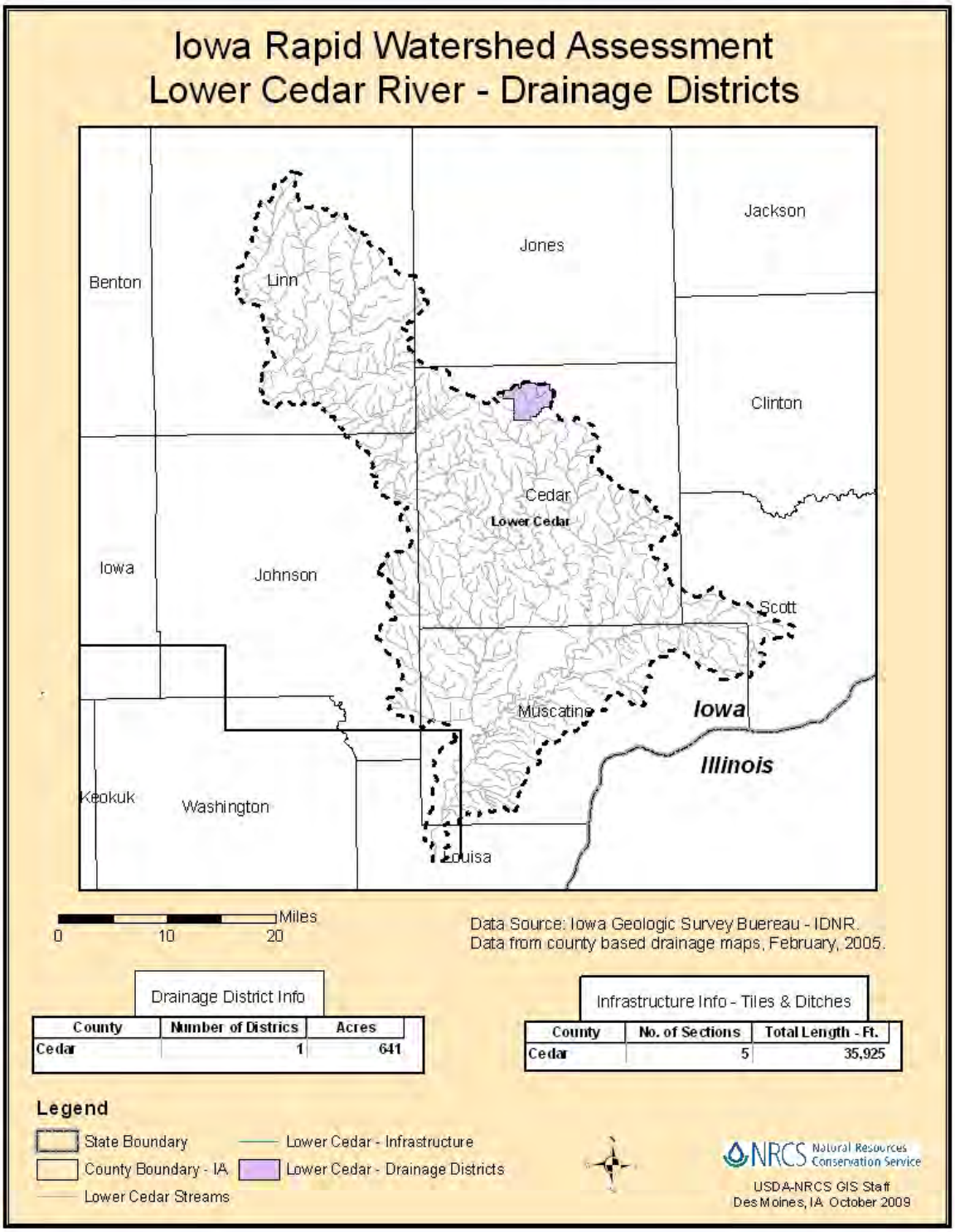
Physical Description (continued)



Wetland Type	No. of Areas	Acres
Freshwater Emergent Wetland	1,446	3,274
Freshwater Forested/Shrub Wetland	1,275	14,800
Freshwater Pond	713	1,093
Lake	16	449
Other	8	3
Riverine	72	5,834

Physical Description (continued)

There is one drainage district in the Lower Cedar River HUC, located in northern Cedar County. *(10)*

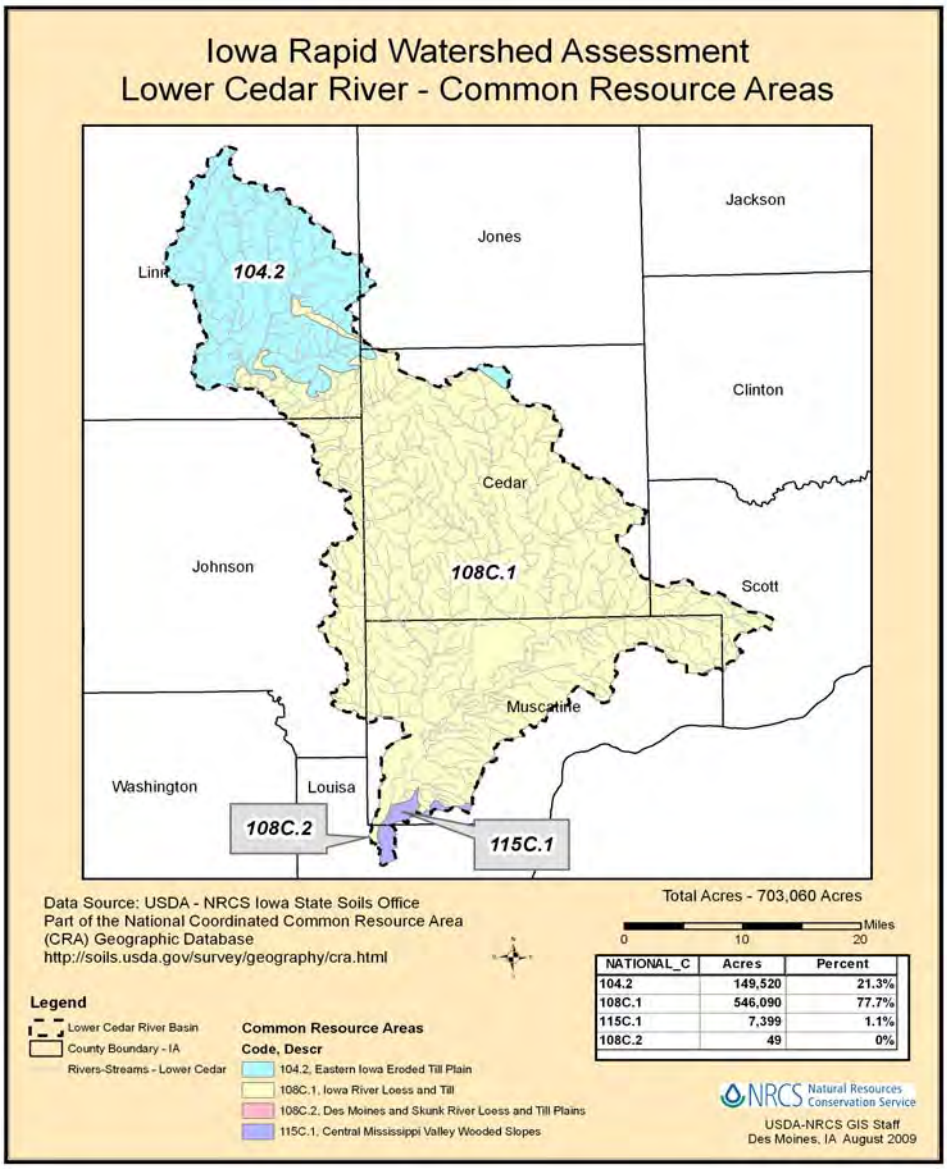


Physical Description (continued)

Common Resource Areas

The Lower Cedar River HUC includes portions of four National Common Resource Areas (CRA): 104.2; 108C.1; 108C.2; and 115C.1. Seventy-eight percent of the watershed is in CRA 1008C.1, 21 percent in 104.2, and the remainder in 115C.1 and 108C.2 (*13, 14*).

The CRAs delineated below for the Lower Cedar River HUC are described in the next section (for additional information, see ftp://ftp-fc.sc.egov.usda.gov/NSSC/CRA/national_cra_legend_v1.2_011604.xls). A CRA is defined as a geographical area where resource concerns, problems, or treatment needs are similar. It is considered a subdivision of an existing Major Land Resource Area (MLRA) map delineation or polygon. Landscape conditions, soil, climate, human considerations, and other natural resource information are used to determine the geographic boundaries of a CRA (General Manual Title 450, Subpart C, §401.21) (*13, 14*).



NATIONAL_C	Acres	Percent
104.2	149,520	21.3%
108C.1	546,090	77.7%
115C.1	7,399	1.1%
108C.2	49	0%

Common Resource Area Descriptions (*13, 14*)

The National Coordinated CRA Geographic Database provides:

- A consistent CRA geographic database;
- CRA geographic data compatible with other GIS data digitized from 1:250,000 scale maps, such as land use/land cover, political boundaries, Digital General Soil Map of the U.S. (updated STATSGO), and ecoregion boundaries;
- A consistent (correlated) geographic index for Conservation Management Guide Sheet information and the eFOTG;
- A geographic linkage with the national MLRA framework.

104.2 – Eastern Iowa Eroded Till Plain

This area is made up of broad upland, nearly level to moderately sloping, moderately well drained to poorly drained soils that formed in silty/loamy material over glacial till. Many low gradient drainage ways are common in this unit. Native vegetation was mostly prairie with timber and brush in valleys and steeper side slopes. Corn and soybeans are common crops with many swine and poultry production facilities. Resource concerns are soil erosion, water quality and nutrient management.

108C.1 – Iowa River Loess and Till

This area consists of silty soils on ridge tops and highly dissected side slopes with drainage ways and streams. Glacial till soils dominate the steeper side slopes. Native vegetation was prairie on the ride tops with thin bands of timber in the valleys and ravines. Common crops are corn and soybeans with some hay. Swine and poultry operations are numerous. Resource concerns are soil erosion, soil quality, nutrient management, water quality and wildlife habitat.

108C.2 – Des Moines and Skunk River Loess and Till Plains

This area consists of gently sloping to steep, silty soils on connected ridge tops and highly dissected side slopes with drainage ways and streams. Glacial till soils dominate the steeper side slopes with paleosols occurring on shoulder slopes that cause side-hill seeps. Native vegetation was mixed prairie with deciduous forest on steeper slopes. Common crops are corn and soybeans with some forage crops. Resource concerns are soil erosion, soil quality, water quality, and nutrient management.

115C.1 – Central Mississippi Valley Wooded Slopes

Mississippi and lower Illinois River valleys and adjacent slopes. Low areas consist of the nearly level flood plains and terraces. The Corps of Engineers maintains a levee along the Mississippi River. Adjacent uplands consist of loess hills with moderately steep to very steep side slopes and narrow to moderately wide gently sloping to moderately sloping ridgetops.

Low areas are composed of poorly drained to well drained silty, clayey and loamy alluvial and outwash deposits. Corn and soybeans are the major crops. Upland areas consist of well drained to somewhat poorly drained light colored soils. Hardwood forest dominate the upland side slopes. Livestock and grain farming are dominant in the less sloping upland areas. Urban growth is evident in the area around the Quad Cities.

Physical Description (continued)

Geology

This watershed is drained by the Cedar River and its tributaries, Indian Creek, Big Creek, Pleasant Run Creek, Spring Creek, Clear Creek, Mill Creek, Coon Creek, Gower Creek, Nicholson Creek, Rock Run Creek, Rock Creek, Pee Dee Creek, Crooked Creek, Sugar Creek, Pike Run Creek, Wapsinonoc Creek, Crane Creek, and Pike Creek. Soils and landforms of the watershed formed in deposits laid down by ice, water, and wind during the Pleistocene and Holocene Epochs. Beneath the unconsolidated deposits is Paleozoic bedrock—predominantly Silurian and Devonian carbonates. Bedrock is rarely exposed except in quarries and in localized instances where stream downcutting has eroded the overlying Quaternary sediments.

The landscape of the Lower Cedar RWA area encompasses three distinct landform regions: the Iowan Surface landform region (southwest Linn and northern Cedar counties); the Southern Iowa Drift Plain landform region (eastern Johnson, central Cedar, and northwestern Muscatine counties), and the Mississippi Alluvial Plain landform region (western Muscatine and portions of southern Cedar counties). Topography of the Iowan Surface consists primarily of gently sloping till plain dissected by narrow and shallow stream valleys. The Southern Iowa Drift Plain landform region consists of a landscape of steeply rolling loess hills and integrated drainage networks.

The upper half of the watershed in Linn and Northern Cedar counties lies in a transitional area where the erosional Iowan Surface intersects with the Southern Iowa Drift Plain. The Iowan Surface is a multi-leveled erosional surface developed on and cut into Pre-Illinoian till as a result of the intense periglacial conditions and strong winds during a more recent (Wisconsinan) period of glaciation. The erosion left behind a lag deposit called a “stone line,” which is covered by loamy sediments of variable thickness. Loess mantles the till on isolated topographic highs (paha ridges) that survived the widespread erosion. The portion of the watershed contained in the Southern Iowa Drift Plain landform region consists of Pre-Illinoian till and Pleistocene loess that was largely unaffected by the Wisconsinan erosion. Devonian carbonate outcroppings are locally present, typically within stream valley walls that have cut down into the older formations.

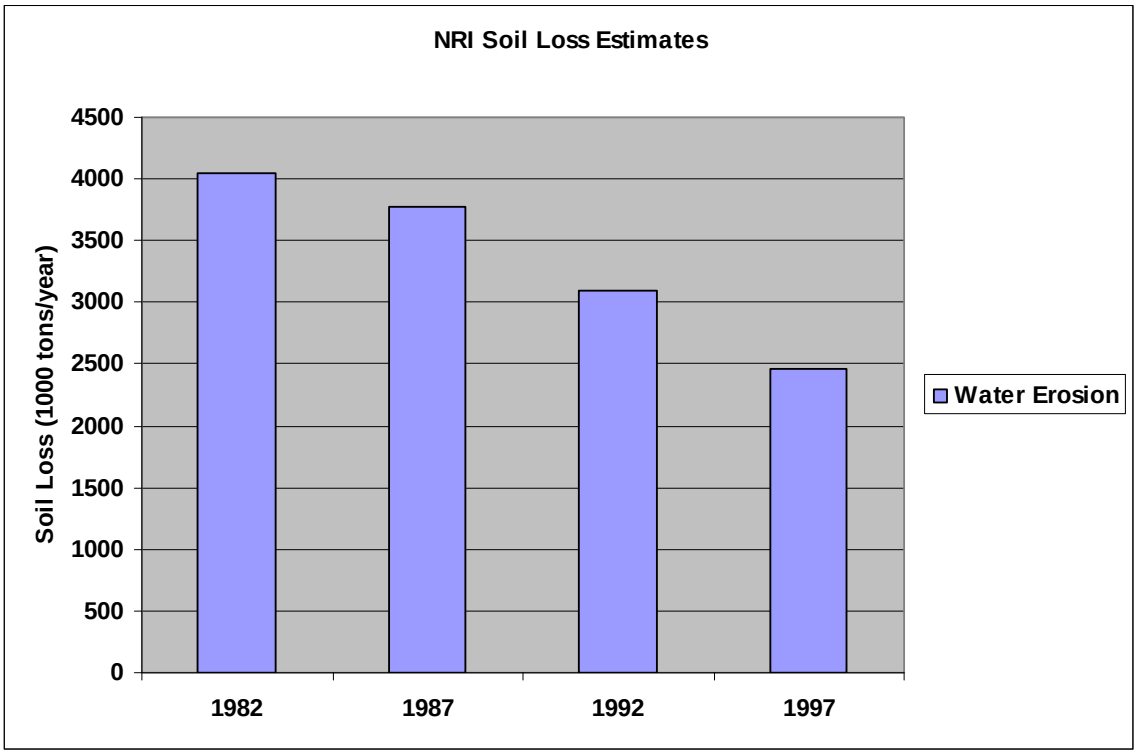
Soils throughout the watershed consist primarily of variable loams (sandy loam, sandy clay loam, clay loam, silty clay loam, and silt loam). These soils formed primarily from loess or loess over shallow glacial till on the stream terraces and uplands, but are also derived from alluvial deposits in the stream valleys. Drainage class of the soils ranges from poorly-drained to well-drained and is largely dependent on landscape position. *(31)*

Physical Description (continued)

Soil Loss

Water erosion (sheet and rill) from cropland accounts for nearly 90 percent of Iowa's soil erosion. In Iowa, there has been a steady decline in sheet and rill erosion from 1982 to 1997, but on average soil erosion remains above the sustainable levels. In order to maintain sustainable levels of soil stability, soil erosion should not exceed 5 tons/acre/year (*22*).

National Resource Inventory (NRI) estimates for sheet and rill erosion by water on cropland and pastureland decreased by approximately 1584.9 tons (39 percent) of soil loss between 1982 and 1997. Wind erosion data is not included for the Lower Cedar River watershed because the data was not collected in these counties in 1982, 1987, 1992, and 1997.



Water Quality

Under Section 303(d) of the Clean Water Act, states are required from "time to time" to submit a list of waters for which effluent limits will not be sufficient to meet all state water quality standards. EPA has defined "time to time" to mean April 1 of even numbered years. The failure to meet water quality standards might be due to an individual pollutant, multiple pollutants, "pollution," or an unknown cause of impairment. The 303(d) listing process includes waters impaired by point sources and nonpoint sources of pollutants. States must also establish a priority ranking for the listed waters, taking into account the severity of pollution and uses. The EPA regulations that govern 303(d) listing can be found in the Code of Federal Regulations 40 CFR 130.7.

The Iowa Department of Natural Resources compiles this impaired water list, or 303(d) listing. The 303(d) listing is composed of those lakes, wetlands, streams, rivers, and portions of rivers that do not meet all state water quality standards. These are considered "impaired water bodies" and states are required to calculate total maximum daily loads (TMDLs) for pollutants causing impairments *(15)*.

Bacteria, nutrients, biological pollutants and their affects are the major pollutants impacting surface waters of the Lower Cedar River Watershed. Surface waters, especially lakes and ponds, have a repeated history of algal blooms. A variety of human activities contribute directly to pollutant loads in the water bodies, including intensive row crop agriculture; urban storm run off; failing septic systems; and Confined Animal Feeding Operations (CAFOs). The change in hydrology due to stream channel straightening, subsurface drainage systems, wetland destruction, and lack of perennial groundcover has resulted in flashy stream flows, thus contributing to stream down cutting and increased stream bank instability.

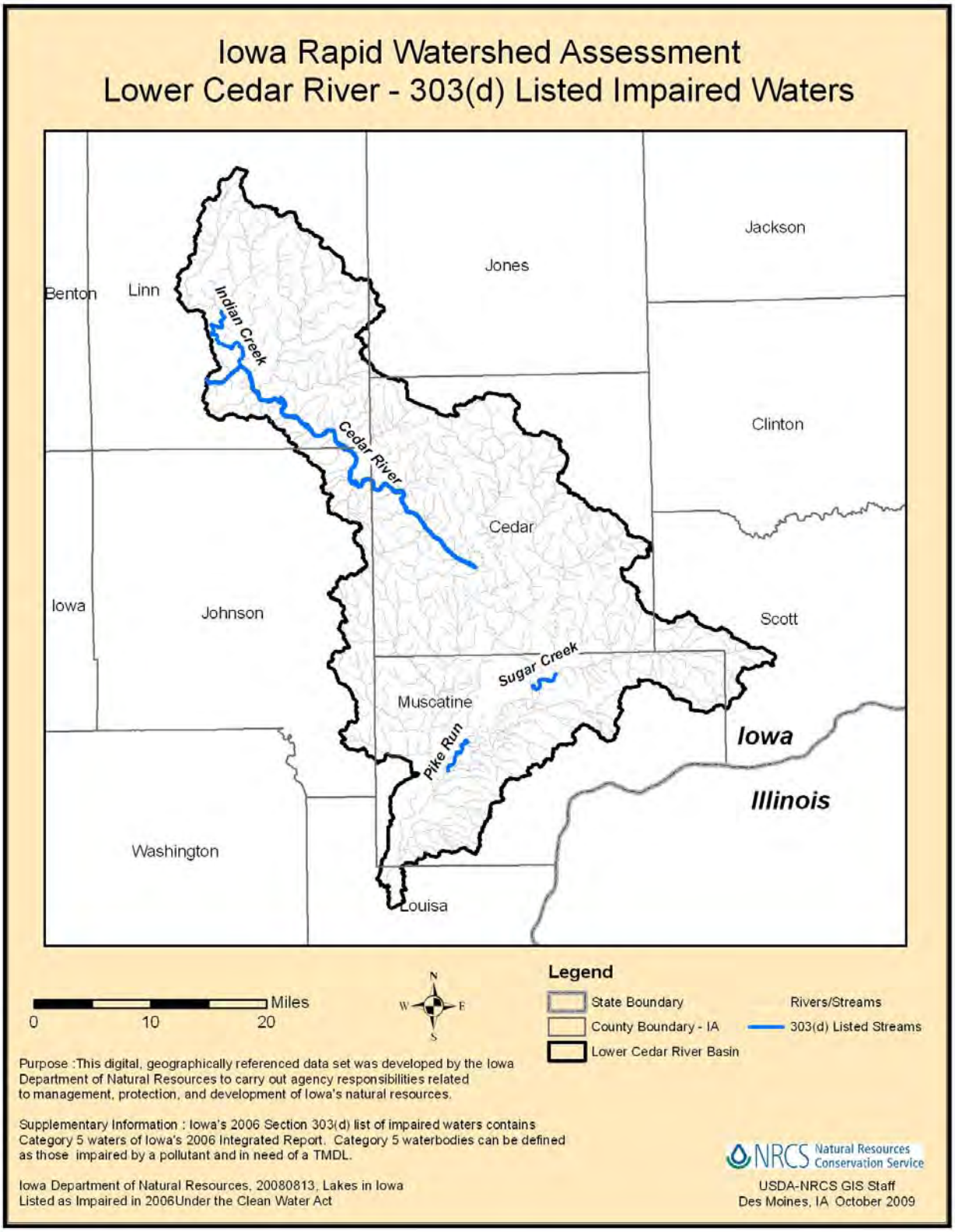
Conservation practices that can be used to address these water quality issues include erosion control structures, residue management, nutrient management, riparian buffers, drainage control structures, wetland restoration, urban Best Management Practices (BMPs), and improved septic systems *(24)*.

For more information on water quality and the Iowa Department of Natural Resources (IDNR) Water Quality Index, go to the following website: http://www.igsb.uiowa.edu/wqm/wqi/wqi.asp.

For more information on water quality and IDNR's Regional Watershed Assessment Tool go to the following website: http://programs.iowadnr.gov/iowawaterweb/rwa.aspx

This assessment tool should be beneficial to watershed stakeholders who are interested in improving water resources at the watershed scale. The first DNR regional watershed assessment covers nutrients. Assessments of other issue areas will follow as they are developed. Note that the text for each HUC-8 assessment is the same, but the data, charts, and maps provided are specific to the individual watershed. For locating the watershed on the website type the watershed name in the "For" box and click on Go.
This website is a work in progress so not all watersheds and issue areas are completed yet.

Water Quality (continued)



Water Quality (continued)

Water Quality Concerns Data Graph/Table (*23, 36*)

Impaired Water Bodies	Biological	Bacteria	Organic Enrichment	PCBs	Fish Kill
Pike Run (CED-0157_1)	X				
Sugar Creek (CED-0170_1)	X				
Unnamed Tributary West Branch Wapsinonoc Creek (aka Hoover Creek) (CED-01545_0)		X			
Cedar Bend Lake (CED-00210-L_0)				X	
Cedar Lake (CED-02250-L_0)				X	
Cedar River (CED-0020_2)	X	X			
Cedar River (CED-0020_3)		X			
Cedar River (CED-0030_1 and 0030_2)		X			
Dry Creek (CED-0217_0)		X			
Indian Creek (CED-0210_1)	X	X			
Indian Creek (CED-0210_2)		X			
McCloud Run (CED-0218_0)					X
Mud Creek (CED-0160_0)	X		X		

Impaired and TMDL Needed

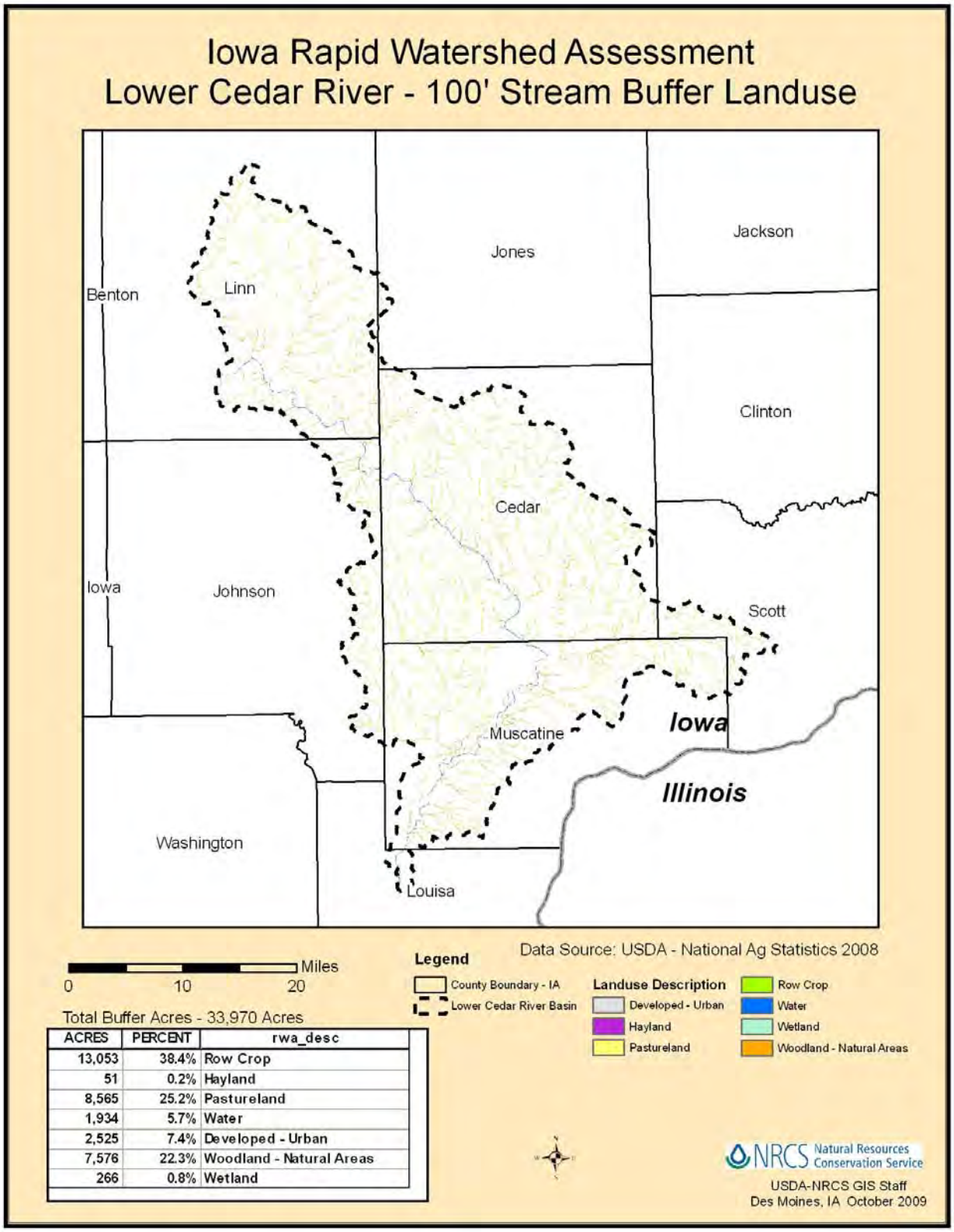
Impaired, TMDL Complete & Approved

Water Quality (continued)

Watershed Projects, Plans, Studies, and Assessments *	
(36, 37)	
Iowa Watershed Improvement Review Board (WIRB) Projects	**IDNR TMDLs**
None	**Mud Creek** , Muscatine County
	IDNR 319 Projects
	Mud Creek, Muscatine County

***** Listing includes past efforts in the watershed, and ongoing studies and assessments.

Water Quality (continued)



Total Buffer Acres - 33,970 Acres

ACRES	PERCENT	rwa_desc
13,053	38.4%	Row Crop
51	0.2%	Hayland
8,565	25.2%	Pastureland
1,934	5.7%	Water
2,525	7.4%	Developed - Urban
7,576	22.3%	Woodland - Natural Areas
266	0.8%	Wetland

Threatened and Endangered Species *(21)*

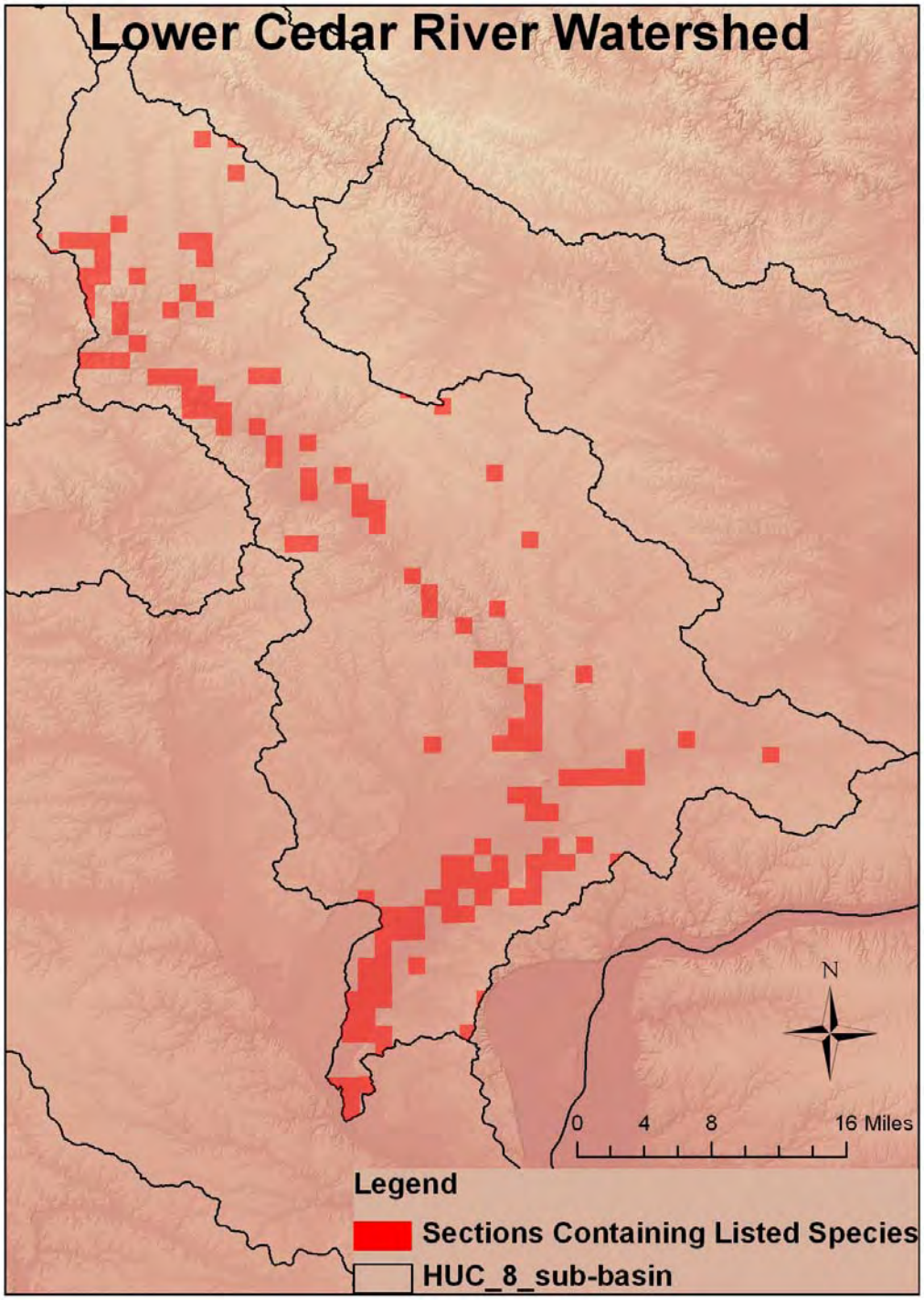
	SPECIES	Status	
		State	Federal
Animals	Lake Sturgeon (Acipenser fulvescens)	E	
	Western Sand Darter (Ammocrypta clara)	T	
	Pirate Perch (Aphredoderus sayanus)	S	
	Red-shouldered Hawk (Buteo lineatus)	E	
	Purple Wartyback (Cyclonaias tuberculata)	T	
	Blanding's Turtle (Emydoidea blandingii)	T	
	Grass Pickerel (Esox americanus)	T	
	Bluntnose Darter (Etheostoma chlorosoma)	E	
	Least Darter (Etheostoma microperca)	E	
	Orangethroat Darter (Etheostoma spectabile)	T	
	Baltimore (Euphydryas phaeton)	T	
	Bald Eagle (Haliaeetus leucocephalus)	E	
	Yellow Mud Turtle (Kinosternon flavescens)	E	
	Yellow Sandshell (Lampsilis teres)	E	
	Smooth Green Snake (Liochlorophis vernalis)	S	
	Central Newt (Notophthalmus viridescens)	T	
	Blacknose Shiner (Notropis heterolepis)	T	
	Weed Shiner (Notropis texanus)	E	
	Freckled Madtom (Noturus nocturnus)	E	
	Bullsnake (Pituophis catenifer sayi)	S	
	Massasauga Rattlesnake (Sisturus catenatus)	E	
	Common Musk Turtle (Sternotherus odoratus)	T	
	Ornate Box Turtle (Terrapene ornate)	T	
	Pistolgrip (Tritogonia verrucosa)	E	
	Barn Owl (Tyto alba)	E	
	Bluff Vertigo (Vertigo meramecensis)	E	

	SPECIES	Status	
		State	Federal
Plants	Slender Copperleaf (Acalypha graciens)	S	
	Pale False Foxglove (Agalinis skinneriana)	E	
	Pearly Everlasting (Anaphalis margaritacea)	S	
	Lake Cress (Armoracia aquatica)	S	
	Wooly Milkweed (Asclepias lanuginose)	T	
	Forked Aster (Aster furcatus)	T	
	Flax-leaved Aster (Aster linariifolius)	T	
	Schreber's Aster (Aster schreberi)	E	
	Bent Milk-vetch (Astragalus distortus)	S	
	Kitten Tails (Bessya bullii)	T	
	Sweet Indian Plantain (Cacalia suaveolens)	T	
	Water Starwort (Callitriche heterophylla)	S	
	Grass Pink (Calopogon tuberosus)	S	
	Glomerate Sedge (Carex aggregate)	S	
	Field Sedge (Carex conoidea)	S	
	Fringed Sedge (Carex crinita)	S	
	Shallow Sedge (Carex lurida)	S	
	Richardson Sedge (Carex richardsonii)	S	
	Slender Sedge (Carex tenera)	S	
	Hill's Thistle (Cirsium hillii)	S	
	Slender Dayflower (Commelina erecta)	T	
	Golden Corydalis (Corydalis aurea)	T	
	Hawthorn (Crataegus coccinea)	S	
	Small White Lady's Slipper (Cypripedium candidum)	S	
	Showy Lady's Slipper (Cypripedium reginae)	T	
	Slim-leaved Panic Grass (Dichanthelium linearifolium)	T	
	Rough Buttonweed (Diodia teres)	S	
	Wolf Spike-rush (Eleocharis wolfii)	S	
	Tall Cotton Grass (Eriophorum angustifolium)	S	
	Queen-of-the-prairie (Filipendula rubra)	T	

	SPECIES	Status	
		State	Federal
Plants	Slender Fimbry (Fimbristylis autumnalis)	S	
	Black Huckleberry (Gaylussacia baccata)	T	
	Spring Avens (Geum vernum)	S	
	Blue Mud-plantain (Heteranthera limosa)	S	
	Grassleaf Rush (Juncus marginatus)	S	
	Dwarf Dandelion (Krigia virginica)	E	
	Cliff Conobea (Leucospora multifida)	E	
	Buckbean (Menyanthes trifoliate)	T	
	Yellow Monkey Flower (Mimulus glabratus)	T	
	Northern Adder's-tongue (Ophioglossum pusillum)	S	
	Cinnamon Fern (Osmunda cinnamomea)	E	
	Royal Fern (Osmunda regalis)	T	
	Green Arrow Arum (Peltandra virginica)	E	
	Cleft Phlox (Phlox bifida)	S	
	Small Green Woodland Orchid (Platanthera clavellata)	S	
	Tubercled Orchid (Platanthera flava)	E	
	Eastern Prairie Fringed Orchid (Platanthera leucophaea)	E	T
	Purple Fringed Orchid (Platanthera psycodes)	T	
	James Cristatella (Polanisia jamesii)	E	
	Crossleaf Milkwort (Polygala cruciata)	E	
	Pink Milkwort (Polygala incarnate)	T	
	Large-leaf Pondweed (Potamogeton amplifolius)	S	
	Nuttall Pondweed (Potamogeton epihydrus)	S	
	Marsh Mermaid-weed (Proserpinaca palustris)	S	
	Meadow Beauty (Rhexia virginica)	T	
	Toothcup (Rotala ramosior)	S	
	Sage Willow (Salix candida)	S	
	Low Nut Rush (Scleria verticillata)	T	
	Wood Stonecrop (Sedum ternatum)	E	
	Meadow Spikemoss (Selaginella eclipse)	E	

	SPECIES	Status	
		State	Federal
Plants	Ledge Spikemoss (Selaginella rupestris)	S	
	Roundleaf Goldenrod (Solidago patula)	E	
	Slender Ladies'-tresses (Spiranthes lacera)	T	
	Great Plains Ladies'-tresses (Spiranthes magnicamporum)	S	
	Oval Ladies'-tresses (Spiranthes ovalis)	T	
	Earleaf Foxglove (Tomanthera auriculata)	S	
	Lance-leaved Violet (Viola lanceolata)	S	
	Violet (Viola macloskey)	S	
	Yellow-eyed Grass (Xyris torta)	E	
	E = Endangered Species T = Threatened Species S = Candidate/Species of Concern		

Threatened and Endangered Species

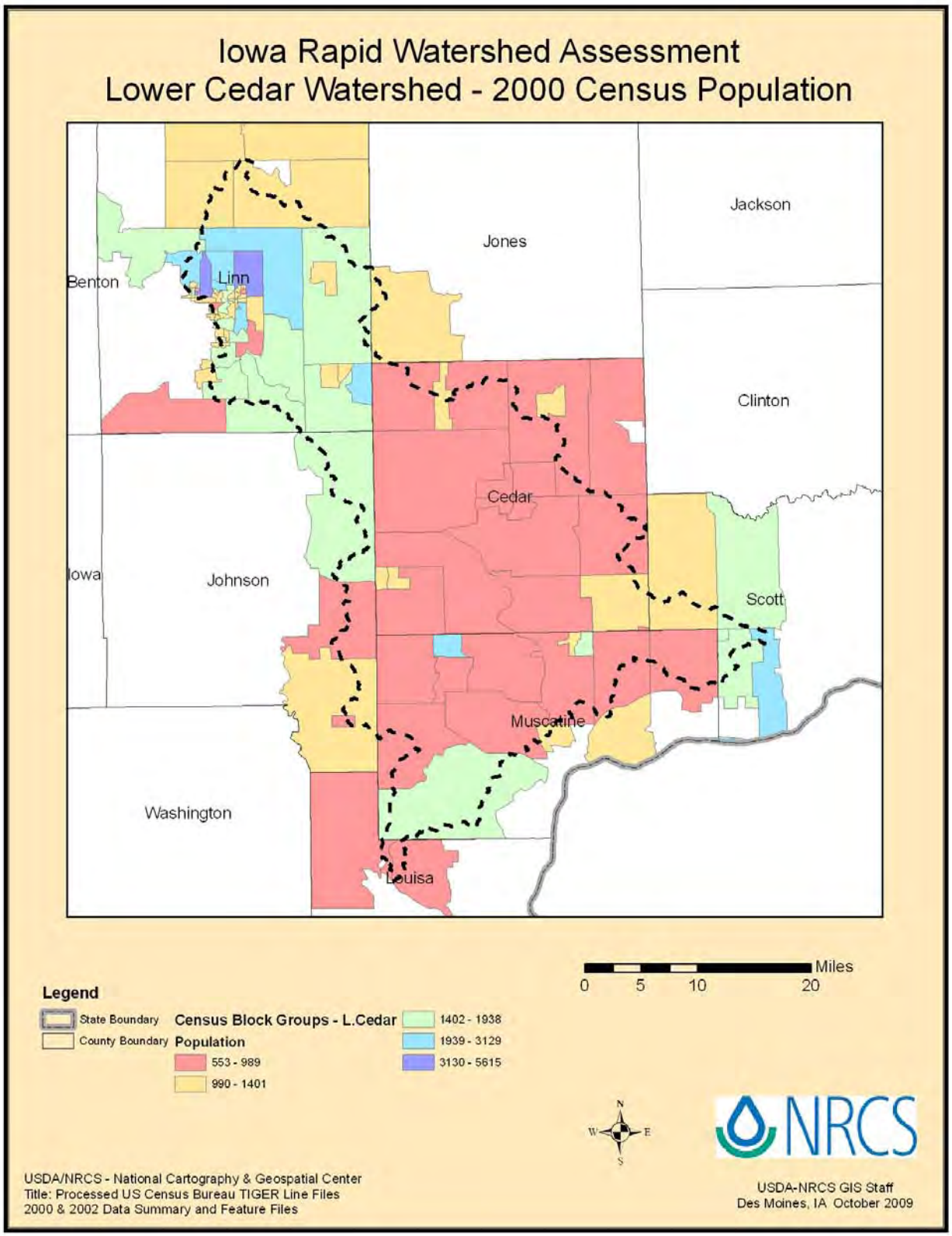


Census and Social Data

There are 2,994 total farm operators in the watershed. Of these, 2,233 are male and 760 are female. Eighty percent of the operators in the watershed are full time farmers (27).

There are 2,049 farms in the Lower Cedar River Watershed with farm size ranging from one acre to over 1,000 acres. Size of farms: 9 percent are 1-9 acres; 22 percent are 10-49 acres; 28 percent are 50-179 acres; 24 percent are 180-499 acres; 10 percent are 500-999 acres; and 7 percent are over 1,000 acres. The Census of Agriculture is authorized under Public Law (PL) 105-113 and uses the definition of a farm as any place from which $1,000 or more of agricultural products are produced and sold, or normally would have been sold, during the census year (*27*).

Census and Social Data (continued)



Census and Social Data (continued)

Total Farms By Size Per County
Lower Cedar Watershed

COUNTY	Acres	% Co. In Wtshd	1 - 10 Acres	10 - 50 Acres	50 - 179 Acres	180 - 499 Acres	500 - 999 Acres	> 1000 Acres	Total Farms
CEDAR	279,870	0.40%	74	162	177	208	92	67	780
JOHNSON	46,927	0.07%	8	37	56	30	15	7	153
JONES	1,988	0.00%	1	1	1	1	1	0	5
LINN	168,939	0.24%	51	128	150	114	47	24	514
LOUISA	3,578	0.00%	1	2	3	2	1	1	10
MUSCATINE	184,137	0.26%	38	117	169	129	51	32	536
SCOTT	17,618	0.03%	7	10	13	12	6	3	51
	703,057	100%	180	457	569	496	213	134	2,049

Data Source: 2007 National Ag Statistics
County numbers obtained by correlating the percent county which lies within the watershed to determine an estimated number (shown in table).

G:\geodata\project_data\nrcs\Rapid_Watershed_Assessment\LCedar\Tables\lced_farmOp_PTable.dbf

USDA-NASS Quickstats Query
Weblink - http://quickstats.nass.usda.gov/
Sector: Economics
Community: Farm Operations
Data Item: Farm Operations
Domain: Area Operated
Locale: County State: Iowa Counties: Select All

Census and Social Data (continued)

NASS Farm Operators Per County
Lower Cedar Watershed

COUNTY	Acres In Watershed	% Co. In Wtshd	Operators	Female Op	Male Op	Part-Full Time Op	Full Time Op	Part Time Op
Scott	17,618	2.50%	77	20	57	80	58	22
Muscatine	184,137	26.20%	795	181	614	862	635	226
Louisa	3,578	0.50%	13	4	10	15	11	4
Linn	168,939	24.00%	742	194	547	831	605	226
Jones	1,988	0.30%	9	2	6	9	7	2
Johnson	46,927	6.70%	226	58	168	249	183	66
Cedar	279,870	39.80%	1,132	301	831	1,255	908	347
Total	703,057	100.00%	2,994	760	2,233	3,301	2,407	893

* Full Time Operators - On Farm Operators > 200 days per year

Data Source: 2007 National Ag Statistics
County numbers obtained by correlating the percent county which lies within the watershed to determine an estimated number (shown in table).

USDA-NASS Quickstats Query
Weblink - http://quickstats.nass.usda.gov/
Sector: Demographics
Community: Operators
Data Item: Operators (All), Operators - Female
Domain: Total
Locale: County State: Iowa Counties: Select All
Year: 2007

USDA-NASS Quickstats Query
Weblink - http://quickstats.nass.usda.gov/
Sector: Demographics
Community: Operators
Data Item: Operators, Principal
Domain: Primary Occupation
Locale: County State: Iowa Counties: Select All
Year: 2007

Resource Concerns

Resource Concerns by Land Use

Pasture (*16*)

Vegetation typically consists of introduced cool season forage. Predominant species are introduced cool season forages, including Kentucky Bluegrass and Smooth Bromegrass, with lesser amounts of Tall Fescue and Orchardgrass. Some introduced legumes are present, with White (Ladino) Clover being the most predominant. Some Red Clover, Birdsfoot Trefoil and Alfalfa are included in lesser amounts. Continuous overgrazing is common.

Typically soil erosion as a result of sheet and rill will be less than1 ton/acre/year. There is evidence of a small amount of gully erosion. Stream bank erosion may be significant because grazing animals typically have unlimited access to streams. In time, undesirable woody species may invade older pastures and decrease the productivity of the forage. Soil compaction on cattle paths and around watering sources can increase soil erosion and create a niche for undesirable plant species. Availability of a reliable watering source can be a hindrance to developing rotational grazing systems.

Hayland (*16*)

Hayland has been seeded to introduced species, including predominantly Smooth Bromegrass and Alfalfa. There also exists Orchardgrass and Red Clover, to a lesser extent. Erosion is not typically a problem on hayland. Nutrient and pest management are often under-utilized. Typically, three cuttings of hay are taken from May through early September.

Cropland (*17, 18, 19*)

Cropland is intensively used, primarily for corn and soybeans production, with a very small amount of oats and meadow as part of a rotation. Corn acres increased in recent years, compared to soybean acres, due to increased grain prices and ethanol plant development.

The average slope is 4.5 percent. Predominant resource concerns on cropland include soil erosion (sheet and rill, gully, and wind); soil compaction; soil eutrophication; weed infestation; and decrease in soil carbon. Over-application of nutrients (commercial and manure-based) and pesticides typically does not meet Iowa NRCS standards. In recent years, no-till systems on soybean acres have increased, although no-till on corn acres has decreased.

Natural Areas/Woodland (*20*)

Natural areas in Iowa consist mostly of poor quality woodlands, degraded meadow found mostly in odd areas along property corners, fence lines, or abandoned pastures. In many locations, these areas include steeper slopes than cropland and pasture. Vegetation includes a mix of native trees and shrubs with increasing undesirable populations of introduced and often noxious species of woody or non-woody plants. Predominant resource concerns include invasive species, classic gully erosion, habitat fragmentation, increasing homogeneity, and land use conversion to cropland.

Resource Concern Trends

Focus of Past 7 Years of Progress

Efforts in the past seven years have included: promotion of conservation tillage and no-till; promotion of Conservation Reserve Program (CRP) and contract extensions to protect sensitive lands; application of comprehensive nutrient management plans; pest management plans; and water monitoring through IOWATER (Iowa's volunteer water monitoring program).

Urban erosion has created increased natural resource concerns related to soil erosion and water quality. Focus on these issues, especially in areas of substantial development, has resulted in increased technical assistance in the urban arena.

On a statewide level, increase in ethanol plant manufacturing utilizes crop residues which adversely affects soil quality and increases soil erosion. This creates more of a need for increased conservation efforts.

Resource Concerns that Require Ongoing Attention

Technical assistance and attention will continue regarding soil erosion by water, especially on cropland. Ongoing efforts are needed to increase utilization of conservation tillage, no-till and contoured buffer strips. Educational activities are needed to promote extension of expiring CRP contracts.

In the Lower Cedar River Watershed, urban natural resource concerns will be an ongoing issue. Urban Best Management Practices (BMPs) will be implemented and increased education of developers, cities, and urban residents will continue *(28)*. Because the Lower Cedar River Watershed has experienced substantial flooding in recent years, public input ranks storm water management as the highest concern related to overall water management, with reducing risk and damages from flooding as the second highest concern *(29)*.

A resource concern that will draw increasing attention and need for technical assistance in the future is the topic of renewable energy systems, now a highlight of the current Farm Bill. This includes the need for alternative and renewable energy resources such as wind and geothermal systems.

In addition, there is increased interest and productivity in alternative agricultural opportunities including specialty and organic crop production, direct marketing opportunities, and non-traditional needs for technical assistance. *(25, 29)*

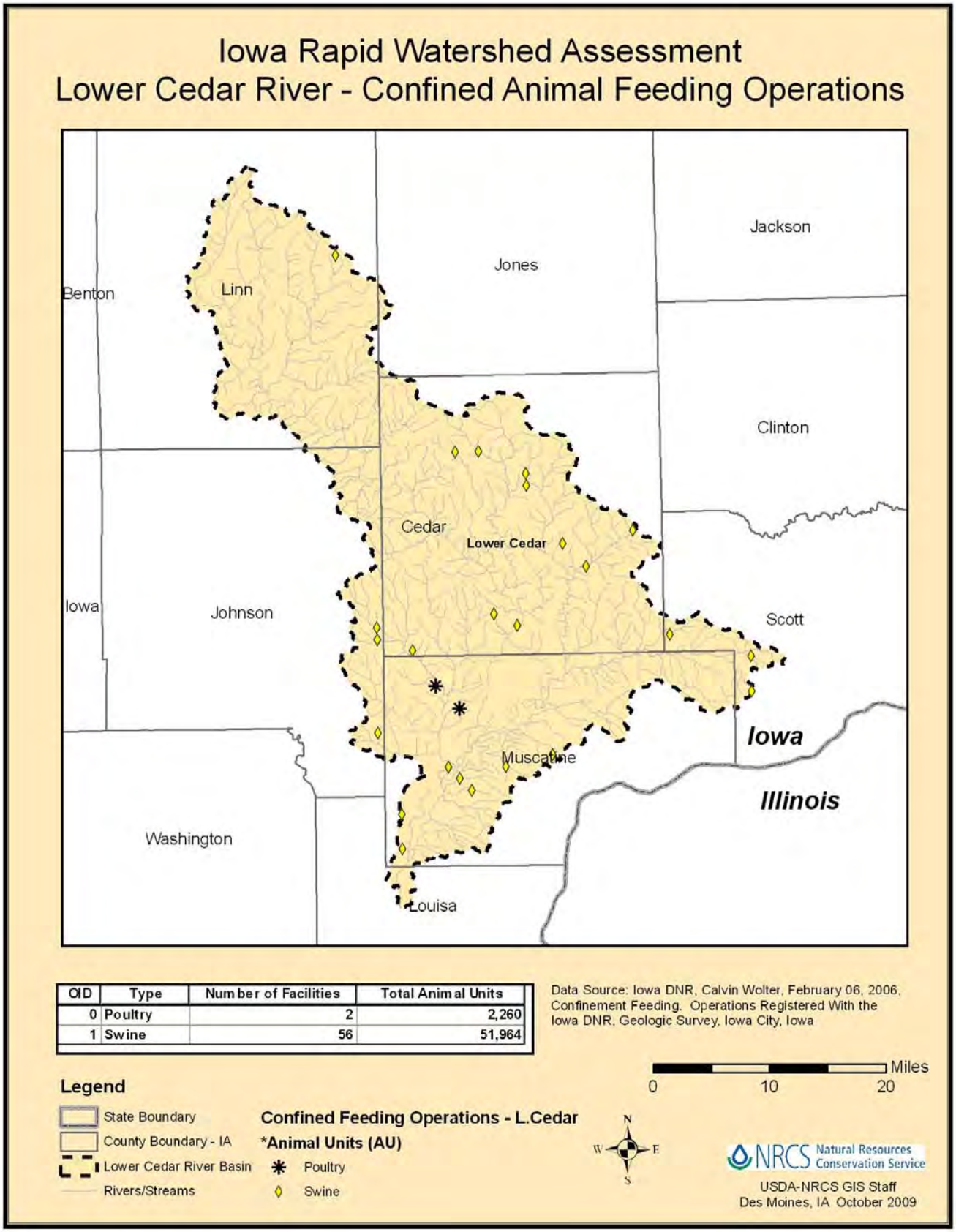
Underground storage tanks create resource issues due to storage of substances, primarily petroleum products (*30*).

Other concerns shown by customers that will be addressed in the future include the preservation, protection, and enhancement of natural areas, including rare plant and animal species. This will require species inventories and an educational campaign. Additionally, this provides opportunity for farm families to identify ways to generate revenue by offering the "family farm experience" because of the unique natural resources in the area. *(25, 28)*

Water quality concerns include cattle feedlots and pastures, especially with livestock grazing along streams. Grazing along streams also creates problems with stream bank stability and creates erosion, which is reduced when management restricts cattle access.

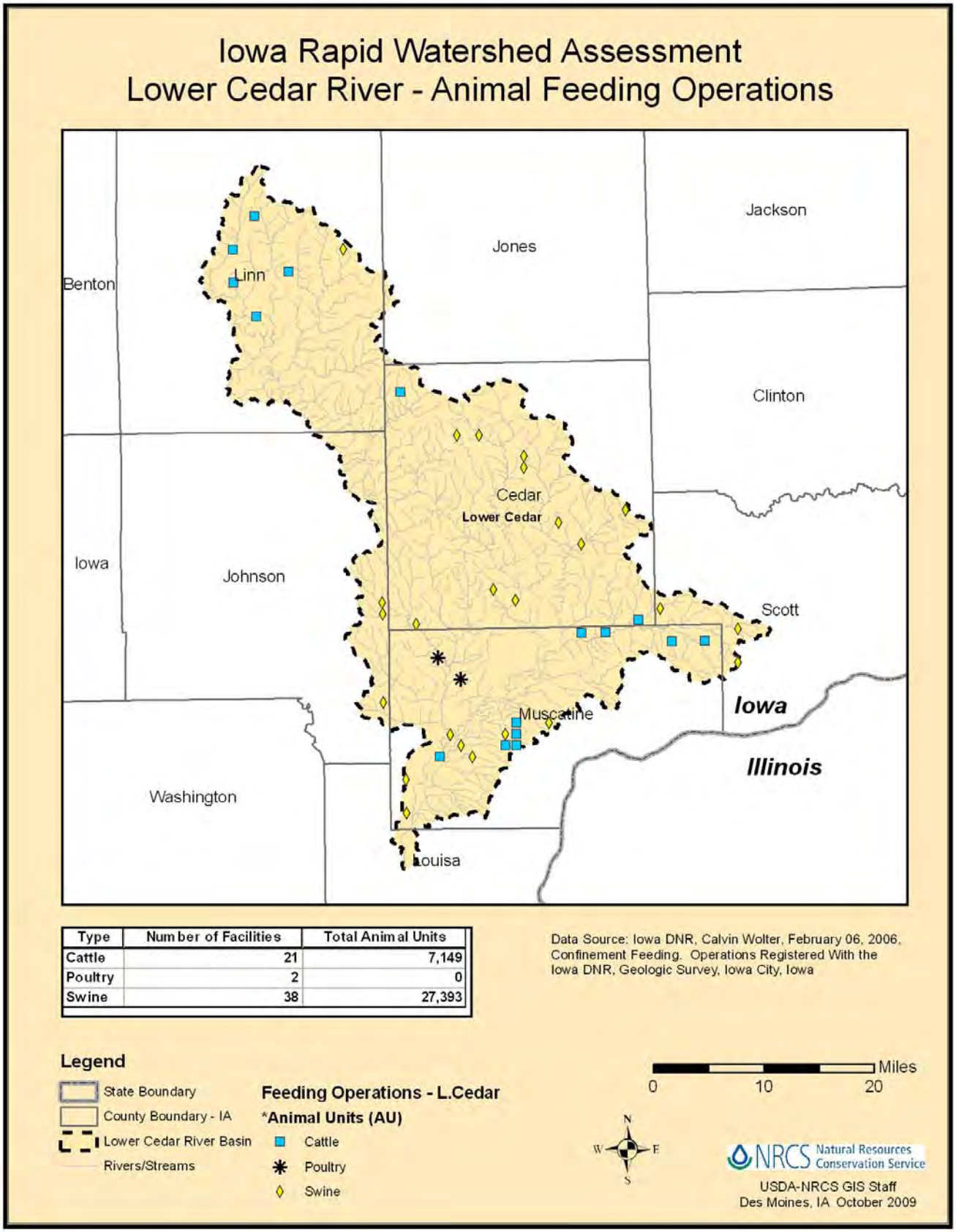
The primary natural resource concerns with animal feeding operations are water and air pollution. Manure contains the nutrients nitrogen and phosphorus, which, when not managed properly on agricultural land, can pollute nearby streams, lakes, and other waters. EPA's regulation of Animal Feeding Operations (AFO) and Confined Animal Feeding Operations (CAFO) provides pollution prevention and environmental protection, while maintaining the country's economic and agricultural competitiveness. (*32*) There are 58 CAFOs in the watershed, with a total of 54,224 animal units. Ninety-seven percent of the CAFOs are swine and 3 percent poultry. There are 61 AFOs in the watershed, with a total number of 34,542 animal units. Sixty-two percent of the AFOs are swine, 34 percent cattle, and almost 4 percent poultry (*33, 34*).

Resource Concerns (continued)



OID	Type	Number of Facilities	Total Animal Units
0	Poultry	2	2,260
1	Swine	56	51,964

Resource Concerns (continued)



Type	Number of Facilities	Total Animal Units
Cattle	21	7,149
Poultry	2	0
Swine	38	27,393

Resource Concerns Table

The table below lists the resource concerns and priorities of stakeholders and landowners in the watershed. The concerns were summarized from the Environmental Quality Incentive Program (EQIP) resource concerns developed in each county. *(26)*

Resource Concerns/Issues by Land Use					
SWAPA *	Specific Resource Concerns/Issues	Cropland	Pasture	Natural Areas	Urban
Soil Erosion	Sheet and Rill	X			
	Ephemeral Gully	X			
	Classic Gully		X	X	X
	Streambank			X	
Water Quality, Surface	Suspended Sediment & Turbidity	X			X
	Pesticides	X			
	Excessive Nutrients & Organics		X		
Water Quality, Ground	Excessive Nutrients & Organics	X	X		
Water Quantity	Inefficient Water Use on Irrigated Land	X			
	Excessive Runoff, Flooding, or Ponding				X
Soil Condition	Animal Waste & Other Organics (N,P,K)	X			
Plant Condition	Productivity, Health, and Vigor		X	X	
Domestic Animals	Inadequate Quantity & Quality Feed & Forage		X		
Air Quality	Particulate Matter less than 10 mm				X
	Objectionable Odors				X
Wildlife	T & E Species			X	

* SWAPA: - Soil, Water, Air, Plants, and Animals

Human Considerations: Implementation of conservation practices and enhancements has the potential for change in management and cost of production. Installation of practices will have an upfront cost and require maintenance. In the short run, increased management may be required as new techniques are learned. Land may be taken out of production for installation of practices or conversion to other uses, such as wildlife habitat. Long term benefits should result from increased soil health, benefits to water quality, improved domestic livestock, air quality, and wildlife habitat. Other considerations by humans in the watershed may include recreation, rural and urban perceptions, market trends and how they relate to conservation practice costs, profitability, and current high land values.

Special Considerations

With over 10 percent of the watershed included in an urban land use, unique resource concerns exist. Resource concerns in urban areas include ephemeral gully erosion, classic gully erosion, excessive suspended sediment and turbidity in surface water, excessive nutrients and organics in surface water, and excessive runoff, flooding or ponding. These concerns exist on developing, newly developed, and existing urban areas. According to the Environmental Protection Agency (EPA), non-porous urban landscapes impede runoff from slowly percolating into the ground, therefore, water remains above the surface, where it accumulates and runs off in large amounts *(12)*. This causes soil erosion and water quality issues.

Cities install storm sewer systems that quickly channel this runoff from roads and other impervious surfaces. When water leaves the storm water system and empties into a stream or river, large volumes of fast flowing runoff erodes stream banks and damages streamside vegetation. Also, discharged storm water tends to have higher temperatures resulting from heating on impervious surfaces. Native fish and other aquatic species cannot survive in urban streams severely impacted by urban runoff. *(12)*

Urban runoff increases the variety and amount of pollutants transported to receiving waters. Sediment from development and new construction, oil, grease, toxic chemicals from automobiles, nutrients and pesticides from turf management and gardening, viruses and bacteria from failing septic systems, road salts, and heavy metals are examples of pollutants generated in urban areas. *(12)* Urban runoff most dramatically impacts urbanizing smaller watersheds with higher percentages of urban land compared to large watersheds (many times over 30%). These types of streams experience frequent localized flooding that is aggravated by urban runoff. *(35)*

Some of the conservation practices implemented on urban areas include: bio-retention (rain gardens); bio-swales; soil quality restoration; permeable pavements; storm water wetlands; wet detention ponds; and native landscaping. During active development or construction of new urban areas in which land use is being converted, practice implementation includes silt fence, sediment basins, temporary seeding, mulching, polymers, rolled erosion control products (i.e. blankets), and compost blankets. *(35)*

Drainage laws in Iowa are contained in the *Code of Iowa.* Chapter 465 applies to individual drainage rights, including tile drainage. Chapter 455 applies to levee and drainage districts, and Chapter 455B applies to the Department of Natural Resources (*11*).

Legal drainage districts are formed according to state laws. Chapter 455 of the *Code of Iowa* applies to formation by County Board of Supervisors of legal drainage districts. Two or more landowners can petition for the formation of a drainage district, and single individuals can petition for sub-districts. Once established, installation and maintenance is under the direct control of the County Board of Supervisors or Drainage District Trustees (*11*).

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