

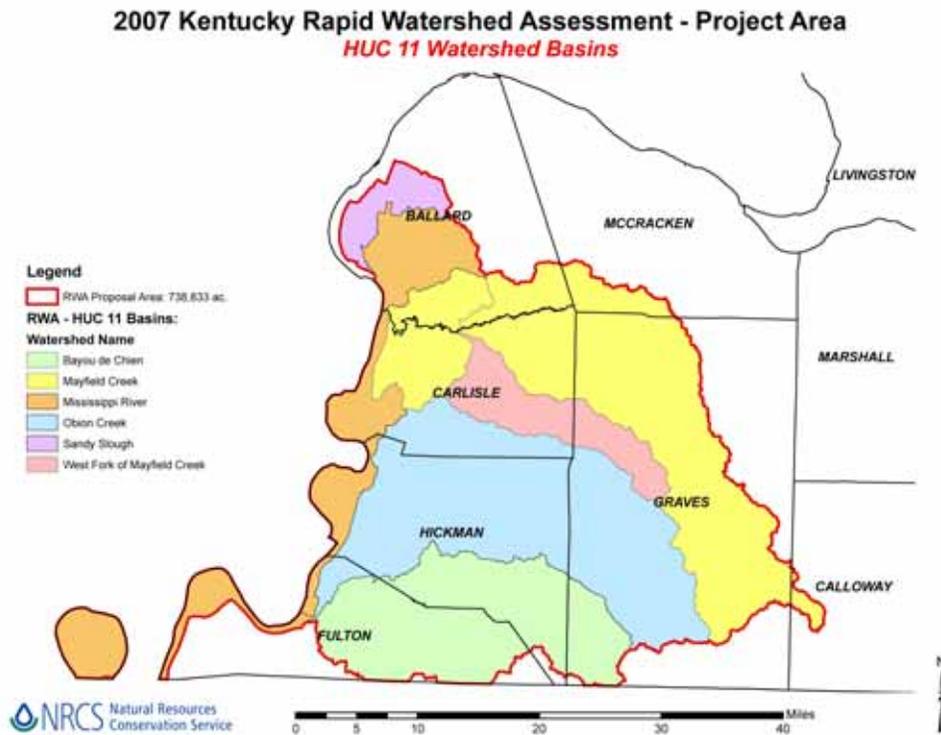
Mississippi Bayous Rapid Watershed Assessment, Kentucky

HUC 08010100 and 08010201

December 2007

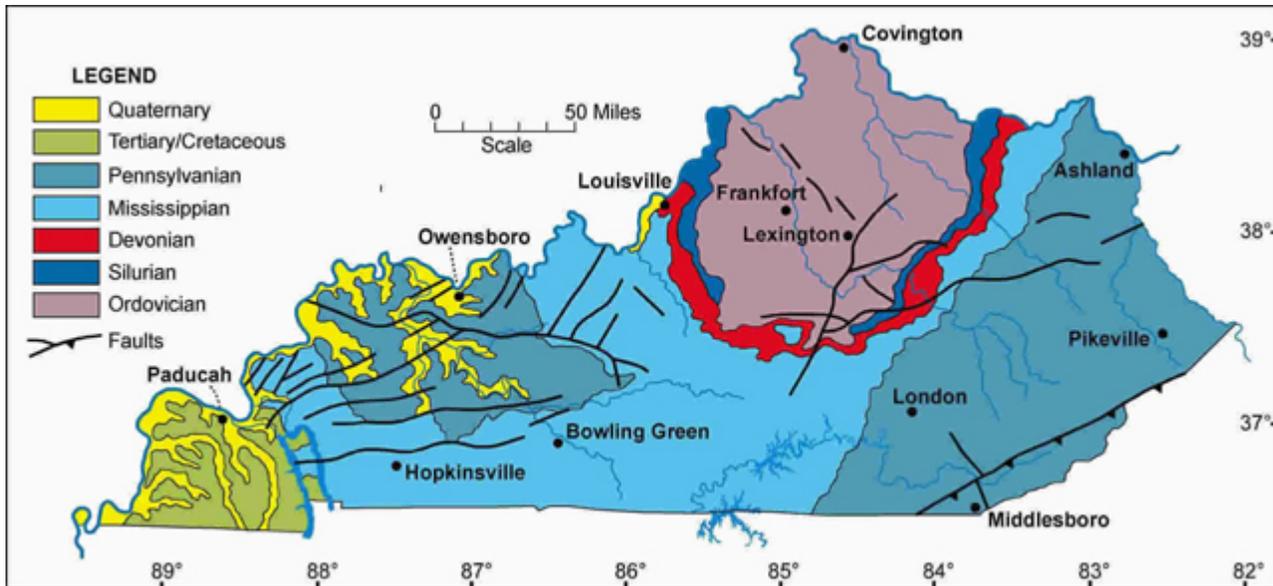
Introduction

The watersheds that empty into the Mississippi River, located in far Western Kentucky, make up the area of this Rapid Watershed Assessment. The approximately 738,000 acre project area lies in Ballard, Calloway, Carlisle, Fulton, Graves, Hickman, and McCracken Counties in Kentucky. These watersheds are part of the Mississippi Gulf Coastal Plain and are immediately downstream of the confluence of the Mississippi River and the Ohio River. Land ownership is mostly private. There is a small acreage owned by the Kentucky Nature Preservations Commission, five Wildlife Management Areas owned by the Kentucky Department of Fish and Wildlife Resources, and Columbus– Belmont State Park. Urban development pressure is almost non-existent within the project area.



Kentucky 2007 Rapid Watershed Assessment Project Area				
11 digit HUC	HUC Name	8 digit HUC	Acres	Square Miles
08010100050	Mississippi River	08010100	17089.86	26.703
08010100040	Mississippi River	08010100	13242.23	20.691
08010201050	Bayou de Chien	08010201	134125.54	209.572
08010201040	Obion Creek	08010201	205866.82	321.665
08010201020	West Fork of Mayfield Creek	08010201	45780.13	71.530
08010100030	Mississippi River	08010100	34899.34	54.531
08010201030	Mayfield Creek	08010201	42455.26	66.336
08010201010	Mayfield Creek	08010201	191937.98	299.899
08010100020	Mississippi River	08010100	32803.49	51.255
08010100010	Sandy Slough	08010100	20632.38	32.238

Kentucky's Western Tip. The RWA project area is in the Jackson Purchase Region, part of greater Gulf Plains Region that starts at the Gulf of Mexico and extends north to Illinois. This area is bordered on the east by Kentucky Lake. To the north is the Ohio River; to the west, the Mississippi River. This area is characterized by flood plains with low hills. The Mississippi River crosses the Madrid Fault zone here. Severe earthquakes in 1811 and 1812 actually caused the Mississippi River to flow backwards.



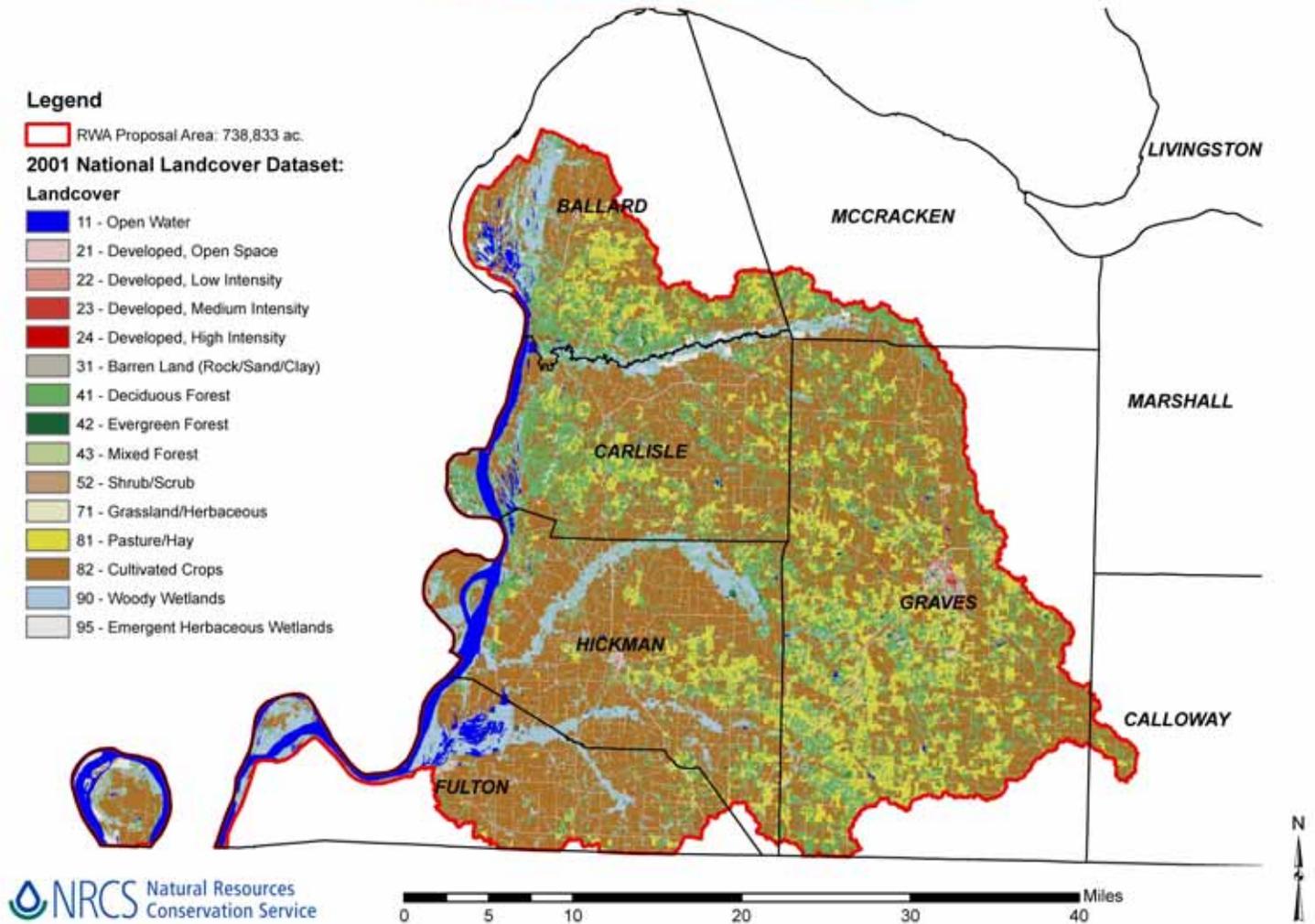
<http://www.uky.edu/KGS/geoky/>

Geology In RWA project area counties, water is obtained from unconsolidated sediments of the Tertiary and Quaternary ages. The oldest geologic formation exposed on the surface in Graves County is the Tertiary Porters Creek Formation. The oldest geologic formation exposed on the surface in the other four counties is the Tertiary Claiborne Formation.

The Tertiary began 70 million years ago, and deposits consisted of marine and fresh to brackish-water sediments. The distribution of deposits indicates that the area was near the northern limit of the Gulf embayment (also called Mississippi Embayment). Portions of the embayment must have been swampy because thin beds of lignite (brown coal) and carbonaceous clays occur in the western half of the eight-county Jackson Purchase area. These geological deposits are a marked contrast to the underlying older hard rocks, because most of the Cretaceous and younger sediments remain unconsolidated and soft. Over the last one million years unconsolidated Quaternary sediments have been deposited along the larger streams and rivers. (Kentucky Geological Survey)

2001 Land Use / Land Cover The principle land cover in the watersheds is cropland. Major crops are corn and soybeans with small acreages of wheat, tobacco, milo, cotton, and rice. The grasslands are utilized for pasture, hay, or recreation. There are no open prairies even though portions of this region were once home to large native grass barrens. Of the project area, approximately 47% is cropland, 21% is forested, 13% is grassland, 9.5% is wetlands, 5% is developed and 4 % is water.

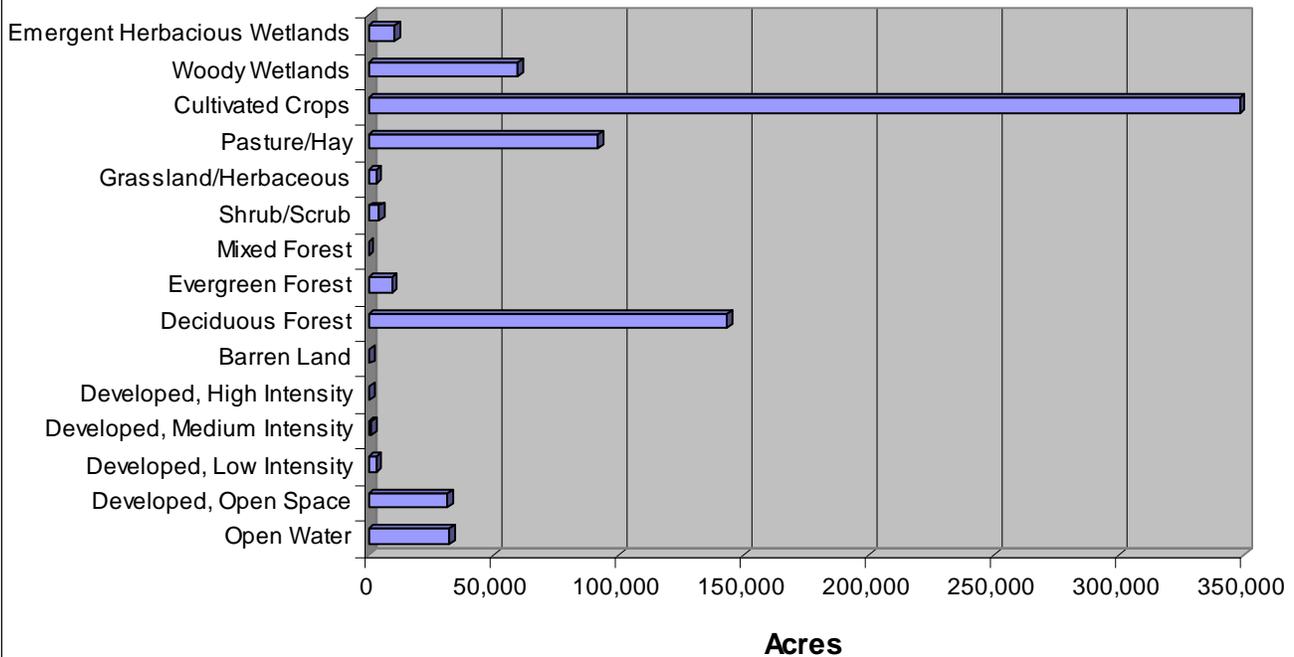
2007 Kentucky Rapid Watershed Assessment - Project Area 2001 National Landcover Dataset



Land Use by Acres, Kentucky RWA Project Area			
Land Use	acres	Land Use	acres
Cultivated Crops	348,557	Shrub/Scrub	4,289
Deciduous Forest	143,268	Grassland/Herbaceous	2,881
Pasture/Hay	91,799	Developed, Low Intensity	2,868
Woody Wetlands	59,649	Developed, Medium Intensity	881
Open Water	32,438	Barren Land	464
Developed, Open Space	31,578	Developed, High Intensity	401
Emergent Herbaceous Wetlands	10,483	Mixed Forest	16
Evergreen Forest	9,172	TOTAL	738,742

Land Use Acres-Kentucky RWA Watersheds

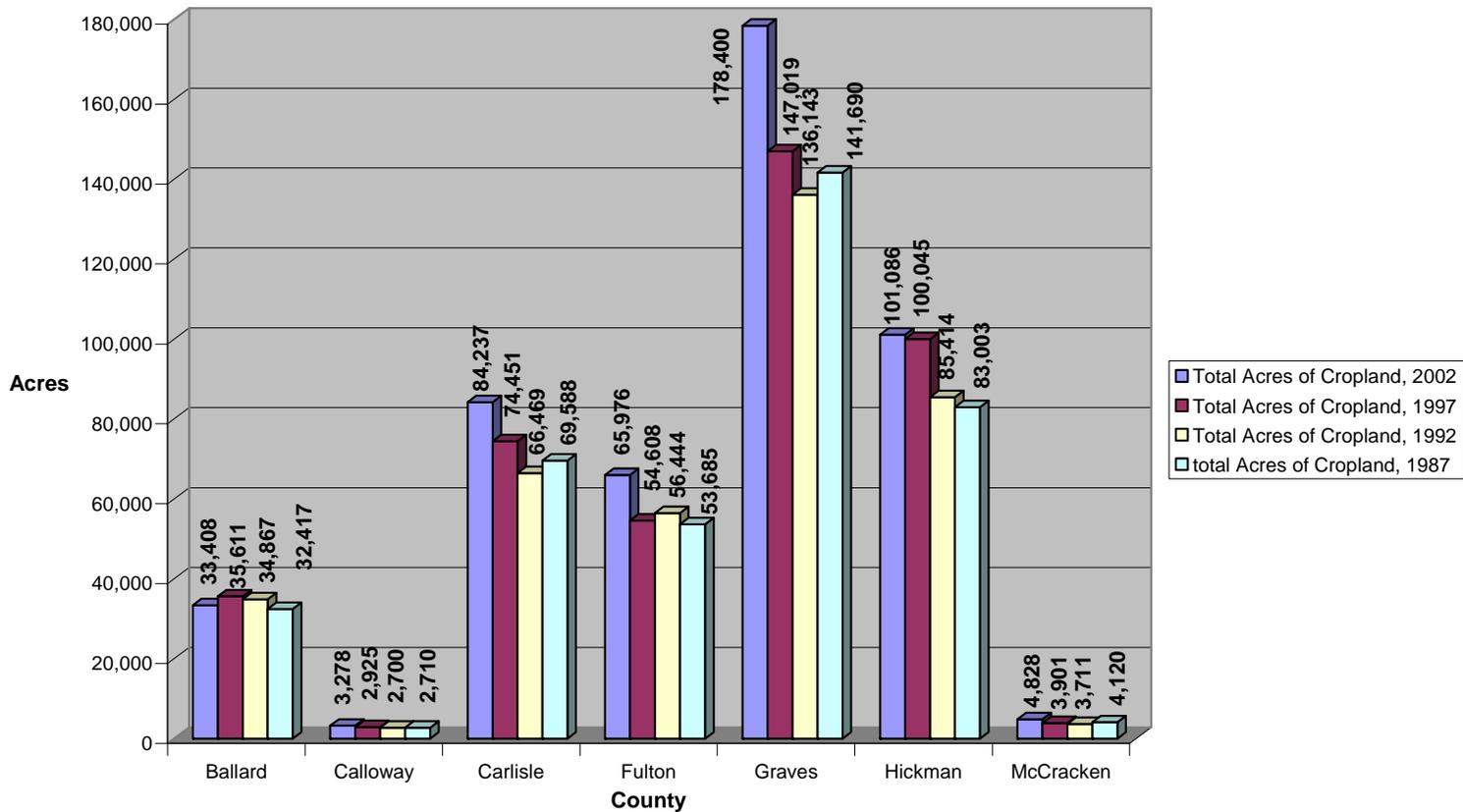
source: 2001 Landcover data



County	Acres In the RWA Project Area	Acres Out of the RWA Project Area	%In	%Out
Ballard	85,270	89,869	49	51
Calloway	3,630	259,031	1	99
Carlisle	127,315	0	100	0
Fulton	104,995	42,421	71	29
Graves	244,260	111,822	69	31
Hickman	159,755	2,141	99	1
McCracken	13,530	157,899	8	92
Totals:	738,755*	663,182		

Discrepancies in the various geographic information system calculated totals are due to boundary variations at the Mississippi River. The ten 11-digit HUCs within this RWA cover a portion of seven counties ranging from 100% of Carlisle County to 1% of Calloway County. Analysis of data within this RWA is focused on watershed-specific information when obtainable and county level data for major counties within the RWA project.

Total Acres of Cropland for Seven Kentucky Counties, 2002-1987
source: NASS-USDA, 2002



County Agriculture Data, NASS, 2002	Ballard	Carlisle	Fulton	Graves	Hickman
Farms (number)	486	380	193	1,712	347
Land in farms (acres)	113,017	107,446	112,130	299,620	125,273
Average size of farm (acres)	233	283	581	175	361
Total cropland (acres)	89,783	84,237	100,727	225,309	102,117
Cattle and calves inventory (number)	9,393	5,981	1,775	17,092	3,701
Cattle and calves sold (number)	4,764	3,132	1,050	10,855	2,098
Hogs and pigs inventory (number)	7,312	15,848	-----	17,600	-----
Hogs and pigs sold (number)	14,658	33,769	-----	50,921	2,852
Broilers and other meat-type chickens sold (number)	8,954,738	6,175,020	5,172,637	47,281,584	26,439,808
Corn for grain (acres)	22,422	23,497	24,629	59,829	39,325
Soybeans for beans (acres)	39,814	37,548	65,643	69,967	45,188
Forage - hay and all haylage, grass silage (acres)	7,176	5,498	1,920	14,488	2,840

County Summary Data, Kentucky Department of Agriculture, 2005	Ballard	Carlisle	Fulton	Graves	Hickman
Corn, Acres Harvested	26,700	21,100	26,400	61,000	41,200
Soybeans, Acres Harvested	39,000	27,500	54,000	62,000	46,000
All Cattle and Calves (number)	9,000	5,500	1,600	16,800	4,000
Beef Cows	5,200	2,900	1,000	7,700	2,100
Milk Production- Lbs.	5,300	4,600	----	15,000	----
County Ranking for Cash Receipts- Crops	16	22	14	4	11
County Ranking for Cash Receipts - Livestock	19	34	41	3	6
County Ranking for Cash Receipts - Total	23	30	26	3	6

Local Stakeholder Participation

On August 9, 2007, a Four Rivers Basin Team and Stakeholder Meeting identified high priority local concerns within the RWA project area.

Identified Concern	Group Comments
Siltation and Streambank Restoration	Serious Issue. More conservation work needed including state cost-share, NRCS programs, and Streambank stabilization/restoration.
Wetland Protection	Wetland Reserve Program participation good, concern over new appraisal process used by NRCS
Flooding and floodplain management	Urban and rural flooding still problematic. Concern over continued construction in floodplains.
Construction of Confined Animal Feeding Operations (CAFOs)	Residents of Hickman and Fulton Counties expressed concern over the construction of nine CAFOs

In July 2006, the Kentucky Division of Water issued construction permits for nine swine feeding operations in Fulton, Hickman and Carlisle Counties. Each proposed facilities would manage approximately 4,960 hogs in barns with animal waste pits below each barn. The waste would be managed by land application in accordance with approved plans.

Other concerns were erosion, surface compaction, and soil productivity and health. Conservation practices identified by stakeholders as needed were grade stabilization structures, conservation tillage, buffers, nutrient management, diversions, grassed waterways, pest management, wetland restoration, forest planting. Practices identified as needed on pasturelands were prescribed grazing, watering systems, fencing, manage livestock access to streams, pasture planting, nutrient management, and hayland plantings.

Partners and potential partners to address resource concerns within the RWA project area:

Local Level: Four Rivers Basin Team, Ballard County Conservation District, Calloway County Conservation District, Carlisle County Conservation District, Fulton County Conservation District, Graves County Conservation District, McCracken County Conservation District

State Level: Kentucky Department of Fish and Wildlife Resources, Kentucky Farm Bureau Federation, Kentucky Division of Water

National Level: USDA Farm Service Agency, US Fish and Wildlife Service, The Nature Conservancy, Quail Unlimited, Ducks Unlimited, National Wild Turkey Federation

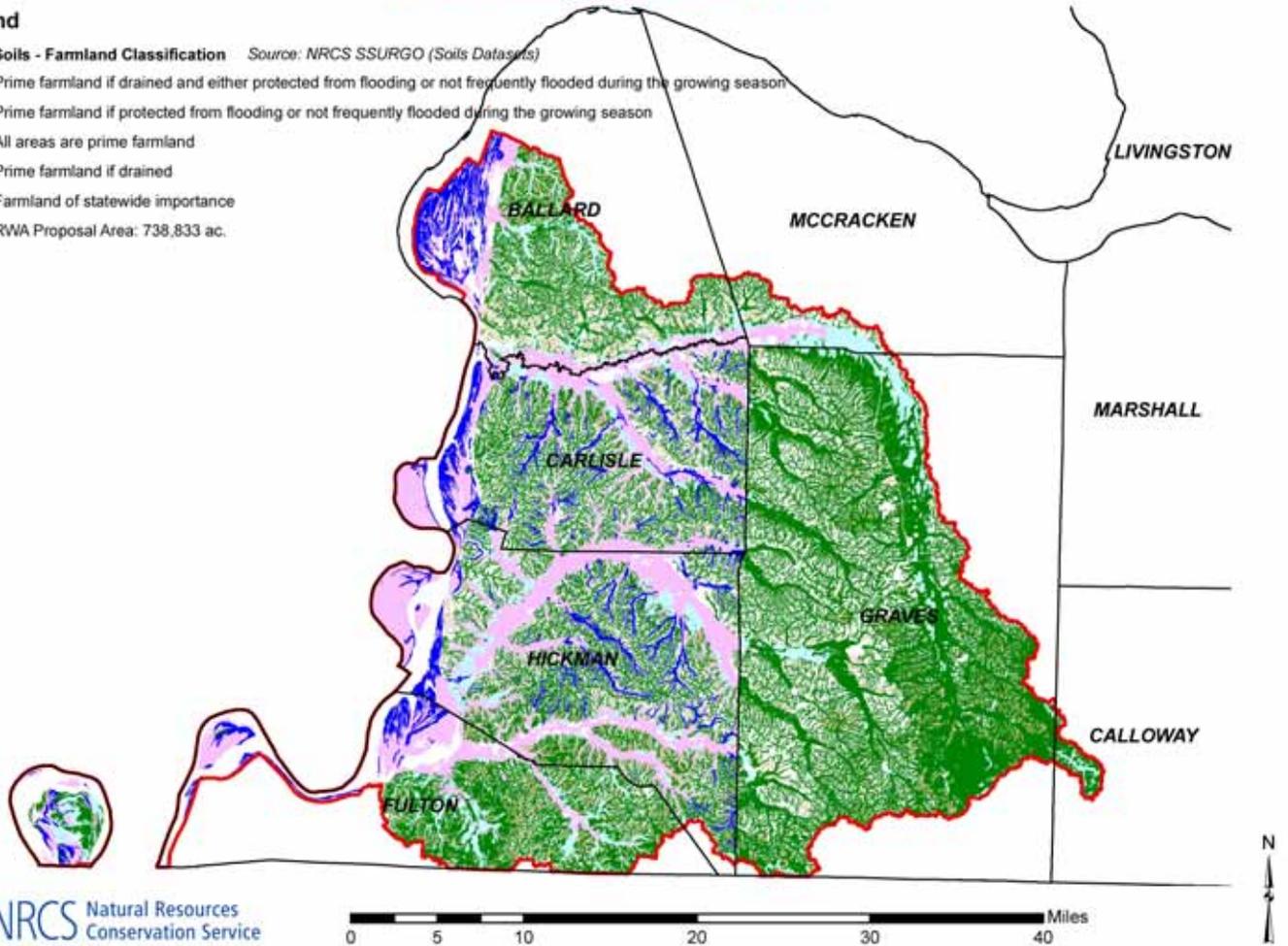
2007 Kentucky Rapid Watershed Assessment - Project Area

Soils: Farmland Classification

Legend

RWA - Soils - Farmland Classification Source: NRCS SSURGO (Soils Datasets)

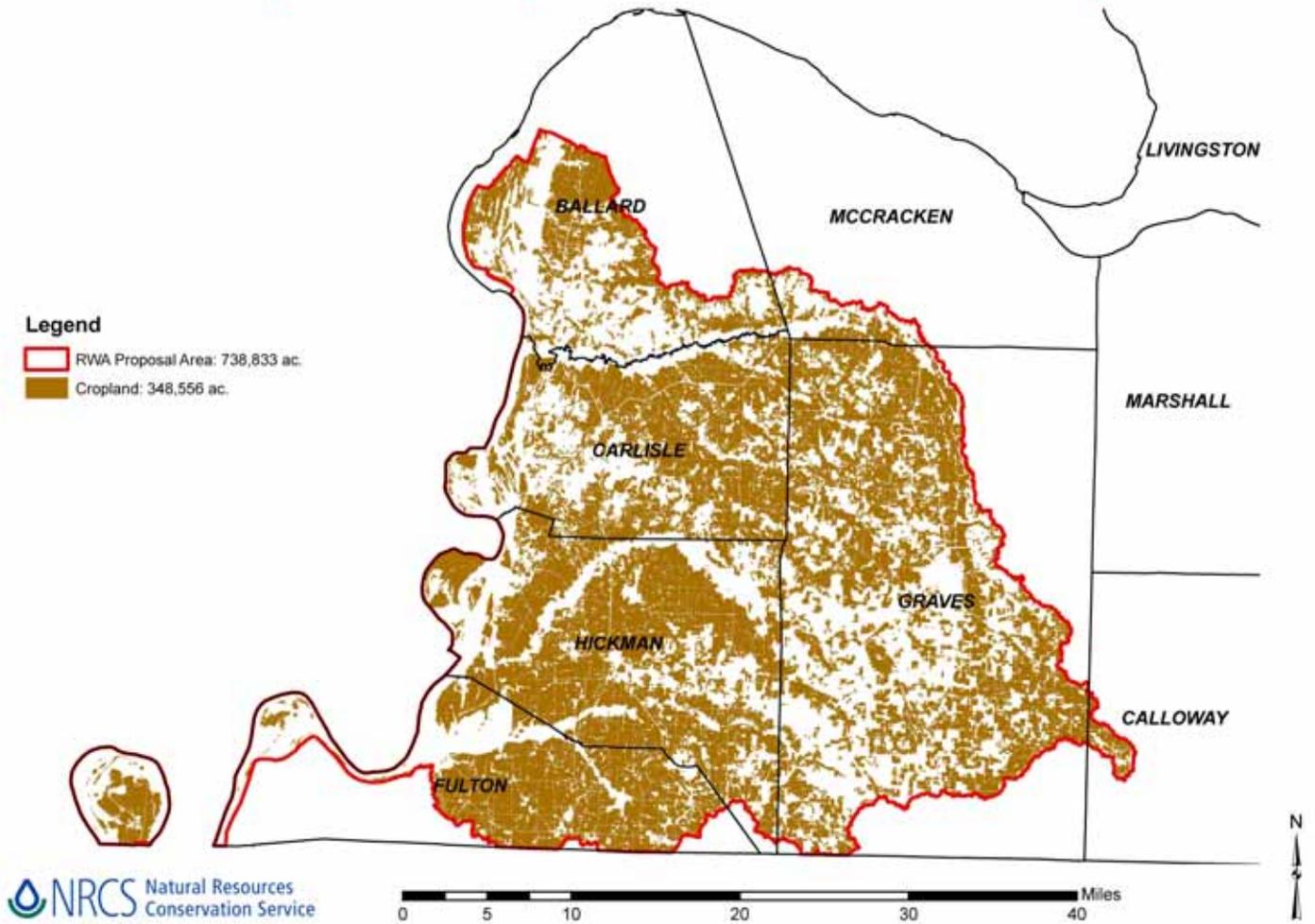
- Prime farmland if drained and either protected from flooding or not frequently flooded during the growing season
- Prime farmland if protected from flooding or not frequently flooded during the growing season
- All areas are prime farmland
- Prime farmland if drained
- Farmland of statewide importance
- RWA Proposal Area: 738,833 ac.



NRCS Natural Resources Conservation Service

Farmland Classification of the Kentucky 2007 RWA Project Area (from SSURGO)	Acres
Not prime farmland	264,712
All areas of prime farmland	246,643
Prime farmland if drained	45,254
Prime farmland if drained and either protected from flooding or not frequently flooded during the growing season	99,224
Prime farmland if protected from flooding or not frequently flooded during the growing season	37,843
Farmland of statewide importance	<u>44,825</u>
Total:	738,502

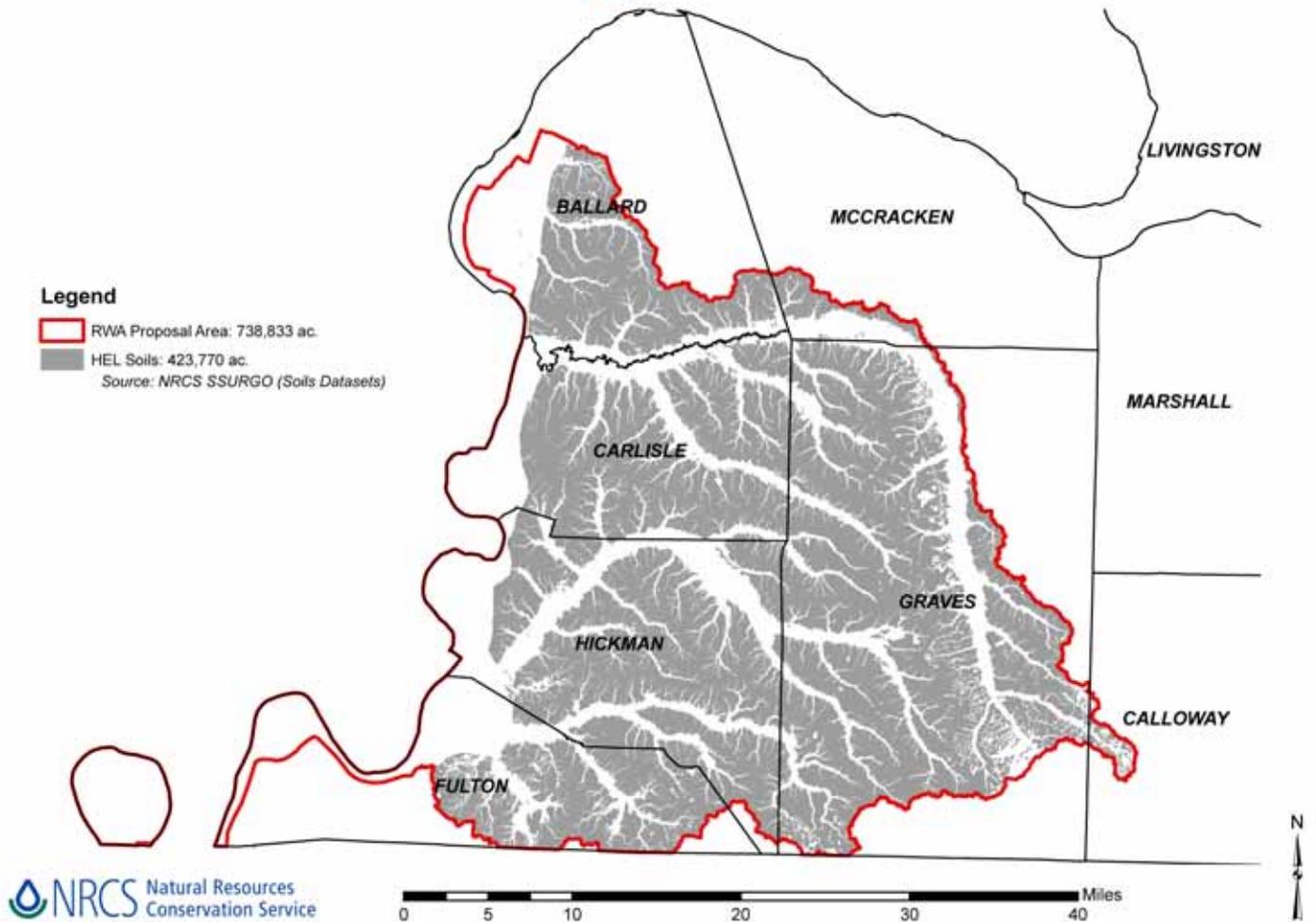
2007 Kentucky Rapid Watershed Assessment - Project Area
Cropland Landcover (from 2001 National Landcover Dataset)



Cropland Landcover by HUC 11 Basin			
HUC_NAME	Cropland Acres	Total HUC Acres	Percent Cropland
Bayou de Chien	76,925	134,126	57%
Mayfield Creek	110,381	234,393	47%
Mississippi River	26,410	98,035	27%
Obion Creek	97,605	205,867	47%
Sandy Slough	10,817	20,632	52%
West Fork of Mayfield Creek	26,202	45,780	57%
Total:	348,340	738,833	47%

2007 Kentucky Rapid Watershed Assessment - Project Area

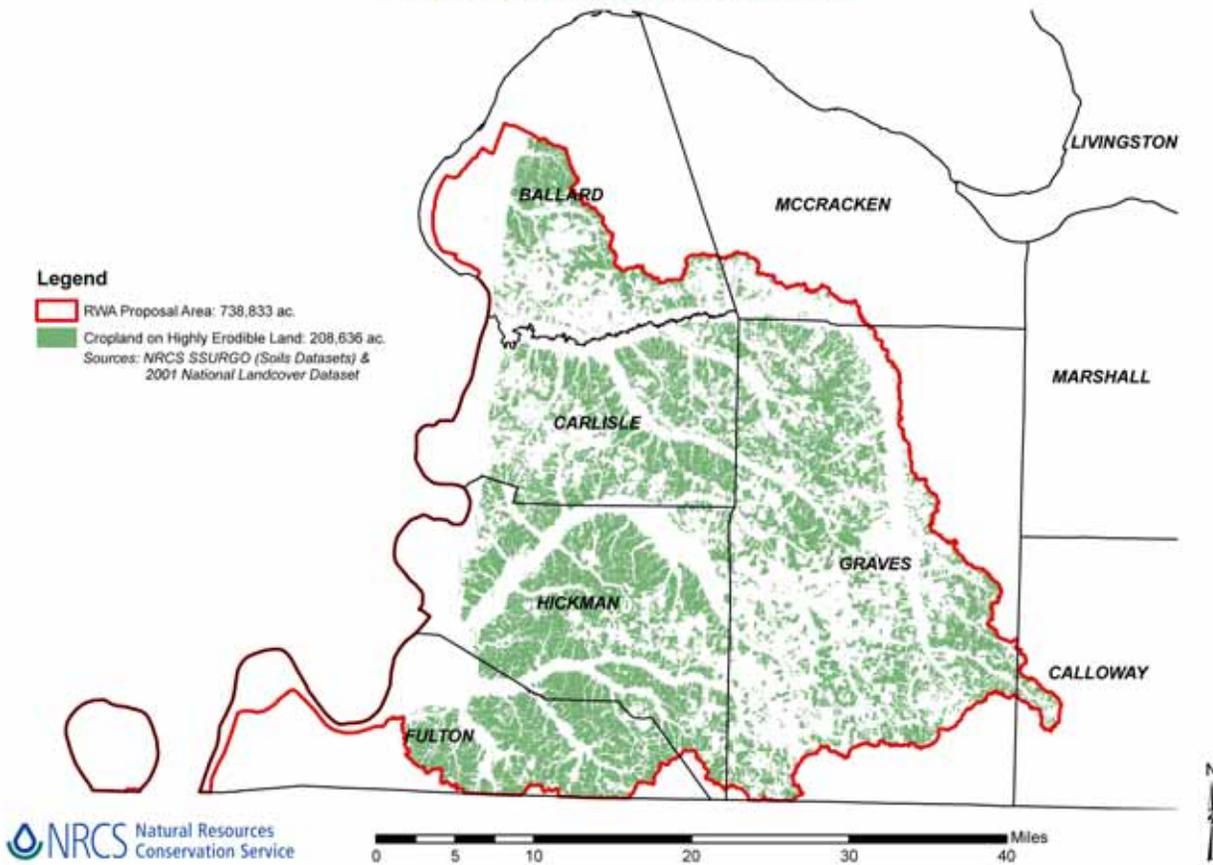
Soils: Highly Erodible Land



Highly Erodible Land Soils by HUC 11 Basin				
HUC_NAME	HEL Acres	Total HUC Acres	Percent HEL Soils	
Bayou de Chien	88,496	134126	66%	
Mayfield Creek	140,392	234393	60%	
Mississippi River	23,941	98035	24%	
Obion Creek	134,213	205867	65%	
Sandy Slough	4,883	20632	24%	
West Fork of Mayfield Creek	31,845	45780	70%	
Total:	423,770	738833	57%	

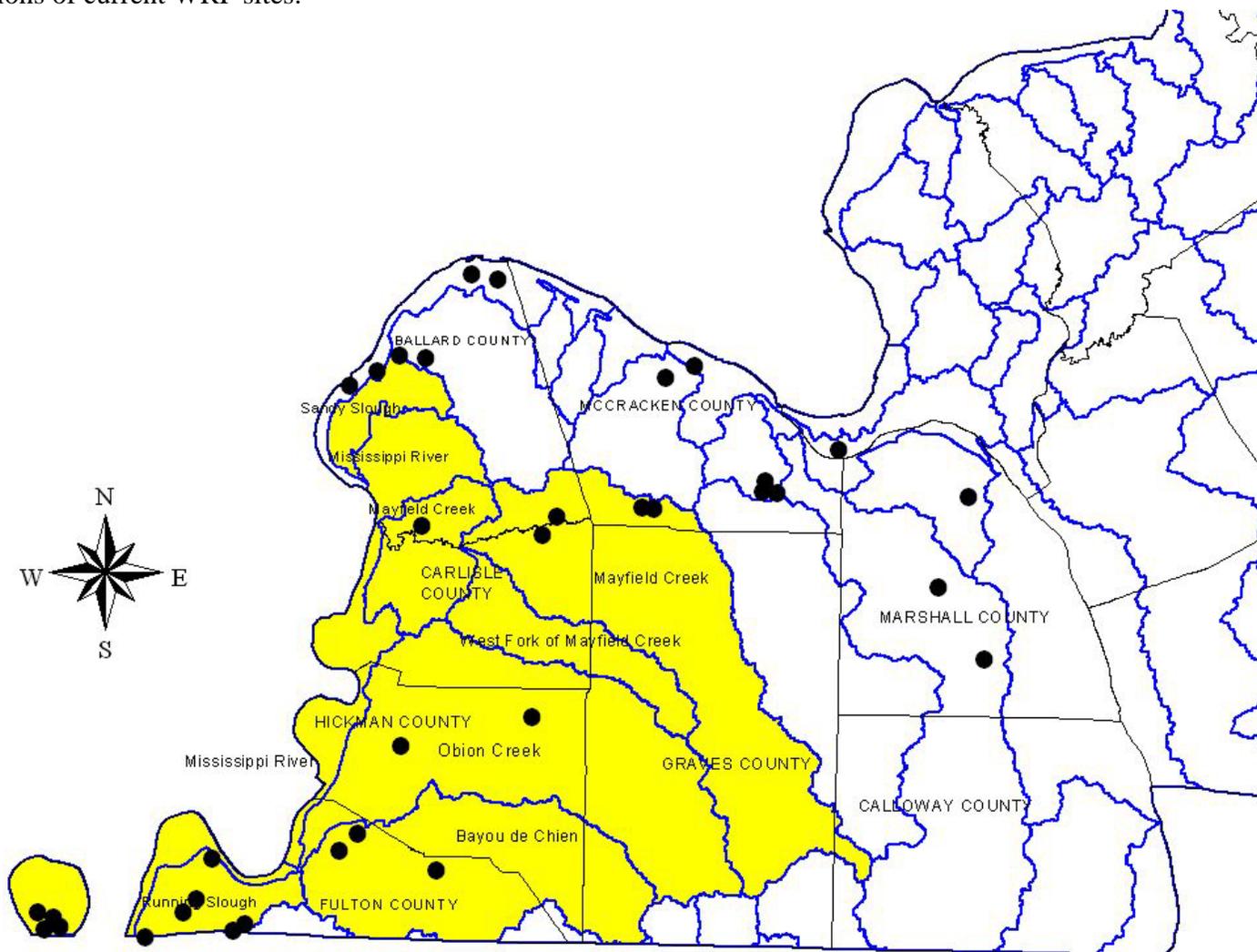
The erodibility index (EI) for a soil map unit is determined by dividing the potential erodibility for the soil map unit by the soil loss tolerance (T) value established for the soil in the Field Office Technical Guide (FOTG). A soil map unit with an EI of 8 or greater is considered to be Highly Erodible Land (HEL). Potential erodibility is based on default values for rainfall amount and intensity, percent and length of slope, surface texture and organic matter, permeability, and plant cover. Actual erodibility and EI for any specific map unit depends on the actual values for these properties.

2007 Kentucky Rapid Watershed Assessment - Project Area *Cropland on Highly Erodible Land*



Cropland on HEL by HUC 11 Basin			
HUC_NAME	HEL Acres	Total HUC Acres	Percent HEL Cropland
Bayou de Chien	55,326	134,126	41%
Mayfield Creek	62,381	234,393	27%
Mississippi River	8,706	98,035	9%
Obion Creek	61,156	205,867	30%
Sandy Slough	4,206	20,632	20%
West Fork of Mayfield Creek	16,861	45,780	37%
Total:	208,636	738,833	28%

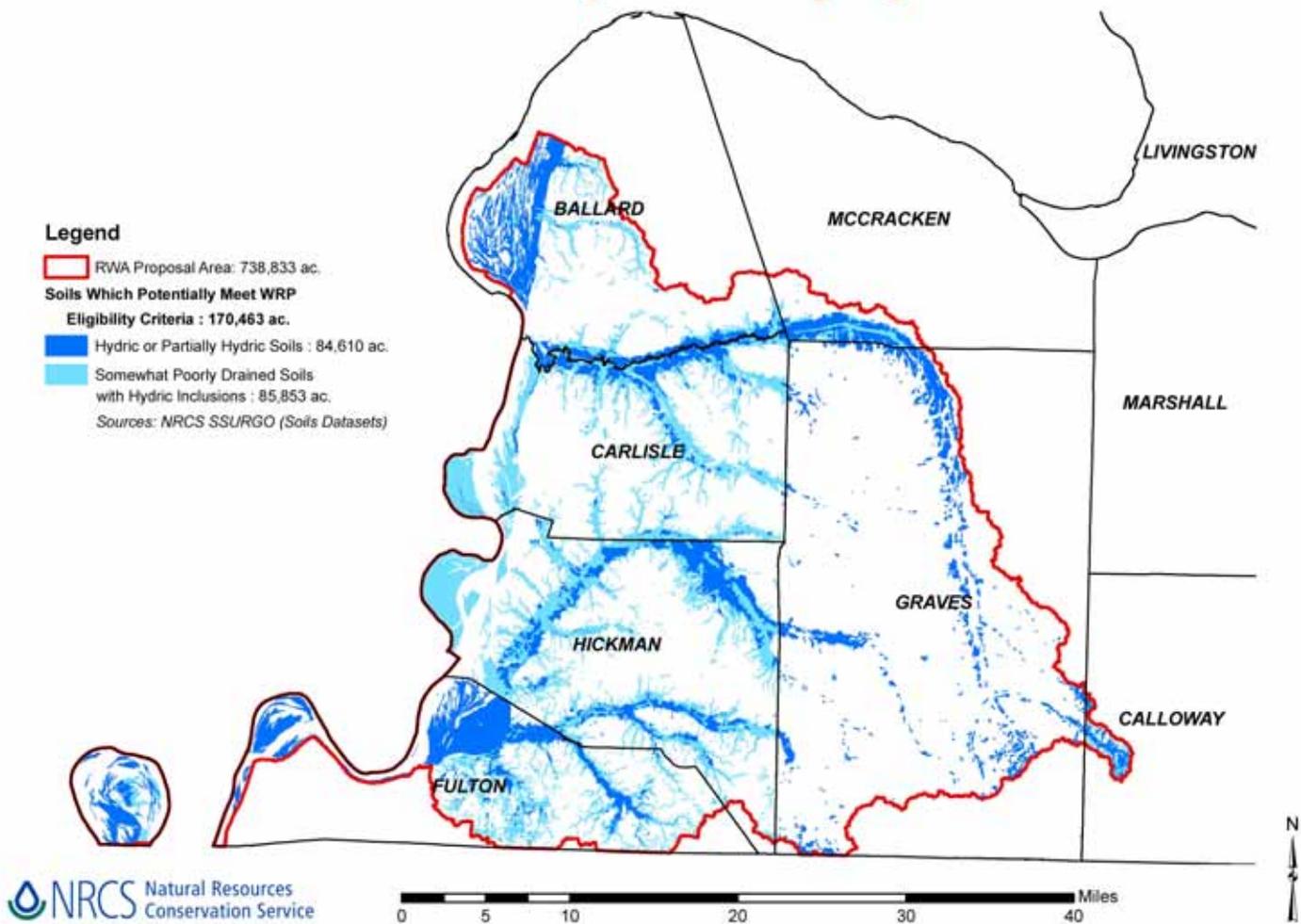
The Wetland Reserve Program (WRP) There are 4069 acres of enrolled easements within the RWA project area as of November 2007. WRP acres by watershed are shown below preceded by a map showing generalized locations of current WRP sites.



Watershed Name	Counties	Current enrolled WRP Acres
Mississippi River HUCs	Carlisle, Fulton, Hickman	1775
Running Slough	Fulton	941
Bayou de Chien	Fulton, Hickman, Graves	409
Obion	Carlisle, Hickman, Graves	630
Mayfield, including West Fork of Mayfield	Ballard, Carlisle, Graves, McCracken	314
Sandy Slough	Ballard	41

Hydric/ Partially Hydric Soils. Hydric soils are defined by the National Technical Committee for Hydric Soils (NTCHS) as “soils that formed under conditions of saturation, flooding, or ponding long enough during the growing season to develop anaerobic conditions in the upper part” (Federal Register 1994). These soils, under natural conditions, are either saturated or inundated long enough during the growing season to support the growth and reproduction of hydrophytic vegetation. If soils are wet enough for a long enough period of time to be considered hydric, they should exhibit certain properties that can be easily observed in the field.

2007 Kentucky Rapid Watershed Assessment - Project Area
Soils Which Potentially Meet WRP Eligibility Criteria

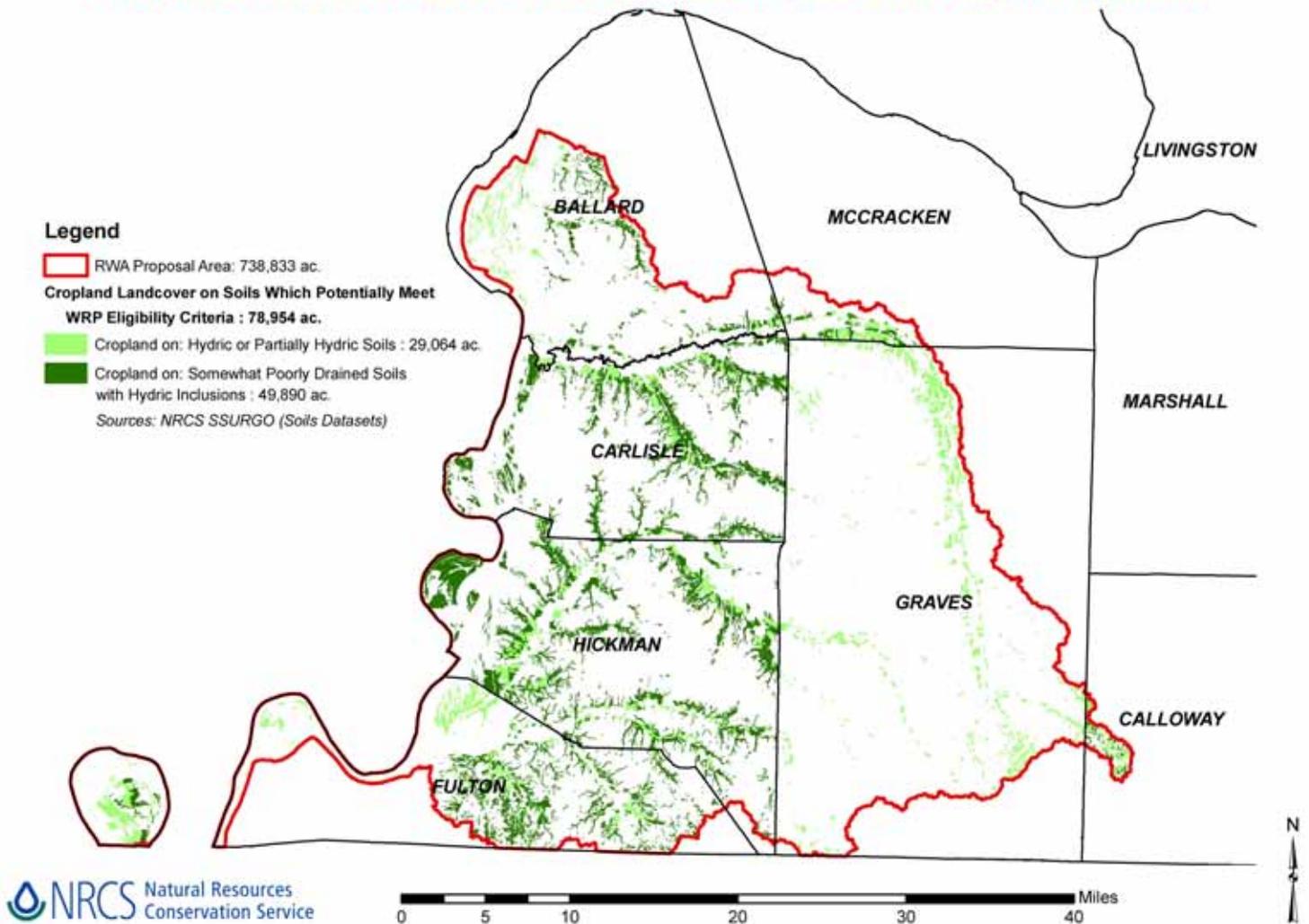


Soils Which Potentially Meet WRP Eligibility Criteria by HUC 11 Basin

HUC Name	Acres	Total HUC Acres	Percent Within HUC
Bayou de Chien	37,212	134,126	28%
Mayfield Creek	43,975	234,393	19%
Mississippi River	30,736	98,035	31%
Obion Creek	43,185	205,867	21%
Sandy Slough	7,705	20,632	37%
West Fork of Mayfield Creek	7,649	45,780	17%
Total:	170,463	738,833	23%

2007 Kentucky Rapid Watershed Assessment - Project Area

Cropland Landcover on Soils Which Potentially Meet WRP Eligibility Criteria



Cropland on Soils Which Potentially Meet WRP Eligibility Criteria by HUC 11 Basin

(Cropland occurring on Soils either Hydric or Somewhat poorly drained with hydric inclusions)

HUC_NAME	Acres	Total HUC Acres	Percent Within HUC
Bayou de Chien	17,835	134,126	13%
Mayfield Creek	21,194	234,393	9%
Mississippi River	10,100	98,035	10%
Obion Creek	22,181	205,867	11%
Sandy Slough	2,163	20,632	10%
West Fork of Mayfield Creek	5,483	45,780	12%
Total:	78,954	738,833	11%

**NRCS Conservation Practices Installed in HUC
08010201, 2004-2007**

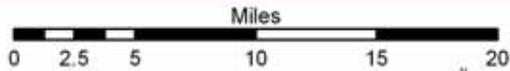
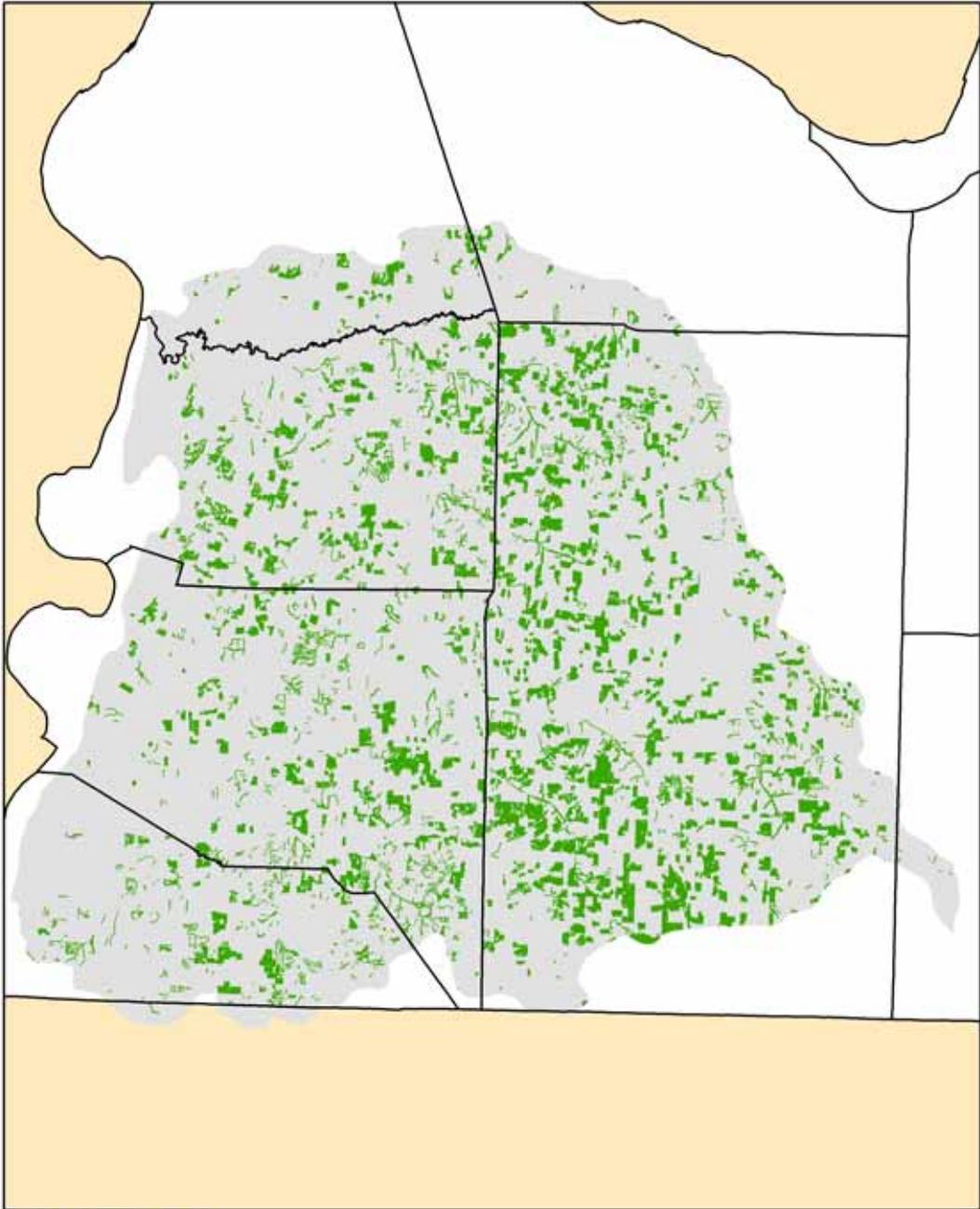
(Data source: NRCS PRS Database, 11.9.07)

	2004	2005	2006	2007	Total
100 100-Comprehensive Nutrient Plans				6	6
201 201-Managed Hay/Grazing				290	290
313 313-Waste Storage Facility no.				5	5
327 327-Conservation Cover Ac	3,228	660	260	354	4,502
328 328-Conservation Crop Rotation Ac	8,619	14,110	14,330	11,508	48,567
329 329A-C-Residue Management Ac	8,267	12,870	11,775	5,702	38,614
330 330-Contour Farming Ac	8,619	10,517	11,163	5,863	36,162
340 340-Cover Crop Ac	516	2,707	3,397	3,359	9,979
342 342-Critical Area Planting Ac	3	2	5		10
344 344-Residue Management, Seasonal Ac	3,785	7,902	10,815	6,527	29,029
345 345-Residue and Tillage Management, Ac				304	304
356 356-Dike Ft	1,751	2,725	1,857	2,385	8,718
382 382-Fence Ft	1,400	1,200	16,895		19,495
386 386-Field Borders Ft		86,446	154,242	83,270	323,958
391 391A-Riparian Forest Buffers Ac	27			55	82
391 391-Riparian Forest Buffer Ac	27		25	55	107
393 393-Filter Strip Ac	336	188	131	147	802
410 410-Grade Stabilization Structure				72	72
412 412-Grassed Waterways Ac	336	188	131	61	716
468 468-Lined Waterways or Outlets, ft				100	100
472 472-Use Exclusion Ac	140	16	8	63	227
490 490-Tree/Shrub Site Preparation Ac	239	19	6	72	336
511 511-Forage Harvest Management Ac	413	217	409	184	1,223
512 512-Pasture and Hay Planting Ac	57	230	85	74	446
516 516-Pipeline Ft	400	2,600	2,900	740	6,640
528 528A-Prescribed Grazing Ac	352	418	125	31	926
528 528-Prescribed Grazing Ac			671	769	1,440
580 580-Streambank Protection Ac		301	1,635		1,936
587 587-Structure for Water Control No	11	4		2	17
590 590-Nutrient Management, Ac				8,589	8,589
595 595-Pest Management, Ac				9,806	9,806
612 612-Tree/Shrub Establishment Ac	218	94	75	101	488
614 614-Watering Facility				3	3
620 620-Underground outlet Ft				870	870
642 642-Water Wells no.				1	1
643 643-Restoration of Rare and/or Declining Habitats Ac				18	18
644 644-Wetland Wildlife Habitat Management Ac	0	224	165	164	553
645 645-Upland Wildlife Habitat Management Ac				2,525	2,525
646 646-Shallow Water Management Ac				10	10
657 657,658,659-Wetlds Created Restored or Enhanced Ac	0	255	75	0	330
666 666-Forest Stand Improvement Ac	0	0	31	0	31

**NRCS Conservation Practices Installed in HUC 08010100,
2004-2007**

(Data source: NRCS PRS Database, 11.9.07)		2004	2005	2006	2007	Totals
327	327-Conservation Cover Ac		21	13		
328	328-Conservation Crop Rotation Ac	637	582	326	1,928	3,473
329	329B-Residue Management, Mulch Till	262	368	259	172	1,061
329	329A-Residue Management, No-Till/Strip Till Ac	354	152	153	314	973
329	329A-C-Residue Management Ac	616	520	412	485	2,033
330	330-Contour Farming Ac	366	327	267	374	1,334
340	340-Cover Crop Ac	274		9		283
342	342-Critical Area Planting Ac			1	1	2
344	344-Residue Management, Seasonal Ac				536	536
345	345-Residue and Tillage Management, Mulch Till. Ac				305	305
356	356-Dike Ft	5,550	14,135		560	20,245
362	362-Diversion Ft				900	900
382	382-Fence Ft				2,700	2,700
386	386-Field Borders Ft		37,730			37,730
391	391A-Riparian Forest Buffers Ac			25	5	30
391	391-Riparian Forest Buffer Ac				5	5
393	393-Filter Strip Ac	22	9		7	38
410	410-Grade Stabilization Structure				5	5
412	412-Grassed Waterways Ac	15	1	47	9	72
472	472-Use Exclusion Ac	3	6	4	1,420	1,433
490	490-Tree/Shrub Site Preparation Ac				344	344
511	511-Forage Harvest Management Ac		23			23
512	512-Pasture and Hay Planting Ac		124			124
516	516-Pipeline Ft		2,000			2,000
528	528-Prescribed Grazing Ac				76	76
561	561-Heavy Use Area Protection Ac		1			1
587	587-Structure for Water Control No		1			1
590	590-Nutrient Management Ac				555	555
595	595-Pest Management Ac				850	850
612	612-Tree/Shrub Establishment Ac				900	900
644	644-Wetland Wildlife Habitat Management Ac	21	1,210		391	1,622
645	645-Upland Wildlife Habitat Management Ac				483	483
646	646-Shallow Water Development and Management Ac				24	24
657	657,658,659-Wetlands Created Restored or Enhanced Ac	80	561		1,145	1,786

Conservation Reserve Program Acres within the RWA Watersheds



Prepared by FSA
Date: November 26, 2007



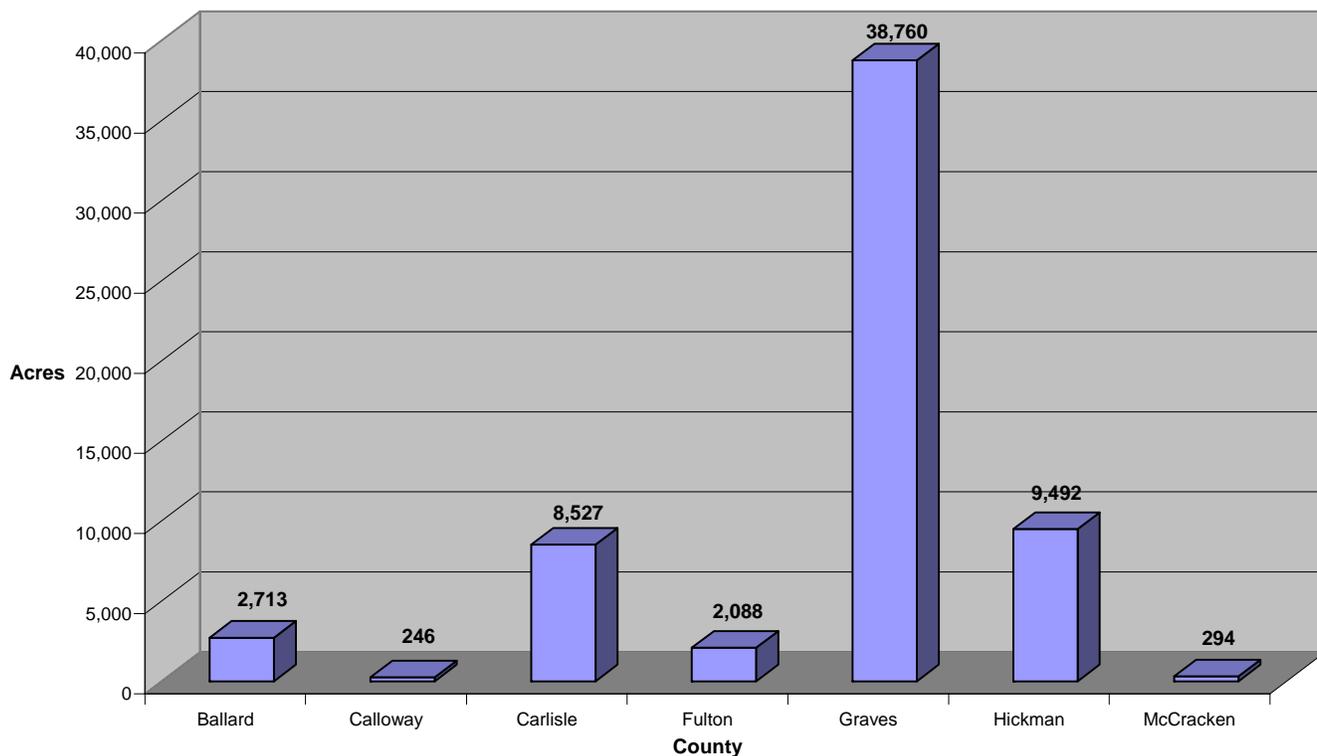
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- CRP
- Project Area
- County Boundaries

Active Conservation Reserve Program (CRP) Acres for Seven Kentucky Counties

September 2007

source: NRCS Performance Results System



Currently, Landowners within the RWA project area have voluntarily enrolled over 60,000 acres in the Conservation Reserve Program (CRP). Approximately 27,702 acres are currently under contracts which will expire 2007-2010. It is expected that high land rental rates and strong row crop prices will cause many of these acres to return to production.

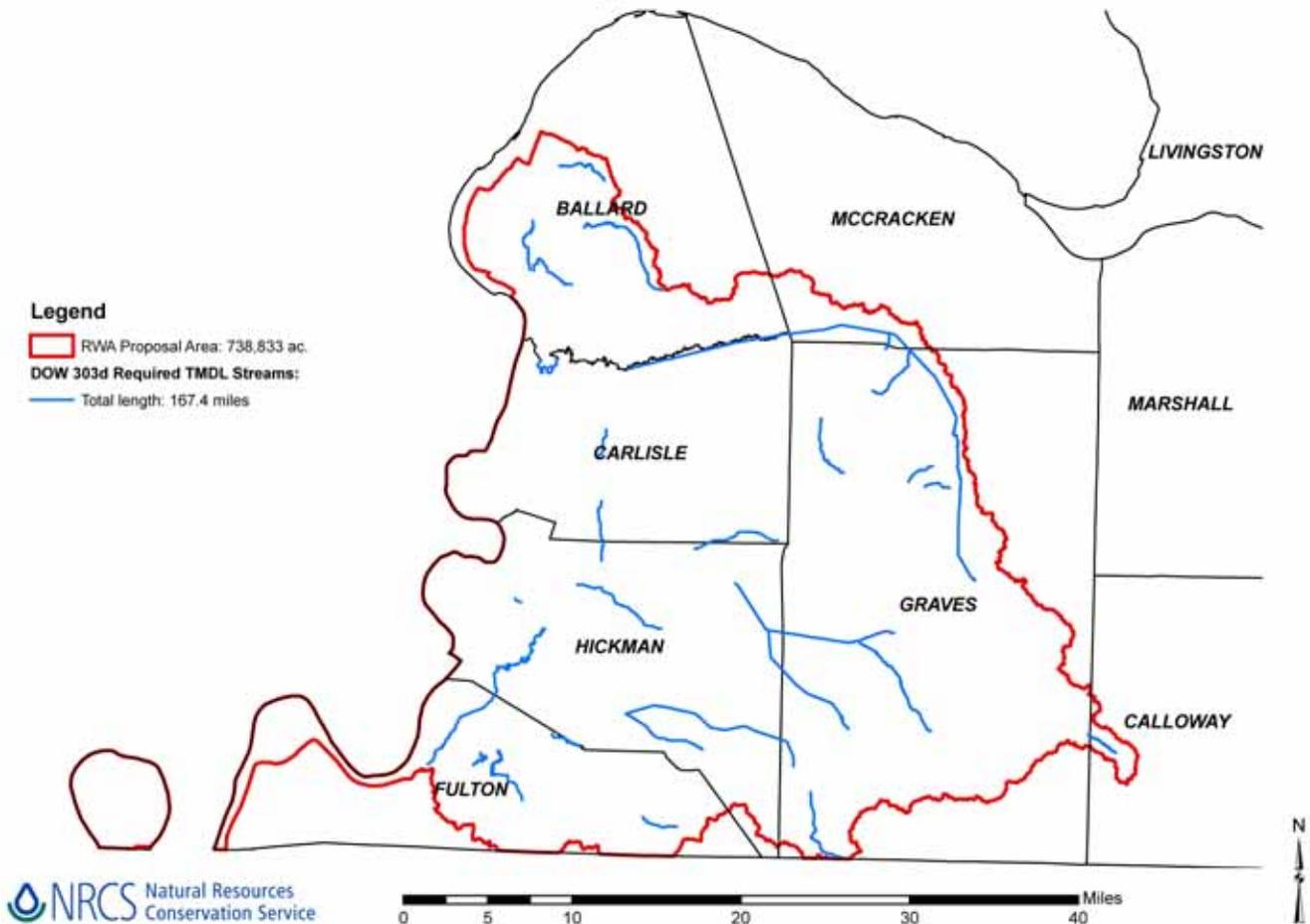
Conservation Reserve Program (CRP) Acres for Seven Kentucky Counties Acreages Located within the RWA Study Area and Contracts Expiring 2007					
County	Active CRP Acres	Acres Expiring 2007	Acres Expiring 2008	Acres Expiring 2009	Acres Expiring 2010
Ballard	2,713	543	122	63	491
Calloway	246	31	3	7	24
Carlisle	8,527	1,585	433	221	2,001
Fulton	2,088	525	20	144	117
Graves	38,760	6,825	1,554	3,513	4,641
Hickman	9,492	2,604	933	512	741
McCracken	294	30	2	3	14
TOTALS	62,120	12,143	3,068	4,463	8,028

Waters of Kentucky

Section 303(d) of the Clean Water Act states that water bodies with impaired uses must be placed on a state impaired waters list. The 2006 Integrated Report (IR) replaces the 305(b) report and 303(d) report previously prepared by the Kentucky Division of Water. The 305(b) portion of the report (Volume I) lists all water quality assessment results for surface waters (streams and lakes or reservoirs) in Kentucky. The 303(d) portion of the report (Volume II) is a subset of these assessed waters including all waters not supporting one or more designated uses and requiring the development of a Total Maximum Daily Load (TMDL). Within the RWA project area, 167.4 miles of streams have impaired uses. The list of streams, impairments and causes of impairment are listed in detail on the following page three pages.

Twenty of the thirty-seven identified stream segments (54%) are impacted by sedimentation and siltation. Twenty of the stream segments have an agricultural/crop production source of impairment. Nine of the thirty-seven segments (24%) have an “unknown” component of impairment and two segments (5%) are impacted by industrial/municipal sources.

2007 Kentucky Rapid Watershed Assessment - Project Area DOW 303d Required TMDL Streams



Waterbody Name	Impaired Segment	Receiving Waterbody	HUC 8	County	Impairments	Sources of Impairment	Designated Uses Impaired
Bayou de Chien	14.0-25.9	Obion Creek	8010201	Hickman	Pathogens	Pathogens	partial contact recreation: non-support
Brush Creek	0 to 8.3	Obion Creek	8010201	Graves	Sediment and siltation	Channelization, Dredging, Agriculture	Aquatic Life: partial support
Brush Creek	0 to 6.0	Obion Creek	8010201	Hickman	Sediment and siltation	Channelization, Riparian Habitat Loss, Non-Irrigated Crop Production	Aquatic Life: partial support
Cane Creek	0 to 5.4	Bayou de Chien	8010201	Hickman	Sediment and siltation, Nutrients and Eutrophication	Riparian Habitat Loss, Non-Irrigated Crop Production	Aquatic Life: partial support
Cane Creek	0 to 3.8	Shawnee Creek	8010100	Ballard	Organic Enrichment (Sewage)	Municipal Point Source Discharge	Aquatic Life: partial support
Central Creek	.8-2.5	Truman Creek	8010201	Carlisle	Pathogens	Unknown	partial contact recreation: non-support
Cooley Creek	.6-2.3	Mayfield Creek	8010201	Graves	Pathogens	Industrial Point Source Discharge	partial contact recreation: non-support
Gilbert Creek	1.8-3.5	Mayfield Creek	8010201	Graves	Sediment and siltation	Riparian Habitat Loss	Aquatic Life: non-support
Goose Creek	0 to 4.4	Wilson Creek	8010201	Graves	Sediment and siltation	Channelization, Riparian Habitat Loss, Non-Irrigated Crop Production	Aquatic Life: partial support
Hazel Creek	0 to 3.7	Axe Lake	8010100	Ballard	Sediment and siltation, Nutrients and Eutrophication	Channelization, Unknown	Aquatic Life: non-support
Hurricane Creek	0 to 3.7	Obion Creek	8010201	Carlisle	Sediment and siltation	Channelization, Riparian Habitat Loss, Non-Irrigated Crop Production	Aquatic Life: partial support
Little Bayou deChein	0 to 2.1	Bayou de Chien	8010201	Hickman	Sediment and siltation	Riparian Habitat Loss, Agriculture	Aquatic Life: partial support
Little Bayou deChein	10.1 to 12.3	Bayou de Chien	8010201	Fulton	Sediment and siltation	Crop Production, Habitat Modification	Aquatic Life: non-support
Little Creek	0 to 6.2	Obion Creek	8010201	Hickman	Sediment and siltation	Channelization, Riparian Habitat Loss	Aquatic Life: non-support
Little Cypress Creek	0 to 2.1	Obion Creek	8010201	Graves	Sediment and siltation	Unknown	Aquatic Life: non-support
Little Mud Creek	0 to 1.8	Bayou de Chien	8010201	Fulton	Sediment and siltation, Nutrients and Eutrophication	Non-Irrigated Crop Production	Aquatic Life: partial support
Mayfield Creek	0 to 3.4	Mississippi River	8010201	Carlisle	Unknown	Unknown	Aquatic Life: partial support

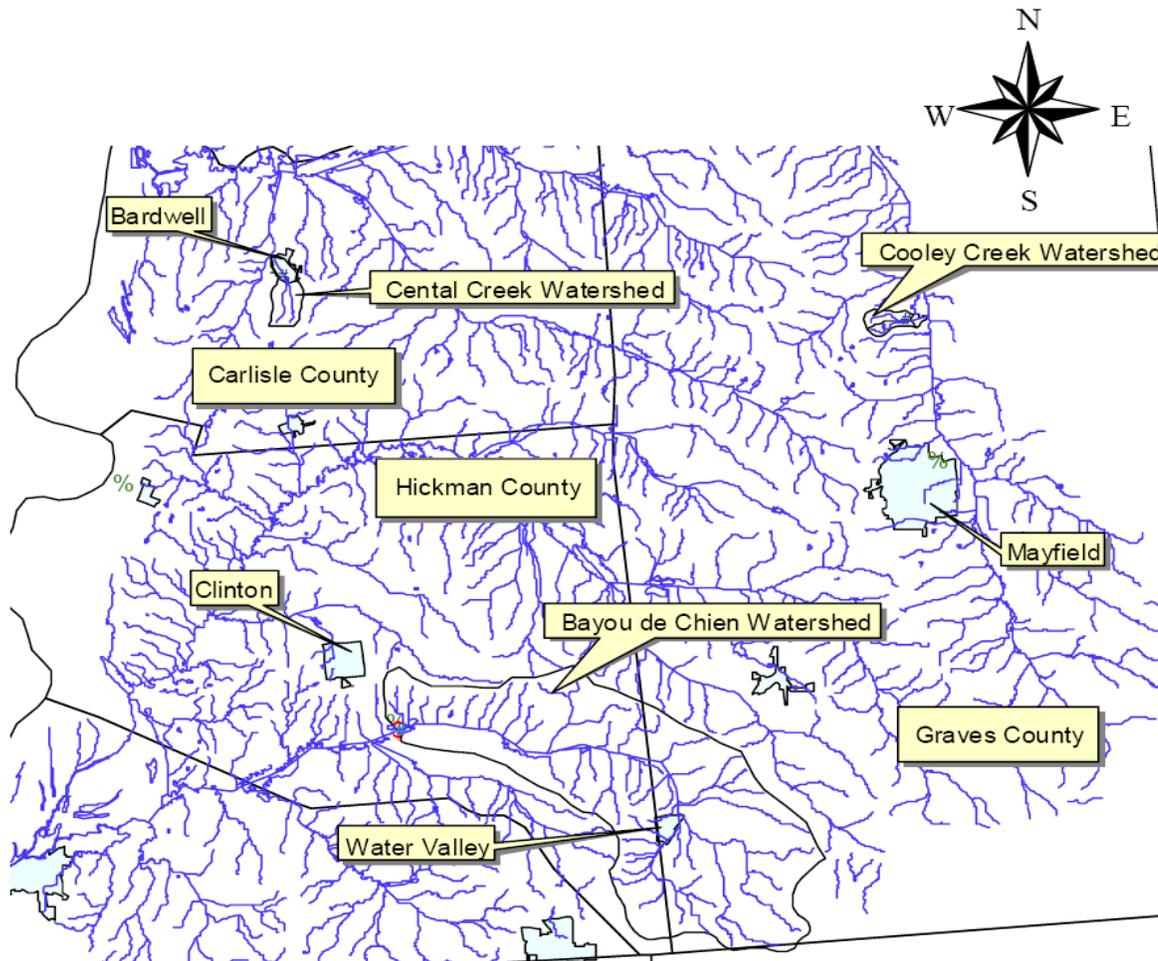
Waterbody Name	Impaired Segment	Receiving Waterbody	HUC 8	County	Impairments	Sources of Impairment (green denotes agricultural source inputs)	Designated Uses Impaired
Mayfield Creek	8.2 to 13.5	Mississippi River	8010201	McCracken	Copper, Iron, Sediment/siltation, Pathogens, Zinc	Channelization, Unknown, Habitat Modification	Aquatic Life, Water Quality, partial contact rec: non-support
Mayfield Creek	13.5 to 14.8	Mississippi River	8010201	Graves	sediment and siltation	Agriculture	Aquatic Life: non-support
Mayfield Creek	19.2 to 32.9	Mississippi River	8010201	Graves	Sediment and siltation	Channelization, Riparian Habitat Loss	Aquatic Life: partial support
Mayfield Creek	34.9 to 37.6	Mississippi River	8010201	Graves	Sediment and siltation	Channelization, Unknown, Agriculture	Aquatic Life: partial support
Mayfield Creek	37.6 to 40.8	Mississippi River	8010201	Graves	Sediment and siltation	Channelization, Riparian Habitat Loss, Habitat Modification	Aquatic Life: partial support
Mayfield Creek	40.8 to 43.7	Mississippi River	8010201	Graves	Sediment and siltation	Channelization, Riparian Habitat Loss	Aquatic Life: partial support
Mayfield Creek	57.7 to 59.8	Mississippi River	8010201	Calloway	Sediment and siltation	Crop Production	Aquatic Life: non-support
Mud Creek	0 to 6.4	Bayou de Chien	8010201	Fulton	Sediment and siltation	Channelization, Riparian Habitat Loss, Non-irrigated Crop Production	Aquatic Life: non-support
Obion Creek	1.3 to 15.8	Mississippi River	8010201	Fulton	Iron, Sediment/siltation	Channelization, Impacts from Hydrostructure Flow, Riparian Habitat Loss, Non-irrigated Crop Production	Aquatic Life: non-support, Water Quality: non-support
Obion Creek	38.6 to 42.0	Mississippi River	8010201	Hickman	Unknown	Channelization, Unknown	Aquatic Life: non-support
Obion Creek	42 to 47.6	Mississippi River	8010201	Hickman	Sediment and siltation	Channelization, Crop Production	Aquatic Life: partial support
Obion Creek	47.6-56.0	Mississippi River	8010201	Graves	Sediment and siltation, Unknown	Unknown, Agriculture	Aquatic Life: partial support
Opossum Creek	0 to 2.2	Obion Creek	8010201	Graves	Sediment and siltation	Channelization	Aquatic Life: non-support
Shawnee Creek Slough	0 to 3	Mississippi River	8010100	Ballard	Iron	Unknown	Water Quality: non-support
Shawnee Creek Slough	8.9 to 17.9	Mississippi River	8010100	Ballard	Sediment and siltation	Channelization, Riparian Habitat Loss, Agriculture	Aquatic Life: partial support
South Fork Bayou de Chien	2 to 7.2	Bayou de Chien	8010201	Graves	Sediment and siltation	Crop Production	Aquatic Life: non-support
Swan Pond	193 acres	Minor Slough	8010201	McCracken	nutrients and eutrophication	Natural Sources and Agriculture	Water Quality: non-support

Waterbody Name	Impaired Segment	Receiving Waterbody	HUC 8	County	Impairments	Sources of Impairment (green denotes agricultural source inputs)	Designated Uses Impaired
Upper Tributaries (UT) to Mayfield Creek	0 to 1.0	Mayfield Creek	8010201	McCracken	Sediment and siltation	Agriculture	Aquatic Life: non-support
UT to Mayfield Creek	1.1 to 3.5	Mayfield Creek	8010201	Graves	Sediment and siltation	Riparian Habitat Loss, Agriculture	Aquatic Life: non-support
UT to Obion Creek	1.6 to 2.2	Mayfield Creek	8010201	Hickman	Unknown	Channelization, Riparian Habitat Loss, Streambank Modification/Destabilization, Unknown	Aquatic Life: non-support

TMDL - Total Maximum Daily Load. TMDL is associated with water pollution planning and can refer to the maximum amount of a pollutant (examples are sediment, phosphorus and bacteria) that a stream or lake can receive and still meet water quality standards. A TMDL may also refer to a written report, which includes detailed assessment information of site-specific impaired waters, watershed information, mathematical modeling and the calculated number of a pollutant load. A TMDL reports was published in 2007 for Central Creek, Cooley Creek (tributary to Mayfield Creek) and Bayou de Chien. The pollutant of concern is pathogens with a TMDL endpoint of 400 colonies/100 ml. Identified sources of pollution are agriculture and industrial. On Cooley Creek, Conagra Poultry Company of Kentucky operates Pilgrim Pride, a poultry slaughtering and processing facility. The facility is permitted to discharge 1.71 MGD of processed wastewater, non-contact cooling water and stormwater runoff into Cooley Creek at river mile (RM) 1.1.

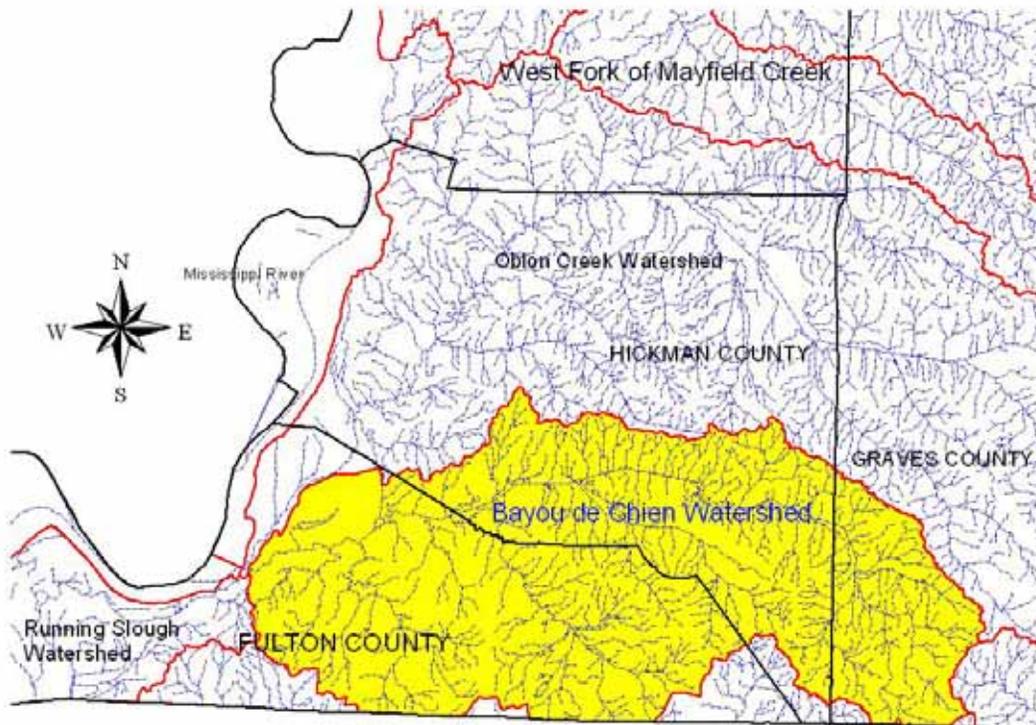
Impaired Waterbodies for TMDLs (2004 303(d) List)	Segments/ Length	Suspected Source(s)	County
Bayou de Chien	River mile (RM) 14.0 to 25.9 miles	Agriculture	Graves/Hickman
Central Creek	RM .8 to 2.5/ 1.7 miles	Unknown	Carlisle
Cooley Creek	RM .7 to 2.3/ 1.6 miles	Industrial	Graves

Note: Suspected sources as identified in the 2004 303(d) Report for Kentucky.



A Unique Opportunity to Preserve an Endangered Species– Conservation Efforts and the Relict Darter

The RWA Watersheds, especially the Obion Creek and Bayou de Chien watersheds, provide important habitat for a variety of plants and animals. For one fish species in the Bayou de Chien watershed, ongoing conservation efforts are a matter of life or extinction. The Relict Darter (*Etheostoma chienense*) is known to exist nowhere else on earth but the **Bayou de Chien** watershed in western Kentucky and is listed as endangered by the U.S. Fish and Wildlife Service.



Many local landowners and conservation organizations are working to improve habitat for all aquatic species within the RWA study area. For example, over 6,000 feet of Obion Creek were restored in 2004. The Obion Creek project is a cooperative effort between the Stream Institute (Louisville, KY) and the Obion Creek Watershed Conservancy District. Working jointly, these two entities addressed multiple problems arising from the 1930s channelization of local area stream segments.

The Nature Conservancy (TNC) is also working with willing private landowners to identify conservation actions that can be implemented to improve water quality and endangered species protection within the RWA project watersheds. Through NRCS, over 50,000 acres of Conservation Reserve Program (CRP) acres exist within Graves, Fulton and Hickman Counties; however, 22,000 of these contracts will expire between 2007-2020.

Special Use Waters in the RWA Watersheds

Special Use Waters are rivers, streams and lakes listed in Kentucky Administrative Regulations that are worthy of additional protection. **Outstanding state resource waters** are those surface waters designated by the Environmental and Public Protection Cabinet and include certain unique waters of the commonwealth, including those with federally threatened or endangered species.

Reference Reach Waters are a representative subpopulation of the least-impacted streams within a bioregion. These streams serve as chemical, physical and biological models from which to determine the degree of impairment (physical, chemical or biological) to similar stream systems in each representative bioregion. These are not necessarily pristine streams, but represent those least-disturbed conditions that are attainable in each bioregion.

Exceptional waters refer to certain waterbodies whose quality exceeds that necessary to support propagation of fish, shellfish and wildlife and recreation in and on the water. Waters placed in this category are reference reach waters, Kentucky Wild Rivers, some outstanding state resource waters and waters with "excellent" fish or macroinvertebrate communities. (<http://www.water.ky.gov/sw/specialwaters/>).

Special Use Waters in the RWA area. Bayou de Chien, Cane Creek, Jackson Creek, Sand Creek, and south fork of Bayou deChien provide habitat for many species including the federally endangered relict darter. Murphy's Pond adjoins the Obion Creek State Nature Preserve and is an old oxbow of Obion Creek. The bald cypress swamp is one of the most important ecological areas in Kentucky. Also of note is Axe Lake in Ballard County. This area is a large, intact bald cypress-tupelo swamp that contains a large great blue heron rookery is the only known nesting site for the great egret (*Casmerodius albus*) in Kentucky.

Waterbody Name	County	Up stream Mile Point	Down stream Mile Point	Length	Acres	Exceptional Water Designation	Reference Reach Stream	Outstanding State Resource Water	Federally Endangered Species
Bayou de Chien	Hickman, Graves	30.6	13	17.6	0			Y	Relict Darter (Etheostoma chienense)
Cane Creek of Bayou de Chien	Hickman	12.4	0	12.4	0			Y	Relict Darter
Jackson Creek	Graves	2.6	0	2.6	0	Y	Y	Y	Relict Darter
Murphy's Pond	Hickman	0	0	0	0	Y		Y	
Obion Creek	Hickman	35.5	25.2	10.3	0	Y	Y		
Sand Creek	Graves	3.6	0	3.6	0			Y	Relict Darter
South Fork of Bayou de Chien	Graves	7.3	0	7.3	0			Y	Relict Darter
Swan Pond	Ballard	0	0	0	193	Y		Y	

Demographics The main five counties within the RWA area demographics are similar in demographics and can be summarized as predominately middle income, Caucasian, and rural. These trends have been highly consistent over the last decade within the region.

Demographic Profile Highlights, U.S. Census 2000					
County	Ballard	Carlisle	Fulton	Graves	Hickman
Total Population	8,286	5,351	7,752	37,028	5,262
Median Household Income	\$32,130	\$30,087	\$24,382	\$30,874	\$31,615
Individuals below Poverty Level	1,102	691	1,731	5,921	887
Median Value of Single Family Homes	\$58,800	\$49,400	\$40,500	\$63,600	\$49,200

Kentucky Demographic Overview (www.thinkkentucky.gov)	Ballard	Carlisle	Fulton	Graves	Hickman
2007 Population	8,245	5,376	7,236	37,679	5,101
2007 Median Household Income	\$39,631	\$35,845	\$28,915	\$37,318	\$38,560
Population by Race, White	7,855 or 95.3%	5,257 or 97.8%	5,478 or 75.7%	34,931 or 92.7%	4,519 or 88.6%
Population by Race, Black	229 or 2.8%	50 or .9%	1,627 or 22.5%	1,621 or 4.3%	489 or 9.6%
2006 Unemployment Rate	6.20%	6.10%	7.50%	7.20%	6.90%

Climate Western Kentucky has a moderate climate, characterized by warm, moist summer conditions and cold winters. Kentucky's weather patterns are influenced by the Gulf of Mexico, especially during summer months. Much of Kentucky's the precipitation each year falls in spring, the rainiest season. From south to north within the State, precipitation decreases. Southern Kentucky receives the highest average precipitation, over 50 inches a year, while the northern portions of the state average only 40 inches.

**Climate Data Overview for Western Kentucky Counties in RWA
(www.thinkkentucky.gov)**

Normal Temperature (30 year record)	56.8 degrees
Average Annual, 2006	58.7 degrees
Record Highest, August 1988 (23-year record)	104 degrees
Record Lowest, January 1985 (23-year record)	minus 15 degrees
Normal Precipitation (30 year record)	49.24 inches
Mean Annual Snowfall (30 year record)	10.2 inches
total precipitation, 2006	67.11 inches
Mean number of days precipitation	110.3
Mean number of days thunderstorms (48 year record)	51.3
Prevailing Winds	South
Relative Humidity (30 year record), 12 noon	59 percent

References

Combined Animal Feeding Operation, Information about CAFO application, reviews, and permit issuance can be found at: <http://www.kentucky.gov/Newsroom/environment>, <http://www.kyrc.org>, and <http://www.cnmpwatch.com>

Exceptional, High Quality Streams Exceptional Value and Special Use Waters were taken from the data set received from the Kentucky Division of Water. For more information on what qualifies a stream as exceptional value or high quality or any information go to <http://water.ky.gov/sw/specialwaters/>

Geology: U.S. Geological Survey Web Page (www.usgs.gov) and the Kentucky Geological Survey (<http://www.uky.edu/KGS/geoky/>)

Impaired Streams Impaired Streams were derived from the Kentucky Division of Water, 2006 list on Non-Attaining Streams. More information can be found on DOW website at <http://www.water.ky.gov/sw/tmdl/303d.htm>

Land Use / Land Cover 2001 Land Use / Land Cover map was created using the National Land Cover Dataset. The National Land Cover Dataset was compiled from Landsat satellite TM imagery with a spatial resolution of 30 meters and supplemented by various ancillary data (where available). More information can be found online at <http://landcover.usgs.gov/>

National Elevation Dataset (NED) The NED is a seamless mosaic of the best-available elevation data. The primary source data were the USGS 7.5-minute (30-meter or 10-meter resolution) DEM's. A hillshade grid was also created using the DEM and used to create a 3-D effect. More information on NED can be found online at <http://ned.usgs.gov/>

National Wetlands Inventory (NWI) The NWI maps do not show all wetlands since the maps are derived from aerial photo interpretation with varying limitations due to scale, photo quality, inventory techniques, and other factors. More information can be found online at <http://www.fws.gov/nwi/>

Performance Results System (PRS) PRS data was extracted from PRS by year, conservation system, conservation practice, and programs by hydrologic unit code. More information can be found online at the PRS homepage <http://ias.sc.egov.usda.gov/prshome/>

Social and Census Data, Ag census data and ethnicity data were downloaded from the National Agricultural Statistics Service (NASS). More information can be found online at http://www.nass.usda.gov/Census_of_Agriculture/index.asp, <http://www.census.gov> and <http://thinkkentucky.com>

Soil Survey spatial and tabular data were used for the following survey areas: Ballard County (KY007), Calloway County (KY035), Carlisle County (KY039), Fulton County (KY075) Graves County (KY083), Hickman County (KY105), McCracken County (KY145) Spatial and tabular data can be downloaded at <http://soildatamart.nrcs.usda.gov/>

Total Maximum Daily Load (TMDL) TMDL is the sum of the individual waste load allocations and load allocations which would not produce a violation of water quality standards. The data used is from the Kentucky Division of Water TMDL Section of the Water Quality Branch. More information can be found on TMDL locations in at <http://water.ky.gov/sw/tmdl/>