KENTUCKY GREEN RIVER
Conservation Reserve Enhancement Program

Programmatic Environmental Assessment
U.S. Department of Agriculture, Farm Service Agency

August 2006
Abstract

Mandated Action: The U.S. Department of Agriculture, Commodity Credit Corporation (USDA/CCC) and the Commonwealth of Kentucky have agreed to implement the Kentucky Conservation Reserve Enhancement Program (CREP), a component of the national Conservation Reserve Program (CRP). CREP is a voluntary program for agricultural landowners.


Type of Document: Programmatic Environmental Assessment

Lead Federal Agency: U.S. Department of Agriculture, Farm Service Agency

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The Kentucky Conservation Reserve Enhancement Program Programmatic Environmental Assessment has been prepared pursuant to the National Environmental Policy Act of 1969, as amended (42 U.S.C. 4321-4347); the Council on Environmental Quality regulations (40 CFR Parts 1500-1508); USDA-Farm Service Agency draft environmental regulations (7 CFR Part 799.4, Subpart G); and USDA-Farm Service Agency 1-EQ, Revision 1, Environmental Quality Programs, dated November 19, 2004.

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Cover photo courtesy of Dr. Richie Kessler, The Nature Conservancy. A relatively undisturbed bend in the Green River winding through Hart County, Kentucky.
The Kentucky Green River CREP Partners

Without the continued collaborative efforts of its Partners, the Kentucky Green River CREP and the sustainability of the Green River Watershed could not be accomplished—

USDA Farm Service Agency

USDA Natural Resources Conservation Service

The Office of the Governor of the Commonwealth of Kentucky

Kentucky General Assembly

Kentucky State Nature Preserves Commission

Kentucky Soil and Water Conservation Commission

Kentucky Division of Conservation

Kentucky Division of Forestry

Kentucky Division of Water

Kentucky Department of Fish and Wildlife Resources

The Nature Conservancy

National Park Service, Mammoth National Park

Kentucky Soil and Water Conservation Districts

U.S. Army Corps of Engineers

U.S. Environmental Protection Agency

Campbellsville University

Western Kentucky University
EXECUTIVE SUMMARY

The Green River is the most biologically diverse and rich branch of the Ohio River system. The greatest aquatic diversity occurs in a 100-mile stretch of unhindered river that flows from the Green River Reservoir dam through Mammoth Cave National Park (NP), the world’s longest and most diverse cave systems in south-central Kentucky. This section of the Green River Watershed includes 917,197 acres in Adair, Barren, Edmonson, Green, Hart, Metcalfe, Russell and Taylor Counties, Kentucky.

The USDA Farm Service Agency, as lead Federal agency for administering the Conservation Reserve Enhancement Program (CREP), proposes improvements to the Kentucky Green River CREP that involve expanding the existing area by 28,904 acres to encompass a total of 946,101 acres. This proposed expansion would include all or parts of Allen, Butler, Edmonson, Grayson, Logan, Simpson and Warren Counties, and would add environmentally significant watersheds to encompass the entire Upper Green River Basin with the exception of the watersheds that lie above the U.S. Army Corps of Engineers’ reservoirs.

The Kentucky Green River CREP was initially approved as a 100,000-acre and $110 million program, with the Federal government contributing $88 million, the Commonwealth of Kentucky contributing $17 million, and The Nature Conservancy contributing $5 million over 15 years. However, in Fiscal Year 2002, Congress shifted $490,000 to the Farmland Protection Program for a farm along Green River in the CREP area. This diversion of funds resulted in limiting the land available for the Green River CREP to 99,500 acres and it reduced the program’s funding to $109,510,000. Subsequently, USDA’s share was reduced to $87,510,000. With only 10,813.3 acres currently enrolled in the program, no change or increase in acreage for enrollment into the program above the 99,500 acres is proposed.

The objectives of the Kentucky Green River CREP are to—

- Reduce by 10 percent the amount of sediment, pesticides, and nutrients from agricultural sources entering the tributaries and mainstem of the Green River and Mammoth Cave system. This would be accomplished through the installation of BMPs designed for that purpose and other conservation practices designed to improve water quality, such as re-establishing riparian buffers around sinkholes and along high-priority streams;
- Enhance habitat and populations of wildlife, including State and federally threatened and endangered species, species of special concern, and rare species, and measure success of this objective by reducing the need to list additional species as threatened and endangered;
- Sustain and restore the composition, structure, and function of riparian corridors associated with the Green River and its tributaries, targeting 28,000 acres that include buffers around sinkholes;
- Reconnect habitat types to restore the full range of the ecological system;
- Establish buffers around sinkholes, targeting 1,000 high priority sinkholes;
- Sustain and restore non-riparian wetlands, targeting 3,000 acres (riparian and non-riparian wetlands);
- Protect and restore subterranean ecosystems;

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• Collect, store and analyze data to enhance planning for sustaining the health of the watershed; and
• Develop an outreach program targeting all active agricultural producers in the area.

The purpose of the proposed action is to provide protection to the Green River basin resources by including environmentally sensitive areas in the Upper Green River basin to preserve and protect the unique natural resources, especially the karst topography, that supports numerous threatened and endangered species and feeds the unique ecosystem of Mammoth Cave NP.

Changes have been proposed to the Kentucky CREP that would implement a community-based approach to more effectively protect locally unique resources and provide better service to the local landowners. The proposed changes to the KY CREP are as follows:

1. The addition of 28,904 acres, which would include the Green River Watershed from Mammoth Cave National Park to the confluence with the Barren River, including the Barren River Watershed. This area encompasses 946,101 acres and includes land in Allen, Barren, Butler, Edmonson, Grayson, Logan, Simpson, and Warren Counties. This addition would place all of the Upper Green River Basin into the CREP with the exception of those areas above the U.S. Army Corps of Engineers’ reservoirs.

2. The addition of CP29-Marginal Pastureland Wildlife Habitat Buffer as a conservation practice. This practice was not originally included into this program, but was determined important to the protection of the region’s unique karst resources.

3. The flexibility to allow landowners to enroll entire marginal pastureland fields into conservation practices if a required percentage of the field meets eligibility requirements. This change was considered essential to protect the region’s sinkhole plain, a fragile and critical resource specific to this region. Under the current program, only sinkholes in cropped fields could be buffered.

4. The increase in the maximum buffer widths on select streams within the watershed. Currently, the mainstem of the Green River has a maximum buffer width of 1,000 feet that exceeds the 300-foot width provided for tributaries.

The need for this action is to reduce runoff of sediments, nutrients, pesticides and pathogens from agricultural sources that are adversely affecting the health of the Green River system and threatening the integrity of the Mammoth Cave ecosystem and the region’s water resources.

This programmatic environmental assessment (PEA) assesses two alternatives: (1) Alternative 1-No Action, which evaluates the current CREP program, its existing conditions, and its effects on the environment, and (2) Alternative 2-Expanded Kentucky Green River CREP, which assesses the effects of expanding the CREP area and other programmatic changes as described above. Alternative 2 is the agency’s preferred alternative and the environmentally preferred alternative. Both alternatives would allow up to a total of 99,500 acres to be enrolled in the program. A total of 88,686.7 acres remains eligible for enrollment into the program.

In March 2006, FSA announced its intent to prepare a PEA of the Kentucky Green River CREP. Notices were placed in 17 local newspapers and letters were mailed to Federal, State and local agencies and organizations. Six comments were received from agencies and are summarized in Chapter 2 and provided in full in Appendix D.
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**APPENDICES**

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CHAPTER 1.0 INTRODUCTION

1.1 Background

1.1.1 Conservation Reserve Program (CRP)

The Conservation Reserve Program (CRP) began in 1985 with the enactment of the Food Security Act. This program was initiated to address issues related to erosion and soil losses on cropland, as well as the destruction of wildlife habitat due to the conversion of fallow land to production. Under Title XII of the Food Security Act of 1985 (16 U.S.C. 3830 et seq.), CRP was established as a long-term cropland retirement program. In exchange for retiring highly erodible or environmentally sensitive cropland from production, CRP offered farm owners, operators or tenants annual rentals plus payments for establishing a permanent conservation land cover, such as grasses or trees.

In 1990, the Food, Agriculture, Conservation, and Trade Act of 1990 extended the CRP enrollment period through 1995 and broadened the program’s focus to improve water quality and other environmental goals. In April 1996, the Federal Agriculture Improvement and Reform Act (1996 Act) was passed, further amending the 1985 Act and confirming the CRP’s new focus on environmental benefits.

In 2002, the Farm Security and Rural Investment Act expanded the program to provide for enrollment of up to 39.2 million acres. Of the 39.2 million acres authorized for CRP enrollment, CCC reserves about 3 million acres for special CRP initiatives that target the most pressing environmental needs. These initiatives are:

- Continuous Sign-up – protecting the most environmentally sensitive land through ongoing enrollment;
- Conservation Reserve Enhancement Program – targeting defined geographic areas through Federal-State-private partnerships;
- Farmable Wetlands Program – protecting certain farmed and prior converted wetlands;
- Bottomland Hardwood Tree Initiative—planting trees that mitigate greenhouse gases;
- Presidential Quail Initiative – increasing quail habitat and populations; and
- Wetlands Restoration Initiative—restoring playa lakes and prairie potholes.

As of the end of fiscal year 2005, more than 34.9 million acres have been enrolled into CRP, providing $1.6 billion in annual rental payments to land owners and farm operators. CRP is an important part of USDA’s conservation agenda that has helped reduce soil erosion by more than 40 percent on cropland since 1982. CRP is the national largest private-lands conservation program both in terms of acreage and dollars spent. Some of CRP’s major accomplishments include:

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• Restoring and protecting more than 2 million acres of wetlands and adjacent buffers.
• Reducing soil erosion by 450 million tons per year.
• Establishing 1.7 million acres of grass and forested buffers to protect water quality.
• Improving wildlife populations and habitat.
• Mitigating 48 million metric tons of carbon dioxide annually.
• Reducing sediment into and nutrient enrichment of water bodies

General sign-up extended from March 27 to April 28, 2006. Of the 22,990 offers received for enrollment, FSA accepted 18,140 offers that will become effective on October 1, 2006. Of these, 252 offers were accepted in Kentucky, totaling 6,263 acres.4

In June 2006, USDA announced that it will accept 1 million acres of the 1.4 million acres offered under CRP’s general sign-up. USDA selected the most environmentally fragile of the cropland acres offered, ranking offers based on cost and the Environmental Benefits Index (EBI) factors of soil erosion, water quality, enduring benefits, air quality and wildlife enhancement. In addition, USDA announced that existing CRP participants intend to re-enroll and extend contracts covering 13 million acres set to expire Sept. 20, 2007.

1.1.2 Conservation Reserve Enhancement Program (CREP)

The Conservation Reserve Enhancement Program (CREP) sprung from CRP in 1997, as the CCC and FSA joined with States to achieve specific conservation and environmental objectives. CREP is a conservation partnership program between the FSA and States that addresses specific State and nationally significant water quality, soil erosion and wildlife habitat issues related to agriculture. The primary goals of CREP are to—

• create an opportunity where the resources of a State or Tribal government and CCC can be targeted in a coordinated manner to address specific conservation and environmental objectives of that State and the nation; and
• improve water quality, reduce soil erosion, enhance air quality, or develop wildlife habitat in specific geographic areas that have been adversely impacted by agricultural activities.

CREP is administered by the FSA and funded through CCC and differs from CRP in the following ways:

• CREP is a collaborative undertaking among Federal government, States, and local stakeholders;
• CREP focuses conservation practices on high-priority environmental concerns;
• CREP requires States to establish measurable objectives and conduct monitoring; and
• CREP offers more flexibility regarding local legal constraints and environmental conditions.

Under CREP agreements, Federal/State partnerships implement projects designed to address specific environmental objectives related to improving water quality and enhancing wildlife habitat through targeted CRP enrollments. Sign-up is held on a continuous basis, general sign-up practices may be included, and additional financial incentives are generally provided. The program provides incentives to landowners to develop conservation practices that protect environmentally sensitive land, decrease erosion, restore wildlife habitat, and improve the quality

4 USDA-Farm Service Agency. “History of the CRP.”
of water resources. Farmers and landowners voluntarily enroll land in the program through contracts with FSA and the State and agree to convert cropland to native vegetation and establish riparian buffer zones, plant trees and grasses, restore wetlands, and enhance wildlife habitat. As of June 2006, approximately 836,000 acres have been enrolled in CREP nationwide.\(^5\)

### 1.1.3. Kentucky Conservation Reserve Enhancement Program (KYCREP)

The Kentucky CREP involves the restoration of riparian habitat and other vital natural habitats to protect Mammoth Cave NP and the ecologically significant Green River. In August 2001, the Commonwealth of Kentucky and USDA entered into an agreement to target the restoration of up to 100,000 acres of environmentally sensitive land in the Green River Watershed in south-central Kentucky and to protect Mammoth Cave. The acreage for enrollment into this program was later approved for 99,500 acres. Producers can enroll land in any part of the watershed below the Green River Lake Dam into CREP. Eligible acreage also includes areas adjacent to streams and rivers, surrounding sinkholes and other lands that meet CREP eligibility requirements.

The program was established to provide financial incentives to producers who agreed to plant vegetative covers designed to protect the water quality and improve wildlife habitat in the project area. The KYCREP area borders a 100-mile section of the Upper Green River Watershed and extends from the Green River Dam downstream to Mammoth Cave NP, encompassing all or part of the following eight counties (see Figure 1-1):

- Adair
- Barren
- Edmonson
- Green
- Hart
- Metcalfe
- Russell
- Taylor

The proposed expanded CREP area would include all or parts of the existing counties listed above and all or parts of the following counties (see Figure 1-2):

- Allen
- Butler
- Grayson
- Logan
- Simpson
- Warren

As of May 2006, 574 contracts, totaling 10,813.3 acres were approved in the Kentucky CREP. Under Kentucky CREP, agricultural producers can enter into contracts from 10 to 15 years to convert eligible cropland to stands of native grasses, trees and other conservation practices. Program participants would have the opportunity to enter into the State incentive program and either extend the benefits of the CRP contract for another 15 or 35 years through a supplemental contract with Kentucky or receive payment from Kentucky in return for executing a voluntary permanent easement with Kentucky.

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Figure 1-1: Existing Kentucky Green River CREP Area

Source: Kentucky Environmental and Public Protection Cabinet.

Figure 1-2: Proposed Kentucky CREP Expansion

Source: Kentucky Department of Fish and Wildlife Resources.
KYCREP is an environmental conservation program that focuses on the farming community and improving agricultural practices. This program provides the following benefits, including—

- reduction in soil erosion
- enhanced wildlife habitat
- improvement of water quality through the protection of streams, creeks and rivers from runoff
- improvement of aquatic habitat by providing shade along creeks and rivers through establishment of riparian buffer zones
- protection of sinkholes that further protect groundwater and cave ecosystems
- replenishment of depleted organic matter and nutrients and improves soil conditions
- restoration of flood storage capacity along creeks and streams

The program benefits landowners by—

- providing landowners with consistent income on less productive and highly erodible farmland
- providing landowners with a cost-effective way to address agriculturally related environmental problems, meet regulatory requirements and become stewards of the land
- providing landowners with an average rental rate of $100/acre per year for a 15-year contract
- providing landowners with an additional one-time bonus payments (depending on the conservation practice selected)
- providing landowners with an option to either return the land to production after the CREP agreement has expired or to purchase an optional and permanent easement for an added payment
- providing cost-sharing by both the State and the Federal government for installation of eligible conservation practices; there are additional bonus and/or incentive payments on most practices up front, which allows the landowner to actually make money on the installation process
- allowing the landowner to select areas of the farm to enroll in CREP and providing technical advisors to help develop a conservation plan that will work for both the landowner and the environment
- providing a broad range of conservation practices to accommodate both landowners and specific environmental needs
- encouraging wildlife diversity and providing opportunities for attracting wildlife for enjoyment

Funding for the Kentucky Green River CREP was initially approved at $110 million program, with the Federal government contributing $88 million, the Commonwealth of Kentucky contributing $17 million, and The Nature Conservancy contributing $5 million over 15 years. In Fiscal Year 2002, Congress shifted $490,000 to the Farmland Protection Program for a farm along Green River in the CREP area. This diversion of funds resulted in a reduction in the land available for enrollment into the program from 100,000 acres to 99,500 acres and it reduced the program’s funding to $109,510,000. Subsequently, USDA’s share was reduced to $87,510,000. With only 10,813.3 acres currently enrolled in the program, there will be no change or increase in acreage. These parameters will serve the proposed new region, thus the only change to the

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maximum designated acreage or cost of the program will be to reflect the reduction in USDA’s commitment.

1.2 PURPOSE AND NEED FOR ACTION

The Green River is one of the most diverse ecosystems in North America and the most biologically rich branch of the Ohio River system. The Green River flows unhindered for more than 100 miles through eight counties and Mammoth Cave National Park, the world’s largest and most diverse cave system. Mammoth Cave is a unique and valuable natural resource visited by approximately 1.8 million visitors annually. The quality of the water that enters this area has a significant impact on the ecosystem that supports Mammoth Cave. Sinkholes, characteristic of the region’s karst topography, occur throughout the watershed and contribute to the sensitivity of the area’s aquatic systems.

The Kentucky Green River Conservation Reserve Enhancement Program (KYCREP) seeks to reduce environmental impacts associated with agricultural uses in the Green River Watershed through voluntary and incentive-based conservation practices. To accomplish this reduction, the FSA proposes to add 28,904 acres of environmentally significant watersheds in the Green River basin, to utilize the community-based approach of this program to more effectively protect locally unique resources, and to provide better service to the local landowners. The proposed additional area will include all or parts of Allen, Barren, Butler, Edmonson, Grayson, Logan, Simpson, and Warren Counties. The expanded KYCREP will encompass a total of 946,101 acres with many of the same characteristics of the original Green River CREP area.

The goal of the Kentucky CREP is to greatly reduce runoff of sediments, nutrients, pesticides and pathogens from agricultural sources that currently have an adverse effect on the health of the Green River system. The purpose of the proposed action is to extend the project area to include environmentally sensitive areas down river (approximately 30 river miles) to include the entire Upper Green River Basin (excluding those watersheds that lie above U.S. Army Corps of Engineers Reservoirs). This proposal also addresses key needs for the specific geographic region in order to properly protect unique natural resources and to better service landowners by adapting this program so that it may be utilized in a practical manner.

Agricultural runoff significantly impacts the water quality and the aquatic life in the Green River Watershed. The impacts from this runoff include the flow of nutrients, pesticides, sediments, and pathogens into the waterways and the groundwater. Sinkholes associated with the region’s karst topography contribute to the vulnerability of pollutants entering the area’s aquatic system and ecosystems. Other agricultural impacts involve the fragmentation of riparian corridors, native grasslands and forestlands.

The need for the Kentucky CREP is to ensure the long-term protection of the region’s globally significant and irreplaceable natural resources, fragile karst ecosystem, and water quality, and to enhance habitat for a wide diversity of terrestrial and aquatic wildlife, many of which are listed as federally and State protected. The Green River is the most biologically diverse and species rich branch of the Ohio River system. Included in its watershed are Mammoth Cave, which is a unit of the national park system, a World Heritage site, and an International Biosphere Reserve; the Green River Bioreserve; and seven federally endangered species, as well as hundreds of other species. Implementation of the Kentucky Green River CREP will facilitate conservation practices

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7 Text obtained from original Green River CREP Proposal document.
8 Ibid.
designed to improve water quality, protect the valuable resources within the watershed, and enhance wildlife habitat targeted at the State’s declining species.

1.3 OBJECTIVES

The overall goal of the Kentucky CREP is to sustain and, where needed, restore the health and viability of degraded or threatened natural habitats and ecosystems in the project area. The program goals are to be accomplished through a voluntary, incentive-based program that seeks participation from 80 percent of the agricultural producers within the project area. The objectives of the Kentucky CREP are to—

1. reduce the amount of sediment, pesticides and nutrients entering the tributaries and mainstem of the Green River and Mammoth Cave system from agricultural sources by 10 percent (based on 1999 data), as measured by installation of Best Management Practices (BMPs) designed for that purpose and compliance with water quality standards (replanting riparian buffers along streams and around sinkholes are high priority);

2. enhance wildlife habitat and populations, including State and federally threatened and endangered species, species of special concern, and rare species, using as a measure of success a reduction in the need to list additional species as threatened or endangered;

3. sustain and restore composition, structure and function of riparian corridors associated with the Green River and its tributaries, targeting 28,000 acres that include buffers around sinkholes;

4. reconnect landscape elements that will restore landscape level ecological processes;

5. establish buffers around sinkholes, targeting 1,000 high priority sinkholes;

6. sustain and restore non-riparian wetlands, targeting 3,000 acres (riparian and non-riparian wetlands);

7. protect and restore subterranean ecosystems;

8. collect, store and analyze data to enhance planning for sustaining the health of the watershed; and

9. develop an outreach program targeting all active agricultural producers in the area.

1.4 ORGANIZATION OF DOCUMENT

This document follows the organization established by the USDA-FSA guidelines for preparing a programmatic environmental assessment and by the standard components for and environmental assessment as prescribed by NEPA.

- Cover Sheet, Executive Summary and Contents
- Chapter 1.0-Introduction: Presentation of the history and background of CREP, the purpose and need for the action and its objectives are presented in Chapter I.
- Chapter 2.0-Alternatives including the Proposed Action: This chapter describes the proposed action, summarizes the issues identified during the scoping process and evaluates alternatives to the proposed action, including the No Action alternative.
- Chapter 3.0-Affected Environment: This chapter describes the area affected by CREP, including the natural and cultural resources, and the social and economic characteristics of the affected area.
- Chapter 4.0-Environmental Consequences: This chapter evaluates the potential benefits and consequences of the alternatives to the natural, cultural and social and economic resources described in Chapter 3.0.
- Chapter 5.0-Cumulative Effects: The cumulative effects of the program, which are the past, present and reasonably foreseeable future actions, are identified.
- Chapter 6.0-Mitigation Measures: Measures to avoid or minimize adverse effects of the program are discussed.
• Chapter 7.0-List of Preparers, Contributors and Reviewers
• Chapter 8.0-Persons and Agencies Contacted
• Chapter 9.0-References

Appendices, which provide background material and supporting technical data, are appended to the end of this document as follows:

Appendix A  Proposed Memorandum of Agreement between U.S. Department of Agriculture and the Commonwealth of Kentucky and Addendum Agreement
Appendix B  Kentucky CREP Conservation Practices
Appendix C  Kentucky CREP Relevant Laws and Regulations
Appendix D  Kentucky CREP Agency Correspondence
Appendix E  Federally and State-Protected Species by Kentucky CREP County
Appendix F  Listing of National Register Sites and National Historic Landmarks
Appendix G  Nationwide Rivers Inventory by Kentucky CREP County
Appendix H  Kentucky Historic, Park and Recreation Areas
Appendix I  Listing of Kentucky’s Exotic Species
CHAPTER 2.0 ALTERNATIVES INCLUDING THE PROPOSED ACTION

Chapter 2.0 describes the proposed Federal action, discusses alternatives initially considered, provides reasons for dismissing any alternative because it was not determined feasible, and more fully evaluates the alternatives that were considered reasonable for further evaluation.

2.1 PROPOSED ACTION

The Commodity Credit Corporation (CCC), FSA and the Commonwealth of Kentucky propose to amend the Green River CREP by including environmentally significant watersheds downstream of the existing CREP area and utilize the community-based approach of this program to more effectively protect locally unique resources and provide better service to the local landowners. The proposed additional area will include all or parts of Allen, Barren, Butler, Edmonson, Grayson, Logan, Simpson, and Warren Counties. This area will encompass a total of 946,101 acres. Figure 2-1 shows this proposed new area. It should be noted that many of the characteristics of the proposed area are the same as those in the original Green River CREP region.

The proposed expansion to the Green River CREP will extend downstream to river 149.5 where the Green River joins the Barren River. This expansion will include the tributary watersheds contributing to the Green, including the Nolin River and Barren River systems upstream. The following changes are proposed to the program:

- Include the area of the Green River Watershed from Mammoth Cave National Park to the confluence with the Barren River (including the Barren River Watershed). This addition will not place the entire Upper Green River Basin (excluding those areas above USCOE reservoirs) into the program. This area encompasses 946,101 acres, and includes land in Allen, Barren, Butler, Edmonson, Grayson, Logan, Simpson, and Warren Counties.
- Incorporate CP29–Marginal Pastureland Wildlife Habitat Buffer into the Green River CREP. This new practice was not included in the original program, and has been added due to the important benefits it would provide in protecting the region’s unique karst resources.
- Enroll entire marginal pastureland fields into a conservation practice(s), if a required percentage of the field meets eligibility requirements. This proposal is essential for enrollment and installment to protect the valuable karst features of the region. Within the Green River Watershed, an area of pastureland is nearly three times greater than cropland.

Because of this predominant land use and the karst topography, it would be beneficial to permit entire fields to be applied to marginal pastureland similar to the “infeasible to farm” criterion in the cropping history requirements. In this region, harvesting hay is as important as row cropping. It is common within this CREP area to have buffers on streams that “cut” fields up because of buffer width requirements and terrain characteristics. In addition, local landowners often question committing a large portion of productive land to a conservation easement, but “wasting” the remainder of the field. It is common for landowners not to enroll land into CREP for this reason and thus lose an entire buffer.
Figure 2-1: Proposed Kentucky Green River CREP Expansion Area

Source: Western Kentucky University, 2006.
• Increase maximum buffer widths on select streams within the watershed. Currently, the mainstem of the Green River has a maximum buffer of 1,000 feet. This buffer width exceeds that buffer for the tributaries (300 ft.). The extended buffer width of 1,000 feet is also needed along larger tributaries to the Green River.

• CREP is a conservation partnership program targeted to address specific State and nationally significant water quality, soil erosion and wildlife habitat issues associated with agriculture. CREP establishes voluntary contractual agreements between USDA and private landowners, who agree to implement eligible conservation practices. CREP is administered by the Farm Service Agency and the Commonwealth of Kentucky.

2.2 SCOPING

To comply with 40 CFR §1501.7 of the Council on Environmental Quality’s regulations and to provide agencies and the public with an early opportunity to comment on the program, FSA conducted a scoping process and notified agencies and the public about the intent to prepare a programmatic environmental assessment on the proposed CREP. The Kentucky FSA office announced its plans to prepare a PEA on the Kentucky CREP by sending scoping letters to Federal and State agencies on March 27, 2006. An announcement was published in 17 local newspapers throughout the State during the first and second weeks of April 2006. The dates and newspapers are shown in Table 2-1.

Table 2-1: Kentucky Green River CREP Scoping Announcements

<table>
<thead>
<tr>
<th>Newspaper</th>
<th>Announcement Published</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bowling Green Daily News</td>
<td>04/05/06 and 04/12/06</td>
</tr>
<tr>
<td>Brownsville Edmonson News</td>
<td>04/06/06 and 04/13/06</td>
</tr>
<tr>
<td>Campbellsville Central KY News Journal</td>
<td>04/06/06 and 04/13/06</td>
</tr>
<tr>
<td>Cave City Barren Co. Progress</td>
<td>04/06/06 and 04/13/06</td>
</tr>
<tr>
<td>Columbia Adair Co. Community Voice</td>
<td>04/06/06 and 04/13/06</td>
</tr>
<tr>
<td>Columbia Adair Progress</td>
<td>04/06/06 and 04/13/06</td>
</tr>
<tr>
<td>Edmonton Herald News</td>
<td>04/05/06 and 04/12/06</td>
</tr>
<tr>
<td>Franklin Favorite</td>
<td>04/06/06 and 04/13/06</td>
</tr>
<tr>
<td>Greensburg Record-Herald</td>
<td>04/06/06 and 04/13/06</td>
</tr>
<tr>
<td>Leitchfield Grayson Co. News Gazette</td>
<td>04/06/06 and 04/13/06</td>
</tr>
<tr>
<td>Leitchfield The Record</td>
<td>04/06/06 and 04/13/06</td>
</tr>
<tr>
<td>Morgantown Butler Co. Banner/Green River</td>
<td>04/06/06 and 04/13/06</td>
</tr>
<tr>
<td>Munfordville Hart Co. News-Herald</td>
<td>04/06/06 and 04/13/06</td>
</tr>
<tr>
<td>Russell Springs Russell Register</td>
<td>04/06/06 and 04/13/06</td>
</tr>
<tr>
<td>Russell Springs Times-Journal</td>
<td>04/06/06 and 04/13/06</td>
</tr>
<tr>
<td>Russellville News Democrat &amp; Leader</td>
<td>04/04/06 and 04/11/06</td>
</tr>
<tr>
<td>Scottsville Citizen-Times</td>
<td>04/06/06 and 04/13/06</td>
</tr>
</tbody>
</table>

Source: USDA-Farm Service Agency-Kentucky, June 2006.

Six written comments were received during the scoping period that extended through April 20, 2006. These comments are summarized in the following section. Appendix D contains copies of all comments received from agencies during the scoping period.

Kentucky Division of Forestry, Kentucky Environmental and Public Protection Cabinet:

• The proposed area eligible for enrollment will negatively impact the Division of Forestry by challenging our ability to maintain other stewardship program services with limited personnel. Additional funding may be needed to support the Division of Forestry’s assistance with CREP.
Meeting the increased demand of tree seedlings for restoring the riparian areas within the 99,500-acre area is a concern. Pre-planning for the increased demand to support the program will be vital to ensure that we can meet the demand from the Division’s two tree nurseries. Adequate notice would be required.

The demand for the Division of Forestry’s tree planting machines are currently at the maximum, thus more machines will be needed to cover the additional demand. The Division’s ability to purchase new planters has been greatly reduced.

The increase in establishing warm season grasses in riparian areas may also increase the risk of wildfires. The Division of Forestry would prefer more trees planted in the riparian areas to create permanent buffers, which would be more beneficial to water quality.

The Division commented that it felt it would be excessive to provide a maximum 1,000-foot buffer width to all fourth order and higher streams within the CREP area. The Division provided a table comparing streamside management zone (SMZ) widths among other States in the southeastern United States. The table shows that for municipal waters the maximum SMZ is 200 feet dependent upon slope. Most of the Green River Watershed has minimal slope gradient especially in the agricultural areas.

U.S. Army Corps of Engineers (Two Sets of Comments)
The Corps responded with two sets of comments that are summarized as follows:

- The CREP has benefited its Green River Lake operations by allowing releases to occur as they were designed. Prior to CREP and other environmental enhancements by The Nature Conservancy, development had begun to occur around the lake and discharges from the lake had been inhibited. Similar encroachments occur below Barren River Lake in Warren County that inhibit outflow capabilities, as well as near the mouth of the Mud River, which is outside the CREP area.

- The goals of Kentucky CREP compliment the Corps’ Environmental Operating Principles, especially in regards to environmental sustainability. The Louisville District office began a three-year experiment using a revised operating guide curve for Green River Lake, which is a Corps reservoir upstream of the original CREP area. A critical factor in the success of this project was early enrollment of the lowest lying lands. Enrollment of these low-lying properties eliminated many problems that had occurred with discharges impacting downstream landowners. The CREP PEA should recognize the benefits of CREP to the Corps’ efforts to protect the same resources. Both projects contributed to the improvements in the downstream aquatic ecosystem.

- The Green River is rated the fourth most biodiverse stream in the country. The CREP covers the longest stretch of “exceptional surface water” in Kentucky. Expansion will assist in protecting additional “exceptional and reference reaches” of surface waters in the area. Such expansion will only benefit the Corps’ efforts to operate projects in a more environmentally sustainable manner.

State Historic Preservation Office, Commerce Cabinet

- The Green River and its tributaries have a high density of significant archaeological sites. Some of the proposed practices (tree plantings, shallow water areas, wetland restoration, etc.) have potential for impacting prehistoric and historic archaeological sites. Consequently, archaeological surveys should be conducted by a professional
archaeologist on all tracts where ground-disturbing activities are proposed to determine if there are any sites eligible for listing in the National Register of Historic Places that could be affected. • If any structures 50 years or older are affected by this program, FSA should provide photographs of the buildings that are keyed to maps.

**U.S. Fish and Wildlife Service**

- Fully supports FSA’s proposal to expand and improve on the Green River CREP. Supports the following programmatic changes to CREP—
  a) Include sink hole protection as a primary objective of the program
  b) Increase riparian buffer width eligibility on many of the larger Green River tributaries within the program area; and
  c) Provide landowners with “whole field” eligibility under specified circumstances.
- Large area south of the Green River, known as the sinkhole plain, is an important groundwater recharge zone for the Green River. It is important that as many sinkholes as possible are buffered in this area to reduce the input of sediments and other contaminants into the groundwater system and ultimately the Green River.
- Other significant benefits from the CREP program improvements are—
  a) Increased buffers on larger Green River tributaries, and
  b) “whole field” eligibility.

These improvements make the program more “landowner friendly” which, in turn, ensure that greater conservation benefits will be achieved from the program. The improvements offer more flexibility for landowners. As a result, landowners who might not otherwise enroll may now enroll into CREP.

**National Park Service, Mammoth Cave National Park**
The National Park Service reviewed the “Green River Conservation Reserve Enhancement Program, Subproject Amendment: Area Expansion and Programmatic Requests to Enhance Resource Protection and Landowner Participation.” Central to the mission of the National Park Service (NPS) is the conservation and protection of natural resources within its boundaries. As a long-time active partner in the Green River CREP, the NPS fully supports the proposal to expand the Green River CREP and believes that the proposed changes will enhance program goals relative to improving water quality at Mammoth Cave NP. The following key changes are of special interest to NPS:

  a) Treatment of sinkholes, either by inclusion as marginal pastureland or as whole fields, addresses a general land use throughout much of Mammoth Cave’s recharge area. If approved, this change would affect large portions of the Pennyroyal Plateau.
  b) The increased buffers along stream corridors from 300 feet to 1,000 feet would seem to benefit wildlife habitat, water quality, and perhaps most importantly, increase landowner participation.

Mammoth Cave NP is the primary recipient of land conservation practices of CREP.

**2.3 PRELIMINARY ALTERNATIVES ELIMINATED FROM ANALYSIS**

*Shifting Acreage from Various Conservation Programs*—Preliminary consideration was given to shifting acreages from various other agricultural programs into conservation easements. A conservation easement is a voluntary, legally enforceable land preservation agreement between a landowner and a land trust or government agency that permanently restricts real estate
development, commercial and industrial uses, and certain other activities in order to protect its conservation values. The primary purpose of a conservation easement is to protect agricultural land, timber resources, and/or other valuable natural resources such as wildlife habitat, clean water, clean air, or scenic open space by separating the right to subdivide and build on the property from the other rights of ownership. The landowner who gives up these "development rights" continues to privately own and manage the land and may receive significant State and Federal tax advantages for having donated the conservation easement. Perhaps more importantly, the landowner has contributed to the public good by preserving the conservation values associated with their land for future generations. In accepting the conservation easement, the easement holder has a responsibility to monitor future uses of the land to ensure compliance with the terms of the easement and to enforce the terms if a violation occurs.

KYCREP counties gave shown varying levels of success with different conservation programs. **Table 2-2** identifies some of the various conservation programs and their acreages, as provided by a survey of FSA offices in the CREP area.

**Table 2-2: Other Conservations Programs within the KYCREP Area**

<table>
<thead>
<tr>
<th>CREP County</th>
<th>Other Conservation Program</th>
<th>Contracts(Acres Enrolled)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Allen</td>
<td>CRP</td>
<td>26 contracts</td>
</tr>
<tr>
<td></td>
<td>WHIP</td>
<td>1 contract</td>
</tr>
<tr>
<td>Butler</td>
<td>CRP</td>
<td>80 contracts (1,500 acres)</td>
</tr>
<tr>
<td>Grayson</td>
<td>CRP</td>
<td>319 contracts (13,253 acres)</td>
</tr>
<tr>
<td>Logan</td>
<td>CRP</td>
<td>502 contracts (13,224 acres)</td>
</tr>
<tr>
<td></td>
<td>EQIP</td>
<td>N/A</td>
</tr>
<tr>
<td></td>
<td>WHIP</td>
<td>N/A</td>
</tr>
<tr>
<td></td>
<td>State cost-share practices</td>
<td>N/A</td>
</tr>
<tr>
<td>Simpson</td>
<td>CRP</td>
<td>20 contracts</td>
</tr>
<tr>
<td>Warren</td>
<td>CRP</td>
<td>1,500 acres</td>
</tr>
<tr>
<td></td>
<td>WHIP</td>
<td>50 acres</td>
</tr>
<tr>
<td></td>
<td>EQIP</td>
<td>116 contracts (5,000 acres)</td>
</tr>
<tr>
<td></td>
<td>State cost-share practices</td>
<td>&gt;110 contracts to install animal waste feeding facilities and other conservation practices</td>
</tr>
</tbody>
</table>

N/A=data not available.


Further consideration of this alternative was considered infeasible because administration of many of these programs is not under the authority of FSA, because this alternative did not contribute to meeting the goals of reducing sediment, pesticides, and nutrients that enter the Green River and Mammoth Cave systems and because the viability of other programs cannot be reasonably predicted.
2.4 ALTERNATIVES SELECTED FOR ANALYSIS

2.4.1 Alternative 1-No Action (Existing Program)

Alternative 1 describes the existing Kentucky CREP, which was established through a Memorandum of Agreement (MOA) between USDA-CCC and the Commonwealth of Kentucky in August 2001. The authority for the original Kentucky CREP initially extended through December 31, 2002, and later was extended through the end of 2003. The purpose of this agreement is to restore up to 99,500 acres in south-central Kentucky’s Green River Watershed. Under the existing CREP, producers can enroll land in the watershed below the Green River Lake Dam. Restoring this area will help protect the resources in Mammoth Cave NP and the ecologically rich Green River.

Under Alternative 1, eligible producers can enroll land in the Kentucky CREP through 14- to 15-year CRP contracts. Eligible acreage includes areas adjacent to streams, rivers, and sinkholes and other land that meet the existing CREP eligibility requirements. Producers may extend the benefits of CREP through separate contracts with the State. Applicants must be able to offer eligible acreage and must satisfy the basic eligibility criteria for CRP. Land must be cropland that has been cropped 2 out of the past 5 years and is physically and legally capable of being cultivated. Marginal pastureland is also eligible provided it is suitable for use as a riparian buffer that can be planted to trees. Haying and grazing are not permitted during the CRP contract period unless USDA permits these practices for emergency purposes under standard CRP rules.

Applicants must generally have owned or operated the land for at least one year prior to enrollment. Persons with an existing CRP contract or an approved offer with a contract pending are not eligible for CREP until that contract expires.

Program Goals

The goals of the Kentucky CREP are to—

1. To reduce by 10 percent (based on 1999 data) the amount of sediment, nutrients, and pesticides from agricultural sources entering the tributaries and the mainstem of the Green River and the Mammoth Cave System as measured by installation of Best Management Practices (BMPs) designed for that purpose and compliance with water quality standards (replanting riparian buffers along streams and around sinkholes are high priority);
2. To enhance habitats and populations of wildlife, including State and Federal special concern, rare, threatened and endangered species, using as a measure of success a reduction in the need to list additional species as threatened or endangered;
3. To sustain and restore composition, structure and function of riparian habitat corridors associated with the Green River and tributary watersheds, targeting 28,000 acres that include buffers around sinkholes;
4. To reconnect landscape elements that will restore landscape level ecological processes;
5. To establish buffers around sinkholes, targeting 1000 high priority sinkholes;
6. To sustain and restore non-riparian wetlands, targeting 3000 acres (riparian and non-riparian wetlands);
7. To protect and restore subterranean ecosystems;
8. To collect, store, and analyze data to enhance planning for sustaining the health of the watershed; and
9. To develop an outreach program targeting all active agricultural producers in the area.
Eligible Conservation Practices
The CRP conservation practices approved for Alternative 1 are—

- CP1 Introduced Grasses
- CP2 Native Grasses
- CP3 Tree Planting
- CP3A Hardwood Tree Planting
- CP4B Permanent Wildlife Habitat (corridors)
- CP4D Permanent Wildlife Habitat
- CP8A Grassed Waterways, Non-easement
- CP9 Shallow Waterways for Wildlife
- CP10 Grass Cover - Already Established
- CP11 Tree Cover - Already Established
- CP12 Wildlife Food Plots
- CP21 Filter Strips
- CP22 Riparian Buffer
- CP23 Wetland Restoration
- CP25 Rare and Declining Habitat

Acreage and Targeted Land for Enrollment
Under Alternative 1, the Kentucky CREP would allow enrollment of up to 99,500 acres into the program. Landowners can enroll land in the watershed below the Green River Lake Dam. This area includes land adjacent to streams, rivers and sinkholes and other land that meet CREP eligibility requirements. As of May 2006, 574 contracts have been approved enrolling 10,813.3 acres into the Kentucky Green River CREP. As a result, a total of 88,686.7 acres remain available for enrollment into Kentucky CREP under Alternative 1. Table 2-3 presents the currently approved CREP contracts and acreages by county and conservation practice. Figure 2-2 shows the locations existing CREP contracts under this alternative.

Table 2-3: Kentucky CREP Contracts and Acreages by Conservation Practice through May 2006

<table>
<thead>
<tr>
<th>County</th>
<th>Conservation Practice</th>
<th>Number</th>
<th>Acres</th>
</tr>
</thead>
<tbody>
<tr>
<td>Adair</td>
<td>CP 1 Permanent Native Grasses</td>
<td>1</td>
<td>4.0</td>
</tr>
<tr>
<td></td>
<td>CP2 Permanent Native Grasses</td>
<td>9</td>
<td>193.7</td>
</tr>
<tr>
<td></td>
<td>CP3A Hardwood Tree Planting</td>
<td>3</td>
<td>6.8</td>
</tr>
<tr>
<td></td>
<td>CP22 Riparian Buffer</td>
<td>110</td>
<td>1036.3</td>
</tr>
<tr>
<td></td>
<td>CP25 Rare and Declining Habitat</td>
<td>1</td>
<td>55.9</td>
</tr>
<tr>
<td>Barren</td>
<td>CP1 Permanent Introduced Grasses/Legumes</td>
<td>1</td>
<td>2.7</td>
</tr>
<tr>
<td></td>
<td>CP2 Permanent Native Grasses</td>
<td>63</td>
<td>2353.8</td>
</tr>
<tr>
<td></td>
<td>CP3 Tree Planting</td>
<td>1</td>
<td>15.5</td>
</tr>
<tr>
<td></td>
<td>CP3A Hardwood Tree Planting</td>
<td>1</td>
<td>.50</td>
</tr>
<tr>
<td></td>
<td>CP22 Riparian Buffer</td>
<td>25</td>
<td>275.7</td>
</tr>
<tr>
<td>Edmonson</td>
<td>CP1 Permanent Introduced Grasses/Legumes</td>
<td>2</td>
<td>39.0</td>
</tr>
<tr>
<td></td>
<td>CP2 Permanent Native Grasses</td>
<td>2</td>
<td>122.1</td>
</tr>
<tr>
<td></td>
<td>CP21 Filter Strips</td>
<td>1</td>
<td>1.0</td>
</tr>
<tr>
<td>County</td>
<td>Conservation Practice</td>
<td>Number</td>
<td>Acres</td>
</tr>
<tr>
<td>--------</td>
<td>---------------------------------------</td>
<td>--------</td>
<td>--------</td>
</tr>
<tr>
<td>Green</td>
<td>CP1 Permanent Introduced Grasses/Legumes</td>
<td>1</td>
<td>16.3</td>
</tr>
<tr>
<td></td>
<td>CP2 Permanent Native Grasses</td>
<td>9</td>
<td>287.3</td>
</tr>
<tr>
<td></td>
<td>CP22 Riparian Buffer</td>
<td>113</td>
<td>2054.8</td>
</tr>
<tr>
<td></td>
<td>CP25 Rare and Declining Habitat</td>
<td>1</td>
<td>68.7</td>
</tr>
<tr>
<td>Hart</td>
<td>CP1 Permanent Introduced Grasses/Legumes</td>
<td>6</td>
<td>150.1</td>
</tr>
<tr>
<td></td>
<td>CP2 Permanent Native Grasses</td>
<td>12</td>
<td>572.3</td>
</tr>
<tr>
<td></td>
<td>CP22 Riparian Buffer</td>
<td>50</td>
<td>1215.0</td>
</tr>
<tr>
<td>Metcalfe</td>
<td>CP1 PermanentIntroduced Grasses/Legumes</td>
<td>2</td>
<td>22.0</td>
</tr>
<tr>
<td></td>
<td>CP2 Permanent Native Grasses</td>
<td>13</td>
<td>431.1</td>
</tr>
<tr>
<td></td>
<td>CP22 Riparian Buffer</td>
<td>20</td>
<td>195.5</td>
</tr>
<tr>
<td>Russell</td>
<td>CP22 Riparian Buffer</td>
<td>6</td>
<td>12.8</td>
</tr>
<tr>
<td></td>
<td>CP25 Rare and Declining Habitat</td>
<td>3</td>
<td>5.1</td>
</tr>
<tr>
<td>Taylor</td>
<td>CP2 Permanent Native Grasses</td>
<td>23</td>
<td>498.2</td>
</tr>
<tr>
<td></td>
<td>CP3A Hardwood Tree Planting</td>
<td>3</td>
<td>53.8</td>
</tr>
<tr>
<td></td>
<td>CP22 Riparian Buffer</td>
<td>91</td>
<td>1089.1</td>
</tr>
<tr>
<td></td>
<td>CP25 Rare and Declining Habitat</td>
<td>1</td>
<td>34.2</td>
</tr>
<tr>
<td><strong>TOTAL</strong></td>
<td></td>
<td><strong>574</strong></td>
<td><strong>10,813.3</strong></td>
</tr>
</tbody>
</table>


**Sign-up and Eligibility Requirements**

Eligible producers can enroll in CREP through 14- to 15-year CRP contracts. Producers may extend the benefits of CREP through separate contracts with the State. Applicants must be able to offer eligible acreage and must satisfy the basic eligibility criteria for CRP. Land must be cropland that has been cropped 2 out of the past 5 years and is physically and legally capable of being cropped. Marginal pastureland is also eligible provided it is suitable for use as a riparian buffer planted to trees. Applicants must generally have owned or operated the land for at least one year prior to enrollment. Persons with an existing CRP contract or an approved offer with a contract pending are not eligible for CREP until that contract expires.

**CREP Payments**

Kentucky CREP participants are eligible for four types of USDA payments:

1. **Signing Incentive Payment** - a one-time payment of $140 to $150 per acre for land enrolled in a riparian buffer practice, filter strip, or grassed waterway. USDA makes this payment soon after the contract has been signed.
2. **Practice Incentive Payment** - payment equal to about 40 percent of the total cost for establishing the riparian buffer practice, filter strip, or grassed waterway practice. This payment is in addition to the 50 percent cost share assistance that USDA provides.
3. **Annual rental payment** of 125 percent to 200 percent of the dryland cash rental rate, depending on the practice that is selected.
4. **Cost share assistance** for installing the conservation practices on land that is retired.

Kentucky can also offer one-time lump sum incentive payments for contract extension or permanent easements and will provide additional cost-share assistance.

Land is currently authorized for enrollment through December 31, 2007, under Alternative 1.
Figure 2-2: Location of Existing CREP Contracts, September 2005

2.4.2 Alternative 2-Expanded Kentucky Green River CREP (Agency Preferred Alternative)

Alternative 2 proposes to amend and expand the Kentucky Green River CREP area by adding 28,904 acres of environmentally significant watersheds downstream of the existing project area (refer to Figure 2-1) for a total of 946,101 acres into CREP. Further, Alternative 2 proposes to more effectively protect locally and globally significant resources and provide better government service to the local landowners. The proposed additional area for inclusion into the CREP boundary will encompass all or parts of Allen, Barren, Butler, Edmonson, Grayson, Logan, Simpson, and Warren Counties. Of the total of 946,101 acres, 99,500 acres may be enrolled into the program. The 99,500 acres eligible for enrollment will be available from areas along the Green River and its tributaries.

The Kentucky CREP will consist of a Federal continuous sign-up CRP component and a voluntary State incentive program. This alternative would provide for the enrollment of crop and pastureland with high environmental value along the mainstem of the Green River and its tributaries. The project objectives are—

- To reduce by 10 percent the amount of sediment, nutrients, and pesticides from agricultural sources entering the tributaries and mainstem of the Green River and Mammoth Cave System through the installation of BMPs designed for that purpose, and other conservation practices designed to improve water quality (replanting riparian buffers around sinkholes and along streams are high priority).
- To enhance habitats and populations of wildlife, including those listed as State and Federal special concern, rare, threatened and endangered, using a measure of success a reduction in the need to list additional species as threatened or endangered.
- To sustain and restore the composition, structure, and function of riparian habitat corridors associated with the Green River and tributary watersheds.
- To reconnect habitat types in order to restore the full range of ecosystem function.
- To establish buffers around sinkholes, targeting 1,000 high priority sinkholes.
- To sustain and restore non-riparian wetlands.
- To protect and restore subterranean ecosystems.
- To collect, store, and analyze data to enhance planning for sustaining the health of the watershed.
- To develop an outreach program targeting all active agricultural producers in the area.
- To utilize native species, including warm season grasses, to the greatest extent possible.

The following are the principal changes to the Kentucky CREP proposed under this alternative:

- The addition of the Green River Watershed from Mammoth Cave National Park to the confluence with the Barren River (including the Barren River Watershed). This addition would place the entire Upper Green River Basin (excluding those areas above USCOE reservoirs) into the program. This area would encompass a total of 946,101 acres, which is an increase of 28,904 acres more than Alternative 1. The area includes all or portions of Allen, Barren, Butler, Edmonson, Grayson, Logan, Simpson, and Warren Counties in the Upper Green River Watershed.

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• The incorporation of the CP29 – Marginal Pastureland Wildlife Habitat Buffer into the Green River CREP. This practice was not originally included into this program, but has been determined important to the protection of the region’s unique karst resources. The purpose of CP29 is to remove nutrients, sediment, organic matter, pesticides and other pollutants from surface runoff and subsurface flow by deposition, absorption, plant uptake, de-nitrification and other processes and thereby reduce pollution and protect surface water and subsurface water quality while enhancing the ecosystem of the waterbody. Through restoration of native plant communities, particularly along streambanks, these plantings will help in stabilizing soils adjacent to streams, improve flood control, and restore and enhance wildlife habitat.

• The ability to enroll “whole fields” or entire marginal pastureland fields into conservation practices if a required percentage of the field meets eligibility requirements. This is essential to protect karst features.

• The increase of maximum buffer widths on select streams within the watershed. Currently, the mainstem Green River has a maximum buffer with (1,000 ft.) that exceeds the buffers for tributaries (300 ft.). The extended buffer width of 1,000 feet is also needed on larger tributaries.

The Kentucky Green River CREP was finally approved for 99,500 acres with a $109,510,000 budget. USDA’s share was approved at $87,510,000. No increase in acreage for enrollment is proposed for this alternative.

Eligible Conservation Practices
The following practices are proposed for Alternative 2:

- CP1 Introduced Grasses and Legumes
- CP2 Native Grasses, Legumes and Forbs
- CP3 Tree Planting
- CP3A Hardwood Tree Planting
- CP4B Permanent Wildlife Habitat (Corridors), Non-easement
- CP4D Permanent Wildlife Habitat, Non-easement
- CP8A Grassed Waterways, Non-easement
- CP9 Shallow Waterways for Wildlife
- CP10 Vegetative Cover--Grass--Already Established
- CP11 Vegetative Cover--Trees--Already Established
- CP12 Wildlife Food Plots
- CP15A Permanent Vegetative Cover (Contour Grass Strips), Non-easement
- CP21 Filter Strips
- CP22 Riparian Buffer
- CP23 Wetland Restoration
- CP25 Rare and Declining Habitat
- CP29 Marginal Pastureland Wildlife Habitat Buffer

Additionally, in accordance with FSA’s 2-CRP Handbook, the project will include the following practices funded through the Kentucky Soil Erosion and Water Quality State Cost Share Program:

1. Alternative Water Supplies for Livestock:
   a. Limited point access to streams for livestock
   b. Water lines and tanks

Table 2-4 shows the proposed contracts pending approval by county and conservation practice as of May 2006.
Table 2-4: Kentucky CREP Contracts and Acreages by County and Conservation Practice through May 2006

<table>
<thead>
<tr>
<th>County</th>
<th>Conservation Practice</th>
<th>Number</th>
<th>Acres</th>
</tr>
</thead>
<tbody>
<tr>
<td>Adair</td>
<td>CP22 Riparian Buffer</td>
<td>7</td>
<td>45.0</td>
</tr>
<tr>
<td>Barren</td>
<td>CP2 Permanent Native Grasses</td>
<td></td>
<td>18.0</td>
</tr>
<tr>
<td>Edmonson</td>
<td>CP1 Permanent Introduced Grasses/Legumes</td>
<td>2</td>
<td>29.0</td>
</tr>
<tr>
<td>Hart</td>
<td>CP22 Riparian Buffer</td>
<td>5</td>
<td>136.9</td>
</tr>
<tr>
<td>Metcalfe</td>
<td>CP22 Riparian Buffer</td>
<td>3</td>
<td>65.0</td>
</tr>
<tr>
<td>Russell</td>
<td>CP2 Permanent Native Grasses</td>
<td>1</td>
<td>3.0</td>
</tr>
<tr>
<td>Russell</td>
<td>CP22 Riparian Buffer</td>
<td>5</td>
<td>45.0</td>
</tr>
<tr>
<td>TOTAL</td>
<td></td>
<td>23¹</td>
<td>341.9</td>
</tr>
</tbody>
</table>

¹ Estimated. No number of contracts identified for Barren County.


**Enrollment Period**

Land would be authorized for enrollment through December 31, 2007. All CRP contracts for land enrolled in the CREP will be not less than 10 years or more than 15 years and will be subject to all normal CRP provisions as provided for in the CRP guidance. Program participants will have the opportunity to enter into the State incentive program and either extend the benefits of the CRP contract for another 15 or 35 years through a supplemental contract with Kentucky, or receive payment from Kentucky in return for executing a voluntary permanent easement with the State.

**CREP Payments**

Kentucky CREP participants are eligible for four types of USDA payments:

1. Signing Incentive Payment - a one-time payment of $140 to $150 per acre for land enrolled in a riparian buffer practice, filter strip, or grassed waterway. USDA makes this payment soon after the contract has been signed.
2. Practice Incentive Payment - payment equal to about 40 percent of the total cost for establishing the riparian buffer practice, filterstrip, or grassed waterway practice. This payment is in addition to the 50 percent cost share assistance that USDA provides.
3. Annual rental payment of 125 percent to 200 percent of the dryland cash rental rate, depending on the practice that is selected.
4. Cost share assistance for installing the conservation practices on land that is retired.

In addition, Kentucky can offer one-time lump sum incentive payments for contract extension or permanent easements and will provide additional cost-share assistance.

**2.5 COMPARISON OF ALTERNATIVES**

Table 2-2 compares the existing and proposed components of Alternatives 1 and 2. A total of 99,500 acres would be eligible for enrollment into the Kentucky Green River CREP. The expiration of the program would be December 31, 2007 for both alternatives.
<table>
<thead>
<tr>
<th>Program Component</th>
<th>Alternative 1-No Action (Existing Program)</th>
<th>Alternative 2-Expanded Kentucky Green River CREP</th>
</tr>
</thead>
<tbody>
<tr>
<td>Expiration</td>
<td>December 31, 2007</td>
<td>December 31, 2007</td>
</tr>
<tr>
<td>Contract Term</td>
<td>14-15 years</td>
<td>10-15 years; maintenance plans</td>
</tr>
<tr>
<td>CREP Boundary Area</td>
<td>917,197 acres</td>
<td>946,101 acres, an increase of 28,904 acres into the program</td>
</tr>
<tr>
<td>Eligible Enrollment Acreage</td>
<td>Allows up to 99,500 acres for CREP enrollment; currently 10,813.3 acres are enrolled; 88,686.7 acres remaining for enrollment</td>
<td>Allows up to 99,500 acres for CREP enrollment; 88,686.7 acres remaining for enrollment</td>
</tr>
<tr>
<td>Eligible CRP Practices</td>
<td>CP1 Introduced Grasses and Legumes, CP2 Native Grasses, CP3 Tree Planting, CP3A Hardwood Tree Planting, CP4B Permanent Wildlife Habitat (Corridors), Non-easement, CP4D Permanent Wildlife Habitat, Non-easement, CP8A Grassed Waterways, Non-easement, CP9 Shallow Waterways for Wildlife, CP10 Vegetative Cover--Grass--Already Established, CP11 Vegetative Cover--Trees--Already Established, CP12 Wildlife Food Plots</td>
<td>CP1 Introduced Grasses and Legumes, CP2 Native Grasses, CP3 Tree Planting, CP3A Hardwood Tree Planting, CP4B Permanent Wildlife Habitat (Corridors), Non-easement, CP4D Permanent Wildlife Habitat, Non-easement, CP8A Grassed Waterways, Non-easement, CP9 Shallow Waterways for Wildlife, CP10 Vegetative Cover--Grass--Already Established, CP11 Vegetative Cover--Trees--Already Established, CP12 Wildlife Food Plots</td>
</tr>
<tr>
<td>Program Component</td>
<td>Alternative 1-No Action (Existing Program)</td>
<td>Alternative 2-Expanded Kentucky Green River CREP</td>
</tr>
<tr>
<td>-------------------</td>
<td>------------------------------------------</td>
<td>-----------------------------------------------</td>
</tr>
</tbody>
</table>
|                   | ▪ CP15A Permanent Vegetative Cover (Contour Grass Strips), Non-easement  
|                   | ▪ CP21 Filter Strips  
|                   | ▪ CP22 Riparian Buffer  
|                   | ▪ CP23 Wetland Restoration  
|                   | ▪ CP25 Rare and Declining Habitat | ▪ CP15A Permanent Vegetative Cover (Contour Grass Strips), Non-easement  
|                   |                                | ▪ CP21 Filter Strips  
|                   |                                | ▪ CP22 Riparian Buffer  
|                   |                                | ▪ CP23 Wetland Restoration  
|                   |                                | ▪ CP25 Rare and Declining Habitat  
|                   |                                | ▪ CP29 Marginal Pastureland Wildlife Habitat Buffer |
| Program Cost      | ▪ $105 million total program cost: $88 million from the Federal Government; $17 million from the State; $5 million from The Nature Conservancy | ▪ $109,510,000 total program cost; $87,510,000 from the Federal Government; $17 million from the State; $5 million from The Nature Conservancy |

Source: MOA between CCC and Commonwealth of Kentucky for Implementation of the Conservation Reserve Enhancement Program.
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CHAPTER 3.0  AFFECTED ENVIRONMENT

Chapter 3 describes the natural, cultural, and social resources that exist within the proposed 14-county Kentucky Green River CREP area.

3.1 BIOLOGICAL RESOURCES

The Green River is the most biologically diverse branch of the Ohio River system. Although its upper headwaters are impounded, the river flows unhindered for more than 100 miles from Green River Reservoir to Mammoth Cave NP, the world’s longest and most diverse cave system. The Upper Green River Basin also includes several recognized endangered ecosystems of the United States. These include native prairies, hardwood savannahs, canebrakes, and old-growth deciduous forest. Agricultural runoff significantly impacts the health and diversity of aquatic ecosystems. Habitat conversion to agricultural use has contributed to fragmentation of endangered riparian and upland ecosystems. 10

3.1.1 Wildlife and Fisheries

The South-Central Kentucky karst region has cave species and biotic cave communities among the most diverse in the world. The Green River area below Green River Lake is considered to be one of the most diverse rivers for fish and mussel species in the United States. The upper Green River system historically harbored 66 mussel species, or 22 percent of North America’s mussel fauna, including the endemic Kentucky creekshell (Villosa ortmanni). Eight of these mussels and one endemic crustacean are protected under the Endangered Species Act.

Based on the U.S. Army Corps of Engineers Green River Lake Sustainable River Project, the area includes over 151 species of fish and 71 species of fresh water mussels. 11 Of these species, more than 130 species are regular inhabitants within the Mammoth Cave system.

The Nature Conservancy (TNC) ranked the upper Green River fourth nationally in the number of imperiled aquatic species. 12 The following sections describe the aquatic and terrestrial species. This information was obtained from the National Park Service Mammoth National Park, Nature and Science, website at http://www.nps.gov/maca/pphtml/nature.html.

In 2005, the Kentucky Department of Fish and Wildlife Resources (KDFWR) completed a Comprehensive Wildlife Conservation Strategy (CWCS) which was developed to identify and conserve Kentucky’s Species of Greatest Conservation Need and to comply with the requirements of the congressionally authorized State and Tribal Wildlife Grants (STWG) Program. This strategy represents a proactive plan for sustaining the diversity of species and habitats found throughout Kentucky. A total of 251 Species of Greatest Conservation Need were identified for Kentucky, representing species from seven taxonomic groups: bivalves, fishes, lampreys, amphibians, reptiles, birds, and mammals. Priority Conservation Areas were identified where many of these species can be found in relatively small regions. Table 3-1 shows the classification of wildlife species, the total number of species, the number of species in need of conservation, and the number of threatened and endangered species.

10 Byron, William J. “Green River Lake, KY—Sustainable River Project.” Text obtained from original Green River CREP proposal document.
11 Ibid.
Table 3-1: Kentucky Wildlife by Classification, Number in Need of Conservation and Listed as Threatened or Endangered

<table>
<thead>
<tr>
<th>Wildlife Classification</th>
<th>Total Number of Species</th>
<th>Species in Need of Conservation</th>
<th>Species Listed as Threatened or Endangered</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mussels</td>
<td>134</td>
<td>46</td>
<td>21</td>
</tr>
<tr>
<td>Fish</td>
<td>269</td>
<td>59</td>
<td>7</td>
</tr>
<tr>
<td>Amphibians</td>
<td>74</td>
<td>22</td>
<td>0</td>
</tr>
<tr>
<td>Reptiles</td>
<td>80</td>
<td>27</td>
<td>1</td>
</tr>
<tr>
<td>Birds</td>
<td>361</td>
<td>81</td>
<td>6</td>
</tr>
<tr>
<td>Mammals</td>
<td>94</td>
<td>16</td>
<td>3</td>
</tr>
<tr>
<td><strong>TOTALS</strong></td>
<td><strong>1,012</strong></td>
<td><strong>251</strong></td>
<td><strong>38</strong></td>
</tr>
</tbody>
</table>

*The criteria are based on the list of species monitored by Kentucky Heritage Program and NatureServe Global Rank. The list was modified based on biologists’ knowledge of State endemics, species that are not well-studied, and potential re-introductions.


### 3.1.1.1 Aquatic Species

Currently there are many aquatic and semi-aquatic species of concern in the Green River and the Barren River Watersheds. These species of concern are discussed later in section 3.1.3. This section describes the most common aquatic species in the CREP area.

**Fishes:** Common species of fish that occur in the Green River system include white, largemouth, smallmouth and Kentucky bass; crappie; muskie; bluegill; muskellunge; yellow perch; gar; and catfish. Cave-adaptive fish species occur in the Mammoth Cave system, known generally known as eyeless fish. These unusual fish have adapted to lightless, low-energy environments and do not have eyes or skin pigment.

**Amphibians:** The following common amphibians are known to occur in the Green River basin: mudpuppy, hellbender, red-spotted newt, Jefferson salamander, spotted salamander, marbled salamander, tiger salamander, zigzag salamander, slimy salamander, eastern mud salamander, northern red salamander, northern two-lined salamander, long-tailed salamander, cave salamander, northern dusky salamander, small-mouthed salamander, eastern spadefoot toad, American toad, Fowler's toad, southern cricket frog, mountain chorus frog, spring peeper, gray treefrog, bullfrog, green frog, pickerel frog, leopard frog, wood frog, and eastern narrow-mouthed toad.

**Invertebrates:** The following crustaceans are found in area caves and streams: the endangered Kentucky cave shrimp, cave crayfish, partially cave-adaptive amphipod, crayfish, sculpin, and the springfish. Sediments of Mammoth Cave streams support nematodes or roundworms (undescribed), copepods, tardigrades, and oligochaete worms.

The aquatic and terrestrial ecosystems in caves are generally distinct and separate, but areas near cave streams are transitional. For example, mud banks support troglobitic beetles, which feed on worms and other small invertebrates. As part of the community dependent upon flood-deposited organic films, springtails are preyed upon by the troglobitic daddy longlegs. Troglobites are “cave dwellers” that can pass their life history either in cool, dark, moist areas outside the cave or inside caves if sufficient food is found.
Another major transition area develops at cave entrances when litter from vegetation accumulates, providing habitat for collembolans or springtails. Predators in these areas include the beetle (*Pseudanophthalmus*), and a mite (*rhagidid*).\(^{13}\)

### 3.1.1.2 Terrestrial Species

Terrestrial wildlife commonly seen in the Kentucky Green River Watershed include white-tailed deer; red fox; small mammals, including cottontail rabbits, several types of squirrels, raccoons, opossum, skunks; wild turkey; eastern bluebird and other song birds; Northern bobwhites; migratory waterfowl, including Canada geese, great blue heron; bald eagle; and red-tail hawk. The following discussion provides an overview of the most common terrestrial species within the watershed.

**Mammals.** Mammals commonly seen in Mammoth Cave NP include whitetail deer, bobcats, foxes, muskrats, gray squirrels, flying squirrels, rabbits, opossums, raccoons, striped and spotted skunks, beaver, mink, groundhogs, chipmunks, moles, voles, shrews, mice, and woodrats. Woodrats and raccoons were formerly abundant in Mammoth Cave, but are fewer in number today. A reintroduction program for river otter has been initiated within the park and the rock shrew, nine-banded armadillo, pygmy shrew, or least weasel have also been recorded in Kentucky.\(^{14}\)

**Bats:** Kentucky provides habitat for 14 species of bats, three of which are federally endangered: Indiana bat, gray bat, and Virginia big-eared bat. In addition to the variety of terrestrial habitats available to bats in Kentucky (e.g., upland forests, riparian corridors, forested wetlands, etc.), subterranean karst caves and sinkholes are abundantly scattered throughout the State. Caves and sinkholes offer breeding sites for gray bats and Virginia big-eared bats, and also provide important hibernacula for numerous species of bats that migrate from other States.\(^{15}\)

Indiana bats, and to a lesser extent gray bats, were once prominent species in Mammoth Cave about 150 years ago, but today these species are federally protected and listed as endangered. Little brown bats were also abundant, whereas the big brown bat and eastern pipistrelle were less common. While many bat species still exist in Mammoth Cave, their numbers have been greatly reduced.

**Reptiles:** Among the reptiles in the area, the following species are known to occur: fence lizard, slender glass lizard, six-lined racerunner, ground skink, coal lizard, five-lined skink, broad-headed skink; stinkpot turtle, snapping turtle, eastern box turtle, map turtle, slider, red eared turtle, smooth softshell turtle, eastern spiny softshell worm snake, northern ringneck snake, hognose snake, rough green snake, northern black racer, gray rat snake, northern pine snake, northern water snake, northern brown snake, red-bellied snake, eastern garter snake, Butler's garter snake, eastern ribbon snake, southeastern crowned snake, northern copperhead, and timber rattlesnake.

**Insects:** Many insects are called troglobiphiles, which means essentially “cave lovers.” These creatures can only complete their life histories in caves. These troglobiphiles are in the form of spiders, mites, copepods, cave crickets, millipedes, and pseudoscorpions. Trogloxenes are “cave

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\(^{13}\) National Park Service, Mammoth Cave National Park; http://www.nps.gov/maca/pphtml/nature.html

\(^{14}\) Kentucky’s Comprehensive Wildlife Conservation Strategy 2005, Kentucky Department of Fish and Wildlife Resources, #1 Game Farm Road, Frankfort, KY 40601; Web site: http://fw.ky.gov/kfwis/stwg/

\(^{15}\) Ibid.
guests" and cannot complete their life history in caves. These creatures may be crickets, flies, and gnats as well as other non-insect creatures.

On mud banks, the trogloptic beetles *Pseudanophthalmus striatus*, *P. menetriesi*, and *Neaphaenops tellkampfi* prey upon worms and other small invertebrates. As part of the community dependent upon flood-deposited organic films, the springtails (*Folsomia candida*) and *Pseudosinella* are preyed upon by daddy longlegs (*Phalangodes armata*). At cave entrances, collemobolans or springtails (*Tomocerus*, *Hypogastrura*, *Sinella*, and *Arrhopalites*) are found.

Cave crickets (*Hadenoecus subterraneus*) bury their eggs in sandy passages with moderate moisture in the constant temperature zone and blind cave beetles (*Neaphaenops*) often prey on those eggs. This beetle has the highest density of any species in Mammoth Cave after the cave crickets. The springtail (*Arrhopalites*) and the dipluran *Litocampa* are preyed upon by the mite *Arctoseius*, the spider *Anthrobia*, and the pseudoscorpion *Kleptochthonius*. These latter two are in turn preyed upon by blind cave beetles.

Cricket guano supports millipedes, springtails, plus bristletails, beetles, snails and mites. These species are preyed upon by the pseudoscorpion *Kleptochthonius*, the beetle *Pseudanophthalmus menetriesi*, the larval fly (*Macrocera nobilis*), and the spider *Phanetta*.

*Invertebrates*: The following invertebrate species have been found in the Green River: ring pink, rough pigtoe, pistolgrip, fatmucket, spectaclecase, plain pocketbook, washboard, sheepnose, and snuffbox. Several of the mussel species are federally endangered. A snail (*Antroselates spiralis*) is known to occur in cave environments.

*Birds*: Approximately 375 species of birds have been recorded in Kentucky, and of these, about 150 species are known to regularly breed in the State (B. Palmer-Ball, pers. comm.). These bird species include landbirds, waterbirds, shorebirds, and waterfowl. The following birds have been recorded in the Green River Watershed: grebes, herons, geese, ducks, vultures, hawks, bald eagles, quail, wild turkey, sandpipers, doves, hummingbirds, kingfishers, whip-poor-wills, owls, flycatchers, crows, blue jays, chickadees, titmice, nuthatches, wrens, thrushes, catbirds, starlings, vireos, wood warblers, tanagers, cardinals, sparrows, blackbirds and finches.

### 3.1.2 Vegetation

Kentucky once encompassed a vast area of savannah grassland known as the "Barrens." This vegetation pattern was maintained by intentional burning by Native Americans before European contact. Although largely eliminated from the region by agricultural practice and fire suppression, small remnant stands of native grasses still exist comprised of varieties of Indian grass, big bluestem, and little bluestem. These varieties tend to be genetically distinct from their cousins in the Great Plains.
Oak-hickory forest is the predominant forest type.\(^{20}\) Vegetation features second growth forests of various vintages and small areas of old growth. Old fields are largely dominated by eastern red cedar and Virginia pine mixed with deciduous trees along the outer margins. More mature upland sites are generally oak hickory forest, and in moist hollows, beech-maple-tulip poplar forest dominates.

### Mesic Slope and Floodplain Forests
- Moist ravines connected with the major river valleys support beech, maple, and tulip poplar in largely calcareous mesic habitats. On the floodplain alluvium, boxelder, sycamore, and river birch complement beech and maple.\(^{21}\)

### Cedar-Oak Glades
- In the driest limestone habitat types (calcareous xeric and sub-xeric), especially on south to west facing slopes, cedar-oak glades prevail. These are sites where the dryness of the site is an important factor in limiting growth of deciduous trees other than drought-tolerant species, such as chinquapin oak and blue ash, and eastern red-cedar is not successional.

### Ridgetop Pine-Oak Stands
- Located on the dry edges of sandstone cliffs facing south to west, acid habitats support nearly pure but narrow stands of Virginia pine and chestnut oak. As with cedar-oak glades mentioned above, Virginia pine is not successional at these sites.

### Prairie Ecosystem
- Prairie grasses and forbs, such as big bluestem, Indian grass, goldenrod, and tall coreopsis, serve as refuges for species marginalized by conversion of former prairie on the sinkhole plain to agriculture.

Along the Green and Nolin Rivers, sycamore, silver poplar, river birch, box elder and American elm are found. Special communities of limited distribution include upland swamps with pin oak, red sweet gum, and red maple; deep sandstone hollows with hemlock and umbrella magnolia; dry limestone cedar oak glades; and cliff margin stands of Virginia pine on sandstone cliff margins. Patches of prairie, locally called “barrens” due to the lack of trees, were originally maintained by Native Americans through burning, and now exist only in remnant patches. Efforts to restore native prairie within Mammoth Cave NP are currently underway.\(^{22}\)

### Invasive Species
- Often referred to as exotic, nonnative, alien, noxious, or non-indigenous weeds, invasive species impact native plant and animal communities by displacing native vegetation and competing with native species for food and habitat. As defined in Executive Order 13112, an "invasive species" is 1) non-native (or alien) to the ecosystem under consideration and 2) whose introduction causes or is likely to cause economic or environmental harm or harm to human health. Invasive species can be plants, animals, and other organisms (e.g., microbes). Human disturbance is the primary means of introducing invasive species into an area.

As a Federal agency, FSA must comply with Executive Order 13112, which prevents the introduction of invasive species and provides for their control. As conversion of cropland to grasslands, riparian areas, forestlands and wetlands can provide opportunities for non-native plants and animals to establish, monitoring converted farmland for these species and working with NRCS and FWS to prevent and eradicate these species is encouraged.

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\(^{22}\) Ibid.
The most predominant exotic species noted by the Kentucky Nature Preserves Commission are—

- Bush Honeysuckle (*Lonicera maackii*)
- Chinese Yam (*Dioscorea oppositifolia*)
- Garlic Mustard (*Alliaria petiolata*)
- Japanese Honeysuckle (*Lonicera japonica*)
- Japanese Knotweed (*Polygonum cuspidatum*)
- Japanese Stilt Grass (*Microstegium vimineum*)
- Musk Thistle (*Carduus nutans*)
- Wintercreeper (*Euonymus fortunei*)

A more comprehensive listing of Kentucky’s exotic and invasive flora and fauna can be found in Appendix I.

### 3.1.3 Protected Species and Habitat

The Green River Watershed ranks second to the Cumberland River drainage with respect to species diversity and endemism (Butler et al. 2003). Five darter species (teardrop darter, splendid darter, orangefin darter, Kentucky darter, and Shawnee darter), as well as the blackfin sucker, are endemic to the upper Green River drainage area, and one darter species (frecklebelly darter) is shared exclusively with the Kentucky River (Burr and Page, 1986; Ces and Page, 1997). Three species in the cavefish family Amblyopsidae also occur in the karst region of the Green River. At least 20 of the 61 species listed as species of special concern, rare, or endangered by the Kentucky State Nature Preserves Commission are found in the Green River drainage.23

Table 3-2 lists the species and identifies their occurrence by CREP county. Appendix E presents a table listing the federally protected species by CREP county, as well as a listing of State-protected plant species identified by the Kentucky State Nature Commission.

### Table 3-2: Federally and State Protected Species by CREP County, Kentucky

<table>
<thead>
<tr>
<th>Common Name</th>
<th>Scientific Name</th>
<th>CREP County</th>
<th>Federal Status</th>
<th>KY Status</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bald eagle</td>
<td><em>Haliaeetus Leucocephalus</em></td>
<td>Adair, Allen, Barren, Russell, Taylor, Warren</td>
<td>PS:LT, PDL</td>
<td>T</td>
</tr>
<tr>
<td>Catspaw</td>
<td><em>Epioblasma Obliquata Obliquata</em></td>
<td>Butler, Hart, Russell, Warren</td>
<td>LE</td>
<td>E</td>
</tr>
<tr>
<td>Clubshell</td>
<td><em>Pleurobema Clava</em></td>
<td>Butler, Edmonson, Grayson, Green, Hart, Taylor, Warren</td>
<td>LE, XN</td>
<td>E</td>
</tr>
<tr>
<td>Copperbelly water snake</td>
<td><em>Nerodia Erythrogaster Neglecta</em></td>
<td>Butler, Logan</td>
<td>PS:LT</td>
<td>S</td>
</tr>
<tr>
<td>Cumberland bean</td>
<td><em>Villosa Trabalis</em></td>
<td>Russell</td>
<td>LE, XN</td>
<td>E</td>
</tr>
<tr>
<td>Cumberlandian combshell</td>
<td><em>Epioblasma Brevidens</em></td>
<td>Russell</td>
<td>LE, XN</td>
<td>E</td>
</tr>
<tr>
<td>Fanshell</td>
<td><em>Cyprogenia Stegaria</em></td>
<td>Butler, Edmonson, Green, Hart, Russell, Taylor, Warren</td>
<td>LE</td>
<td>E</td>
</tr>
</tbody>
</table>

23 *Kentucky’s Comprehensive Wildlife Conservation Strategy 2005*, Kentucky Department of Fish and Wildlife Resources, #1 Game Farm Road, Frankfort, KY 40601; Web site: http://fw.ky.gov/kfwis/stwg/
<table>
<thead>
<tr>
<th>Common Name</th>
<th>Scientific Name</th>
<th>CREP County</th>
<th>Federal Status</th>
<th>KY Status</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gray bat</td>
<td><em>Myotis grisescens</em></td>
<td>Adair, Allen, Barren, Edmonson, Grayson, Green, Hart, Logan, Metcalfe, Simpson, Taylor, Warren</td>
<td>LE</td>
<td>T</td>
</tr>
<tr>
<td>Littlewing pearlymussel</td>
<td><em>Pegias Fabula</em></td>
<td>Logan</td>
<td>LE</td>
<td>E</td>
</tr>
<tr>
<td>Mammoth cave shrimp</td>
<td><em>Palaemonias Ganteri</em></td>
<td>Edmonson</td>
<td>LE</td>
<td>E</td>
</tr>
<tr>
<td>Northern riffleshell</td>
<td><em>Epioblasma Torulosa Rangiana</em></td>
<td>Edmonson, Grayson, Hart, Taylor, Warren</td>
<td>LE</td>
<td>E</td>
</tr>
<tr>
<td>Orangefoot pimpleback</td>
<td><em>Plethobasus Cooperianus</em></td>
<td>Hart, Russell</td>
<td>LE</td>
<td>E</td>
</tr>
<tr>
<td>Pink mucket</td>
<td><em>Lampsilis Abrupta</em></td>
<td>Butler, Russell, Warren</td>
<td>LE</td>
<td>E</td>
</tr>
<tr>
<td>Piping plover</td>
<td><em>Charadrius Melodus</em></td>
<td>Warren</td>
<td>LE, LT</td>
<td>N</td>
</tr>
<tr>
<td>Ring pink</td>
<td><em>Obovaria Retusa</em></td>
<td>Butler, Edmonson, Hart, Russell</td>
<td>LE</td>
<td>E</td>
</tr>
<tr>
<td>Rough pigtoe</td>
<td><em>Pleurobema Plenum</em></td>
<td>Butler, Edmonson, Green, Hart, Warren</td>
<td>LE</td>
<td>E</td>
</tr>
</tbody>
</table>

Source: Kentucky Dept. of Fish and Wildlife Resources. http://fw.ky.gov/kfwis/speciesInfo/CountyListSpecies.asp

Federal Listings: LE=Listed Endangered; LT=Listed Threatened; PS=Partial Status, indicating that the status only applies to a portion of the species range; PDL=Proposed delisting; XN=Nonessential Experimental Population

State Listings: E=Endangered; T=Threatened; N=None; S=Special Concern

Mammoth Cave NP is home to more than 70 threatened, endangered or State-listed species, including birds, crustaceans, fish, gastropods, insects, mammals, mussels, plants, reptiles, and aquatic species. Currently, there are many aquatic species of concern located within the Green River and Barren River Watersheds. These watersheds are identified as “hot spots” of aquatic diversity by both the Kentucky State Nature Preserves Commission and The Nature Conservancy because of the extreme diversity of aquatic species present in their waters. There are at least 11 aquatic species within the park boundary classified as either State or federally threatened or endangered. Nine of these are mussel species and two are fish.¹²⁴

Table 3-3 lists the threatened and endangered species within the Green River and Barren River Watersheds.

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Table 3-3: Aquatic Species of Concern within the Green River and Barren River Watersheds, Kentucky CREP

<table>
<thead>
<tr>
<th>Common Name</th>
<th>Scientific Name</th>
<th>Classification</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Mussels</td>
<td></td>
</tr>
<tr>
<td>Spectaclecase</td>
<td><em>Cumberlandia mondonta</em></td>
<td>State Endangered/Federal Species of Concern</td>
</tr>
<tr>
<td>Fanshell</td>
<td><em>Cyprogenia stegaria</em></td>
<td>State/Federally Endangered</td>
</tr>
<tr>
<td>Catspaw*</td>
<td><em>Epioblasma obliquata obliquata</em></td>
<td>State/Federally Endangered</td>
</tr>
<tr>
<td>Longsolid</td>
<td><em>Fusconaia subrotunda subrotunda</em></td>
<td>State Special Concern</td>
</tr>
<tr>
<td>Pink Mucket</td>
<td><em>Lampsilis abrupta</em></td>
<td>State/Federally Endangered</td>
</tr>
<tr>
<td>Pocketbook</td>
<td><em>Lampsilis ovata</em></td>
<td>State Endangered</td>
</tr>
<tr>
<td>Sheepnose</td>
<td><em>Plethobasus cyphyus</em></td>
<td>State Endangered/Federal Species of Concern</td>
</tr>
<tr>
<td>Rough Pigtue</td>
<td><em>Pleurobema plenum</em></td>
<td>State/Federally Endangered</td>
</tr>
<tr>
<td>Pyramid Pigtue</td>
<td><em>Pleurobema rubrum</em></td>
<td>State Endangered</td>
</tr>
<tr>
<td></td>
<td>Fishes</td>
<td></td>
</tr>
<tr>
<td>Spotted Darter</td>
<td><em>Etheostoma maculatum</em></td>
<td>State Threatened</td>
</tr>
<tr>
<td>Stargazing Minnow</td>
<td><em>Phenacobius uranops</em></td>
<td>State Special Concern</td>
</tr>
</tbody>
</table>

*The Catspaw is not found in any other watershed in the Commonwealth of Kentucky.


Kentucky’s Comprehensive Wildlife Conservation Strategy 2005, prepared by the Kentucky Department of Fish and Wildlife Resources, classifies much of the proposed CREP expansion area as a Tier I Priority Conservation Area, based on overlapping conservation areas for four or more taxonomic groups. This designation is limited to 14 percent of the State.25

Habitat Diversity. Kentucky possesses a range of habitat types due to the variability in the State’s topography, soils, and water resources (i.e., streams, rivers, ponds, sloughs, lakes, and reservoirs). Elevations range from a high of 1,262 meters in the rugged mountains of southeastern Kentucky down to 78 meters in the Mississippi River floodplains of western Kentucky, with extremely variable types of topography and thousands of kilometers of streams in between (Jones 2005). Highly diverse plant communities are scattered throughout the State because of variations in soil properties, moisture, and slope characteristics (Jones 2005).

Kentucky’s habitat variability supports a diversity of mammals that represents communities typical of the region as well as those found elsewhere. As examples, several animals reach their northern limit in or just north of Kentucky (e.g., Rafinesque’s big-eared bat (*Corynorhinus rafinesquii*); swamp rabbit (*Sylvilagus aquaticus*)). Others are typical of southern States (e.g., cotton mouse, *Peromyscus gossypinus*), western States (e.g., prairie vole, *Microtus ochrogaster*; coyote, *Canis latrans*), northern States (e.g., meadow jumping mouse, *Zapus hudsonius*), or even the Appalachian Mountains (e.g., Appalachian cottontail, *Sylvilagus obscurus*; rock shrew, *Sorex dispar*) (Barbour and Davis 1974).

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25 Kentucky’s Comprehensive Wildlife Conservation Strategy 2005, Kentucky Department of Fish and Wildlife Resources, #1 Game Farm Road, Frankfort, KY 40601; Web site: http://fw.ky.gov/kfwis/stwg/
3.2 CULTURAL RESOURCES

Consultation with the Kentucky Heritage Council was conducted in April 2006. The State Historic Preservation Officer (SHPO) submitted comments during the scoping period (see Appendix D). Based on the SHPO's comments, the Green River and its tributaries have a high density of significant archaeological sites. Specific concerns will be discussed in Chapter 4.

3.2.1 Archaeological Resources

The Kentucky Heritage Council has a unit call the Kentucky Archaeological Survey (KAS) whose mission is to provide a service to other State agencies, to work with private landowners to protect archaeological sites, and to educate the public about Kentucky's rich archeological heritage. KAS is jointly administered by the Kentucky Heritage Council (State Historic Preservation Office) and the Department of Anthropology at the University of Kentucky.26

During the summer of 1996, KAS archaeologists conducted joint excavations with the Louisville District Corps of Engineers in Barren River State Park, Barren County. Work focused on recovering a small Mississippian site inhabited between A.D. 1260-1300. KAS archaeologists uncovered the remains of at least four houses. The houses were built in basins that measured about 15 feet on a side.

In addition to KAS, the National Park Service has conducted an archaeological survey within Mammoth Cave NP. Information on the discoveries within the park boundary can be obtained by accessing http://www.nps.gov/maca/archeo.htm. Cultures that were described in this survey included PaleoIndians, Archaic Indians, Woodland Indians, Mississippian Cultures and Proto-Historic Cultures.

In addition to Mammoth Cave NP within the Kentucky CREP area, the NPS administers Russell Cave National Monument, which was home to around 10,000 years of habitation by Pre-historic people. Russell Cave is unique to have had people from all five periods of southeastern prehistoric cultures listed in the preceding paragraph inhabiting the cave shelter. Russell Cave has an extensive archeological record that reveals detailed information about the way of life of the Pre-historic people who once lived in Russell Cave.

3.2.2 Traditional Cultural Properties

Indigenous tribes believed to have inhabited the area now known as Kentucky were the Cherokee, Chickasaw, Mosopelea, Shawnee, and the Yuchi. According to some early maps, the Yuchi had established a town in Kentucky on a river that appears to be identical with Green River. Hunting bands of Illinois, Miami, Iroquois, and Delaware were also thought to have passed through Kentucky at times.27

By the time the first white settlers moved to Kentucky following the Revolutionary War, much of the land was used as a hunting ground by the Shawnee, Cherokee, and other groups. Soon, white settlers pushed these few remaining tribes from their lands. So ended thousands of years of Native American settlement in Kentucky and Mammoth Cave NP.28

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On June 29, 2006, discussions with the U.S. Department of the Interior, Bureau of Indian Affairs, Easter Region Realty Officer, were conducted to determine the presence of Native American tribal lands within the expanded CREP area. No tribal entities and no lands held in trust exist in Kentucky.\footnote{Telecon with Randall Trickey and Eileen Carlton, BIA Eastern Region Realty Officer. June 29, 2006.}

### 3.2.3 National Register Sites and National Historic Landmarks

Since the 1980s, the Kentucky Heritage Council has been recognized for its successful National Register Program. In fact, among all States, Kentucky has the fourth highest number of listings in the National Register of Historic Places. From 1998 to 1999, Kentucky gained 75 Register listings and 3 official Determinations of Eligibility, bringing its total to 3,015 listings overall. Table 3-4 presents the number of National Register sites listed within each CREP county.

<table>
<thead>
<tr>
<th>Kentucky CREP County</th>
<th>Number of Sites Listed in the National Register of Historic Places</th>
</tr>
</thead>
<tbody>
<tr>
<td>Adair</td>
<td>9</td>
</tr>
<tr>
<td>Allen</td>
<td>11</td>
</tr>
<tr>
<td>Barren</td>
<td>20</td>
</tr>
<tr>
<td>Butler</td>
<td>20</td>
</tr>
<tr>
<td>Edmonson</td>
<td>18</td>
</tr>
<tr>
<td>Grayson</td>
<td>12</td>
</tr>
<tr>
<td>Green</td>
<td>44</td>
</tr>
<tr>
<td>Hart</td>
<td>10</td>
</tr>
<tr>
<td>Logan</td>
<td>20</td>
</tr>
<tr>
<td>Metcalfe</td>
<td>4</td>
</tr>
<tr>
<td>Russell</td>
<td>1</td>
</tr>
<tr>
<td>Simpson</td>
<td>14</td>
</tr>
<tr>
<td>Taylor</td>
<td>11</td>
</tr>
<tr>
<td>Warren</td>
<td>93</td>
</tr>
<tr>
<td><strong>TOTAL</strong></td>
<td><strong>287</strong></td>
</tr>
</tbody>
</table>


Of the 14 CREP counties, Warren County holds the most sites listed in the National Register. A listing of all the sites in the National Register of Historic Places by CREP county can be found in Appendix F. There are 30 National Historic Landmarks (NHLs) listed within the National Historic Landmarks Survey for the entire Commonwealth of Kentucky. A list of these NHLs is found at the end of Appendix F.

### 3.2.5 State Historic Sites

Kentucky offers 11 State historic sites. These are listed below:

- Boone Station, Lexington
- Constitution Square, Danville
- Dr. Thomas Walker, Barbourville
- Isaac Shelby Cemetery, Stanford
- Jefferson Davis Monument, Fairview
- Old Mulkey Meeting House, Tompkinsville
- Perryville Battlefield, Perryville
3.3 WATER RESOURCES

3.3.1 Surface Waters

The Green River is one of Kentucky's largest, longest, and most navigable rivers. It flows west creating Green River Lake and draining 12 counties before emptying into the Ohio River across from Evansville, Indiana. The Green and Nolin Rivers possess one of the most diverse array of fish (82 species) and invertebrates (51 mussel species) in North America. In addition, there are also approximately 200 species of benthic macroinvertebrates (bottom-dwelling creatures without a backbone, such as mussels, crustaceans, and insects) in these rivers. For these biological reasons, the Green River has been designated an "Outstanding Resource Water" by the National Park Service in the Nationwide Rivers Inventory (NRI). The Green River is also considered the most biologically diverse and rich branch of the Ohio River system.

Although its upper headwaters are impounded, the river flows unhindered for more than 100 miles from Green River Reservoir to Mammoth Cave NP, the world’s longest and most diverse cave system. There is a relict lock and dam (Lock and Dam #6) located on the Green River just upriver from Brownsville, KY, at river mile 181.7 (see Figure 3-1). This constraint impounds waters within the river channel approximately 16-17 miles depending on water levels. This lock and dam also impounds waters up a major tributary, the Nolin River, approximately 5 miles. This project was part of a collaborative The Nolin River flows into the Green River at river mile 183.5 within Mammoth Cave NP.

Figure 3-1: Green River Lock and Dams, U.S. Army Corps of Engineers


In 2001, the Corps proposed removing Lock and Dam 6 to restore ecological conditions in the Green River and Mammoth Cave. In its environmental assessment of the dam removal proposal, the Corps explained that the locks and dams had caused a shift in river habitats from cool, free-flowing conditions to slower-flowing, warm-water conditions, to the great detriment of many of the river's species. Riffle and shoal areas with sand and gravel beds were eliminated by the navigation dams, replacing them with silty-bottomed artificial pools.

By removing Lock and Dam 6, the Corps can restore 27 kilometers of river habitat. In addition, the endangered Kentucky cave shrimp and innumerable other creatures in Mammoth Cave will likely benefit from the restoration of their habitats.

The proposed Green River CREP expansion area would encompass 946,101 acres and extend the Green River CREP boundary to its confluence with the Barren River at river mile 149.5. This expansion would include the tributary watersheds contributing to the Green, including the Nolin River and Barren River systems upstream to their respective reservoirs. This area also includes the Difficult Creek, Trammel Creek, Buck Creek, and Bays Fork Creek Watersheds.

Normal flow of 16 miles of the Green River, 7 miles of the Nolin River, and many miles of cave streams in the park are slowed by Lock and Dam #6. Habitats for seven federally listed endangered aquatic species are seriously degraded through reduction of natural flow velocity and resultant siltation.

The 100-mile section of the Green River between the Green River Reservoir Dam and Mammoth Cave NP is the focus of a major TNC community-based habitat restoration project. The primary goals of this project are to reduce nonpoint source pollution and eliminate other stresses on aquatic habitats.

The Green River and some of its tributaries contend with adverse effects related to agricultural activities. Section 303(d) of the Clean Water Act (CWA) requires States to identify waters that do not meet applicable water quality standards and for which a Total Maximum Daily Load (TMDL) must be approved. A TMDL is defined as the sum of wasteload allocations (for point sources) and load allocations (for nonpoint sources) which do not violate the loading capacity of a waterbody, i.e., do not violate water quality standards. In 2006, 12 TMDLs were approved in the entire State, which was up from four approved in 2004, but slightly lower than the 14 approved in 2001.

As defined in the Act, water quality standards include the designated uses of a waterbody, the adopted water quality criteria and an antidegradation policy. Kentucky Regulations define water quality standards as beneficial uses to be made of a waterbody and the established water quality objectives. The Section 303(d) listing must include a description of the pollutants causing the violation of the water quality standards.

As mentioned above, the 2004 303(d) List of Waters of Kentucky, prepared by the Kentucky Division of Water, lists 12 the surface waters within the Green River Basin that do not meet applicable water quality standards: four for the Upper Green, five for the Middle Green, and three

32 Ibid.
34 U.S. Environmental Protection Agency and Kentucky Division of Water.
for the Lower Green.\textsuperscript{35} The 1st Priority Listings\textsuperscript{36} identified in the CREP counties include the following:

- Bacon Creek of Nolin River, Hart/Larue Counties
- Barren River of Green River, Allen County
- Bear Creek of Green River, Grayson County
- Big Creek of Russell Creek, Adair County
- Big Reedy Creek of Green River, Butler/Edmonson Counties
- Glens Fork of Russell Creek, Adair County
- Green River of Ohio River, Hart/Edmonson/Green Counties
- Nolin River of Green River, Hart/Grayson Counties
- Lake Cumberland, Russell County
- Barren River Lake Reservoir, Allen/Barren Counties
- Campbellsville City Lake Reservoir, Taylor County
- Caneyville Reservoir, Grayson County
- Green River Lake, Taylor/Adair Counties
- Rough River Lake, Grayson County
- Spa Lake, Logan County

Approximately 89,431 miles of rivers and streams flow through Kentucky, of which 6,992 miles are monitored by the State. Between 1997 and 1999, 34 percent of the rivers monitored were found to be impaired. Agricultural activities are the leading source of water pollution in monitored waterways based on the most available data. Contaminated runoff containing agricultural nutrients and chemicals is impacting 25 percent of the monitored impaired stream miles.

The Green River is rated the fourth most biodiverse stream, particularly for fish and mussel species in the United States. Despite its outstanding qualities, sections of the river and its tributaries experience significant impairment from various sources of pollution. Refer to Chapter 3 for more detail on the streams and water quality in the area.

As a result, a number of segments are listed in the State’s listing of impaired waters, which are required under Section 303(d) of the Clean Water Act. For most of the Section 303(d) river segments listed in the List of Impaired Waters for Kentucky, agriculture is the principal source of contamination (refer to Chapter 3). \textbf{Figure 3-2} illustrates the percentage of stream and river miles impaired by pollution by river basin. Note that in 1997-99 the Green River has 557 river miles that are impaired and cannot support designated uses. \textbf{Figure 3-3} illustrates the percentage of the sources of pollution found in Kentucky’s waterways in 1997-99.

The Kentucky Agriculture Water Quality Act, enacted in 1994, requires all farms greater than 10 acres in size and that meet the definition of an agricultural operation to develop and implement water quality plans to protect water quality and prevent pollution. As of June 2001, 32,592 agriculture operations (36 percent of the State’s 91,000 farms) had voluntarily filed plans with the State Conservation Districts, based on the finding in the \textit{2000-2001 State of Kentucky’s Environment}.\textsuperscript{37}

\textsuperscript{35} Kentucky Division of Water, September 2005. \textit{2004 303(d) List of Waters for Kentucky}.
\textsuperscript{36} Waters on the 1st Priority Listing are those that are impaired or threatened by one or more pollutants or an unknown cause.
Figure 3-2: Stream and River Miles Impaired by River Basin (1997-99)


Figure 3-3: Sources of Pollution to Pollutions to Kentucky Stream and River, 1997-99

3.3.2 Groundwater

Groundwater is the water from rain or melting snow that soaks into the ground to fill the cracks and cavities in soils and rocks. Much water transport within the CREP region occurs in underground conduits rather than surface streams. The groundwater that flows underground from the sinkhole plain south of Mammoth Cave NP into the Green River through countless springs. Among the most notable springs in Mammoth Cave NP are River Styx Spring, Echor River Spring and Turnhole Spring.\(^{38}\)

Groundwater has been intensively studied for years at Mammoth Cave NP. Base-line water quality inventories have been done, as well as investigations into the mechanisms of non-point contaminant transport and water quality. Mammoth Cave NP also operates several continuous-recording digital water monitoring sites, which yield data on the physical and chemical characteristics of the groundwater.

Large portions of the upper Green River Watershed and the groundwater basins affecting Mammoth Cave NP are beyond the park’s boundaries, but activities in these areas greatly influence water quality within the park. The primary activities that influence the park’s water quality include: disposal of domestic, municipal and industrial sewage, solid waste disposal, agricultural and forestry management practices, oil and gas exploration and production, urban land-use and recreational activities.\(^{39}\)

Several measures have been undertaken to protect groundwater resources in Kentucky, including promulgating regulations requiring facilities that have the potential to pollute groundwater to develop and implement groundwater protection plans by 2003. The Kentucky Division of Water established a statewide Ambient Groundwater Monitoring Program in 1995. Samples from more than 260 wells had shown that various pesticides had been detected in springs and wells sampled.

The percentages of chemicals above State standards in sampled springs are shown below:

- Metolachlor 5.44 percent
- Benzene 2.3 percent
- Atrazine 1.34 percent
- Nitrates 0.34 percent
- Fluoride 0.12 percent

The percentages of chemicals above State standards in sampled wells are shown below:

- Nitrates 4.3 percent
- Atrazine 2.8 percent
- Fluoride 0.9 percent
- Metolachlor 0.88 percent

Other major sources of groundwater contamination in Kentucky included the following:

- Animal feedlots
- Landfills
- Mining and mine drainage
- Septic systems
- Spills


\(^{39}\) Ibid.
• Underground storage tanks
• Runoff

Despite of these groundwater pollutants, the Kentucky Division of Water considers groundwater quality generally good throughout the State. The State has implemented three major programs to help protect groundwater:

1) the Groundwater Protection Plan Program, which requires development and implementation of a protection plan by anyone conducting activities that could have the potential to pollute groundwater.

2) The Wellhead Protection Program, which requires public water supplies that rely on groundwater to delineate the recharge area of the well or spring from which it draws its water, identify potential contaminant sources in the area and implement groundwater protection strategies.

3) Drillers Certification Program, which requires certification of water wells.

3.3.3 Aquifers

There are no sole-source aquifer recharge areas designated by EPA within the Commonwealth of Kentucky. The KYCREP involves water supplies of 83 reservoirs that provide water for 58 public water suppliers. The KYCREP is located in karst topography with hundreds of sinkholes occurring throughout the area, many of which feed into one of the world’s largest and most diverse cave systems. The primary geological feature of the KYCREP area is the “sinkhole plain,” which lies in the Western Pennyroyal. This area drains southern Hart and Edmonson Counties and northern Barren County. The sinkhole plain serves as the underground watershed for the Green River. It also includes the karst aquifers that drain into the Mammoth Cave system. A portion of the area’s sinkhole plain currently lies within the existing Green River CREP area and much of it would be included within the KYCREP under the proposed expansion plan (Alternative 2). Figure 3-4 shows a field within the sinkhole plain.

Figure 3-4: Aerial Photograph of a Field within the Sinkhole Plain


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40 USDA-FSA. Preliminary Programmatic Environmental Assessment Kentucky Conservation Reserve Enhancement Program.
The following text describes the sinkhole plain and karst drainage. This text was extracted from the Kentucky Division of Water’s *The Green and Tradewater Basins Status Report 2001*:

“Karst landscapes and their associated aquifers are very important features in parts of the Green River Basin. These are areas of soluble limestone bedrock where the bedrock has dissolved, leading to the development of caves, sinkholes, sinking streams, and underground rivers. Indeed, the Green River Basin contains some of the world’s most famous and well-developed karst areas, including the longest known cave, the Mammoth Cave System. Due to the spectacular nature of karst development within the basin, parts of Hart, Barren, and Edmonson Counties have not only been protected with the establishment of Mammoth Cave NP, but have been designated by the United Nations as a World Heritage Site and International Biosphere Reserve.

Within the Green River Basin, contaminants can be introduced to karst groundwater from urban, industrial, and agricultural sources. Nowhere is this a more significant concern than in the sinkhole plain. The sinkhole plain extends from Hart County to the northeast, through Mammoth Cave NP, into Logan County in the southwest. An especially severe and widespread problem is bacterial contamination from human and animal waste.”

Figure 3-5 is an illustration that represents the dynamics of the sinkhole plain and Mammoth Cave. The sinkhole plain is the underground watershed for the Green River above the existing western boundary, including the karst aquifers that drain into Mammoth Cave NP. As this sinkhole plain trends southeastward, the underground water flows to base level streams outside of the existing boundary, including the Barren River.

**Figure 3-5: Diagram of the Dynamics of Mammoth Cave and the Sinkhole Plain**


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3.3.4 Wetlands
Under Executive Order 11990, Protection of Wetlands, wetlands are “those areas that are inundated by surface or groundwater with a frequency sufficient to support and, under normal circumstances, support a prevalence of vegetation or aquatic life that requires saturated or seasonally saturated soil conditions for growth and reproduction. Wetlands generally include swamps, marshes, bogs, and similar areas such as potholes, wet meadows, river overflows, mud flats and natural ponds.” Approximately 789.2 acres of wetlands (0.08 percent of the proposed area) would be included in the CREP expansion area.  

3.3.5 Floodplains
Floodplains are defined in Executive Order 11988, Floodplain Management, as “the lowland and relatively flat areas adjoining inland and coastal waters including floodprone areas of offshore islands, including at a minimum, that area subject to a one percent or greater chance of flooding in any given year;” i.e., the area that would be inundated by a 100-year flood. Executive Order 11988 directs Federal agencies to “take action to reduce the risk of flood loss, to minimize the impact of floods on human safety, health and welfare and to restore and preserve the natural and beneficial values served by floodplains…”.

Chapter 151 of the Kentucky Revised Statutes (KRS), approved in 1966, is Kentucky State Statute 151, which addresses the development of floodplain areas. The most pertinent sections of KRS 151 are—
1) KRS 151.250, which establishes the requirements for obtaining a floodplain development permit;
2) KRS 151.125, which establishes the authority and powers of the secretary of the Natural Resources and Environmental Protection Cabinet to administer KRS 151; and
3) (3) KRS 151.320. Pursuant to KRS 151, the Division of Water in the Kentucky Natural Resources and Environmental Protection Cabinet is the State coordinating agency for the National Flood Insurance Program (NFIP).

In July 2002, the U.S. Army Corps of Engineers and TNC formed a partnership to restore and preserve rivers across the country. This partnership, known as the “Sustainable Rivers Project,” focused its efforts in Kentucky on the Green River habitat below Green River Lake. Green River Lake is a multipurpose lake providing flood control, water supply, water quality and recreational benefits to the Green River Basin and Lower Ohio River Basin. The lake was authorized by the Flood Control Act of 1938 and began operation in February 1969. The drainage area above the dam is 682 square miles. The dam was constructed of earth and fill material and is controlled by a gated concrete control structure and conduit system located at the base of the dam. There is minor capability for release of water from different levels of the impounded pool.

The lake maintains a pool elevation of at least elevation 664 during the winter months. Around mid-March the lake stores spring runoff and to build an 11 ft conservation storage pool. This pool allows the lake to maintain a desired minimum low flow below the dam during normal low flow periods of the year and provides a recreation pool through the summer and early fall. It is a goal for the lake to reach the conservation pool (a.k.a. summer pool) by mid-April. At the end of

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the recreation season the lake begins releasing from the conservation storage in order to return to
the normal pool elevation of 664 by early December. This lake drawdown begins slowly in mid-
September and increases in mid-October.  

Throughout the year the lake is operated to store flood waters when river levels below the dam
are above target stages and release the accumulated flood storage as fast as possible when levels
below recede below their target stages. The lake was designed to release at maximum outflow of
8,000 cfs during non-crop periods and 5,300 cfs during crop periods. Following the dam's early
operational years downstream, property owners slowly encroached on the stream to a point
where maximum outflows were reduced to about 6,000 cfs during non-crop periods and 4,400 cfs
during crop periods.

During non-flood periods, the lake is operated to maintain elevation near the guide curve by
regulating outflow and to release at least a minimum of 50 cfs. The lake also follows a tailwater
temperature guide curve that was developed in the early 1970s in cooperation with FWS.  
The direct effects resulting from this effort was early enrollment of the lowest lying properties in
the area into CREP. This eliminated many problems experience by the Corps District with
discharges from lake operations impacting properties downstream. This project is contributing to
improvements in the downstream aquatic ecosystem, the same resource that the Kentucky Green
River CREP is designed to protect and enhance.

This partnership indirectly led to other successful projects within the watershed designed to
improve the riparian and ecological habitat while still maintaining flood control in the basin.
Modifications to the operation of the Green River Dam were evaluated through a 3-year trial
period to assess the impacts that were identified as potential ecological improvements in the
downstream target areas. The Green River Lake operational modifications will provide improved
ecological management for the environment while continuing to provide its authorized benefits
to the Green River Basin.

3.4 SOIL RESOURCES

The proposed expanded CREP region is situated on the Mississippian Plateau. There are three
primary physiographic subdivisions that describe this area: the Eastern Pennyroyal, which is
primarily in Allen and southern Barren Counties; the Western Pennyroyal, which underlies
Barren, Warren, Simpson, and Logan Counties; and the Western Coal Field, which extends
through Butler, Grayson, and Edmonson Counties.

The Eastern Pennyroyal subdivision lies in the extreme southeastern portion of the expanded
KYCREP area and is underlain by Pennsylvanian and Silurian sedimentary rock layers. The
predominant soils in this area are ultisols and inceptisols. Watersheds include Difficult Creek,
Trammel Creek, Buck Creek, and Bays Ford Creek.

Just to the northwest of the Eastern Pennyroyal is the largest area of the three physiographic
subdivisions, the Western Pennyroyal. This region is underlain by Mississippian and some
Ordovician limestone, calcareous shale, sandstone, siltstone, and shale. The predominant soils in

45 Ibid.
46 Ibid.
47 Letter from Michael Turner, Chief, Economics and Environmental Resources, U.S. Army Corps of
Engineers, dated Apr. 19, 2006, to Joyce Hobbs, State Environmental Coordinator, Kentucky FSA; and
“Green River Lake, KY—Sustainable River Project,” William J. Byron, Jr., Chief, Water Management,
CELRL-ED-TW, U.S. Army Corps of Engineers, Louisville District.
this area are alfisols. The sensitive “sinkhole plain” exists mainly in the Western Pennyroyal area where much water transport occur in underground conduits rather than surface streams.\textsuperscript{48}

The Western Coal Field lies in the northern reaches of the proposed CREP expansion area and spans Butler, Grayson, and Edmonson Counties. This subdivision is underlain by Pennsylvanian sandstone, siltstone, shale, and limestone. The predominant soil is thin loess. The primary watersheds in this area include the Green River, Alexander Creek, Bear Creek, and Big Reedy Creek.\textsuperscript{49}

The “sinkhole plain” drains southern Hart and Edmonson Counties, and northern Barren County, and essentially is the underground watershed for the Green River. It also includes the karst aquifers that drain into Mammoth Cave NP. As the sinkhole plain trends southeastward, the groundwater flows to base level streams outside of the existing CREP boundary.\textsuperscript{50} More information on the sinkhole plain is provided in section 3.3.3 Aquifers.

North of the Green River an alternating series of limestone and insoluble rocks are exposed with the main limestone strata accessible only near the river and in the bottom of a few deeply incised valleys. This formation has resulted in rugged topography with streams that alternately flow on insoluble rocks, over waterfalls, enter caves in limestone and resurface at springs perched on the next lower stratum of insoluble rock. South of the Green River, the insoluble sandstone and shale caprock over the limestone has preserved significant portions of Mammoth Cave.

CREP practices are eligible for use with highly erodible lands (HEL):

- CP1 Introduced Grasses
- CP2 Native Grasses
- CP3 Tree Planting
- CP3A Hardwood Tree Planting
- CP4B Permanent Wildlife Habitat (corridors)
- CP4D Permanent Wildlife Habitat
- CP10 Grass Cover - Already Established
- CP11 Tree Cover - Already Established
- CP12 Wildlife Food Plots
- CP25 Rare and Declining Habitat

3.5 AIR QUALITY

The Commonwealth of Kentucky has operated an air-quality monitoring network since July 1967. This network includes 143 monitors located in 31 counties, three of which are located in the following counties within the proposed CREP area:

1) Mammoth Cave National Park in Edmonson County,
2) Simpson County, and
3) Warren County.


\textsuperscript{49} Information on physiographic characteristics obtained from “HUC 11 Narratives,” Kentucky Division of Water, Dale Reynolds.

Data from the network are used to demonstrate compliance with and/or progress toward meeting EPA’s ambient air quality standards and to identify pollution trends. The data are also used to provide pollutant levels for daily air quality index reporting and to detect elevated pollutant levels for activation of emergency control procedures, if necessary.

Mammoth Cave NP is situated in an industrialized part of the United States where a number of coal-fired power plants line the Ohio Valley. Recently, a number of new power plants have been proposed in Kentucky and Tennessee, and the emissions from those sources are likely to affect air quality at the park. The park extends through Edmonson, Barren, and Hart Counties. All three counties are classified as in attainment under EPA’s National Ambient Air Quality Standards (NAAQS).

The park has operated an air monitoring station since 1992. Enhanced, high sensitivity air quality monitoring instrumentation was installed at Green River Bluffs Overlook, a monitoring site to measure ozone, sulfur dioxide, carbon monoxide, nitric oxide, mercury vapor, and particulate matter (PM). PM is composed of tiny particles of a solid, such as smoke, or liquid that is suspended in a gas. PM is monitored as part of the National Park Service’s IMPROVE visibility program. IMPROVE is the Interagency Monitoring of Protected Visual Environments program composed of representatives from Federal and regional-State organizations. IMPROVE was established in 1985 to help with the development of Federal and State Implementation Plans (SIP) for the protection of visibility in Class I areas, as stipulated by the Clean Air Act, as amended.

Mammoth Cave NP is one of 49 national park system units designated as a Class I area by the Clean Air Act, as amended, and is Kentucky’s only Class I area. A Class I area is one that receives the most stringent degree of air quality protection within and around its borders. For example, potential new or modified sources of significant pollution that plan to locate near a Class I area must obtain a permit from the State. The NPS has significant input to the permitting process to ensure that potential air emissions do not pose a threat to visibility or other park air quality related values.51

Another air quality concern facing the park relates to a 1,500-megawatt coal-fired power plant proposed by Peabody Energy in Muhlenberg County about 50 miles west of the park. In August 2002, the U.S. Department of the Interior requested that the State lower the plant's emissions limit to a level that would not induce an adverse impact on visibility at Mammoth Cave NP. In October 2002, the Commonwealth of Kentucky issued an air permit but in the spring of 2004, this project has suspended due to improper procedures that occurred in filing this permit. This project is currently in court pending a decision.52

Based on data from the IMPROVE Program, Mammoth Cave was ranked fifth in a list of national parks with the worst annual average visibility as measured in miles, although the site has shown a significant improvement in recent years (NPS 2002). With respect to ozone, the park area is in attainment with the one-hour standard, but has shown a significant degradation trend over the 1990s, similar to the conditions found in Great Smoky Mountains National Park in nearby Tennessee and North Carolina.53

51 Telecon with Bob Carson, Air Quality Specialist, Mammoth Cave National Park, Aug. 9, 2006.
Visibility at Mammoth Cave ranges from 10 to 17 miles during the summer and 60 miles in the winter. The average visibility year-round at the park is about 30-35 miles. Based on the deciview scale for visibility, visibility should be 88 miles.\(^4\) Deciview is a scale that makes changes in visibility based on what one can see rather than in miles. It is analogous to the decibel scale for sound. Higher deciview levels are hazier whereas lower deciview levels are clearer.\(^5\)

Discussions with the park’s air quality specialist identified major air quality issues in the region and how these issues affect not only the park’s resources, but resources that are external to the park as well. These issues included haze and visibility impacts, mercury deposition, acidification, and ozone. Sources of these impacts include emissions from mobile sources, coal-fired power plants, and biogenic sources, such as off-road vehicles and fires.

A National Atmospheric Deposition Program/National Trends Network (NADP/NTN) wet deposition monitor has been in operation at Mackville, Kentucky, located about 62 miles northeast of the park, since 1983. The Commonwealth of Kentucky has monitored the chemistry and amount of precipitation at Mammoth Cave since 1992. A comparison of State and NADP/NTN data shows the Mackville site likely underestimates pollutant deposition at Mammoth Cave NP. A NADP/NTN monitor, a Mercury Deposition Network monitor, and a Clean Air Status and Trends Network (CASTNET) monitor will be installed at the park in the near the future.\(^6\)

A CASTNet dry deposition site monitor has also been operating at Mackville since 1990. Data gathered from this site show a decrease in dry sulfur deposition, but no trend in dry nitrogen deposition. CASTNet estimates total nitrogen deposition at the site is composed of 38 percent dry deposition and 62 percent wet deposition, while total sulfur deposition is 50 percent dry and 50 percent wet.

Limited soil studies also indicate some soils in the park are sensitive to acidification from atmospheric deposition. Surface water chemistry data collected in the Green and Nolin Rivers confirm that the rivers are well buffered against acidification. Although the chemistry of small creeks in Mammoth Cave NP has not been systematically monitored, concern has been expressed by park staff that acidification occur in ponds and water up on the ridges. There is also concern that during rainstorms, when there is little opportunity for rainwater to come into contact with deep soils, episodic acidification could occur. Park staff noted that sulfates have been showing a downward trend and nitrates are holding steady.\(^7\)

Ozone has been monitored at Mammoth Cave NP since 1985. Data from monitoring sites indicate that ozone concentrations in the park consistently have exceeded levels known to cause foliar injury and growth loss in certain species of vegetation. There are 19 species known to be sensitive to ozone within the park. Surveys of the effects of ozone on park vegetation were conducted in the 1980s and foliar injury was observed on a number of plants.

As part of the IMPROVE network, visual air quality in Mammoth Cave NP has been monitored. EPA’s regional haze regulations require improving visibility in Class I air quality areas on both the best visibility and the worst visibility days. A review of aerosol data collected at Mammoth

\(^4\) Telecon with Bob Carson, Air Quality Specialist, Mammoth Cave National Park, Aug. 9, 2006.
\(^5\) Deciview definition provided by Clean Air Task Force. http://www.catf.us
\(^6\) National Park Service, Nature and Science, Air Resources Division. “Mammoth Cave National Park Air Quality Information.” http://www2.nature.nps.gov/air/Permits/ARIS/maca/
\(^7\) Ibid.
Cave NP show no significant trend in visibility on good, bad, or average visibility days since 1991. Although the park reports slight improvements in regional haze, this condition has not been improving as rapidly as the park would like.

The component that relates most directly to agriculture is particulates, which are small particles of dust, dirt, chemicals and soot in the air. Concerns about the impacts of particulates on public health prompted the U.S. Environmental Protection Agency (EPA) to issue a PM$_{10}$ standard in 1987 to control particulates that are 10 microns in diameter or smaller. Particulates are emitted from cars, construction sites, agricultural operations and roads. The largest source of particulates in 1998 was fugitive dust, followed by agriculture and forestry activities.\(^{58}\)

Air monitors are measuring particulates based on the PM$_{10}$ standard developed in 1987. The closest air monitoring station is located at Mammoth Cave NP. Since 1983, a National Atmospheric Deposition Program monitor has been operating at Mackville, Kentucky, 100 km northeast of the park (site #KY03). The Commonwealth of Kentucky has monitored precipitation amount and chemistry at Mammoth Cave NP since 1992. A comparison of State and NADP/NTN data indicates the Mackville site likely underestimates pollutant deposition at Mammoth Cave NP. A NADP/NTN monitor, along with a Mercury Deposition Network monitor, will be installed at the park this year.

Ozone has been monitored at Mammoth Cave NP since 1985. The data show ozone exceeded the 1-hr human health-based primary National Ambient Air Quality Standard (NAAQS) in 1987, 1988, and 1999, and has exceeded of the updated 8-hr primary NAAQS.

Ozone injury surveys were conducted in the park in the 1980s and foliar injuries were observed on a number of species of plants. Ozone concentrations in Mammoth Cave NP consistently exceed levels known to cause foliar injury and growth loss in sensitive species of vegetation.

Industrial development near the park, such as coal-fired power plants that emit sulfur dioxide and other pollutants, has contributed to the region’s air quality problems, as have other industrial development and nearby interstate highway traffic.\(^{59}\)

EPA’s new Regional Haze regulations require improving visibility in Class I air quality areas on both the best visibility and the worst visibility days. A review of aerosol data collected at Mammoth Cave NP shows no significant trend in visibility on good, bad, or average visibility days since 1991.

The park reports that Western Kentucky University will investigate the fate and transport of mercury in the karst aquifer system of Mammoth Cave. The researcher hopes to 1) establish the extent, occurrence, and distribution of mercury in groundwater, surface water, and sediments in the park; 2) determine the level of mercury in fish and mussels in the park; and 3) investigate the fate and transport characteristics of mercury in a karst aquifer. This study, combined with mercury deposition monitoring, will give the National Park Service a better understanding of how mercury emissions from power plants and other sources are affecting resources at Mammoth Cave NP.\(^{60}\)

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60 National Park Service, “Mammoth Cave National Park Air Quality Information.” http://www2.nature.nps.gov/air/Permits/ARIS/maca/
In June 2006, an article appeared online at the USA Today website, noting that one of the biggest issues for Mammoth Cave has been air quality. According to the article, a group of national environmental groups listed Mammoth Cave NP as one of the country's five most polluted parks in 2004, citing ozone concentration and particulates as the main source of their criticism. Coal-fired power plants in the area that emit sulfur dioxide and other pollutants have contributed to the problem, as have other industrial development and nearby interstate highway traffic.

Recent studies on air quality at Mammoth Cave NP show that the air quality is neither improving nor worsening; in fact, according to the park air quality specialist, ozone concentrations and visibility have improved since the early 1990s. Table 3-5 shows the principal sources of particulates (PM\textsubscript{2.5}) emissions in Kentucky during 1998.

### Table 3-5: Principal Sources of PM\textsubscript{2.5} Emissions in Kentucky, 1998

<table>
<thead>
<tr>
<th>Source of Emission</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fugitive dust</td>
<td>60.8%</td>
</tr>
<tr>
<td>Agriculture and forestry</td>
<td>20%</td>
</tr>
<tr>
<td>Residential wood combustion</td>
<td>3%</td>
</tr>
<tr>
<td>Open burning</td>
<td>2.4%</td>
</tr>
</tbody>
</table>


Particulate matter (PM) has been improving on hazy days and slightly on clean days. By 2064, the goal is to achieve a natural background at Mammoth Cave. The definition of a “natural background” has not yet been specified, but the objective is to try to achieve an ambient level that was pre-industry.

Limited soil studies also indicate some soils in the park are sensitive to acidification from atmospheric deposition. Surface water chemistry data collected in the Green and Nolin Rivers confirm that the rivers are well buffered against acidification. Although the chemistry of small creeks in Mammoth Cave NP has not been systematically monitored, concern has been expressed by park staff that acidification occur in ponds and water up on the ridges. There is also concern that during rainstorms, when there is little opportunity for rainwater to come into contact with deep soils, episodic acidification could occur. Park staff noted that sulfates have been showing a downward trend and nitrates are holding steady.

USGS and Western Kentucky University have been conducting studies of mercury found in fish in the Green River within the park boundary. The fish survey showed 1 ppm of mercury in bass, compared with EPA’s threshold of 0.3 ppm as an acceptable level for mercury in fish. As part of this collaborative study, Western Kentucky University is also investigating mercury in the karst aquifer system of Mammoth Cave NP. The objectives of this study are to: 1) establish the extent, occurrence, and distribution of mercury in groundwater, surface water, and sediments in the park; 2) determine the level of mercury in fish and mussels in the park; and 3) investigate the fate and transport characteristics of mercury in a karst aquifer.

This study, combined with USGS’ ongoing mercury deposition monitoring, will give the park a clearer understanding of how mercury emissions from power plants and other sources are affecting resources at Mammoth Cave. Mercury is a particular concern due to impacts on the

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62 Telecon with Bob Carson, Air Quality Specialist, Mammoth Cave National Park, Aug. 9, 2006.
63 Ibid.
cave’s aquatic species such as mussels and fish. The USGS report is expected to be completed in December 2006.  

Other park concerns regarding mercury pertain to the potential effects this pollutant may have on bats. The park is home to two federally endangered bats: the Indiana bat and the gray bat. Results of tests on bat hair sampled from clippings showed that concentrations of mercury ranged from very low up to 11 ppm.

Other issues affecting the region’s air quality include mobile sources from the major transportation network (I-65 and a new I-66 corridor), coal-fired power facilities throughout the Ohio Valley, and biogenic sources such as fires and off-road vehicles.

In addition to stationary and mobile sources that contribute to air quality issues, global sources that contribute to the air quality conditions in the Green River basin include Saharan and Asian dust, Mexican fires, hurricanes and tropical storms.

3.6 RECREATION

The Green River is one of the best areas for paddling in the region. Canoe rental and camping facilities are available at the American Legion Park in Greensburg (among other locations). The Green River also runs through Mammoth Cave NP, an especially beautiful paddling spot and visitor destination.

Mammoth Cave NP was established in 1941 to protect the unparalleled underground labyrinth of caves, the rolling hilly country above and the Green River valley. Approximately 1.8 million visitors a year tour Mammoth Cave NP. Activities at Mammoth Cave include:

- Auto Touring
- Backpacking
- Biking
- Bird Watching
- Photography
- Boating
- Camping
- Caving
- Fishing
- Hiking
- Horseback Riding
- Nature Walks
- Wildlife Viewing

Mammoth Cave, the largest cave system in the world, has more than 350 miles of known underground passageways and possibly hundreds of more miles not yet discovered. Touring this subterranean limestone labyrinth, of course, is why most people come to the national park. Indeed, the visitor center has a kind of Grand Central Station feel to it as tourists rush to sign up for the popular cave trips, which are often sold out. The park’s 52,830 aboveground acres are also an attraction, but one less known. The park covers scores of wooded hollows and ridges along the Green River. In spring especially, these little valleys are alive with creeks and waterfalls.

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64 Ibid.
punctuated by spreads of colorful wildflowers. Running across it all are some 70 miles of hiking trails.

The 32-mile Ferry Loop crosses two ferries on its way around the western two-thirds of the park. It follows gravel roads for 6 miles of its length. The Flint Ridge Loop covers 12 miles of the eastern part of the park on paved roads. At nine miles, the Joppa Ridge Loop is shortest. It includes 2.3 milers of gravel on Joppa Ridge Road. All rides are suitable for cyclists of all skill levels. Mammoth Cave is a scenic trail located 35 miles northeast of Bowling Green.

The Commonwealth of Kentucky has a network of Recreation Parks, managed by the Department of Parks. The following are State Recreation Parks that are located within the proposed CREP area.

- Green River Lake, Taylor County
- Lake Malone, Logan County
- Nolin Lake, Edmonson County

The Kentucky State Nature Preserves Commission maintains a system of nature preserves, whose primary function is to protect rare biological resources and natural communities. For this reason, only passive recreation is appropriate on a nature preserve. These preserves offer passive recreational activities such as hiking, photography, bird watching and nature study. The Kentucky State Nature Preserves Commission owns and manages State Nature Preserves (SNP), State Natural Areas (SNA) and conservation easements. Combined, these areas encompass a total of 23,190 acres of ecological communities and natural habitat supporting rare species across the State.

The majority of the preserves are open to the public for hiking, birding, photography, and nature study. SNPs are legally dedicated areas recognized for their natural significance and protected by law for scientific and educational purposes. SNPs were established to protect and preserve rare species and the natural environment. SNAs are sites jointly managed as a Wildlife Management Area with the Kentucky Department of Fish and Wildlife Resources. These areas are also dedicated to permanently protecting resources, but allow hunting, which differentiates them from the Preserves. There are seven SNPs located within the proposed expanded CREP area. Table 3-5 lists the SNPs and SNAs in the State by CREP county.

<table>
<thead>
<tr>
<th>CREP County</th>
<th>State Nature Preserve/Natural Area</th>
</tr>
</thead>
<tbody>
<tr>
<td>Allen</td>
<td>Goodrum Cave SNP</td>
</tr>
<tr>
<td>Barren</td>
<td>Brigadoon SNP</td>
</tr>
<tr>
<td>Logan</td>
<td>Logan County Glade SNP; Raymond Athey Barrens SNP</td>
</tr>
<tr>
<td>Simpson</td>
<td>Flat Rock Glade SNP</td>
</tr>
<tr>
<td><strong>Warren</strong></td>
<td>Chaney Lake SNP; Woodburn Glade SNP</td>
</tr>
</tbody>
</table>


3.7 LAND USE

The proposed expanded CREP area is similar to the initial Kentucky Green River CREP area. Although the eastern portion of the sinkhole plain lies within the original CREP boundary (the portion that flows directly to the Green River), this geologic feature trends from northwest to southeast, thus incorporating large areas into the proposed expansion area. More agricultural activities occur within the sinkhole plain than in surrounding terrain, thus agricultural land use tends...
to increase within this region. Row cropping is noticeably more frequent in this area, particularly in Warren, Simpson and Logan Counties.⁶⁵

Table 3-6 provides a summary of the land use characteristics within the proposed expansion area.⁶⁶

### Table 3-6: Land Use and Cover Types of the Proposed Kentucky CREP Expansion Area

<table>
<thead>
<tr>
<th>Land Use</th>
<th>Acreage</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Forest/Woodland</td>
<td>372,571.48</td>
<td>39.38%</td>
</tr>
<tr>
<td>Pasture/Hay</td>
<td>336,783.48</td>
<td>35.97%</td>
</tr>
<tr>
<td>Cropland</td>
<td>128,038.52</td>
<td>13.53%</td>
</tr>
<tr>
<td>Developed</td>
<td>69,597.70</td>
<td>7.36%</td>
</tr>
<tr>
<td>Wetlands</td>
<td>789.2</td>
<td>0.08%</td>
</tr>
<tr>
<td>Other (including water, mined areas, barrens, etc)</td>
<td>34,816.51</td>
<td>3.68%</td>
</tr>
</tbody>
</table>

*Data supplied by Meier Lab, Center for Biodiversity Studies, Western Kentucky University*

**Source:** Commonwealth of Kentucky. Green River Conservation Reserve Enhancement Program; Subproject Amendment: Area Expansion and Programmatic Requests to Enhance Resource Protection and Landowner Participation.

3.8 TRAFFIC AND TRANSPORTATION

Interstate 65 and Cumberland Parkway are the major highways that extend through the Green River basin. The Kentucky Green River CREP area is rural and is relatively sparsely populated, with the exception of Warren County. However, industries, such as Peabody Energy, have begun to settle in the area, which increase employment, housing and traffic.

Figure 3-2 shows the major transportation network throughout the State. The figure also shows that Warren County, within the Kentucky Green River CREP area, represents the densest population (persons/sq. mile) of the counties within the CREP.

The 1999 Kentucky Statewide Transportation Plan, a long-range 20-year plan for all modes of transportation (highways, air, bikeways and pedestrian, public transportation, rail, and waterways) lists projects in two phases: a short-range element (ranging from one to six years) and a long-range element (generally fourteen to nineteen years beyond the short-range element), based on estimated funding over the 20-year period. The following transportation projects are proposed for the respective CREP counties⁶⁷:

- KY-1008-Simpson County
- Proposed I-66-Edmonson County
- Proposed I-66 and Bowling Green Outer Beltline-Warren County
- Heartland Parkway-Adair and Taylor Counties
- KY-88-Grayson and Hart Counties
- Northwest Leitchfield Bypass Study-Grayson County


⁶⁶Ibid.

Springs located in the Green River Basin, Kentucky, are valuable natural resources and important sources of public and domestic water supplies. Groundwater and springs in the Green River Basin potentially are vulnerable to increased concentrations of pesticides and nitrates associated with agricultural activities because of the region’s karst topography. The karst topography can allow rapid flow from the surface into groundwater through fractures in rock and conduits with little opportunity for natural filtering to occur.

Potential exists for groundwater contamination associated with the use of pesticides and fertilizers in the Green River Basin because of the extensive agricultural development of land. By sampling the water quality of karst springs and examining the use and detections of pesticides, information can be provided to better evaluate ground-water quality and agricultural nonpoint-source pollution in the Green River Basin, and assist resource managers in the planning and implementation of nonpoint-source pollution-control programs.

A groundwater study by the USGS in 2001 found--

- Nine different pesticides were detected in eight karst springs sampled in the Green River drainage basin.
- The five most frequently detected pesticides at all springs were atrazine (100 percent), simazine (93 percent), metolachlor (80 percent), tebuthiuron (66 percent), and prometon (58 percent).
- The pesticides detected were not necessarily the pesticides most heavily applied in the Green River drainage basin.
- Nitrite plus nitrate-nitrogen concentrations did not exceed EPA’s drinking water standards (10 milligrams per liter) at any of the eight springs.
Pesticides
Pesticides have become an integral part of controlling insects, weeds, fungi, and bacteria in both agricultural and urban settings. The use of pesticides has increased over the last 40 to 50 years. This increased crop production and controlled public health hazards (Larson and others, 1997), but also raised concerns about the possible harmful effects of increased pesticide concentrations on the environment and human health.

Of the 50 pesticides analyzed, 8 herbicides and 1 insecticide were detected at or above a common method reporting level (CMRL) of 0.01 micrograms per liter (µg/L) at the 8 springs. A CMRL allows the detection frequencies of pesticides to be compared to each other. The detected pesticides in the springs were atrazine, simazine, metolachlor, tebuthiuron, and prometon. Based on estimated pesticide sales data for agricultural applications in 2000, a total of 1.5 million pounds of herbicides (fig. 3) and 18,000 pounds of insecticides were applied in the Green River Basin (Ernest Collins, Kentucky Department of Agriculture, written commun., 2001).

The pesticides detected were not necessarily the pesticides most heavily applied (in pounds of active ingredient) in the Green River Basin. Acetochlor, a restricted-use pesticide, was found in only 14 percent of the samples, but was one of the most heavily applied pesticides. Table 3-7 summarizes the concentrations of certain pesticides sampled in the Green River Basin between May and September 2001.

Nutrients
More than 60 water samples were collected at the eight springs and analyzed for nutrients: ammonia-nitrogen (NH3-N), nitrite plus nitrate-nitrogen (NO2+NO3-N), total phosphorus (TP), and orthophosphate (orthoP). Concentrations of ammonia-nitrogen were at, or below, the method reporting level of 0.04 milligrams per liter (mg/L), except for Crawford Blue Hole and Finney Spring.

Nitrite and nitrate are inorganic ions produced during various stages of the nitrogen cycle. Nitrate is the predominant ion in well-oxygenated water because of the rapid oxidation of nitrite. Concentrations of nitrate greater than 10 mg/L in drinking water can have adverse human-health effects, especially to infants who may experience reduced blood-oxygen levels, as a result of drinking the water, a life-threatening condition termed methemoglobinemia (blue-baby syndrome) (U.S. Environmental Protection Agency, 1999b). Nitrite plus nitrate-nitrogen concentrations from the eight springs ranged from 2.92 to 8.39 mg/L.68

Although there is no established aquatic-life criterion for dissolved phosphorus, the EPA recommends a maximum concentration of total phosphorus of 0.1 mg/L to discourage excessive growth of aquatic plants and algae. Approximately 13 percent of the samples resulted in TP concentrations greater than 0.1 mg/L. The highest TP concentration among the springs sampled was 0.28 mg/L in Finney Spring. The high TP concentrations possibly were associated with high values of turbidity measured at this site because phosphorus can adsorb sediment particles. The median concentration of TP for all springs sampled was 0.06 mg/L. Orthophosphate concentrations ranged from 0.02 to 0.18 mg/L.69

69 Ibid.
<table>
<thead>
<tr>
<th>Pesticide/Trade Name</th>
<th>Type of pesticide</th>
<th>Lab reporting level (µg/L)</th>
<th>% Detected (number of samples)</th>
<th>Median concentration of detections (µg/L)</th>
<th>Maximum concentration of detections (µg/L)</th>
<th>Water-quality criteria for aquatic life (µg/L)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Acetochlord/Harness Plus, Surpass</td>
<td>Herbicide</td>
<td>0.004</td>
<td>14 (59)</td>
<td>0.004</td>
<td>0.099</td>
<td>--</td>
</tr>
<tr>
<td>Atrazined/Atrex, Atred</td>
<td>Herbicide</td>
<td>.007</td>
<td>100 (59)</td>
<td>.159</td>
<td>7.40</td>
<td>a1.8</td>
</tr>
<tr>
<td>Chlorpyrifos/Brodan, Dursban</td>
<td>Insecticide</td>
<td>.005</td>
<td>2 (59)</td>
<td>.005</td>
<td>.011</td>
<td>b.041</td>
</tr>
<tr>
<td>Metolachlor/Dual, Pennant</td>
<td>Herbicide</td>
<td>.013</td>
<td>80 (59)</td>
<td>.035</td>
<td>.343</td>
<td>a7.8</td>
</tr>
<tr>
<td>Metribuzin/Lexone, Sencor</td>
<td>Herbicide</td>
<td>.006</td>
<td>5 (59)</td>
<td>.006</td>
<td>.011</td>
<td>a1</td>
</tr>
<tr>
<td>Napropamide/Devrinol, Naproguard</td>
<td>Herbicide</td>
<td>.007</td>
<td>3 (59)</td>
<td>.007</td>
<td>.011</td>
<td>--</td>
</tr>
<tr>
<td>Prometon/Pramitol</td>
<td>Herbicide</td>
<td>.015</td>
<td>58 (59)</td>
<td>c.014</td>
<td>.468</td>
<td>--</td>
</tr>
<tr>
<td>Simazine/Aquazine, Princep</td>
<td>Herbicide</td>
<td>.011</td>
<td>93 (59)</td>
<td>.019</td>
<td>.210</td>
<td>a10</td>
</tr>
<tr>
<td>Tebuthiuron/Spike, Tebusan</td>
<td>Herbicide</td>
<td>.016</td>
<td>66 (59)</td>
<td>c.014</td>
<td>.043</td>
<td>a1.6</td>
</tr>
</tbody>
</table>

3.10 SOCIOECONOMICS

The proposed Kentucky CREP area consists of 14 counties: Adair, Allen, Barren, Butler, Edmonson, Grayson, Green, Hart, Logan, Metcalfe, Russell, Simpson, Taylor and Warren. Based on the 2000 Census, approximately 335,526 people were living in the 14-county CREP area. Table 3-8 presents the overall population for these CREP counties, based on the 2000 Census, and shows the respective land area by CREP county.

Table 3-8: Population and Land Area by Kentucky CREP County, 2000

<table>
<thead>
<tr>
<th>CREP County</th>
<th>2000 Population</th>
<th>Square Miles</th>
</tr>
</thead>
<tbody>
<tr>
<td>Adair</td>
<td>17,244</td>
<td>407</td>
</tr>
<tr>
<td>Allen</td>
<td>17,800</td>
<td>346</td>
</tr>
<tr>
<td>Barren</td>
<td>38,033</td>
<td>491</td>
</tr>
<tr>
<td>Butler</td>
<td>13,010</td>
<td>428</td>
</tr>
<tr>
<td>Edmonson</td>
<td>11,644</td>
<td>303</td>
</tr>
<tr>
<td>Grayson</td>
<td>24,053</td>
<td>504</td>
</tr>
<tr>
<td>Green</td>
<td>11,518</td>
<td>289</td>
</tr>
<tr>
<td>Hart</td>
<td>17,445</td>
<td>416</td>
</tr>
<tr>
<td>Logan</td>
<td>26,573</td>
<td>556</td>
</tr>
<tr>
<td>Metcalfe</td>
<td>10,037</td>
<td>291</td>
</tr>
<tr>
<td>Russell</td>
<td>16,315</td>
<td>254</td>
</tr>
<tr>
<td>Simpson</td>
<td>16,405</td>
<td>236</td>
</tr>
<tr>
<td>Taylor</td>
<td>22,927</td>
<td>270</td>
</tr>
<tr>
<td>Warren</td>
<td>92,522</td>
<td>545</td>
</tr>
<tr>
<td><strong>Total CREP Area Population</strong></td>
<td><strong>335,526</strong></td>
<td><strong>5,336</strong></td>
</tr>
</tbody>
</table>


Table 3-9 provides greater detail on the demographic profile of the existing eight CREP counties and Table 3-10 provides demographic data on the proposed expanded CREP area and six new counties. These tables also show changes in demographic characteristics in these areas over time.

The fastest growing counties were Allen, which jumped 21.7 percent between 1990 and 2000, and grew another 5.1 percent between 2000 and 2005, and Warren, which grew 19 percent between 1990 and 2000. Warren County is the most populated county in the proposed CREP area with 98,960 residents. More recent growth spurts occurred with Warren County, which leaped another 7 percent between 2000 and 2005. This compares with the overall State growth, which was only 3.2 percent between 2000 and 2005 and 9.6 percent between 1990 and 2000. Warren County is also the most densely populated county with more than 169.7 persons per square mile in a county that is 545 square miles in size.

Economically, Logan County had $1.7 billion in manufactured shipments in 2002 and Warren County had $1.2 billion in retail sales.

Demographically, Simpson and Warren Counties were homes to the largest non-white populations, with blacks comprising 9.9 percent of the population for Simpson County and 8.8 percent for Warren County in 2004. Warren County showed more diversity with 1.7 percent of its population Asian and 3.3 percent Hispanic or Latino. Approximately 7.5 percent of the State population was black during this time period. Blacks represented the largest minority population for Logan, Simpson and Warren Counties in 2004.
<table>
<thead>
<tr>
<th>Characteristic</th>
<th>Adair</th>
<th>Barren</th>
<th>Edmonson</th>
<th>Green</th>
<th>Hart</th>
<th>Metcalfe</th>
<th>Russell</th>
<th>Taylor</th>
<th>Kentucky</th>
</tr>
</thead>
<tbody>
<tr>
<td>Population, 2005 estimate</td>
<td>17,573</td>
<td>40,073</td>
<td>12,030</td>
<td>11,588</td>
<td>18,319</td>
<td>10,197</td>
<td>17,020</td>
<td>23,754</td>
<td>4,173,405</td>
</tr>
<tr>
<td>Population, percent change, April 1, 2000 – July 1, 2005</td>
<td>1.9%</td>
<td>5.4%</td>
<td>3.3%</td>
<td>0.6%</td>
<td>5.0%</td>
<td>1.6%</td>
<td>4.3%</td>
<td>3.6%</td>
<td>3.2%</td>
</tr>
<tr>
<td>Population, 2000</td>
<td>17,244</td>
<td>38,033</td>
<td>11,644</td>
<td>11,518</td>
<td>17,445</td>
<td>10,037</td>
<td>16,315</td>
<td>22,927</td>
<td>4,041,769</td>
</tr>
<tr>
<td>Population, percent change, 1990 – 2000</td>
<td>12.3%</td>
<td>11.9%</td>
<td>12.4%</td>
<td>11.1%</td>
<td>17.2%</td>
<td>12.0%</td>
<td>10.9%</td>
<td>8.4%</td>
<td>9.6%</td>
</tr>
<tr>
<td>White persons, percent, 2004</td>
<td>95.9%</td>
<td>94.7%</td>
<td>98.6%</td>
<td>96.5%</td>
<td>93.4%</td>
<td>97.5%</td>
<td>98.7%</td>
<td>94.0%</td>
<td>90.4%</td>
</tr>
<tr>
<td>Black persons, percent, 2004</td>
<td>2.9%</td>
<td>4.0%</td>
<td>0.6%</td>
<td>2.6%</td>
<td>5.5%</td>
<td>1.8%</td>
<td>0.7%</td>
<td>5.2%</td>
<td>7.5%</td>
</tr>
<tr>
<td>American Indian and Alaska Native persons, percent, 2004</td>
<td>0.2%</td>
<td>0.2%</td>
<td>0.4%</td>
<td>0.0%</td>
<td>0.2%</td>
<td>0.2%</td>
<td>0.1%</td>
<td>0.1%</td>
<td>0.2%</td>
</tr>
<tr>
<td>Asian persons, percent, 2004</td>
<td>0.4%</td>
<td>0.4%</td>
<td>0.1%</td>
<td>0.2%</td>
<td>0.1%</td>
<td>0.1%</td>
<td>0.2%</td>
<td>0.3%</td>
<td>0.9%</td>
</tr>
<tr>
<td>Native Hawaiian and Other Pacific Islander, percent, 2004</td>
<td>0.0%</td>
<td>0.0%</td>
<td>0.0%</td>
<td>0.0%</td>
<td>0.0%</td>
<td>0.0%</td>
<td>0.0%</td>
<td>0.0%</td>
<td>0.0%</td>
</tr>
<tr>
<td>Persons reporting two or more races, percent, 2004</td>
<td>0.6%</td>
<td>0.6%</td>
<td>0.2%</td>
<td>0.7%</td>
<td>0.6%</td>
<td>0.3%</td>
<td>0.4%</td>
<td>0.5%</td>
<td>1.0%</td>
</tr>
<tr>
<td>Persons of Hispanic or Latino origin, percent, 2004</td>
<td>0.7%</td>
<td>1.0%</td>
<td>0.8%</td>
<td>1.2%</td>
<td>1.0%</td>
<td>0.6%</td>
<td>0.8%</td>
<td>1.1%</td>
<td>1.9%</td>
</tr>
<tr>
<td>White persons, not Hispanic, percent, 2004</td>
<td>95.2%</td>
<td>93.8%</td>
<td>97.9%</td>
<td>95.5%</td>
<td>92.5%</td>
<td>97.0%</td>
<td>97.9%</td>
<td>93.0%</td>
<td>88.7%</td>
</tr>
<tr>
<td>Housing units, 2004</td>
<td>7,837</td>
<td>17,424</td>
<td>6,334</td>
<td>5,433</td>
<td>8,232</td>
<td>4,746</td>
<td>9,188</td>
<td>10,214</td>
<td>1,842,971</td>
</tr>
<tr>
<td>Homeownership rate, 2000</td>
<td>80.2%</td>
<td>72.3%</td>
<td>85.6%</td>
<td>78.2%</td>
<td>77.3%</td>
<td>79.3%</td>
<td>79.5%</td>
<td>72.3%</td>
<td>70.8%</td>
</tr>
<tr>
<td>Median value of owner-occupied housing units, 2000</td>
<td>$60,800</td>
<td>$77,900</td>
<td>$63,700</td>
<td>$52,500</td>
<td>$60,100</td>
<td>$52,600</td>
<td>$62,000</td>
<td>$70,700</td>
<td>$86,700</td>
</tr>
<tr>
<td>Households, 2000</td>
<td>6,747</td>
<td>15,346</td>
<td>4,648</td>
<td>4,706</td>
<td>6,769</td>
<td>4,016</td>
<td>6,941</td>
<td>9,233</td>
<td>1,590,647</td>
</tr>
<tr>
<td>Characteristic</td>
<td>Adair</td>
<td>Barren</td>
<td>Edmonson</td>
<td>Green</td>
<td>Hart</td>
<td>Metcalfe</td>
<td>Russell</td>
<td>Taylor</td>
<td>Kentucky</td>
</tr>
<tr>
<td>----------------------------------------------------</td>
<td>--------</td>
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<td>----------</td>
<td>--------</td>
<td>-------</td>
<td>----------</td>
<td>---------</td>
<td>--------</td>
<td>------------</td>
</tr>
<tr>
<td>Persons per household, 2000</td>
<td>2.44</td>
<td>2.44</td>
<td>2.47</td>
<td>2.41</td>
<td>2.54</td>
<td>2.47</td>
<td>2.33</td>
<td>2.41</td>
<td>2.47</td>
</tr>
<tr>
<td>Per capita money income, 1999</td>
<td>$14,931</td>
<td>$16,816</td>
<td>$14,480</td>
<td>$16,107</td>
<td>$13,495</td>
<td>$13,236</td>
<td>$13,183</td>
<td>$15,162</td>
<td>$18,093</td>
</tr>
<tr>
<td>Median household income, 2003</td>
<td>$25,205</td>
<td>$32,837</td>
<td>$29,058</td>
<td>$27,314</td>
<td>$26,550</td>
<td>$25,390</td>
<td>$24,555</td>
<td>$30,351</td>
<td>$36,663</td>
</tr>
<tr>
<td>Persons below poverty, percent, 2003</td>
<td>20.0%</td>
<td>15.3%</td>
<td>16.3%</td>
<td>17.1%</td>
<td>19.4%</td>
<td>19.4%</td>
<td>19.8%</td>
<td>16.6%</td>
<td>14.9%</td>
</tr>
<tr>
<td>Private non-farm establishments, 2003</td>
<td>324</td>
<td>860</td>
<td>116</td>
<td>180</td>
<td>249</td>
<td>119</td>
<td>378</td>
<td>676</td>
<td>90,651</td>
</tr>
<tr>
<td>Private non-farm employment, percent change 2000-2003</td>
<td>-3.4%</td>
<td>-0.2%</td>
<td>15.7%</td>
<td>-10.9%</td>
<td>28.2%</td>
<td>-43.0%</td>
<td>15.6%</td>
<td>23.8%</td>
<td>-2.8%</td>
</tr>
<tr>
<td>Manufacturers shipments, 2002 ($1000)</td>
<td>NA</td>
<td>1,006,589</td>
<td>NA</td>
<td>NA</td>
<td>256,279</td>
<td>171,163</td>
<td>286,362</td>
<td>240,799</td>
<td>88,513,497</td>
</tr>
<tr>
<td>Retail sales, 2002 ($1000)</td>
<td>106,552</td>
<td>410,128</td>
<td>26,242</td>
<td>40,212</td>
<td>81,086</td>
<td>37,279</td>
<td>118,321</td>
<td>329,342</td>
<td>40,062,561</td>
</tr>
<tr>
<td>Retail sales per capita, 2002</td>
<td>$6,124</td>
<td>$10,584</td>
<td>$2,218</td>
<td>$3,443</td>
<td>$4,582</td>
<td>$3,722</td>
<td>$7,169</td>
<td>$14,151</td>
<td>$9,795</td>
</tr>
<tr>
<td>Land area, 2000 (square miles)</td>
<td>407</td>
<td>491</td>
<td>303</td>
<td>289</td>
<td>416</td>
<td>291</td>
<td>254</td>
<td>270</td>
<td>39,728</td>
</tr>
<tr>
<td>Persons per square mile, 2000</td>
<td>42.4</td>
<td>77.5</td>
<td>38.5</td>
<td>39.9</td>
<td>41.9</td>
<td>34.5</td>
<td>64.4</td>
<td>85</td>
<td>101.7</td>
</tr>
</tbody>
</table>

(a) Includes persons reporting only one race.
(b) Hispanics may be of any race, and are included in applicable race categories.
Source: U.S. Census Bureau State & County QuickFacts.
<table>
<thead>
<tr>
<th>Characteristic</th>
<th>Allen</th>
<th>Butler</th>
<th>Grayson</th>
<th>Logan</th>
<th>Simpson</th>
<th>Warren</th>
<th>Kentucky</th>
</tr>
</thead>
<tbody>
<tr>
<td>Population, 2005 estimate</td>
<td>18,706</td>
<td>13,414</td>
<td>25,189</td>
<td>27,169</td>
<td>17,021</td>
<td>98,960</td>
<td>4,173,405</td>
</tr>
<tr>
<td>Population, percent change, April 1, 2000 to July 1, 2005</td>
<td>5.1%</td>
<td>3.1%</td>
<td>4.7%</td>
<td>2.2%</td>
<td>3.8%</td>
<td>7.0%</td>
<td>3.2%</td>
</tr>
<tr>
<td>Population, 2000</td>
<td>17,800</td>
<td>13,010</td>
<td>24,053</td>
<td>26,573</td>
<td>16,405</td>
<td>92,522</td>
<td>4,041,769</td>
</tr>
<tr>
<td>Population, percent change, 1990 to 2000</td>
<td>21.7%</td>
<td>15.7%</td>
<td>14.3%</td>
<td>8.8%</td>
<td>8.3%</td>
<td>19.0%</td>
<td>9.6%</td>
</tr>
<tr>
<td>White persons, percent, 2004 (a)</td>
<td>97.8%</td>
<td>98.6%</td>
<td>98.5%</td>
<td>91.2%</td>
<td>88.2%</td>
<td>87.9%</td>
<td>90.4%</td>
</tr>
<tr>
<td>Black persons, percent, 2004 (a)</td>
<td>1.4%</td>
<td>0.5%</td>
<td>0.6%</td>
<td>7.4%</td>
<td>9.9%</td>
<td>8.8%</td>
<td>7.5%</td>
</tr>
<tr>
<td>American Indian and Alaska Native persons, percent, 2004 (a)</td>
<td>0.1%</td>
<td>0.2%</td>
<td>0.1%</td>
<td>0.2%</td>
<td>0.2%</td>
<td>0.3%</td>
<td>0.2%</td>
</tr>
<tr>
<td>Asian persons, percent, 2004 (a)</td>
<td>0.2%</td>
<td>0.3%</td>
<td>0.2%</td>
<td>0.2%</td>
<td>0.3%</td>
<td>0.9%</td>
<td>0.9%</td>
</tr>
<tr>
<td>Native Hawaiian and Other Pacific Islander, percent, 2004 (a)</td>
<td>0.0%</td>
<td>0.0%</td>
<td>0.0%</td>
<td>0.0%</td>
<td>0.1%</td>
<td>0.1%</td>
<td>0.0%</td>
</tr>
<tr>
<td>Persons reporting two or more races, percent, 2004</td>
<td>0.5%</td>
<td>0.5%</td>
<td>0.6%</td>
<td>1.0%</td>
<td>0.7%</td>
<td>1.3%</td>
<td>1.0%</td>
</tr>
<tr>
<td>Persons of Hispanic or Latino origin, percent, 2004 (b)</td>
<td>0.8%</td>
<td>1.6%</td>
<td>1.0%</td>
<td>1.5%</td>
<td>1.0%</td>
<td>3.3%</td>
<td>1.9%</td>
</tr>
<tr>
<td>White persons, not Hispanic, percent, 2004</td>
<td>97.0%</td>
<td>97.0%</td>
<td>97.5%</td>
<td>89.8%</td>
<td>87.3%</td>
<td>84.8%</td>
<td>88.7%</td>
</tr>
<tr>
<td>Housing units, 2004</td>
<td>8,327</td>
<td>5,990</td>
<td>12,911</td>
<td>12,063</td>
<td>7,512</td>
<td>41,689</td>
<td>1,842,971</td>
</tr>
<tr>
<td>Homeownership rate, 2000</td>
<td>79.0%</td>
<td>79.6%</td>
<td>77.3%</td>
<td>75.2%</td>
<td>71.8%</td>
<td>64.0%</td>
<td>70.8%</td>
</tr>
<tr>
<td>Median value of owner-occupied housing units, 2000</td>
<td>$69,300</td>
<td>$59,900</td>
<td>$65,600</td>
<td>$67,100</td>
<td>$81,400</td>
<td>$100,400</td>
<td>$86,700</td>
</tr>
<tr>
<td>Households, 2000</td>
<td>6,910</td>
<td>5,059</td>
<td>9,596</td>
<td>10,506</td>
<td>6,415</td>
<td>35,365</td>
<td>1,590,647</td>
</tr>
<tr>
<td>Persons per household, 2000</td>
<td>2.55</td>
<td>2.52</td>
<td>2.47</td>
<td>2.5</td>
<td>2.52</td>
<td>2.46</td>
<td>2.47</td>
</tr>
<tr>
<td>Per capita money income, 1999</td>
<td>$14,506</td>
<td>$14,617</td>
<td>$14,759</td>
<td>$15,962</td>
<td>$17,150</td>
<td>$18,847</td>
<td>$18,093</td>
</tr>
<tr>
<td>Characteristic</td>
<td>Allen</td>
<td>Butler</td>
<td>Grayson</td>
<td>Logan</td>
<td>Simpson</td>
<td>Warren</td>
<td>Kentucky</td>
</tr>
<tr>
<td>-----------------------------------------</td>
<td>---------</td>
<td>---------</td>
<td>---------</td>
<td>---------</td>
<td>---------</td>
<td>---------</td>
<td>----------</td>
</tr>
<tr>
<td>Median household income, 2003</td>
<td>$33,759</td>
<td>$30,620</td>
<td>$29,240</td>
<td>$33,588</td>
<td>$38,381</td>
<td>$37,483</td>
<td>$36,663</td>
</tr>
<tr>
<td>Persons below poverty, percent, 2003</td>
<td>14.8%</td>
<td>16.1%</td>
<td>16.1%</td>
<td>14.9%</td>
<td>13.1%</td>
<td>15.2%</td>
<td>14.9%</td>
</tr>
<tr>
<td>Private non-farm establishments, 2003</td>
<td>214</td>
<td>205</td>
<td>463</td>
<td>512</td>
<td>366</td>
<td>2,613</td>
<td>90,651</td>
</tr>
<tr>
<td>Private non-farm employment, percent change 2000-2003</td>
<td>-2.8%</td>
<td>-20.1%</td>
<td>0.0%</td>
<td>-14.1%</td>
<td>0.0%</td>
<td>1.4%</td>
<td>-2.8%</td>
</tr>
<tr>
<td>Manufacturers shipments, 2002 ($1000)</td>
<td>$195,256</td>
<td>$126,000</td>
<td>$536,304</td>
<td>$1,780,412</td>
<td>$786,584</td>
<td>N/A</td>
<td>$88,513,497</td>
</tr>
<tr>
<td>Retail sales, 2002 ($1000)</td>
<td>$81,336</td>
<td>$142,242</td>
<td>$142,242</td>
<td>$158,388</td>
<td>$288,715</td>
<td>$1,243,132</td>
<td>$40,062,561</td>
</tr>
<tr>
<td>Retail sales per capita, 2002</td>
<td>$4,481</td>
<td>$4,799</td>
<td>$5,858</td>
<td>$5,922</td>
<td>$17,350</td>
<td>$13,197</td>
<td>$9,795</td>
</tr>
<tr>
<td>Land area, 2000 (square miles)</td>
<td>346</td>
<td>428</td>
<td>504</td>
<td>556</td>
<td>236</td>
<td>545</td>
<td>39,728</td>
</tr>
<tr>
<td>Persons per square mile, 2000</td>
<td>51.4</td>
<td>30.4</td>
<td>47.8</td>
<td>47.8</td>
<td>69.5</td>
<td>169.7</td>
<td>101.7</td>
</tr>
</tbody>
</table>

(a) Includes persons reporting only one race.
(b) Hispanics may be of any race, and are included in applicable race categories.
Source: U.S. Census Bureau State & County QuickFacts.
Homeownership was highest in Edmonson County (85.6 percent), followed by Adair and Butler Counties in 2000. Warren County experienced the highest ($100,400) median value of home, compared with the State median value of $86,700. There were 35,365 households in Warren County, which was significantly higher than the other CREP counties. Green County offered the lowest median value of housing at $52,500 and had 4,706 households recorded in 2000.

Per capita income was highest in Warren County ($18,847) and lowest in Russell County ($13,183) in 1999. Simpson County had the highest median household income ($38,381) in 2003, and Russell had the lowest household income level ($24,555). Most of the proposed CREP counties, with the exception of Allen and Simpson Counties, were above the State’s poverty rate (14.9 percent). Adair County had the highest percentage of persons living below poverty in 2003. Russell, Metcalfe, Hart, Green, Butler and Grayson Counties also showed a high percentage of county residents living in poverty.

CCC has disbursed more than $1.7 million dollars to landowners for KYCREP since its inception. Table 3-11 summarizes the cumulative payments to landowners for CREP enrollments.

Table 3-11: Kentucky CREP Cumulative Payment Summary

<table>
<thead>
<tr>
<th>County</th>
<th>Average Acres/Contract</th>
<th>Avg. Rental Rate/Acre</th>
<th>Incentive Paid Per Acre</th>
<th>Total Estimated Cost-Share</th>
</tr>
</thead>
<tbody>
<tr>
<td>Adair</td>
<td>10</td>
<td>$97</td>
<td>$45</td>
<td>$342,172</td>
</tr>
<tr>
<td>Barren</td>
<td>30</td>
<td>$111</td>
<td>$46</td>
<td>$426,724</td>
</tr>
<tr>
<td>Edmonson</td>
<td>49</td>
<td>$103</td>
<td>$41</td>
<td>$14,544</td>
</tr>
<tr>
<td>Green</td>
<td>20</td>
<td>$129</td>
<td>$61</td>
<td>$393,254</td>
</tr>
<tr>
<td>Hart</td>
<td>25</td>
<td>$138</td>
<td>$64</td>
<td>$189,559</td>
</tr>
<tr>
<td>Metcalfe</td>
<td>21</td>
<td>$103</td>
<td>$44</td>
<td>$91,880</td>
</tr>
<tr>
<td>Russell</td>
<td>NA</td>
<td>NA</td>
<td>NA</td>
<td>NA</td>
</tr>
<tr>
<td>Taylor</td>
<td>15</td>
<td>$119</td>
<td>$54</td>
<td>$260,488</td>
</tr>
<tr>
<td>Total Region</td>
<td>19</td>
<td>$118</td>
<td>$53</td>
<td>$1,765,863</td>
</tr>
</tbody>
</table>


In FY 2005, the program paid $548,600 to landowners (Table 3-12). Landowners are compensated for retiring environmentally sensitive land from cultivation. In addition to the money they receive from the program, they often gain further revenues from this land by opening it to hunting or other purposes.

FSA determines the eligibility to participate in the CRP portion of the Enhancement Program and pays the landowner 50 percent of the costs of CRP conservation practices. Landowners, in turn, receive rental payments for the 15-year CRP contract at normal CRP rates, plus several incentive payments. Landowners, for example, receive an additional 30-percent increase in the annual per acre rental rate for
enrolling cropland situated in riparian areas or for restoring wetlands. The corresponding incentive payment for enrolling erodible land is 20 percent.

Table 3-12: Fiscal Year 2005 CREP Payments

<table>
<thead>
<tr>
<th>County</th>
<th>Average Acres/Contract</th>
<th>Avg. Rental Rate/Acre</th>
<th>Incentive Paid Per Acre</th>
<th>Total Estimated Cost-Share</th>
</tr>
</thead>
<tbody>
<tr>
<td>Adair</td>
<td>10</td>
<td>$100</td>
<td>$46</td>
<td>$244,992</td>
</tr>
<tr>
<td>Barren</td>
<td>16</td>
<td>$118</td>
<td>$50</td>
<td>$22,379</td>
</tr>
<tr>
<td>Edmonson</td>
<td>NA</td>
<td>NA</td>
<td>NA</td>
<td>NA</td>
</tr>
<tr>
<td>Green</td>
<td>18</td>
<td>$125</td>
<td>$67</td>
<td>$161,940</td>
</tr>
<tr>
<td>Hart</td>
<td>23</td>
<td>$137</td>
<td>$65</td>
<td>$23,435</td>
</tr>
<tr>
<td>Metcalfe</td>
<td>20</td>
<td>$104</td>
<td>$46</td>
<td>$39,103</td>
</tr>
<tr>
<td>Russell</td>
<td>NA</td>
<td>NA</td>
<td>NA</td>
<td>NA</td>
</tr>
<tr>
<td>Taylor</td>
<td>6</td>
<td>$124</td>
<td>$58</td>
<td>$24,350</td>
</tr>
<tr>
<td>Region</td>
<td>13</td>
<td>$114</td>
<td>$52</td>
<td>$548,699</td>
</tr>
</tbody>
</table>


The Kentucky Division of Conservation is the State agency that administers the financial portion of the Green River CREP (State cost share and incentive payments), and works closely with local conservation districts and partner agencies to promote and administer the program. Table 3-13 present payment information on the State’s contributions to CREP contracts.

Table 3-13: Total State Share of Payments for CREP Contracts

<table>
<thead>
<tr>
<th>County</th>
<th>Total Contracts</th>
<th>Total Dollars</th>
</tr>
</thead>
<tbody>
<tr>
<td>Adair</td>
<td>54</td>
<td>$96,366.00</td>
</tr>
<tr>
<td>Barren</td>
<td>76</td>
<td>$334,525.00</td>
</tr>
<tr>
<td>Edmonson</td>
<td>3</td>
<td>$10,688.00</td>
</tr>
<tr>
<td>Green</td>
<td>82</td>
<td>$202,122.75</td>
</tr>
<tr>
<td>Hart</td>
<td>60</td>
<td>$158,888.50</td>
</tr>
<tr>
<td>Metcalfe</td>
<td>34</td>
<td>$71,307.00</td>
</tr>
<tr>
<td>Russell</td>
<td>0</td>
<td>$0.00</td>
</tr>
<tr>
<td>Taylor</td>
<td>102</td>
<td>$238,553.00</td>
</tr>
<tr>
<td>TOTAL</td>
<td>411</td>
<td>$1,112,450.25</td>
</tr>
</tbody>
</table>


During 2005, the CREP permanent easement (valued at $480 in 2005) was recorded on 14 tracts totaling just over 380 acres for the year. The cumulative total is 20 easements totaling ~ 460 acres. TNC ceased recording easements in October 2005 in order to reevaluate the value of the easement. The value increased substantially to $650 per acre.
Farm Demographics

Table 3-14 provides an overview of the area’s agriculture and summarizes the agricultural demographics for the proposed expanded CREP counties.

Table 3-14: Farm Demographics by Proposed Expanded CREP County

<table>
<thead>
<tr>
<th>Farm Characteristic</th>
<th>Allen</th>
<th>Barren</th>
<th>Butler</th>
<th>Edmonson</th>
<th>Grayson</th>
<th>Logan</th>
<th>Simpson</th>
<th>Warren</th>
<th>Totals</th>
</tr>
</thead>
<tbody>
<tr>
<td>No. of Farms</td>
<td>1,500</td>
<td>100</td>
<td>475</td>
<td>1,450</td>
<td>656</td>
<td>800</td>
<td>450</td>
<td>4,400</td>
<td>9,831</td>
</tr>
<tr>
<td>Avg. Acres/Farm</td>
<td>120</td>
<td>125</td>
<td>250</td>
<td>140</td>
<td>103</td>
<td>110</td>
<td>200</td>
<td>136</td>
<td>138</td>
</tr>
<tr>
<td>Crops</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Pasture/Hay</td>
<td>66,590</td>
<td>10,205</td>
<td>13,891</td>
<td>31,534</td>
<td>20,930</td>
<td>21,249</td>
<td>35,213</td>
<td>140,124</td>
<td>339,736</td>
</tr>
<tr>
<td>Corn</td>
<td>2,000</td>
<td>624</td>
<td>3,475</td>
<td>1,700</td>
<td>1,143</td>
<td>5,154</td>
<td>18,102</td>
<td>27,500</td>
<td>59,698</td>
</tr>
<tr>
<td>Soybeans</td>
<td>550</td>
<td>600</td>
<td>3,790</td>
<td>3,800</td>
<td>1,753</td>
<td>4,000</td>
<td>16,474</td>
<td>25,700</td>
<td>56,667</td>
</tr>
<tr>
<td>Wheat</td>
<td>400</td>
<td>200</td>
<td>125</td>
<td>200</td>
<td>NA</td>
<td>2,000</td>
<td>8,819</td>
<td>14,500</td>
<td>26,244</td>
</tr>
<tr>
<td>Tobacco</td>
<td>245</td>
<td>106</td>
<td>59</td>
<td>275</td>
<td>194</td>
<td>160</td>
<td>200</td>
<td>1,100</td>
<td>2,339</td>
</tr>
<tr>
<td>Grain Sorghum</td>
<td>NA</td>
<td>NA</td>
<td>NA</td>
<td>NA</td>
<td>NA</td>
<td>200</td>
<td>NA</td>
<td>NA</td>
<td>200</td>
</tr>
<tr>
<td>Barley</td>
<td>NA</td>
<td>NA</td>
<td>NA</td>
<td>NA</td>
<td>NA</td>
<td>400</td>
<td>NA</td>
<td>400</td>
<td>400</td>
</tr>
<tr>
<td>Oats</td>
<td>NA</td>
<td>NA</td>
<td>NA</td>
<td>NA</td>
<td>NA</td>
<td>100</td>
<td>NA</td>
<td>100</td>
<td>100</td>
</tr>
</tbody>
</table>

*Data supplied by local county FSA Offices and Meier Lab, Center for Biodiversity Studies, Western Kentucky University.

3.11 ENVIRONMENTAL JUSTICE

Executive Order 12898, Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations, directs all Federal agencies to achieve environmental justice as part of their mission by identifying and addressing disproportionately high and adverse human health or environmental effects of their activities on minority and low-income populations. Table 3-15 shows the number of farm operators by race for each of the Kentucky Green River CREP counties, as well as the number living below poverty. The poverty rate for the entire State was estimated at 14.9 in 2003, which declined from 15.8 in 1999 and 19.0 in 1989.70

In 2003, Logan, Simpson, and Allen Counties had the lowest rates of persons living in poverty, whereas Adair, Hart, Metcalfe, and Russell Counties had the highest rates. Simpson and Warren Counties represented the largest minority populations of the CREP counties. Blacks comprised 9.9 percent of the county population for Simpson County and 8.8 percent for Warren County in 2004. Blacks comprised approximately 7.5 percent of the State population during this time period. Among all counties, blacks comprised the largest minority population for farm operators.

In 2004, USDA awarded 22 competitive grants totaling more than $5.9 million to land grant colleges, universities, and non-profit organizations that serve socially disadvantaged farmers and ranchers. A socially disadvantaged farmer is one of a group whose members have been subjected to racial or ethnic prejudice without regard to their individual qualities. The grants are part of the Outreach and Assistance for Socially Disadvantaged Farmers and Ranchers Program, also referred to as the 2501 program, and are administered by USDA’s Cooperative State Research, Education and Extension Service. Kentucky State

70 “Kentucky Fact Sheet: KY Agriculture Income Population Education Employment…”
University was awarded $300,000 to enhance the knowledge of socially disadvantaged farmers, specifically Native American and African American farmers in beef cattle and dairy beef operations and marketing systems. This effort will improve their farms’ profitability by applying risk management strategies, farm management and recordkeeping systems.\(^7\)

Table 3-15: Farm Operators by Race and Number Living below Poverty, Kentucky CREP

<table>
<thead>
<tr>
<th>CREP County</th>
<th>2003 Estimated Poverty Rate</th>
<th>Estimated Number in Poverty</th>
<th>Black</th>
<th>American Indian/Alaska Native</th>
<th>Native Hawaiian/Pacific Islander</th>
<th>Asian</th>
<th>Multi-racial</th>
<th>Spanish/Hispanic/Latino</th>
</tr>
</thead>
<tbody>
<tr>
<td>Adair</td>
<td>20.0</td>
<td>3,376</td>
<td>18</td>
<td>3</td>
<td>2</td>
<td>1</td>
<td>6</td>
<td>11</td>
</tr>
<tr>
<td>Allen</td>
<td>14.8</td>
<td>2,726</td>
<td>0</td>
<td>2</td>
<td>0</td>
<td>1</td>
<td>0</td>
<td>14</td>
</tr>
<tr>
<td>Barren</td>
<td>15.3</td>
<td>5,949</td>
<td>51</td>
<td>3</td>
<td>0</td>
<td>4</td>
<td>11</td>
<td>19</td>
</tr>
<tr>
<td>Butler</td>
<td>16.1</td>
<td>2,120</td>
<td>0</td>
<td>3</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>7</td>
</tr>
<tr>
<td>Edmonson</td>
<td>16.3</td>
<td>1,934</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>7</td>
<td>7</td>
<td>7</td>
</tr>
<tr>
<td>Grayson</td>
<td>16.1</td>
<td>3,988</td>
<td>3</td>
<td>4</td>
<td>0</td>
<td>0</td>
<td>7</td>
<td>20</td>
</tr>
<tr>
<td>Green</td>
<td>17.1</td>
<td>1,972</td>
<td>26</td>
<td>2</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>10</td>
</tr>
<tr>
<td>Hart</td>
<td>19.4</td>
<td>3,498</td>
<td>40</td>
<td>7</td>
<td>0</td>
<td>0</td>
<td>4</td>
<td>13</td>
</tr>
<tr>
<td>Logan</td>
<td>14.9</td>
<td>3,983</td>
<td>16</td>
<td>2</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>16</td>
</tr>
<tr>
<td>Metcalfé</td>
<td>19.4</td>
<td>1,956</td>
<td>32</td>
<td>1</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>20</td>
</tr>
<tr>
<td>Russell</td>
<td>19.8</td>
<td>3,309</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>2</td>
<td>12</td>
<td></td>
</tr>
<tr>
<td>Simpson</td>
<td>13.1</td>
<td>2,177</td>
<td>21</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>2</td>
<td></td>
</tr>
<tr>
<td>Taylor</td>
<td>16.6</td>
<td>3,802</td>
<td>28</td>
<td>0</td>
<td>1</td>
<td>0</td>
<td>0</td>
<td>3</td>
</tr>
<tr>
<td>Warren</td>
<td>15.2</td>
<td>13,981</td>
<td>75</td>
<td>4</td>
<td>0</td>
<td>2</td>
<td>13</td>
<td>13</td>
</tr>
<tr>
<td>Kentucky</td>
<td>14.9*</td>
<td>900</td>
<td>256</td>
<td>31</td>
<td>64</td>
<td>314</td>
<td>892</td>
<td></td>
</tr>
</tbody>
</table>

*18.4 rate rural; 12.3 rate urban for the Commonwealth.

CREP’s landlord-tenant provisions can be found in Handbook 2-CRP, rev. 4, Amendment 1, paragraph 86. These requirements state that landlords must provide tenants who have an interest in the acreage being offered at the time of sign-up, an opportunity to participate in CRP and not reduce the number of tenants on the farm as a result of or in anticipation of enrollments in CRP. All producers, landlords and tenants are to be fully informed at the time of sign-up and that landlords violating the provisions will be ineligible to earn CRP/CREP payments.

Although CREP contracts provide compensation to farmers for enrolling certain land in CREP, FSA does not monitor whether these funds are being passed on to compensate tenant farmers for the loss of land. The County Office Committee (COC) is responsible for determining whether landlord tenant provisions have been violated before approving CRP-1. The determination shall be made by reviewing the documentation submitted with the CRP-1 and researching the tenant history on the farm. When there is a dispute between a landlord and a tenant, and the COC determines there is insufficient evidence to make a


Draft PEA for Kentucky Green River CREP 73
determination, the COC shall not approve the CRP contract until the landlord and tenant resolve the dispute.

A tenant may sign a statement voluntarily relinquishing his/her interest in the farm or CRP benefits allowing the landlord to offer land for CRP that has a history of a tenant if COC determines that the landlord has the “necessary means” to conduct the farming operation. As of February 6, 2002, all CRP participants, landlords and tenants are required to sign a copy of the CRP-1 indicating that they fully understand the provisions relating to Tenants and Landlords. Some tenant farmers, who have low incomes and are of minority status, may actually benefit from CREP by receiving a reduction in rent without a reduction in the area that can be farmed.

3.12 OTHER PROTECTED RESOURCES

3.12.1 Wild and Scenic Rivers
The Nationwide Rivers Inventory (NRI) is a listing of more than 3,400 free-flowing river segments in the United States that are believed to possess one or more "outstandingly remarkable" natural or cultural values judged to be of more than local or regional significance. Under a 1979 Presidential directive, and related Council on Environmental Quality procedures, all Federal agencies must seek to avoid or mitigate actions that would adversely affect one or more NRI segments. The NRI is a source of information for statewide river assessments and Federal agencies involved with stream-related projects.

The segment of the Green River listed in the NRI extends through Edmonson, Hart and Green Counties from river mile 189 at Mammoth Cave NP and Lock No. 6 to river mile 290 at Greensburg. The Green River was listed in the NRI in 1982 and is also listed with the State as a Kentucky Wild River and a State Outstanding Resource Water. Other rivers listed in the NRI that extend through the CREP counties include segments of the Barren River, Gasper River, Nolin River, Red River and South Fork of the Red River. Appendix G describes these river segments and their Outstanding Resource Values.

3.12.2 National Natural Landmarks
The National Natural Landmarks Program, which is administered by the National Park Service, recognizes and encourages the conservation of outstanding examples of our country's natural history. It is the only natural areas program of national scope that identifies and recognizes the best examples of biological and geological features in both public and private ownership. National Natural Landmarks (NNLs) are designated by the Secretary of the Interior, with the owner's concurrence. To date, fewer than 600 sites have been designated as an NNL. If requested, the NPS assists NNL owners and managers with the conservation of these important sites.

Kentucky is home to five NNLs, two of which are located in a Kentucky CREP county. Creelsboro Natural Bridge, located in Russell County about 14 miles southwest of Jamestown, is the longest natural bridge or natural tunnel, in the Highland Rim Section of the Interior Low Plateaus natural region. Henderson Sloughs is also mainly located in Russell County and extends into Union County. This NNL is one of the largest wetlands remaining in the State and an important habitat for waterfowl and other wildlife. Henderson Sloughs is also the "home" of John James Audubon.

Figure 3-3 shows the locations of the NNLs in Kentucky.

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3.12.3 Green River Bioreserve

The Green River Bioreserve is a 1,350-square-mile area within the Green River Basin that extends 110 river miles from the tailwater of the COE Green River Lake to downstream of Mammoth Cave NP at old Lock and Dam 6 on the Green River at Brownsville, Kentucky. The Green River Bioreserve is among the most significant aquatic systems in the United States and has been given The Nature Conservancy’s highest biodiversity rating. The area is known to support over 151 species of fish and 71 species of freshwater mussels. There are 35 aquatic species in the area that are considered imperiled.

To implement strategies throughout the watershed to protect and restore the ecosystem functions and rare plants, animals, and communities that are indigenous to this aquatic area was the goal of the U.S. Army Corps of Engineers and The Nature Conservancy (TNC). Figure 3-4 shows the general location of the Green River Bioreserve.

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73 Byron, William J. “Green River Lake, KY—Sustainable River Project.” U.S. Army Corps of Engineers.
3.12.4 World Heritage Sites

The World Heritage Convention, the most widely accepted international conservation treaty, is comparable to the American national park system on worldwide basis. Under this Convention, each participating nation retains sovereignty and control over its listed World Heritage Sites. All participating nations pledge to identify and protect their key natural and cultural sites as part of this global heritage and to cooperate with each other to achieve that goal. By 2004, 178 nations had ratified the World Heritage Convention, and had placed 788 sites, including Mammoth Cave, on the World Heritage List. There are currently 20 World Heritage sites in the United States (including two sites jointly administered with Canada).\footnote{National Park Service, Office of International Affairs.}

Mammoth Cave NP was designated a World Heritage Site in 1981 and an International Biosphere Reserve in 1990.\footnote{Bob Carson, Mammoth Cave National Park, Aug. 2006.} Inscription as a World Heritage Site formally recognizes the respect that the world community holds for this resource.
CHAPTER 4-ENVIRONMENTAL CONSEQUENCES

Chapter 4 assesses the direct, indirect and cumulative effects of two alternatives designed to greatly reduce runoff of sediments, nutrients, pesticides, and pathogens from agricultural sources that adversely affected the health and viability of the Green River Watershed. Two alternatives are evaluated in this PEA—

- Alternative 1-No Action, which evaluates the existing conditions and resources of the Kentucky Green River CREP
- Alternative 2-Expanded Kentucky Green River CREP (Agency’s Preferred Alternative and Environmentally Preferred Alternative)

The components of these alternatives are described in Chapter 2. Chapter 3 describes the affected environment and the context in which the resources exist. The impact categories that are evaluated in this chapter correspond to the resource categories described in Chapter 3-Affected Environment. These categories were determined through USDA-Farm Service Agency draft environmental regulations (7 CFR Part 799.4, Subpart G) and USDA-Farm Service Agency I-EQ, Revision 1, Environmental Quality Programs, dated November 19, 2004. In summary, the following resources will be evaluated for each alternative.

- Biological Resources
- Cultural Resources
- Water Resources
- Soil Resources
- Air Quality
- Recreation
- Land Use
- Traffic and Transportation
- Human Health and Safety
- Socioeconomics
- Environmental Justice
- Other Protected Resources

The environmental consequences described in this chapter contrast Alternative 1-No Action (Existing Conditions) with Alternative 2-Expanded Kentucky Green River CREP (Agency’s Preferred Alternative and Environmentally Preferred Alternative). It is important to understand that there are environmental benefits and consequences for both alternatives.

4.1 BIOLOGICAL RESOURCES

4.1.1 Wildlife and Fisheries

4.1.1.1 Alternative 1-No Action (Existing Conditions)

Under Alternative 1, CREP goals that specifically target the needs of wildlife (non-threatened and endangered) are—

- Reconnecting habitat types in order to restore the full range of ecosystem function
- Utilizing native species, including warm season grasses, to the greatest extent possible
Eligible conservation practices under this alternative designed to benefit wildlife habitat are—

- CP1 Introduced Grasses
- CP2 Native Grasses
- CP3 Tree Planting
- CP3A Hardwood Tree Planting
- CP4B Permanent Wildlife Habitat (corridors)
- CP4D Permanent Wildlife Habitat
- CP22 Riparian Buffer
- CP23 Wetland Restoration
- CP25 Rare and Declining Habitat

Table 4-1 presents the number of contracts approved in the current program by conservation practice. Although most or all of the practices provide benefits to wildlife habitat and improve water quality, CP25 specifically focuses on improving wildlife habitat for rare and declining species. 2-CRP Handbook specifies that the following requirements must be met before this practice may be approved:

- The approved endangered or threatened habitat shall be restored
- The size of the area established should be of sufficient size and location on the landscape to meet the purpose of this practice.
- Any chemicals used in performing this practice must be registered and applied according to directions

### Table 4-1: Cumulative CREP Enrollments by Conservation Practice and County, through FY2005

<table>
<thead>
<tr>
<th>CREP County</th>
<th>Conservation Practice</th>
<th>Number of Contracts</th>
<th>Acres</th>
</tr>
</thead>
<tbody>
<tr>
<td>Adair</td>
<td>CP1 Introduced Grasses</td>
<td>1</td>
<td>4.0</td>
</tr>
<tr>
<td></td>
<td>CP2 Permanent Native Grasses</td>
<td>7</td>
<td>186.6</td>
</tr>
<tr>
<td></td>
<td>CP3A Hardwood Tree Planting</td>
<td>2</td>
<td>5.8</td>
</tr>
<tr>
<td></td>
<td>CP21 Filter Strips</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>CP22 Riparian Buffer</td>
<td>105</td>
<td>1,029.9</td>
</tr>
<tr>
<td></td>
<td><strong>Total</strong></td>
<td><strong>115</strong></td>
<td><strong>1,226.3</strong></td>
</tr>
<tr>
<td>Barren</td>
<td>CP1 Introduced Grasses</td>
<td>1</td>
<td>2.7</td>
</tr>
<tr>
<td></td>
<td>CP2 Permanent Native Grasses</td>
<td>61</td>
<td>2,326.4</td>
</tr>
<tr>
<td></td>
<td>CP3 Tree Planting</td>
<td>1</td>
<td>15.5</td>
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<tr>
<td></td>
<td>CP3A Hardwood Tree Planting</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>CP21 Filter Strips</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>CP22 Riparian Buffer</td>
<td>25</td>
<td>276</td>
</tr>
<tr>
<td></td>
<td><strong>Total</strong></td>
<td><strong>88</strong></td>
<td><strong>2620.6</strong></td>
</tr>
<tr>
<td>Edmonson</td>
<td>CP1 Introduced Grasses</td>
<td>1</td>
<td>22.7</td>
</tr>
<tr>
<td></td>
<td>CP2 Native Grasses</td>
<td>2</td>
<td>122.1</td>
</tr>
<tr>
<td></td>
<td>CP21 Filter Strips</td>
<td>1</td>
<td>1.0</td>
</tr>
<tr>
<td></td>
<td>CP22 Riparian Buffer</td>
<td></td>
<td></td>
</tr>
<tr>
<td>CREP County</td>
<td>APPROVED CONTRACTS</td>
<td></td>
<td></td>
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<tr>
<td>-------------</td>
<td>-------------------</td>
<td>---</td>
<td>---</td>
</tr>
<tr>
<td></td>
<td>Conservation Practice</td>
<td>Number of Contracts</td>
<td>Acres</td>
</tr>
<tr>
<td>Green</td>
<td>Total</td>
<td>4</td>
<td>144.8</td>
</tr>
<tr>
<td></td>
<td>CP1 Introduced Grasses</td>
<td>8</td>
<td>157</td>
</tr>
<tr>
<td></td>
<td>CP22 Riparian Buffer</td>
<td>82</td>
<td>1,729.4</td>
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<tr>
<td></td>
<td>Total</td>
<td>90</td>
<td>1,886.40</td>
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<tr>
<td>Hart</td>
<td>Total</td>
<td>57</td>
<td>1,389.4</td>
</tr>
<tr>
<td></td>
<td>CP1 Introduced Grasses</td>
<td>6</td>
<td>150.1</td>
</tr>
<tr>
<td></td>
<td>CP2 Native Grasses</td>
<td>4</td>
<td>56.5</td>
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<tr>
<td></td>
<td>CP22 Riparian Buffer</td>
<td>47</td>
<td>1,182.8</td>
</tr>
<tr>
<td>Metcalfe</td>
<td>Total</td>
<td>35</td>
<td>648.6</td>
</tr>
<tr>
<td></td>
<td>CP2 Native Grasses</td>
<td>15</td>
<td>453.1</td>
</tr>
<tr>
<td></td>
<td>CP22 Riparian Buffer</td>
<td>20</td>
<td>195.5</td>
</tr>
<tr>
<td>Russell</td>
<td>Total</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Taylor</td>
<td>Total</td>
<td>114</td>
<td>1,625</td>
</tr>
<tr>
<td></td>
<td>CP2 Native Grasses</td>
<td>23</td>
<td>498.2</td>
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<tr>
<td></td>
<td>CP3A Hardwood Tree Planting</td>
<td>2</td>
<td>45.8</td>
</tr>
<tr>
<td></td>
<td>CP22 Riparian Buffer</td>
<td>89</td>
<td>1,081</td>
</tr>
<tr>
<td></td>
<td>Total</td>
<td>503</td>
<td>9,542.1</td>
</tr>
</tbody>
</table>


With Alternative 1, enrollment would be expected to continue at about the same rate and predominantly in practices supporting grass plantings and riparian buffers. Of the lands enrolled into KYCREP, 179.5 acres (2 percent) of all enrollments, were planted to grasses under CP1; nearly 3,800 acres (40 percent) were converted to warm season grasses; a little more than 67 acres (1 percent) involved tree plantings; 1 acre was used to establish a grass filter strip; and 5,494.6 acres (57 percent) were established as riparian buffers to protect the Green River and its tributaries. Table 4-2 shows the number of stream miles buffered by KYCREP county.

Under Alternative 1, Adair, Green, Hart, and Taylor Counties showed the greatest number of stream miles buffered, thus providing the greatest benefits for wildlife through development of corridors along water resources.

The 2005 Kentucky CREP Annual Program Accomplishment Report (CEP-68R) reported that Adair, Barren, Green and Taylor Counties had exhibited the most consistency in terms of enrollment into the program.

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Table 4-2 shows the number of stream miles buffered by KYCREP county.
Table 4-2: Stream Miles Buffered by Kentucky Green River CREP, Alternative 1

<table>
<thead>
<tr>
<th>County</th>
<th>Miles of Stream Buffered</th>
</tr>
</thead>
<tbody>
<tr>
<td>Adair</td>
<td>38.6</td>
</tr>
<tr>
<td>Barren</td>
<td>8</td>
</tr>
<tr>
<td>Edmonson</td>
<td>0</td>
</tr>
<tr>
<td>Green</td>
<td>33.8</td>
</tr>
<tr>
<td>Hart</td>
<td>23.4</td>
</tr>
<tr>
<td>Metcalfe</td>
<td>7.4</td>
</tr>
<tr>
<td>Russell</td>
<td>0</td>
</tr>
<tr>
<td>Taylor</td>
<td>23.3</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>134.5</strong></td>
</tr>
</tbody>
</table>


Based on the dominant conservation practice being grass plantings for Alternative 1, the benefits of this alternative would be continuation of enhancing and increasing habitat, mainly for grassland bird species, and for controlling erosion. Most grassland conservation practices are implemented on highly erodible land, although some grasses are planted in filter strips and in conjunction with other practices in floodplains.

Grass plantings provide positive benefits for grassland and songbirds and their nesting areas. Buffers and related conservation practices have proven valuable to these species. Grassland practices would provide the greatest benefit to birds if they are placed near other grasslands and away from trees, creating a complex that can support a variety of species. The actual benefits to grassland birds depend upon the volume of enrollment and location of these grassland conservation practices. Studies have shown that CREP fields have exhibited a greater diversity of nesting birds, and because these fields are not mowed during the nesting season and they are able to provide a more stable environment. Other studies have concluded that birds nesting in CREP grassland fields have a higher nesting success rate than those nesting in neighboring hayfields. To be successful, it is important that these areas are of sufficient size and not fragmented. Alternative 1 does not include CP29, which minimizes fragmentation of field sizes.

Grasslands also benefit cottontail rabbits and other small mammals through habitat enhancement. As an edge species, the cottontail rabbit inhabits CREP fields that are in close proximity to wooded areas. Study areas that had an average of 11 percent CREP habitat was used by cottontails more than any other habitat area. The interior portions of larger fields were used less than the edges.

The direct impacts would be habitat improvement for grassland species, songbirds, deer and small mammals. The indirect impacts would be the supply of these species as a food source for larger predators, such as coyotes, bobcat, bear, raptors, and other birds of prey.

4.1.1.2 Alternative 2-Expanded Kentucky Green River CREP (Agency’s Preferred Alternative and Environmentally Preferred Alternative)

The CREP goals established in the MOA between the State and USDA that focus on habitat enhancement and protection are—

- Protect wildlife habitat and populations, including threatened and endangered species;
- Restore riparian habitat along the Green River;
- Restore the subterranean ecosystem by targeting 1,000 high priority sinkholes
In support of these goals, Alternative 2 would allow for the inclusion of a broader area to be incorporated into the Kentucky Green River CREP boundary. If Alternative 2 is selected, an additional 28,904 acres—mostly from the sinkhole plain area—would be available for enrollment into the program. This additional area would increase the land eligible for enrollment to 917,197 acres.

Expansion of the CREP into other areas of the watershed would provide added benefits to federally listed species through improved water quality and habitat conditions and reduced sediment loads in streams. This alternative places emphasis on sinkhole protection, increased riparian buffer widths along many of the larger tributaries to the Green River and opportunities for landowners to enroll whole fields or entire marginal pasture fields into the program under CP29. CP29 would not require trees to be planted, but rather would allow native grasses to be planted on contiguous buffered area.

Implementation of this alternative would encourage increased enrollment into the program, provide opportunities for leveraging and partnering with new landowners, would improve water quality, and would expand benefits to wildlife. The increase in buffer width would also increase functional wildlife habitat.

The direct impacts of Alternative 2 would be—

- An increase the amount of available wildlife habitat through the expansion of the area eligible for selection into the program by 28,904 acres of environmentally sensitive land;
- Species diversity;
- An increase in dissolved oxygen content in aquatic environments needed by aquatic, aerobic life forms;
- Establishment of tree canopy along waterways, which will lower water temperatures and restore aquatic invertebrate communities that serve as food sources for birds, fish, reptiles and amphibians
- Utilize native species, including warm season grasses, to the greatest extent possible
- Reconnect habitat corridors associated with the Green River and its tributary watersheds
- Sustain and restore the composition, structure and function of riparian habitat corridors associated with the Green River
- Enhance habitats and wildlife populations, including those listed as State and Federal species of concern, rare and threatened and endangered

Under Alternative 2, the following eligible conservation practices would focus on improving and enhancing fish and wildlife habitat:

- CP1 Introduced Grasses and Legumes
- CP2 Native Grasses, Legumes and Forbs
- CP3 Tree Planting
- CP3A Hardwood Tree Planting
- CP4B Permanent Wildlife Habitat (Corridors), Non-easement
- CP4D Permanent Wildlife Habitat, Non-easement
- CP8A Grassed Waterways, Non-easement
- CP9 Shallow Waterways for Wildlife
- CP10 Vegetative Cover--Grass--Already Established
- CP11 Vegetative Cover--Trees--Already Established
- CP12 Wildlife Food Plots
- CP22 Riparian Buffer
- CP23 Wetland Restoration
• CP25 Rare and Declining Habitat
• CP29 Marginal Pastureland Wildlife Habitat Buffer

Approximately 50 new acres of grasses would be planted and nearly 292 acres of riparian buffer would be planted once pending contracts are approved. These new areas would provide additional bird habitat and wildlife corridors in the Green River Watershed. It should be considered, however, that an increase in establishing warm season grasses in riparian areas could also increase the potential risk of wildfires.

The incorporation of CP29 into the Kentucky Green River CREP was proposed for this alternative to ensure greater protection of the region’s unique karst resources. The main purpose of CP29 is to remove nutrients, sediment, organic matter, pesticides and other pollutants from surface runoff and subsurface flow by deposition, absorption, plant uptake, de-nitrification and other processes and thereby reduce pollution and protect surface water and subsurface water quality while enhancing the ecosystem of the waterbody. By restoring native plant communities, characteristics for the site will assist in stabilizing streambanks, reduce flood damage impacts and restore and enhance fish and wildlife habitat.

The direct effect on wildlife from farmers enrolling “whole fields” or entire marginal pastureland into the program would be the establishment of larger contiguous areas for wildlife. Wildlife diversity would increase. The increase in buffer widths on larger tributaries to 1,000 feet would also directly provide broader wildlife corridors and links to other food sources and habitat.

4.1.1.3 Conclusion
Based on contracts pending approval, approximately 50 new acres of grasses would be planted and nearly 292 acres of riparian buffer would be established. These new areas would provide additional bird habitat and wildlife corridors in the Green River Watershed, thus increasing the diversity of wildlife species. In comparison to Alternative 1-No Action, wildlife habitat and wildlife diversity would increase after the establishment of the conservation practices. Grassland birds, generally removed from cropland, would be the principal beneficiaries from the establishment of grasses (CP1 and 2). Other species of wildlife in the area would benefit from tree plantings (CP3 and 3A), and nongame and game species would benefit from CP4B, 4D, 12, 25 and 29). Waterfowl would benefit from CP9 and CP23 permanent wildlife habitat and the benefits to threatened and endangered species would occur through implementation of CP25.

In the short-term, increases in wildlife on CREP fields would have a minor effect on the CREP area, although some species such as deer could proliferate and cause damage in many areas, including vehicular incursions, destruction of property and destruction of forest vegetation.

4.1.2 Vegetation
CREP goals that address vegetation benefits to wildlife and improve water quality are—
• Establish tree canopy along waterways, which will lower water temperatures and restore aquatic invertebrate communities that serve as food sources for birds, fish, reptiles and amphibians, and
• Utilize native species, including warm season grasses, to the greatest extent possible

4.1.2.1 Alternative 1-No Action (Existing Conditions)
As of May 2006, a total of 574 contracts, comprised of 10,813.3 acres were enrolled in the Kentucky CREP. Of these, 179.5 acres, or 2 percent of all enrollments, were planted to grasses under CP1; nearly 3,800 acres (40 percent) were converted to warm season grasses under CP2; hardwood trees were planted on 67.1 acres (1 percent) under CP3A; one acre was developed into a grass filter strip enrolled under
CP21: and 5,494.6 acres (57 percent) were established under CP22 as riparian buffers to protect the Green River and its tributaries. Under Alternative 1, 88,686.7 acres remain eligible for enrollment into the program.

The following conservation practices would continue to benefit vegetation in CREP areas under Alternative 1—

- CP1 Introduced Grasses and Legumes
- CP2 Native Grasses, Legumes and Forbs
- CP3 Tree Planting
- CP3A Hardwood Tree Planting
- CP4B Permanent Wildlife Habitat (Corridors), Non-easement
- CP4D Permanent Wildlife Habitat, Non-easement
- CP8A Grassed Waterways, Non-easement
- CP9 Shallow Waterways for Wildlife
- CP10 Vegetative Cover--Grass--Already Established
- CP11 Vegetative Cover--Trees--Already Established
- CP22 Riparian Buffer
- CP25 Rare and Declining Habitat
- CP29 Marginal Pastureland Wildlife Habitat Buffer

Based on the trend shown in the *Kentucky CREP Annual Program Accomplishment Report*, dated January 5, 2005, planting of grasses appears to be the most widely used CRP practice in the Kentucky Green River CREP. Reasons for selecting this practice may be the relative ease in establishing grasses, the cost and the control of erosion on highly erodible land. Most grassland conservation practices are implemented on highly erodible land, although some grasses are planted in filter strips and in conjunction with other CRP practices in floodplain areas. Planting warm season grasses provides the greatest benefit to bird species if these grasses are planted near other grasslands and away from trees, and can create a complex that can support a variety of species. The actual benefits to grassland birds from this practice depend upon the volume of enrollment, the land allocated to grasslands and the location of these plantings.

**4.1.2.2 Alternative 2-Expanded Kentucky Green River CREP (Agency’s Preferred Alternative and Environmentally Preferred Alternative)**

Continuation of and expansion of the Kentucky CREP would allow for a broader area to be considered for—

- establishing tree canopy along waterways, which will lower water temperatures and restore aquatic invertebrate communities that serve as food sources for birds, fish, reptiles and amphibians
- utilizing native species, including warm season grasses, to the greatest extent possible

Under this alternative, up to 99,500 acres may be enrolled into the Kentucky CREP. As with Alternative 1, approximately 88,686.7 acres remain eligible for enrollment into the program. With the proposed expansion of the Kentucky CREP boundary under Alternative 2, an increase of 28,904 acres in the Upper Green River Watershed would be included in the program. Eligible conservation practices that enhance vegetation under this alternative are—

---

- CP1  Introduced Grasses and Legumes
- CP2  Establishment of Permanent Native Grasses
- CP3  Tree Planting
- CP3A Hardwood Tree Planting
- CP4B Permanent Wildlife Habitat (Corridors), Non-easement
- CP4D Permanent Wildlife Habitat, Non-easement
- CP8A Grassed Waterways, Non-easement
- CP10 Vegetative Cover--Grass--Already Established
- CP11 Vegetative Cover--Trees--Already Established
- CP15A Permanent Vegetative Cover (Contour Grass Strips), Non-easement
- CP22 Riparian Buffer
- CP25 Rare and Declining Habitat
- CP29 Marginal Pastureland Wildlife Habitat Buffer

Establishing native grasses and planting hardwood trees, such as oak-hickory forest covers, and other
trees along streams and creeks are conservation practices permitted under this alternative. Based on the
contracts that have been submitted as of May 2006 for approval under this alternative, approximately 50
new acres of grasses would be planted under CP1 and CP2 and nearly 292 acres of riparian buffer would
be planted using CP22.

The demand for tree planting equipment is currently at a high level and with the proposed CREP
expansion, there may be difficulty meeting this additional demand, as well as meeting the increased
demand for more tree seedlings.

Another issue relates to the potential for an increased risk of wild fires as more grasses are planted
throughout the area.

Alternative 2 includes the use of CP29, Marginal Pastureland Wildlife Habitat Buffer. Because much of
the expanded area is karst terrain, it is used as pastureland. Many landowners would resist planting trees
around sinkholes for protection, as required by CP22, and consequently, many have disclosed that they
would not be interested in enrolling their land in CREP. CP29 does not require tree plantings, and allows
the planting of native grasses on the entire buffered area.

It would also be highly beneficial in this region to allow for CP29 to be applied to entire fields. It is
common with the Green River region to have buffers on streams that “cut” or divide fields up because of
the buffer width requirements and the existing terrain. Landowners have questions committing a large
portion of productive land to a conservation easement, but wasting the remainder of the field.

4.1.2.3 Conclusion

For both alternatives, ground disturbance would occur with any planting, especially tree plantings. There
could also be an increased risk in potential wildfires as more areas within the CREP are planted to
grasses.

Based on the contracts that have been received as of May 2006, approximately 50 new acres of grasses
and nearly 292 acres of riparian buffer would be planted. Additional tree plantings may stress resources
that provide tree planting equipment and seedlings due to higher demand. However, these administrative
impacts could be mitigated through grants to help fund personnel and equipment needs.
Alternative 1 would continue to focus mainly on grass plantings with some tree plantings associated with
riparian buffers. Warm season grasses would directly benefit grassland species, songbirds and small mammals, as well as enhance other wildlife habitat areas.

Greater benefits would be expected from Alternative 2 due to the expansion of the CREP area to include much of the Upper Green River Watershed. In addition, the inclusion of CP29 would allow larger or entire fields to be covered under a conservation practice.

4.1.3 Protected Species And Habitat

The Green River is one of the top four river systems in the United States in terms of fish and mussel diversity, particularly the segment of the river below Green River Lake. Aquatic species are of particular importance and include a number of fish and mussel species unique to this area, as described in Chapter 3.

There are currently seven species federally listed as endangered by FWS in the Green River Watershed, and the CREP area also encompasses several ecosystems recognized as Endangered Ecosystems in the United States. These systems include native prairies, hardwood savannahs, canebrakes, and old-growth deciduous forests. A specific CREP goal was established “to enhance habitats and populations of wildlife, including those listed as State and Federal special concern, rare, threatened and endangered, using a measure of success a reduction in the need to list additional species as threatened or endangered.” The CRP practice that supports this goal is CP25-Rare and Declining Habitat.

4.1.3.1 Alternative 1-No Action (Existing Conditions)

Sinkhole protection is particularly important within the Green River Watershed, not only for protection of the area’s groundwater and aquifers, but for the improvement of habitat conditions for the federally endangered Kentucky cave shrimp (Palaemonias ganteri). This species is endemic to Kentucky and only lives in the underground aquifers associated with Mammoth Cave. In recognition of the need to protect these resources, the Kentucky CREP established a goal “to establish buffers around sinkholes, targeting 1,000 high-priority sinkholes.” A separate goal was established “to protect and restore subterranean ecosystems.”

Two endangered bats, the gray bat (Myotis grisescens) and the Indiana bat (M. sodalis) are also known to inhabit the area. Chapter 3 describes the rare, threatened and endangered species that are known to occur in the area. Appendix E lists the federally protected species and the State-listed plant species in the area. Based on FWS’ scoping comments, there are at least 10 federally listed species, 8 of which are aquatic species.

CP25, an eligible CRP practice under the Kentucky CREP, is designed to restore the functions and values of critically endangered, endangered and threatened ecosystem. Through May 2006, 163.9 acres have been enrolled in CREP under CP25 in Green, Adair, Taylor, and Russell Counties where CP25 has been implemented.
4.1.3.2 Alternative 2-Expanded Kentucky Gen River CREP (Agency’s Preferred Alternative and Environmentally Preferred Alternative)

The addition of the Green River Watershed from Mammoth Cave NP to the confluence with the Barren River, including the Barren River Watershed, is a component of this alternative. This area will encompass approximately 946,101 acres and will include all or portions of land in Allen, Barren, Butler, Edmonson, Grayson, Logan, Simpson and Warren Counties. This alternative would provide 28,904 more acres for consideration in the program than Alternative 1. However, both alternatives are limited to enrollment of up to 99,500 acres into the program.

One of the principal goals of the Kentucky CREP is to enhance habitats and populations of wildlife, including State and Federal-listed species of special concern and threatened and endangered species. A measure of the success of the program is the reduction in the need to list additional species as threatened or endangered. In support of this goal, CREP includes CP25, which focuses on improving rare and declining habitat. Restoration of critically endangered, endangered and threatened habitats is the primary consideration when implementing this practice. Approved ecosystems relative to this region include bluegrass savanna-woodland and prairies in Kentucky, canebrakes, wetlands and spruce fir forests.

Although all of the eligible CRP practices listed for Alternative 2 would provide benefits to wildlife habitat and to water quality, CP25 is the principal conservation practice that targets benefits to rare, threatened and endangered species. CP25 is designed to restore the functions and values of critically endangered, endangered and threatened ecosystem. Through May 2006, 163.9 acres have been enrolled in CREP under CP25 in Green, Adair, Taylor, and Russell Counties where CP25 has been implemented.

4.1.3.3 Conclusion

Nearly 164 acres of CREP land are currently enrolled under CP25, a conservation practice designed to restore the functions of critically endangered, endangered and threatened ecosystems. Restoration of these ecosystems is the primary consideration when making determinations about the types of plantings, spacing and other practice specifications. This conservation practice is available under both Alternative 1 and 2.

Alternative 2 proposes to include lands from Mammoth Cave NP to the confluence with the Barren River into the Kentucky CREP. This addition encompasses much of the “sinkhole plain,” which feeds the aquifers and groundwater flowing into the Mammoth Cave system where the endangered cave shrimp exist. The inclusion of this area will make lands available for conservation that will enhance the habitat and conditions for the continued survival of this species and other imperiled aquatic life.

4.1.4 Invasive Species

Often referred to as exotic, nonnative, alien, noxious, or non-indigenous weeds, invasive species impact native plant and animal communities by displacing native vegetation and competing with native species for food and habitat. As defined in Executive Order 13112, an “invasive species” is 1) non-native (or alien) to the ecosystem under consideration and 2) whose introduction causes or is likely to cause economic or environmental harm or harm to human health. Invasive species can be plants, animals, and other organisms (e.g., microbes). Human disturbance is the primary means of introducing invasive species into an area.
As a Federal agency, FSA must comply with Executive Order 13112, which prevents the introduction of invasive species and provides for their control. As conversion of cropland to grasslands, riparian areas, forestlands and wetlands can provide opportunities for non-native plants and animals to establish, monitoring converted farmland for these species and working with NRCS and FWS to prevent and eradicate these species is encouraged.

Chapter 3 identifies the predominant exotic species in Kentucky. Appendix I is a listing of the most common, though not all, invasive and exotic species in Kentucky.

### 4.1.4.1 Alternative 1-No Action (Existing Conditions)

Areas that have been cultivated or have lain fallow provide prime opportunities for invasive species to thrive. Invasive species include mammals, birds, fishes, plants, trees, insects, and other aquatic species, as well as fungi and bacteria. The probability that these species will occur in riparian areas, farm fields, forest edges, wetlands and woodlands that have previously been cut or disturbed is very high, as such species are opportunistic and generally occur in disturbed areas. All CREP contracts stipulate that noxious weeds and other undesirable plants, insects and pests must be controlled to avoid adverse impacts on surrounding land.

Measures to control these species require a management plan when use of pesticides or biocides, including insecticides, fungicides, rodenticides and herbicides, is proposed. Another non-chemical method of controlling noxious weeds is mowing, though FSA Handbook 2-CRP, rev. 4, limits or prohibits mowing in certain circumstances, particularly when nesting and breeding birds are in season.

Weed control is eligible for cost-share as provided in FSA Handbook 2-CRP, rev. 4. After planting, cost-share may be authorized for one post-planting weed control application if it is applied within the first year after planting the cover.

Under Alternative 1, provisions to manage noxious weeds and other invasive species were incorporated into CREP agreements and in conservation plans and are further supported by the Commonwealth’s requirements to prevent, manage and control invasive species. These provisions can be found in Handbook 2-CRP, rev. 4. All CREP contracts must stipulate that noxious weeds and other undesirable plants, insects and pests will be controlled to avoid adverse impacts on surrounding land.

### 4.1.4.2 Alternative 2-Expanded Kentucky Gen River CREP (Agency’s Preferred Alternative and Environmentally Preferred Alternative)

For all CREP contracts, landowners would be required to perform management activities as part of their approved conservation plan. These management activities shall be designed to ensure plant diversity and wildlife benefits, while ensuring protection of the soil and water resources. The conservation plan must also address maintenance for weed, insect and pest control for the life of the contract. Management activities are site-specific and are used to enhance the wildlife benefits for the site. In exchange for approved management activities, the landowner may receive up to 50 percent cost-share for the management practices.

Under Alternative 2, weed control would be eligible for cost-share as provided in FSA Handbook 2-CRP, rev. 4. After planting, cost-share may be authorized for one post-planting weed control application if it is applied within the first year after planting the cover. All CREP contracts must stipulate that noxious
weeds and other undesirable plants, insects and pests will be controlled to avoid adverse impacts on surrounding land.

4.2 CULTURAL RESOURCES

4.2.1 Archaeological Resources
Consultation with the SHPO revealed that the Green River and its tributaries have a high density of significant archaeological sites, particularly within the floodplains. Some of the proposed conservation practices, such as tree plantings, shallow water areas, and wetland restoration have the potential to adversely impact both recorded and unrecorded archaeological sites. Archaeological surveys will be conducted by a qualified archaeologist of all tracts where ground-disturbing activities occur to determine if any sites exist that may be eligible for inclusion in the National Register of Historic Places. The results of these surveys will be submitted to the SHPO for review and comment prior to conducting ground disturbing activities.

For both alternatives, certain eligible conservation practices, such as CP3-Tree Planting; CP3A-Hardwood Tree Planting; CP9-Shallow Waterways for Wildlife; CP4D-Permanent Wildlife Habitat; CP22-Riparian Buffers; and CP23-Wetland Restoration, may have potential impacts on a range of cultural resources. Many archaeological sites are known to occur in floodplains and along rivers. Kentucky and the Green River basin were once home to a number of indigenous tribes (see Chapter 3).

Significant prehistoric and historic archaeological resources are often found below the plow zone, although plowing does not usually constitute significant ground disturbance. However, prior to any ground disturbance, FSA will consult with the SHPO to determine if archaeological resources are known to occur in the area. If any such resources are discovered at any time, all activities will be halted and the Kentucky Heritage Council consulted. All archaeological surveys will be conducted by a qualified professional archaeologist and performed in accordance with the Secretary of the Interior’s Standards and Guidelines for Archeological Investigations in Kentucky. Upon review by the SHPO, additional investigations of discovered resources may be requested.

A listing of the sites listed in the National Register of Historic Places by CREP county can be found in Appendix F. The greatest number of sites listed in the National Register occurs in Warren County.

4.2.2 Architectural Resources
For both alternatives, all eligibility evaluations for historic structures must be made by qualified professionals who meet the Secretary of the Interior’s Professional Qualifications Standards as Architectural Historian or Historian (FR 44738-9 or 36 CFR Part 61. If an architectural survey is conducted, it must be submitted to the Kentucky Heritage Council for review and comment. Upon review by the SHPO, additional investigations of identified resources may be requested.

4.2.3 Traditional Cultural Properties
As discussed in Chapter 3, indigenous tribes believed to have inhabited the area now known as Kentucky were the Cherokee, Chickasaw, Mosopelea, Shawnee and the Yuchi nations. 80

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80 Copyright AccessGeneology.com “Kentucky Indian Tribes.”
http://www.accessgenealogy.com/native/kentucky/index.htm
On June 29, 2006, discussions with the U.S. Department of the Interior, Bureau of Indian Affairs, Easter Region Realty Officer, were conducted to determine the presence of Native American tribal lands within the expanded CREP area. No tribal entities and no lands held in trust exist in Kentucky.  

4.2.3 Conclusion

For both Alternatives 1 and 2, there is high potential for archaeological resources to exist in areas where CREP practices will occur. If any such resources are discovered, all ground disturbing activities will be immediately halted and the Kentucky Heritage Council consulted. All required archaeological surveys will be conducted by a qualified professional archaeologist and performed in accordance with the Secretary of the Interior’s Standards and Guidelines for Archeological Investigations in Kentucky.

If an architectural or archaeological survey is required for potential effects to any historic structure, it will be submitted to the Kentucky Heritage Council for review and comment.

Because there are no traditional cultural properties, tribal lands or recognized tribes within the CREP area, no impacts to these resources would occur.

4.3 WATER RESOURCES

4.3.1 Surface Waters

Contaminated runoff containing agricultural nutrients and chemicals is impacting 25 percent of the monitored impaired stream miles. Mineral extraction accounts for 15 percent of the miles impaired and sewage treatment plants impair 13 percent of the monitored waterways. Disease-carrying pathogens often associated with untreated or poorly treated animal and human waste account for impairing the remaining 31 percent of monitored waterways.

Water quality and water supply, stormwater management, flash flooding, and changes associated with surrounding development are all prominent local and regional issues that impact the State’s surface waters. The 2000-2001 State of Kentucky’s Environment report cited agricultural activities as a leading source of water pollution in Kentucky’s waterways. Some of these agricultural-related impacts are from—

- excessive sedimentation,
- biological oxygen demand,
- pesticides, and
- fecal coliform

Chapter 3 provides information on the existing conditions of the surface water resources within the CREP area.

4.3.1.1 Alternative 1-No Action (Existing Conditions)

The goals for the KYCREP are described in Chapter 2-Alternative 1. Specifically the goals that focus on improving water quality in the Green River Watershed are—

- To reduce the amount of sediment, nutrients and pesticides from agricultural sources entering the tributaries and mainstem of the Green River and Mammoth Cave System by 10 percent through the installation of BMP’s designed for that purpose, and other conservation practices designed to
improve water quality (replanting riparian buffers around sinkholes and along streams are high priority).

- To sustain and restore the composition, structure, and function of riparian habitat corridors associated with the Green River and tributary watersheds.
- To establish buffers around sinkholes, targeting 1,000 high-priority sinkholes.
- To sustain and restore non-riparian wetlands.

These goals complement the Corps of Engineers’ Environmental Operating Principles, especially in regards to environmental sustainability. In July 2002, the Louisville District teamed with TNC to restore and preserve many rivers across the country. This nationally recognized project, known as the “Sustainable Rivers Project,” began in Kentucky with a project to improve habitat along the Green River below Green River Lake, a Corps reservoir located just upstream of the original CREP area (see Chapter 3, Floodplains).

Under Alternative 1, the eligible conservation practices designed to improve water quality are presented in Table 4-3 along with the acreages enrolled through 2005.

Table 4-3: CRP Practices and Acreage Enrolled in Kentucky CREP Targeted to Improve Water Quality, Alternative 1

<table>
<thead>
<tr>
<th>CRP Practice</th>
<th>Acres Enrolled</th>
</tr>
</thead>
<tbody>
<tr>
<td>CP1 Introduced Grasses</td>
<td>179.5</td>
</tr>
<tr>
<td>CP2 Native Grasses</td>
<td>3,799.9</td>
</tr>
<tr>
<td>CP21 Filter Strips</td>
<td>1</td>
</tr>
<tr>
<td>CP22 Riparian Buffer</td>
<td>5,494.6</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>9,475.0</strong></td>
</tr>
</tbody>
</table>


KYCREP currently allows a 1,000-foot buffer along the mainstem of the Green River and a maximum 300-foot buffer on all tributary streams. Many landowners with farms along the tributary streams with large (wide) bottomland are reportedly not enrolling land into the program because: (1) local farmers are often not willing to divide their most productive land, putting part of it into the program, and often have relatively little use for the remaining area; and (2) fencing is impractical in many of the more flood-prone fields due to the frequency of required maintenance.

Often farmers will not even consider CREP after they learn that the entire bottom will not be eligible and their fields will have to be divided. As a result, a significant amount of potential buffers are being lost along very important tributary streams. Evidence of this sentiment was shown in Adair County when 15 landowners who filled out inquiries for the program subsequently declined to establish a buffer because their bottomland would have been split. Of those that declined, all but one or two stated that if program changes allowed for their entire bottomland to be entered, then they would be “likely” to participate in the program.

Several other landowners have changed their minds about enrolling in CREP because they felt that splitting their fields would essentially be “wasting” the remaining land. By splitting the bottomland, it
would take money away from the overall income because there would not be enough land left to be profitable farming.  

In Adair County, 15 landowners reportedly declined to establish buffers because their bottomland would have been split. Those who declined said they would be more “likely” to participate in the program if the program allowed for their entire bottomland to be included under contract. By splitting the bottomland, the farmers would lose money because there would not be enough land left to make money from farming.

4.3.1.2 Alternative 2-Expanded Kentucky Green River CREP (Agency’s Preferred Alternative and Environmentally Preferred Alternative)

Inclusion of the expanded area through implementation of Alternative 2 will add 28,904 acres to the KYCREP. This expansion will enable landowners to install eligible conservation practices on up to 99,500 acres of marginal cropland in the Upper Green River Watershed. The following expanded CREP goals focus on improving water quality in this watershed:

- To reduce the amount of sediments, nutrients, and pesticides from agricultural sources entering the tributaries and mainstem of the Green River and Mammoth Cave System by 10 percent through the installation of BMPs designed for that purpose, and other conservation practices designed to improve water quality (replanting riparian buffers around sinkholes and along streams are high priority).
- To sustain and restore the composition, structure, and function of riparian habitat corridors associated with the Green River and tributary watersheds.
- To establish buffers around sinkholes, targeting 1,000 high priority sinkholes.
- To sustain and restore non-riparian wetlands.
- To protect and restore subterranean ecosystems.

To achieve these goals, the following CPs target water quality improvements under Alternative 2:

- CP1 Introduced Grasses and Legumes
- CP2 Native Grasses, Legumes and Forbs
- CP3 Tree Planting
- CP3A Hardwood Tree Planting
- CP8A Grassed Waterways, Non-easement
- CP15A Permanent Vegetative Cover (Contour Grass Strips), Non-easement
- CP21 Filter Strips
- CP22 Riparian Buffer, which widens buffers to 1,000 feet
- CP23 Wetland Restoration
- CP29 Marginal Pastureland Wildlife Habitat Buffer

Benefits that would be gained from implementing these conservation practices would be—

- Reduction in runoff of sediments and nutrients into surface waters
- Filtering of pesticides and other pollutants
- Replenishing water tables
- Providing tree and ground cover plantings to hold soil in place
- Emphasis on no-till farming and other smart farming practices adjacent to CREP fields

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• Flood control through soil-stabilization and plantings

Several changes are proposed under Alternative 2 would benefit and improve the surface and groundwater resource in the Green River Watershed. These involve the addition of land from Mammoth Cave NP to the confluence with the Barren River, including the Barren River Watershed. This expansion will place the entire Upper Green River Basin into the program, excluding those watersheds that lie above the Corps of Engineers reservoirs. The total area will encompass 946,101 acres, which adds 28,904 acres to the Kentucky CREP for future enrollment.

Alternative 2 proposes a 1,000-foot maximum buffer width for all fourth order and higher streams within the KYCREP area. Lower order streams that exhibited excessive bottomland widths could be added to this listing if applicable. This change would not only greatly increase landowner participation in the program, but it would also increase functional wildlife habitat on a landscape scale and improve overall water quality in the watershed by gaining more miles of buffered stream.

An analysis was conducted of buffer widths on two major tributary streams, Russell Creek and Little Barren River in Green County with a small portion in Hart County. The lower ends of both of these streams were observed. Of 54 potentially eligible bottomland/riparian fields on Russell Creek in Green County, the existing 300-foot buffer width only entirely captured 14 fields (26 percent). If the buffer width was widened to 1,000 feet, then 52 (96 percent) of the 54 fields could have been entirely buffered. Comparably, of 51 potentially eligible bottomland/riparian fields on the Little Barren River in Green and Hart Counties, the existing 300-foot buffer width only entirely captured 11 of the fields, or 22 percent. If the buffer width were widened to 1,000 feet, then 50 of the 51 fields, or 98 percent, could have been entirely buffered. 83

This change would affect several other tributary streams and potentially offer more effective buffer opportunities on several more miles of stream within the Green River basin. 84 The increase in buffer width would not only greatly increase landowner interest and participation in the program, but it would also increase functional wildlife habitat on a landscape scale and improve overall water quality in the watershed by gaining more miles of buffered stream. As CREP was designed to be regionally specific to meet the needs of different areas of the country, implementation of CP22 would benefit the water quality, aquatic resources and wildlife by reducing sedimentation, erosion, and runoff of pollutants into surface waters and would provide wider wildlife corridors.

4.3.1.3 Conclusion

Alternative 1 would allow for a 1,000-foot buffer on the mainstem of the Green River, and a 300-foot buffer along all tributary streams. Many landowners are reportedly not enrolling land into the program because they do not want to divide up their land feeling it would be unprofitable for them to farm remnants that are not enrolled in the program. Farmers also feel that fencing is impractical in flood-prone areas due to the frequent maintenance required on the fences.

84 Ibid.
Studies have shown that the current buffer widths allowable for the existing CREP under Alternative 1 may not meet the needs of surface water protection. In addition, only less than 10 percent of the eligible acreage has been enrolled in CREP.

Alternative 2 would provide greater benefits to surface waters within the Green River basin because—
1) all fourth order and higher streams within the KYCREP region would have 1,000-foot buffer width,
2) lower order streams that have excessive bottomland widths could be included in this listing
3) wider buffer widths would increase functional wildlife habitat on a broader scale,
4) wider buffer widths would improve overall water quality in the watershed by gaining more miles of buffered stream, and
5) it is anticipated that more landowners would participate in the program.

Studies have shown that if the buffer widths were widened to 1,000 feet within the KYCREP, a much larger percentage (96-98 percent) of the fields surveyed would be included in the program. This alternative would impact several other tributary streams and potentially offer more effective buffer opportunities on several more miles of stream within the basin.

4.3.2 Groundwater

Impacts on groundwater quality occur more frequently in the karst areas of the region and are most often caused by agricultural runoff, trash and hazardous materials in sinkholes, as well as runoff of nitrates from fertilizers.\textsuperscript{85} These impacts would occur under both Alternatives 1 and 2.

Chapter 3 discusses and illustrates the dynamics associated with the region’s sinkhole plain and the groundwater.

4.3.2.1 Alternative 1-No Action (Existing Conditions)

As described in Chapter 3, a portion of the watershed’s sinkhole plain drains southern Hart and Edmonson and northern Barren Counties currently lies in the KYCREP boundary. This area is essentially the underground watershed for the Green River above the current western boundary, including the karst aquifers that drain into Mammoth Cave NP. Initially, sinkholes in marginal pastureland were not eligible for conservation purposes under KYCREP. Only those in cropped fields could be buffered. With hay/pastureland acreage at nearly a 3:1 ratio over cropland within the Green River Watershed, little was being done to protect these unique resources and the region’s sensitive underground ecosystems.

Chapter 2, Table 2-3 shows the current acreages enrolled and the CRP practices under which contracts in the current CREP are enrolled for Alternative 1.

4.3.2.2 Alternative 2-Expanded Kentucky Green River CREP (Agency’s Preferred Alternative and Environmentally Preferred Alternative)

Alternative 2 would continue conservation practices implemented under Alternative 1, as well as offer new practices to buffer pollution movement into sinkholes. CP22-Riparian Buffer was modified to include sinkholes and karst features. However, more refinement is needed to be able to practically incorporate this sinkhole protection and allow it to be effective. The inclusion of CP29–Marginal Pastureland Wildlife Habitat Buffer into the Kentucky CREP is an important improvement to the

program. Much of the sinkhole plain area lies in the western portion of the current CREP boundary. The karst terrain in this region varies in character, but could be characterized as gently rolling, open land due to the high concentration of sinkholes with relative gentle slopes. Because of this terrain and land use characteristics, many landowners may resist planting trees around each of these sinkholes and, consequently, many would not enroll their land into the program. CP29 does not require the planting of trees; instead, native grasses could be planted on the entire buffered area, which would make enrolling in this practice more desirable.

The inclusion of “whole fields” allowed under CP29 is essential to the success of the sinkhole protection plan. As previously stated, because pastureland acreage is nearly three times that of cropland within the region, it would be a tremendous benefit to allow entire fields within practices applied to marginal pastureland to be enrolled in a similar manner to fields which meet the infeasible to farm criteria in the cropping history requirements. In this area, harvesting of hay is as important as many row cropping activities. It is common within the Kentucky CREP to have buffers on streams that “cut” fields up because of buffer width requirements and terrain characteristics. As a result, it is common for a landowner not to enter land into a CREP contract for this reason, thus losing an entire buffer.

Table 4-6 shows the current interest landowners are exhibiting in the expanded CREP.

<table>
<thead>
<tr>
<th>County</th>
<th>CRP Practice</th>
<th>Acres</th>
</tr>
</thead>
<tbody>
<tr>
<td>Adair</td>
<td>CP22 Riparian Buffer</td>
<td>45</td>
</tr>
<tr>
<td>Barren</td>
<td>CP2 Native Grasses</td>
<td>18</td>
</tr>
<tr>
<td>Edmonson</td>
<td>CP1 Introduce Grasses</td>
<td>29</td>
</tr>
<tr>
<td>Hart</td>
<td>CP22 Riparian Buffer</td>
<td>136.9</td>
</tr>
<tr>
<td>Metcalfe</td>
<td>CP22 Riparian Buffer</td>
<td>65</td>
</tr>
<tr>
<td>Russell</td>
<td>CP2 Native Grasses</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td>CP22 Riparian Buffer</td>
<td>45</td>
</tr>
<tr>
<td>Total</td>
<td></td>
<td>341.9</td>
</tr>
</tbody>
</table>

Source: Kentucky FSA, 2006.

4.3.2.3 Conclusion

Alternative 1 would not provide the protection to sinkholes, the option for landowners to enroll entire fields, and does not offer the wider buffers for tributary streams. Alternative 2 would improve protection of the region’s karst topography through CP 29, which would allow enrollment of entire fields in the program, and through CP22, which allows for wider buffer zones from 300 to 1,000 feet for fourth order and higher streams.

4.3.3 Aquifers

More information on the impacts to groundwater is found in section 4.3.2, Groundwater.

4.3.3.1 Alternative 1-No Action (Existing Conditions)

There are no sole-source aquifers in the existing KYCREP region. However, a portion of the sinkhole plain lies within the existing CREP boundary. As the sinkhole plain trends southeastward, the under

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groundwater flows to a base level outside the existing CREP boundary. There is a need for consistent best management conservation practices throughout this continuous landscape. Because only a portion of the sinkhole plain lies included within the current CREP boundary, Alternative 1 would not adequately protect or conserve this valuable resource.

### 4.3.3.2 Alternative 2-Expanded Kentucky Green River CREP (Agency’s Preferred Alternative and Environmentally Preferred Alternative)

There are no sole-source aquifers known in the expanded KYCREP area. However, full coverage of the sinkhole plain was a major reason behind expanding the Kentucky Green River CREP boundary. Alternative 2 would encompass the entire sinkhole plain in the Upper Green River Watershed, would provide more complete protection to this resource, and would be more amenable to landowners. Much of the sinkhole plain is open pastureland and many landowners may resist planting trees around each of the sinkholes as required in a riparian buffer practice (CP22). As a result, many landowners may not wish to enroll their land. CP29 (Marginal Pastureland Wildlife Habitat Buffer) does not require the planting of trees; rather, native grasses could be planted on the entire buffered area.

### 4.3.3.3 Conclusion

There are no EPA-designated sole-source aquifers in the KYCREP area. Only a portion of the sinkhole plain lies within the existing KYCREP area under Alternative 1. However, Alternative 2 would encompass most of the sinkhole plain in the Upper Green River Watershed. No impacts to aquifers would occur under either Alternative 1 or 2.

### 4.4 SOIL RESOURCES

#### 4.4.1 Alternative 1-No Action (Existing Conditions)

Soil erosion can result in significant changes in surface soil properties affecting sustainability of production. The organic composition of soil is not only important for good fertility, improved soil permeability, resistance to surface soil crusting and other factors related to crop production potential, but it is also important to the soil’s ability to resist erosion.\(^8^7\)

CREP protects surface waters and improves water quality by controlling soil erosion and sedimentation that occurs from runoff into rivers and streams. The following conservation practices provide greater protection to surface waters by buffering the flow of sediments into streams. These CPs are eligible for use with land classified as HEL\(^8^8\):

- CP1 Introduced Grasses
- CP2 Native Grasses
- CP3 Tree Planting
- CP3A Hardwood Tree Planting
- CP4B Permanent Wildlife Habitat (corridors)
- CP4D Permanent Wildlife Habitat
- CP10 Grass Cover - Already Established

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Draft PEA for Kentucky Green River CREP
• CP11 Tree Cover - Already Established
• CP12 Wildlife Food Plots
• CP25 Rare and Declining Habitat

The current allowable buffer width along the Green River mainstem is a maximum of 1,000 feet and all tributaries are allowed a buffer of 300 feet. Many landowners with fields along the tributaries with large bottomland fields are not enrolling land into the program mainly because they do not want to divide their fields and because the installation of fencing is impractical in many of the more flood-prone areas. In addition to erosion, limited soil studies indicate that some soils are sensitive to acidification from atmospheric deposition. This issue is addressed more under Air Quality. There is also concern that during rainstorms, when there is little opportunity for rainwater to come into contact with deep soils, episodic acidification could occur.

Under Alternative 1, approximately 10,813 acres have been conserved under CREP through May 2006 by planting native grasses and trees in riparian areas. This total is only slightly more than 10 percent of the 100,000-acre enrollment acreage for the program. Because of CREP, improvements have been made toward curbing soil erosion and sedimentation in the Green River Watershed with the use of riparian buffers and grass plantings.

Table 4-7 shows the acreage enrolled by conservation practice that prevents runoff and sedimentation from occurring in the Green River and its tributaries. As shown, nearly 5,495 acres have been enrolled in CP22, riparian buffers, and the remaining acreage has been enrolled under a grass program.

<table>
<thead>
<tr>
<th>CRP Practice</th>
<th>Acres Enrolled</th>
</tr>
</thead>
<tbody>
<tr>
<td>CP1 Introduced Grasses</td>
<td>179.5</td>
</tr>
<tr>
<td>CP2 Native Grasses</td>
<td>3,799.9</td>
</tr>
<tr>
<td>CP8A Grassed Waterways</td>
<td>0</td>
</tr>
<tr>
<td>CP22 Riparian Buffer</td>
<td>5,494.6</td>
</tr>
</tbody>
</table>


4.4.2 Alternative 2-Expanded Kentucky Green River CREP (Agency’s Preferred Alternative and Environmentally Preferred Alternative)

Although the existing Kentucky CREP has made progress toward controlling erosion along the Green River and its tributaries, the expanded CREP would allow for wider buffers which may offer greater incentives for landowners to enroll. As with the current CREP, up to 99,500 acres may be enrolled into the program. In addition, this alternative would encompass 28,904 additional acres in its boundary, mostly within the “sinkhole plain” portion of the State. Alternative 2 supports the goal to reduce the amount of sediments and other agricultural pollutants from entering the Green River waterways by 10 percent.

Currently, CREP allows a maximum 1,000-foot buffer along the Green River mainstem, and a maximum 300-foot buffer along the tributaries. Increasing the buffer widths would provide added incentives to many landowners as they would not need to consider splitting fields or fencing.

80 Ibid.
96
**4.4.3 Conclusion**

Alternative 1 addresses control of erosion and HEL through the 10 conservation practices discussed above. The current buffer widths permitted under Alternative 1 are a maximum of 1,000 feet for the mainstem of the Green River and 300 feet along streams and tributaries to the mainstem.

In addition to the 10 conservation practices identified in the discussion for Alternative 1, Alternative 2 includes CP29-Marginal Pastureland Wildlife Habitat Buffer. As much of the land within the KYCREP area is pastureland, this practice would not require planting trees, but rather would allow native grasses to be planted on an entire buffered field. This practice has been proposed as a Priority I practice, which would make it eligible for all State cost-share and incentive payments, and would make it more attractive to landowners. The ability to establish wider buffers in riparian zones and to include whole fields in the program under Alternative 2 offer greater incentives to landowners and protect a broader critical area.

**4.5 AIR QUALITY**

Chapter 3 describes the air quality sources, monitoring programs and conditions in the KYCREP region. Although no CPs directly address air quality within the KYCREP, several practices have either direct or indirect effects that may lead to improving air quality. These practices involve establishing grass covers (CP1, CP2, CP10, CP11, CP15A, CP25, and CP29) and tree plantings (CP3, CP3A).

**4.5.1 Alternative 1-No Action (Existing Conditions)**

Particulates are emitted through fugitive dust and construction equipment. By retiring marginal cropland from production, enrollment of land into the program would improve the air quality by reducing tilling and for the use of farm equipment. Dust would not be generated except during planting and establishing certain practices.

**4.5.2 Alternative 2-Expanded Kentucky Green River CREP (Agency’s Preferred Alternative and Environmentally Preferred Alternative)**

By expanding the CREP area, widening buffers and increasing enrollments into the program, Alternative 2 would show continued signs of improvement in air quality. As land is enrolled into the program, less tilling and use of farm machinery and equipment would occur. However for both alternatives, short term emissions and dust would be generated during tree plantings and establishment of certain CRP practices, such as digging shallow wildlife ponds.

**4.5.3 Conclusion**

The benefits to air quality through the conversion of cropland to grasslands or trees will provide long-term positive benefits to the region’s air quality. As discussed in Chapter 3, agriculture generates fugitive dust (60.8% of all sources of emission). Alternative 1 would continue to provide benefits through continued enrollments into the program. Alternative 2 would enable entire pasture fields to be enrolled into the program.

**4.6 RECREATION**

Chapter 3 describes the recreation opportunities and facilities within the Kentucky CREP area. Mammoth Cave NP, a major tourist attraction to the region lies within the CREP. There are a number of other State parks and nature preserves, as well as historic sites in the area that generate tourism. The Green River is one of the top recreation rivers for paddling sports, camping, hiking and nature watching.
4.6.1 Alternative 1-No Action (Existing Conditions)
Farming and CREP provide a highly compatible land use with Mammoth Cave NP, as well as the Green River Bioreserve and other parks, recreation resources and activities in the area. The visitor experience that the NPS wishes to achieve at Mammoth Cave is one reflective of the magnificent scenic, natural, and rural beauty of the area.

CREP offers added benefits to recreationalists and park visitors: implementation of CREP practices enhances the rural environment, provides habitat for birds and wildlife for birders and wildlife enthusiasts to enjoy, allows visitors from congested areas to get back in touch with nature, minimizes dust and pollution, improves the water quality of rivers and streams, and preserves and protects the natural resources. For many parks, preservation of the adjacent and surrounding areas is equally important to preserve and protect as the core of the park itself.

4.6.2 Alternative 2-Expanded Kentucky Green River CREP (Agency’s Preferred Alternative and Environmentally Preferred Alternative)
The proposed addition to the Green River CREP area would encompass 946,101 acres, and extend down the Green River to its confluence with the Barren River at river mile 149.5. This would include the tributary watersheds contributing to the Green, including the Nolin River and Barren River systems upstream to their respective reservoirs. This area would include land from Allen, Barren, Butler, Edmonson, Grayson, Logan, Simpson and Warren Counties and extend the CREP boundary to Mammoth Cave NP. An additional 28,904 acres would be included in the Kentucky Green River CREP boundary.

With up to 99,500 acres eligible for enrollment in the program, mostly in the sinkhole plain, the environmental benefits to the park’s resources and to the Green River Watershed will be measurable when more land is enrolled into the program. The water quality, air quality, wildlife habitat and scenic beauty of the area will be enhanced under this alternative.

4.6.3 Conclusion
Under Alternative 1, the benefits of CREP to recreational users would be continued improvements in water quality for swimming, boating and fishing, as well as conservation of a rural environment, wildlife habitat and natural resources in the area. Alternative 2 would extend the CREP boundary to Mammoth Cave, enabling an additional 28,904 acres to be included within the CREP area. CREP would not only continue to benefit the cave’s natural, aquatic, and scenic resources, it would ensure protection of adjacent land uses surrounding the park.

4.7 LAND USE
Changes in land uses and incompatible development may have the greatest impact on the resources CREP strives to protect. Table 3-6 in Chapter 3 shows the percentage of various land uses that occur within the proposed expanded CREP area. Major land use issues that could impact the CREP area relate primarily to transportation (i.e., roadway corridors), mining, and to land development.

4.7.1 Alternative 1-No Action (Existing Conditions)
Under Alternative 1, changes in land uses, such as transportation projects, housing development, mining operations and other infrastructure projects, have the potential to adversely impact the CREP land and the goals of the program. For transportation projects, land may be acquired through the imminent domain process by the Department of Transportation for highway or airport projects. These types of projects
could severe parcels currently enrolled in CREP. In some respects, CREP land would be considered a compatible land use for certain transportation projects, such as airports. However, the effect of fragmenting or splitting parcels may not be suitable for the landowner or for the goal of CREP in achieving wildlife benefits and improving water quality.

4.7 Alternative 2-Expanded Kentucky Green River CREP (Agency’s Preferred Alternative and Environmentally Preferred Alternative)

A limestone quarry located in Hart County is proposed within the expanded KYCREP area. The specific goals of the Kentucky CREP are to reduce by 10 percent the amount of sediment, pesticides, and nutrients entering the Green River and Mammoth Cave system; to protect wildlife habitat and populations, including threatened and endangered species; to restore riparian habitat along the Green River; and to restore the subterranean ecosystem by targeting 1,000 high priority sinkholes. The designation of this reach of the Green River and associated terrestrial habitat are recognized as ecologically sensitive areas of the river and riparian ecosystem. As such, this proposed quarry may pose a threat to the environment through disruption of groundwater quality and flow patterns, and through contamination of surface drainage.

An extension of Interstate 66 is proposed south of Mammoth Cave NP. Other transportation projects are identified in Chapter 3. These changes in land use will spur future development either along the corridors or at interchanges. In conjunction with these changes, ancillary or supporting infrastructure, such as public water and sewer extensions, could be expected, spanning additional residential and commercial development.

A major coal-fired power plant is proposed in Muhlenberg County, about 50 miles from Mammoth Cave NP. Coal-fired power plants are throughout the Ohio Valley and present problems with air quality and visibility.

4.7.3 Conclusion

Changes in land uses could adversely affect or conflict with the goals of CREP. Limestone quarries could alter the pH of groundwater; the coal-fired power plants could potentially impact the visibility and air quality of the region, and produce acidification of the soils.

4.8 TRAFFIC AND TRANSPORTATION

A brief description of some of the proposed surface transportation projects found in the State’s Transportation Improvement Plan is provided in Chapter 3.

4.8.1 Alternative 1-No Action (Existing Conditions)

The Kentucky Green River CREP has a number of major transportation corridors extending through the region. An extension of Interstate 66 has been proposed to the south. Depending on the exact corridor location, CREP lands enrolled in the program could be impacted. The benefits provided by CREP in terms of improving air quality and retaining the rural character of the area would offset the adverse effect of more roadways and more development in the area.
4.8.2 Alternative 2-Expanded Kentucky Green River CREP (Agency’s Preferred Alternative and Environmentally Preferred Alternative)

Under Alternative 2, the proposed CREP expansion area would extend to Mammoth Cave NP and include an additional 28,904 acres through six new counties. Transportation corridors, such as Interstate 66, could potentially impact these lands by segmenting them.

4.8.3 Conclusion

Impacts resulting from transportation systems, patterns and traffic for both Alternatives 1 and 2 could adversely affect CREP lands by fragmenting or dividing lands.

4.9 HUMAN HEALTH AND SAFETY

Chapter 3 identifies issues that could affect human health and safety. Most of these issues were directed at water quality in the CREP area. Nitrates were detected above the drinking water standard in less than 1 percent of the springs and 4.3 percent of the wells samples. The highest nitrate levels in Kentucky have been detected in shallow, hand-dug wells, while the lowest nitrate levels occur in deeper, drilled wells. Improper water well construction and inadequate maintenance also contribute to making these wells more susceptible to nitrate contamination.

Other health and safety concerns related to the use of pesticides and air quality in the region. CREP practices will not only improve water quality, but will also curb fugitive dust and particulates that occur during plowing and the operation of construction and farm equipment.

4.9.1 Alternative 1-No Action (Existing Conditions)

Enrolling marginal farmland into CREP will reduce the amount of land cultivation and tilling, minimize the application of pesticides and fertilizers and will reduce the amount of fugitive dust and emissions from farm equipment. The human health benefits of retiring marginal farmland may be measurable as more land is enrolled into the program and these benefits can be monitored and measured.

4.9.2 Alternative 2-Expanded Kentucky Green River CREP (Agency’s Preferred Alternative and Environmentally Preferred Alternative)

No adverse effects to human health and safety are expected to occur from the expanded Kentucky CREP. Alternative 2 would present greater long-term benefits to human health, as more land would be included in the CREP boundary and available for enrollment into the program. By retiring cropland, the need for pesticides, fertilizers, tilling and use of heavy farm equipment is reduced.

4.9.3 Conclusion

One of the goals of CREP is to reduce nonpoint source pollution loading, such as sediments and fertilizers from agricultural sources into the mainstem of the Upper Green River by 10 percent. The impact to human health and safety would be Negligible for both Alternatives 1 and 2.

4.10 SOCIOECONOMIC IMPACTS

4.10.1 Alternative 1-No Action (Existing Conditions)

Population growth and dispersion, human disturbance, incompatible land uses and development and changes in the regulatory framework are the principal social factors that impact natural resources. Based
on the 2000 Census, approximately 8 percent of the State’s population resides in the expanded Kentucky CREP area. Chapter 3 shows the population by county throughout the CREP region.

4.10.2 Alternative 2-Expanded Kentucky Green River CREP (Agency’s Preferred Alternative and Environmentally Preferred Alternative)

The potential economic impacts related to agricultural suppliers of products and services, such as fertilizer, seed, mulch, equipment, fuel and transportation, are unknown. As land is retired from production, the indirect effects on the local and State economy has not been determined.

4.9.3 Conclusion

Farm policies have been amplified in the 2002 Farm Bill that aim at preserving farmland, assisting farmers in environmental stewardship and providing support for commodity producer to offset low prices. Recent farming trends have shown that land is disappearing from farming and farm operators are leaving the tradition and not being replaced because the economic benefits of farming are less than the rewards from nonagricultural professions.

The threshold impacts for Alternatives 1 and 2 for socioeconomic impacts are Low.

4.11 ENVIRONMENTAL JUSTICE

CREP is a voluntary enrollment program that is open to all landowners or operators who meet the eligibility requirements. No data exist that specifically describe the demographic characteristics of Kentucky CREP participants. Chapter 3 shows the demographic characteristics of the Kentucky Green River CREP counties. Simpson and Warren Counties have the highest percentage of minorities, and Adair, Russell, Metcalfe and Hart Counties had the highest percentage of persons living below poverty.

4.11.1 Alternative 1-No Action (Existing Conditions)

Adair, Russell, Metcalfe and Hart Counties, which have the highest percentage of persons living below poverty, are counties that have been in the CREP since its inception. However, no disproportionate impacts to minority or low-income communities are expected to occur from the Kentucky CREP.

4.11.2 Alternative 2-Expanded Kentucky Green River CREP (Agency’s Preferred Alternative and Environmentally Preferred Alternative)

Simpson and Warren Counties, counties showing the highest percentage of minorities, would be included in the expanded CREP if Alternative 2 is selected. As with Alternative 1, no disproportionate impacts to minority or low-income communities are expected to occur from expanding the CREP boundary.

4.11.3 Conclusion

There would be no impact under either Alternative 1 or 2 for Environmental Justice.
4.12 OTHER PROTECTED RESOURCES

4.12.1 Wild and Scenic Rivers
The Green River was listed in the NRI in 1982 and is also designated a Kentucky Wild River. Refer to Chapter 3 and to Appendix G for a description of the segment listed in the NRI.

4.12.1.1 Alternative 1-No Action (Existing Conditions)
Alternative 1 does not include a critical portion of the Upper Green River Watershed that would provide conservation to a segment of the Green listed in the NRI. In addition, Alternative 1 does not include elements allowing wider buffers along certain tributaries to this system.

4.12.1.2 Alternative 2-Expanded Kentucky Green River (Agency’s Preferred Alternative)
Alternative 2 includes the entire Upper Green River Basin, excluding those watersheds that lie above the Corps’ reservoirs. It includes approximately 30 additional river miles and provides greater protection to the Green River and its outstandingly remarkable values (ORVs): Scenic, Recreation, Geologic, Fish, Historic, Cultural, and Wildlife. This expanded area would encompass 946,101 acres and extend down the Green River to its confluence with the Barren River at river mile 149.5. This expanded area would include the tributary watersheds contributing to the Green, including the Nolin River and Barren River systems upstream to their respective reservoirs.

CREP practices encourage the establishment of buffers along riparian corridors. These buffers not only protect the surface waters from agricultural runoff and sedimentation, but they provide wildlife corridors, control flooding and provide shade for fish. They also add to the scenic quality of the river for recreationalists and canoeists.

4.12.1.3 Conclusion
Under Alternative 1, there would be no change in the existing CREP area and no increase in the protection of the Upper Green River basin. Under Alternative 2, the Upper Green River Basin would be encompassed in KYCREP. There would be modifications to certain CRP practices that provide added value to the ORVs.

4.12.2 National Natural Landmarks
Two NNLs are located within Russell County, a Kentucky CREP county for both alternatives. There would be no affect from the Kentucky CREP to either NNL.

4.12.2.1 Conclusion
KYCREP would not affect either NNLs under either alternative.
CHAPTER 5.0 CUMULATIVE IMPACTS

Cumulative impacts are defined by CEQ in §1508.7 as the incremental effect of the proposed action when added to other past, present and reasonably foreseeable future actions regardless of who or what agency undertakes such other actions. Cumulative impacts can result from individually minor but collectively significant actions that occur over time.

Since the inception of the KYCREP, 574 contracts composed of 10,813.3 acres have been approved for enrollment into the program. As of May 2006, an estimated 23 new contracts, totaling about 342 acres are pending approval. Cumulatively, this enrollment represents only about 11 percent of area eligible for enrollment into the program.

FY 2005 showed steady enrollment with 109 contracts approved, totaling 1,397.7 acres. Of the contracts enrolled, CP22 (Riparian Buffer) and CP2 (Native Grasses) are the dominant practices selected. These two practices account for about 97 percent of the enrolled acreage. By the end of FY 2005, a total of 53 contracts, totaling 9,542.1 acres had been enrolled. Table 5-1 shows the cumulative number of approved contracts at the end of FY 2005 by conservation practice.

Table 5-1: Cumulative Approved Contracts and Acreage by Conservation Practice, through FY 2005

<table>
<thead>
<tr>
<th>Conservation Practice</th>
<th>Approved Contracts</th>
<th>Number</th>
<th>Acres</th>
</tr>
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<tbody>
<tr>
<td>CP1</td>
<td>Introduced Grasses/Legumes</td>
<td>9</td>
<td>179.5</td>
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<tr>
<td>CP2</td>
<td>Native Warm Season Grasses</td>
<td>120</td>
<td>3,799.9</td>
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<tr>
<td>CP3A</td>
<td>Tree Planting</td>
<td>5</td>
<td>67.1</td>
</tr>
<tr>
<td>CP21</td>
<td>Filter Strip</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>CP22</td>
<td>Riparian Buffer</td>
<td>368</td>
<td>5,494.6</td>
</tr>
<tr>
<td><strong>TOTAL</strong></td>
<td></td>
<td><strong>503</strong></td>
<td><strong>9,542.1</strong></td>
</tr>
</tbody>
</table>


The cumulative effects of the Kentucky Green River CREP are contingent upon the willingness of farmers to voluntarily enroll certain environmentally sensitive land into the program for the purpose of reducing runoff and sedimentation and ultimately to improve the water quality in the Green River Watershed. Within the existing KYCREP area, Barren, Green, Taylor, and Hart current lead with the counties with the most acreage enrolled. Figure 5-1 illustrates the trends for enrollment by the existing CREP counties.

Cumulative effects by the resource topics evaluated in Chapters 3 and 4 are addressed in the following sections:

**Biological Resources**

Slightly more than 10 percent of the total acreage eligible for enrollment into KYCREP (99,500 acres) has been approved to date. Specific goals addressed at improvements to the biological resources within the watershed have been established to measure progress. These are identified in Chapters 2 and 3.
A number of studies are ongoing to monitor the water quality and erosion points within the Green River Watershed, including the Nolin River. These include, but are not limited to:

- Historic and projected water quality and biological data, incorporating the results of USGS, Kentucky Dept. of Water, the Upper Green River Watershed Watch, the Kentucky Waterways Alliance Green River Basin, and other studies through modeling
- Analysis of historical patterns of channel migration and field surveys of in-channel and floodplain sediment storage
- Ongoing streamflow gaging and suspended sediment collection and monitoring at three mainstem sites (Mammoth Cave Ferry, Munfordville, Greensburg)
- Streamflow gaging and suspended sediment collection at Green River surface tributary on Pitman Creek in Green County
- Subsurface flux and water quality monitoring in Logsdon River in Barren and Edmonson Counties.

Trends for enrollment within the existing KYCREP area are shown in Figure 5-1 by county.

**Figure 5-1: KYCREP County Trends in Acreage Enrolled into KYCREP through FY 2005**

The cumulative impacts to the area’s water resources occur mainly from the following sources:

- Animal feedlots
- Fertilizers
- Landfills
- Mining and mine drainage
- Pesticides
- Septic systems
- Spills
- Underground storage tanks
- Runoff

If Alternative 1 is selected, the cumulative effects of the KYCREP would most likely continue to focus on planting grasslands (CP1 and CP2) and establishing riparian buffers (CP22). Although these practices have proven beneficial, utilizing wider buffers as proposed for Alternative 2 would result in greater benefits for water quality and for wildlife corridors over time. Under Alternative 1, a 1,000-foot buffer would be allowed along the mainstem of the Green River and a 300-foot buffer would be allowed along all tributaries. For Alternative 2, all fourth order and higher streams within the expanded KYCREP area would be allowed a maximum 1,000-foot buffer width. Furthermore, lower order stream that have excessive bottomland widths could also be permitted to have 1,000-foot buffers under Alternative 2. In addition to a wider buffer, sinkholes and karst features are proposed for inclusion as eligible for CP22-Riparian Buffer. Wider buffers would potentially result in the following:

- More landowners would most like enroll their fields in the program because the wider buffers would avoid splitting their bottomland, thus making it economically more attractive to enroll under the buffer practice
- Surveys showed that more fields in the KYCREP area would be entirely buffered rather than fragmented if wider buffers were implemented
- The increased buffer would benefit wildlife habitat, which would be increased on a landscape scale
- Overall water quality would be improved by gaining more miles of buffered stream
- Aquatic habitat for rare, endangered and threatened mussels and aquatic species, as well as the aquifers and groundwater feeding the Mammoth Cave system would be vastly improved as sediments, fertilizers and pesticides are filtered and prevented from run-off into streams
- Sinkholes and karst features would be protected

Alternative 2 proposes CP29-Marginal Pastureland Wildlife Habitat Buffer. Cumulatively, this practice can be used with CP22-Riparian Buffer for best protection. CP29 allows for the planting of native grasses on entire fields and does not require the planting of trees. As much of the land is open pastureland, landowners are expected to be more amenable to implementing this practice around sinkholes rather than planting trees or installing fences around the sinkholes. Inclusion of this practice is considered essential for the future protection of the region’s karst features and sinkholes.

**Cultural Resources**

Many tribal communities and cultural resources have been found along floodplains and in river corridors where historic and prehistoric cultures once lived. By establishing riparian buffers and protecting these river corridors through CREP, minimal disturbance to these areas and any potential resources in the area would occur. By retaining these resource lands in a conservation program rather than risking development of these areas, archaeological and cultural resources can be preserved.

Prior to any ground disturbing activities, FSA will consult with the SHPO to determine if archaeological resources are known to occur in the area. Any archaeological surveys determined necessary would be conducted by a qualified archaeologist in accordance with the Secretary of the Interior’s *Standards and Guidelines for Archaeological Investigations in Kentucky*.
Water Resources
Cumulatively, CREP, combined with other conservation efforts in the Green River Watershed, will vastly improve the water quality of the Green River and its tributaries, as well as the groundwater system that flows through Mammoth Cave. With existing and proposed conservation practices aimed at improving water quality, this program helps reduce runoff and sediments, nutrients and agricultural pollutants from entering surface streams and the rivers. Currently, approximately 134.5 stream miles are buffered through the KYCREP. With CP22 and propose CP29, it is assured that many additional miles will be buffered through the program.

Soils
Two principal cumulative impacts affect the quality of soils in the KYCREP area: erosion and acidification. CREP would mitigate the effects of erosion through conservation practices that utilize grass plantings and tree plantings. Alternative 2 proposes wider buffer zones along streams and tributaries to the mainstem of the Green River. Conservation practices would be implemented to control erosion.

Air Quality
Conditions affecting the region’s cumulative air quality may be induced from global sources, such as fires from Mexico and other parts of the world, major storms and hurricanes, and Saharan and Asian dust storms. CREP involves landowners planting ground covers to control dust and to help mitigate the effect of emissions and particulate matter. CREP offsets the effects of development and various other projects. Certain domestic projects, such as mining operations, require preparation of a plan for controlling fugitive dust emissions. All sources of dust, from vehicular traffic, material storage and transfer, and windblown erosion of soil and rock storage piles, must be assessed and mitigation measures proposed to eliminate visible dust emissions at the property boundary. A dust control plan indicating how the offsite effects of dust from the crushing and stockpiling activity, haulage and mining activity, will be controlled in order to prevent violations of the fugitive dust standards of the Division of Air Quality.

Recreation
The cumulative effects of CREP on recreational resources focus on improved water quality for fishing and swimming, as well as hiking, and bird watching. Other forms of recreation that are supported by CREP are—

- Boating
- Camping
- National Park tours
- Caving
- Nature Walks and Wildlife Viewing
- Photography

CREP supports passive activities, and in some areas, is supportive of hunting. As the quality of the water and air improve, combined with the rural environment, recreationalists tend to visit CREP areas for the rural experience, peace and beauty the area offers. Indirectly, these visits generate income to farmers and to the local economy. For the KYCREP area, Mammoth Cave National Park brings about 1.8 million visitor a year to the region.

Land Use
Land uses change through enactment of State legislation and local ordinances. Cumulatively, land use changes may precipitate the most significant impacts to CREP land and to agriculture. Mining and
mineral operations, forestry, transportation, residential development and power plants in the region are all threats to the resources CREP is striving to protect and conserve.

Traffic and Transportation
The major transportation projects that are proposed for construction in the KYCREP area are identified in Chapter 3. Construction of these projects will cumulatively impact air quality, potentially fragment CREP land, and will place more pressure on farm operators to remain in farming. Construction of these major roadways could potentially induce more commercial and residential development.

Human Health and Safety
KYCREP would cumulative contribute to the decreased use of pesticides, herbicides and fertilizers that are flowing into the Green River and its tributaries. In addition, with the installation of conservation practices, such as filter strips, wider buffers, riparian corridors, these practices would mitigate the effects of runoff and pollutants attempting to enter surface waters. CREP provides cumulative benefits by buffering surface waters and sinkholes from trash and pollutants impacting these sensitive resources.

Socioeconomic Impacts
Based on the 2000 Census statistics, about 8 percent of the State’s population resides in the Kentucky CREP area. CREP maintains a natural and rural environment and preserves natural resources that are rapidly diminishing due to development pressures, exotic species, blights and diseases, human disturbance and natural disasters. Cumulatively, CREP has provided more than $1.7 million in payments. These payments would be much greater with the expansion area.

Other Protected Resources
CREP is a conservation program and through its implementation would continue to conserve the resources in the region. These would include the Green River, which is listed in the NRI, and the resources adjacent to and underlying Mammoth Cave National Park.
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CHAPTER 6.0 MITIGATION MEASURES

The Commonwealth of Kentucky is conducting several monitoring studies to determine the effectiveness of CREP in Kentucky. These monitoring studies will analyze the historic and projected water quality and the biological data. Use of Geographic Information System mapping and analysis of land use in the Upper Green River Basin will be conducted to determine erosion points, distribution of cane breaks and stretches of very thin riparian along the mainstem of the Green River. Results of these monitoring studies will provide more substantial data to develop appropriate mitigation targeted at improving the resources.

High-quality natural areas, containing rare plant and animal species or relatively undisturbed natural communities, are becoming increasingly imperiled throughout the Commonwealth of Kentucky. A critically important aspect of the Commission’s mandate is working with public and private landowners to ensure the protection of ecologically significant land in Kentucky. Land protection actions by the Commission are always undertaken with the full cooperation and agreement of landowners. For owners of qualifying natural areas, the Commission offers a variety of land protection options, including acquisition of land or conservation easements, dedication of public or private property as a State nature preserve, and enrollment in the Kentucky Natural Areas Registry Program.

The Kentucky Natural Areas Registry is a voluntary, non-regulatory program designed to provide recognition for sound stewardship and awareness of the ecological significance of a landowner’s property. Under the terms of the registry agreement, the landowner does not relinquish any rights to the property and agrees to protect it to the best of their ability. Further, the landowner agrees to notify the Commission if they are interested in selling the land or if the area is threatened in any way. Landowners who enroll their property in the registry program receive a registry certificate and, if desired, other appropriate public recognition. To be eligible for registration, a property must contain habitat for plants or animals that are rare or have declining populations in Kentucky or that contain an outstanding example of a Kentucky ecological community, such as an old growth forest, wetland, glade or prairie.

Protection of rare species requires cooperation of private landowners. Private individuals hold 95 percent of the land in Kentucky. This rich landscape is home to a diverse group of species. Changes in land use, pollution and fragmentation have had a negative impact on many of these species. Pallid sturgeon, Virginia big-eared bat, vesper sparrow, Braun’s rockcress and littlewing pearlymussel are a few of the 390 plant and 317 animal species that are currently listed as rare in the Commonwealth. Additionally, six plant and 49 animal species are considered extirpated from the State or extinct.

The protection of surface water and groundwater resources is a primary environmental issues facing pesticide applicators. Pesticides can reach surface water by running off the application site following a heavy rainfall and into neighboring streams and rivers or sink holes. Pesticides can also leach through the soil profile into the groundwater. Water contamination can also be the result of a direct or specific source, such as a spills or backsiphoning during filling of pesticide application equipment. This type of contamination is referred to as "point source" contamination and can be mitigated. All pesticide users are responsible for ensuring that every means available is used to prevent pesticides from contaminating Kentucky's surface water and groundwater resources. Pesticides applicators can greatly reduce the risk of either point or non-point source contamination from pesticides by utilizing BMPs. BMPs are effective, common sense practices that emphasize proper mixing, loading and application of pesticides and also include methods that should be used before, during and after application.

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Draft PEA for Kentucky Green River CREP
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## CHAPTER 7.0 LIST OF PREPARERS, CONTRIBUTORS, AND REVIEWERS

The following individuals contributed to the data, the mapping and the review of the Kentucky Green River CREP PEA.

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<td>The Nature Conservancy</td>
<td>CREP Partner</td>
</tr>
<tr>
<td>Dr. Richie Kessler</td>
<td>The Nature Conservancy</td>
<td>CREP Easements</td>
</tr>
<tr>
<td>Dr. Scott Grubbs</td>
<td>Department of Biology and Center for Biodiversity Studies, Western Kentucky University</td>
<td>Monitoring and Evaluation</td>
</tr>
<tr>
<td>Dr. Ouida Meier</td>
<td>Center for Biodiversity Studies, Western Kentucky University</td>
<td>Water Quality and Biological Monitoring</td>
</tr>
<tr>
<td>David Morgan</td>
<td>Kentucky State Historic Preservation Office</td>
<td>Archeological, historical and cultural resources</td>
</tr>
<tr>
<td>Eileen M. Carlton</td>
<td>Environmental Management Collaboration, Ltd.</td>
<td>Document author, NEPA &amp; regulatory compliance</td>
</tr>
</tbody>
</table>
CHAPTER 8.0 PERSONS AND AGENCIES CONTACTED

During the planning process for the Kentucky CREP PEA, a number of agencies were consulted at the outset of the project during scoping. Appendix D is a compendium of correspondence received from agencies regarding this program to date.

U.S. Fish and Wildlife Services
Lee Andrews
Field Supervisor
3761 Georgetown Road
Frankfort KY 40601

Kentucky Dept. of Fish & Wildlife Resources
#1 Game Farm Road
Frankfort KY 40601

National Park Service
Mammoth Cave National Park
Attn: Mark DePoy, Chief, Resource Management Division
P.O. Box 7
Mammoth Cave, KY 42259

National Park Service
Mammoth Cave National Park
Bob Carson, Air Quality Specialist

David L. Morgan
State Historic Preservation Officer
Preservation Services Division
Kentucky State Historic Preservation Office
300 Washington Street
Frankfort KY 40601

U.S. Army Corps of Engineers
600 Martin Luther King Jr. Drive
Louisville KY 40202-2232

USDA Natural Resources Conservation Service
771 Corporate Drive, Suite 110
Lexington KY 40503

Kentucky State Nature Preserves Commission
801 Schenkel Lane
Frankfort KY 40601

Kentucky Division of Conservation
375 Versailles Road
Frankfort KY 40601
Kentucky Division of Forestry
627 Comanche Trail
Frankfort, KY 40601

Department of Local Government
State Clearing House
1024 Capital Center Dr., Suite 340
Frankfort KY 40601

Forest Supervisor
USDA Forest Service
Daniel Boone National Forest
1700 Bypass Road
Winchester KY 40391

Dr. Ouida Meier
Department of Biology
Center for Biodiversity Studies
Western Kentucky University
Bowling Green, KY 42101

Dale Reynolds
Kentucky Division of Water
1508 Western Street
Bowling Green, KY 42104

Ernest Collins
Kentucky Department of Agriculture
107 Corporate Drive
Frankfort, KY 40601

Angela Crain
US Geological Survey
9818 Bluegrass Parkway
Louisville, KY 40299

Judith Peterson
Kentucky Waterways Alliance
854 Horton Lane
Munfordville, KY 42765-8135

Mike Turner
USACOE, Louisville District
Division of Environmental Resources
P.O. Box 59
Louisville, KY 40401-0059

Mr. Ray Barry, Chair
Sierra Club, Cumberland Chapter
PO Box 1368
Lexington, KY 40588-1368
Mr. Ken Cooke
Kentucky Water Watch
639 Cardinal Lane
Lexington, KY 40503

Mr. James H. Gray, Hatchery Manager
Wolf Creek National Fish Hatchery
50 Kendall Road
Jamestown, KY 42629

William J. Byron, Chief
Water Management Division
U.S. Army Corps of Engineers
CELRL-ED-TW, P.O. Box 59
Louisville, KY 40201-0059

Green Tradewater River Basin
Division of Water
14 Reilly Road
Frankfort, KY 40601

Ms. Cynthia Schafer
Kentucky Environmental and Public Protection Cabinet
Office of Communications and Public Outreach
500 Mero Street 5th Floor, CPT
Frankfort, KY 40601

The Nature Conservancy
Jim Aldrich
642 W. Main Street
Lexington KY 40508

David Howell
Quail Unlimited
10364 S. 950 E.
Stendal, IN 47585
CHAPTER 9.0 REFERENCES


King, Betty S. and Kimberly A. Zeuli. “A Profile of Female Farmers in Kentucky.” University of Kentucky, Cooperative Extension Service.


The Nature Conservancy. “Green River, Kentucky-Sustainable Waters Program.” www.nature.org/initiatives/freshwater/work/greenriver.html


U.S. Department of Agriculture, Commodity Credit Corporation and Commonwealth of Kentucky. Proposed *Memorandum of Agreement* and *Addendum Agreement between the U.S. Department of Agriculture, the Commodity Credit Corporation and the Commonwealth of Kentucky.*


U.S. Department of Agriculture, Farm Service Agency. Fact Sheet. *Kentucky Noninsured Crop Disaster Assistance Program.*


APPENDICES
APPENDIX A
PROPOSED MEMORANDUM OF AGREEMENT
BETWEEN
U.S. DEPARTMENT OF AGRICULTURE
AND
THE COMMONWEALTH OF KENTUCKY
and
ADDENDUM AGREEMENT
MEMORANDUM OF AGREEMENT
BETWEEN
THE U.S. DEPARTMENT OF AGRICULTURE,
THE COMMODITY CREDIT CORPORATION,
AND
THE COMMONWEALTH OF KENTUCKY

I. PURPOSE
This Memorandum of Agreement (MOA) is between the U.S. Department of Agriculture (USDA), the Commodity Credit Corporation (CCC), and the Commonwealth of Kentucky, to implement a Conservation Reserve Enhancement Program (CREP) in connection with the Conservation Reserve Program (CRP) for certain portions of the Green River watershed. This program is undertaken in order to enhance wildlife habitats in the watershed and to protect the quality of these waters by reduction of sediment and nutrients.

II. GENERAL PROVISIONS
The purpose of this Agreement is to allow, where deemed desirable by USDA, CCC, and Kentucky, certain acreage in the Green River watershed to be enrolled under the CREP. The Green River is the most biologically diverse branch of the entire Ohio River system. The area of greatest biodiversity is located on the 100-mile free-flowing section below Green River Lake Dam and extends into the Mammoth Cave National Park.

The establishment of a CREP seeks to greatly reduce runoff of sediments, nutrients, pesticides, and pathogens from agricultural sources that currently have an adverse impact on the health of the Green River system. Sinkholes, resulting from the area’s karst topography, occur throughout the watershed and contribute to the high sensitivity of the areas’ aquatic systems to pollution. Other agricultural impacts include fragmentation of riparian corridors, native grasslands, and forestlands.

The overall goal is to sustain and, where needed, restore the health and viability of degraded or threatened natural habitats and ecosystems in the project area. The program goals are to be accomplished through a voluntary, incentive-based program that seeks participation from 80 percent of the agricultural producers within the project area.

The primary goals for the CREP are:
1. To reduce by 10 percent (based on 1999 data) the amount of sediment, nutrients, and pesticides from agricultural sources entering the tributaries and the main stem of the Green River and the Mammoth Cave System as measured by installation of Best Management Practices (BMPs) designed for that purpose and compliance with water quality standards (replanting riparian buffers along streams and around sinkholes are high priority);
2. To enhance habitats and populations of wildlife, including state and federal special concern, rare, threatened and endangered species, using as a measure of success a reduction in the need to list additional species as threatened or endangered;
3. To sustain and restore composition, structure and function of riparian habitat corridors associated with the Green River and tributary watersheds, targeting 28,000 acres that include buffers around sinkholes;
4. To reconnect landscape elements that will restore landscape level ecological processes;
5. To establish buffers around sinkholes, targeting 1000 high priority sinkholes;
6. To sustain and restore non-riparian wetlands, targeting 3000 acres (riparian and non-riparian wetlands);
7. To protect and restore subterranean ecosystems;
8. To collect, store, and analyze data to enhance planning for sustaining the health of the watershed; and
9. To develop an outreach program targeting all active agricultural producers in the area.

This agreement is not intended to supersede any rules or regulations, which have been, or may be, promulgated by either USDA, CCC, Kentucky, or any other governmental entity participating in the CREP.

III. AUTHORITY
A. Federal
The CCC has the authority under the provisions of the Food Security Act of 1985, as amended (1985 Act)(16 U.S.C. 3830 et seq.), and the regulations at 7 Code of Federal Regulations (CFR) part 1410 to perform all activities contemplated by this agreement. Pursuant to the 1985 Act, CCC is authorized to enroll land in the CRP through December 31, 2002. Sections 1230, 1234, and 1242 of the 1985 Act and the regulations at 7 CFR §1410.50 authorize CCC to enter into agreements with States to use the CRP in a cost-effective manner to further specific conservation and environmental objectives of a State and the Nation. Other authorities may also apply.

B. State
Kentucky has the authority to perform the activities contemplated by this MOA pursuant to Kentucky Revised Statute (KRS) 146.080, which authorizes the Secretary for Natural Resources and Environmental Protection Cabinet to divide the State into nine soil and water conservation areas, to be approved by the Kentucky Soil and Water Conservation Commission. KRS 262.020 states that the purpose of the Soil and Water Conservation Districts (CD) is to conserve and develop all renewable natural resources within the CD. The individual districts, as agents of the State, are authorized to participate in projects that include among their objectives the control of soil erosion, the retardation of water runoff, the maintenance of flood plains, the stabilization of watersheds, avoidance and abatement of sedimentation and pollution in streams and other bodies of water, and protection of fish and wildlife. Additionally, KRS 262.700 authorizes the State, through the CDs, to form sub-districts of a CD, called Watershed Conservancy Districts, for the purpose of developing and executing plans and programs relating to any phase of conservation of water, water usage, erosion prevention and control of erosion, and sediment damages.

KRS 224.10-100 authorizes the State, through the Natural Resource and Environmental Protection Cabinet, to: provide for the prevention, abatement and control of all water, land and air pollution including but not limited to, that related to pesticides, nutrients and other contaminants; and advise, consult, and cooperate with other agencies of the Commonwealth, other States, the Federal government, and interstate and local agencies, and affected persons, groups, and industries.

KRS 224.70-100 states that the policy of the Commonwealth of Kentucky is to conserve the waters of the State for public water supplies; provide a comprehensive program for the public interest for the prevention, abatement and control of pollution; to provide for cooperation with agencies of other States or of the Federal government in carrying out these objectives; to safeguard from pollution the uncontaminated waters of the Commonwealth; to prevent the creation of any new pollution of the waters of the Commonwealth; and to abate existing pollution.
IV. PROGRAM ELEMENTS

USDA, CCC, and Kentucky agree that:

A. The Kentucky CREP will consist of a Federal continuous sign-up CRP component and a voluntary state incentive program. This MOA contemplates the enrollment of up to 100,000 acres of crop and pastureland with high environmental value along the main stem of the Green River and its tributaries.

B. The 100,000 acres to be enrolled in the CREP will come from a 917,197 acre area along the Green River from the Green River Lake Dam downstream to Lock and Dam 6 and includes Adair, Barren, Edmonson, Green, Hart, Metcalfe, Russell and Taylor counties in Kentucky.

C. The eligible CRP practices for the Kentucky CREP will be:

- CP-1 Introduced Grasses and Legumes
- CP-2 Native Grasses, Legumes and Forbs
- CP-3 Tree Planting
- CP-3A Hardwood Tree Planting
- CP-4B Permanent Wildlife Habitat (Corridors), Non-easement
- CP-4D Permanent Wildlife Habitat, Non-easement
- CP-8A Grassed Waterways, Non-easement
- CP-9 Shallow Waterways for Wildlife
- CP-10 Vegetative Cover--Grass--Already Established
- CP-11 Vegetative Cover--Trees--Already Established
- CP-12 Wildlife Food Plots
- CP-15A Permanent Vegetative Cover (Contour Grass Strips), Non-easement
- CP-21 Filter Strips
- CP-22 Riparian Buffer
- CP-23 Wetland Restoration
- CP-25 Rare or Declining Habitat

D. Additionally the project will include the following practices funded by the Kentucky Soil Erosion and Water Quality State Cost Share Program, in accordance with 2-CRP handbook:

1. Alternative Water Supplies for Livestock:
   a. Limited point access to streams for livestock
   b. Water lines and tanks

E. In determining reimbursable costs to be made by CCC, CCC shall use the appropriate CRP practices. All conservation practices shall meet, but may exceed, the minimum specifications outlined in the applicable Natural Resources Conservation Service (NRCS) Field Office Technical Guide, and in accordance with 2-CRP handbook.

F. All CRP contracts for land enrolled in the CREP will be not less than 10 years or more than 15 years and will be subject to all normal CRP provisions as provided for in the CRP regulations. Program participants will have the opportunity, as described herein, to enter into the State incentive program and either extend the benefits of the CRP contract for another 15 or 35 years through a supplemental
contract with Kentucky, or to receive payment from Kentucky in return for executing a voluntary permanent easement with Kentucky.

G. Eligible agricultural producers will not be denied the opportunity to offer eligible acreage for enrollment during other CRP enrollment periods.

V. FEDERAL COMMITMENTS

USDA and the CCC will:

A. Determine applicant eligibility for participation in the CRP portion of the CREP consistent with the regulations at 7 CFR Part 1410 and administer those CRP contracts that are executed.

B. Pay 50 percent of reimbursable costs of conservation practices. Reimbursements to CREP participants from all sources may not exceed 100 percent of the cost of such practices.

C. Make rental payments under the CRP contract at normal CRP county cropland soil rental rates, subject to such further payments as are provided for in paragraphs D. and E. of this section.

D. Make incentive payments, as a percentage of the basic CRP maximum annual rental rate otherwise applicable to the land under CRP, in an amount equal to:

1. 100 percent for priority one practices (tree planting, hardwood tree planting, riparian buffer, wetland restoration, and rare or declining habitat);

2. 75 percent for priority two practices (native grasses, legumes and forbs; permanent wildlife habitat (corridors), non-easement; permanent wildlife habitat, non-easement; grassed waterways, non-easement; shallow waterways for wildlife; filter strips; and

3. 50 percent for priority three practices (introduced grasses and legumes, wildlife food plots; vegetative cover-grass-already established, vegetative cover-trees-already established, permanent vegetative cover (contour grass strips), non-easement.

E. Pay additional rental incentives, if any, as would otherwise normally apply under the CRP, including any incentives for obligations of maintenance consistent with the applicable CRP payment process.

F. Provide information to landowners concerning Kentucky’s CREP and technical assistance for the CREP in general.

G. Provide, in a manner consistent with the existing CRP program, assistance to producers whose practices are destroyed by circumstances beyond the producers’ control.

H. Permit successors-in-interest to contracts enrolled under this CREP in the same manner as allowed generally for other CRP contracts.

VI. STATE COMMITMENTS

Kentucky agrees to:

A. Enroll landowners who decide to participate in the Kentucky Incentive Program (KIP) in either a 15-year, 35-year, or permanent contract with Kentucky. Landowners will be required to enroll in one of these options in order to receive benefits afforded by Kentucky in the form of either incentive payments or cost-share payments for implementation of conservation practices. Landowners may participate in the Federal portion of the CREP without participating in the voluntary Kentucky portion.

B. Pay 50 percent of reimbursable cost for installation of all CRP practices, and provide, in addition to federal payments, front-end purchases of seeds and seedlings for CP-3, CP-3A, and CP-22, not to exceed 100 percent of the cost of such practices.

C. Provide additional reimbursement for the costs of installation of approved conservation practices equal to:

1. 75 percent of the cost of installing practices not eligible for federal CRP payments, enumerated in point D of this section.
2. 50 percent of the costs of implementing the practice, when the land will be entered into a permanent easement.
3. 30 percent of the costs of implementing the practice, when the land will be entered into a 35-year supplemental contract (totaling 50 years) for lands enrolled as riparian buffers or wetland restoration.
4. 25 percent of the cost of implementing the practices, when land will be entered into 15-year supplemental contract (totaling 25-30 years), regardless of the practice.

D. The Kentucky Soil Erosion and Water Quality State Cost Share Program will, in addition to acreage paid for under the CREP agreement and in accordance with 2-CRP handbook, provide:
   1. Alternative Water Supplies for Livestock:
      1) Limited point access to streams for livestock
      2) Water lines and tanks

E. Provide additional State payments for:
   1. Voluntary permanent easement, a lump sum payment of $400 per acre.
   2. 35-year conservation easement or supplemental contract, a lump sum payment of $300 per acre.
   3. 15-year supplemental contract, a lump sum payment of $150 per acre.

F. Provide technical guidance to ensure that practice specifications are met.

G. Provide assistance in field practice completion.

H. Develop and implement a monitoring program that will include:
   1. Enrollment counts;
   2. Acres buffered;
   3. BMP installations; and
   4. Pollutant reductions that advance water quality objectives.

I. Prepare an annual report for USDA, which summarizes, but is not limited to, the:
   1. Level of program participation;
   2. Results of the annual monitoring program; and
   3. Non-federal CREP expenditures

J. Complete the State enrollment forms and approve contracts for the KIP of the CREP.

VII. OTHER PROVISIONS
A. CRP contracts executed under this CREP will be administered in accordance with the CRP regulations at 7 CFR Part 1410 and other program authorities.
B. The Deputy Administrator for Farm Programs, USDA Farm Service Agency, is delegated authority to carry out this MOA and, with the Secretary of the Natural Resources and Environmental Protection Cabinet, or their designees, may further append this MOA consistent with the provisions of the Food and Security Act of 1985, the regulations at 7 CFR part 1410, and the provisions of this MOA.
C. This MOA, or any portion thereof, may only be modified by written agreement between the parties.
D. This MOA may be terminated by either party after written notice. Such termination will not alter existing contractual obligations under the CREP or affect reporting requirements provided for in this MOA.
IT IS SO AGREED:

So agreed:

On behalf of the United States Department of Agriculture and the Commodity Credit Corporation

__________________                        Date
J. B. Penn                 
Under Secretary
for Farm and Foreign Agricultural Services
President
Commodity Credit Corporation

__________________                        Date
Thomas Hunt Shipman                          
Acting Deputy Under Secretary
for Farm and Foreign Agricultural Services

FOR THE STATE OF KENTUCKY

__________________                        Date
Paul E. Patton                         
Governor
Commonwealth of Kentucky
ADDENDUM AGREEMENT
BETWEEN
THE U.S. DEPARTMENT OF AGRICULTURE,
THE COMMODITY CREDIT CORPORATION
AND
THE COMMONWEALTH OF KENTUCKY

This Addendum Agreement is entered into between the U.S. Department of Agriculture (USDA), the Commodity Credit Corporation (CCC), and the Commonwealth of Kentucky (Commonwealth) to implement a Conservation Reserve Enhancement Program (CREP) for portions of the Green River Watershed in Kentucky. This program is undertaken to protect the habitats in the Green River Watershed. This Addendum hereby modifies the Memorandum of Agreement (MOA) entered into between USDA, CCC, and the Commonwealth as a part of the National Conservation Reserve Program (CRP) operated by USDA for CCC.

The following language is made as an Addendum to the MOA and to modify the respective clauses as numbered in the original agreement.

III. AUTHORITY
A. Federal
The CCC has the authority under the provisions of the Food Security Act of 1985, as amended (1985 Act)(16 U.S.C. 3830 et seq.), and the regulations at 7 Code of Federal Regulations (CFR) part 1410 to perform all activities contemplated by this agreement. Pursuant to the 1985 Act, CCC is authorized to enroll land in the CRP through December 31, 2007. Sections 1230, 1234, and 1242 of the 1985 Act and the regulations at 7 CFR §1410.50 authorize CCC to enter into agreements with states to use the CRP in a cost effective manner to further specific conservation and environmental objectives of a state and the nation. Other authorities may also apply.

IT IS SO AGREED:

FOR THE UNITED STATES DEPARTMENT OF AGRICULTURE AND THE COMMODITY CREDIT CORPORATION,

____________________________      __________
John A. Johnson    Date
Deputy Administrator
For Farm Programs
Farm Service Agency and
Deputy Vice President
Commodity Credit Corporation

For the Commonwealth of Kentucky

_____________________________  __________
Ernie Fletcher                                              Date
Governor
Commonwealth of Kentucky

Draft PEA for Kentucky Green River CREP
May 8, 2006

TO: Deputy Administrator Farm Programs  
    Attn: Chad Chadwell, CREP Project Manager

FROM: Jeffery S. Hall  
    State Executive Director

SUBJECT: Proposed Expansion of the Green River Conservation Reserve Enhancement Program

Enclosed is a proposed Addendum to the current Green River CREP agreement. The Addendum is submitted on behalf of all partners and has their full support.

The proposal is to amend the CREP project area to add environmentally significant watersheds downstream of our current project area, and to utilize the community-based approach of this program to more effectively protect locally unique resources and provide better service to the local landowners in both the original and added regions. The following items are the primary changes requested in the program:

- The addition of the Green River Watershed from Mammoth Cave National Park to the confluence with the Barren River (including the Barren River Watershed). This addition will not place the entire Upper Green River Basin (excluding those areas above USCOE reservoirs) into the program. This area encompasses 946,101 acres, and includes land in Allen, Barren, Butler, Edmonson, Grayson, Logan, Simpson, and Warren Counties.
- The incorporation of the CP29 – Marginal Pastureland Wildlife Habitat Buffer into the Green River CREP. This practice was not originally included into this program, but has been deemed important to the protection of the region’s unique karst resources.
- The ability to enroll entire marginal pastureland fields into conservation practices if a required percentage of the field meets eligibility requirements. This request is essential for practicality of enrollment and installment if the karst features are to be protected.
- The increase of maximum buffer widths on select streams within the watershed. Currently, the main stem Green River has a maximum buffer with (1,000 ft.) that exceeds that of tributaries (300 ft.). After four years of program implementation, it has become obvious that the extended buffer width of 1,000 ft. is needed on larger tributaries as well.

Please direct questions on this proposal to Faye Brown, Conservation Specialist, at either (859) 224-7685 or Faye.Brown@ky.usda.gov.

Thank you for your consideration of this proposal.
APPENDIX B
KENTUCKY CREP CONSERVATION PRACTICES
The proposed eligible CRP practices for the Kentucky CREP are as listed below—

CP1  Introduced Grasses and Legumes
CP2  Native Grasses, Legumes and Forbs
CP3  Tree Planting
CP3A Hardwood Tree Planting
CP4B Permanent Wildlife Habitat (Corridors), Non-easement
CP4D Permanent Wildlife Habitat, Non-easement
CP8A Grassed Waterways, Non-easement
CP9  Shallow Waterways for Wildlife
CP10 Vegetative Cover--Grass--Already Established
CP11 Vegetative Cover--Trees--Already Established
CP12 Wildlife Food Plots
CP15A Permanent Vegetative Cover (Contour Grass Strips), Non-easement
CP21 Filter Strips
CP22 Riparian Buffer
CP23 Wetland Restoration
CP25 Rare or Declining Habitat
CP29 Marginal Pastureland Wildlife Habitat Buffer

The proposed program would also include the following practices funded by the Kentucky Soil Erosion and Water Quality State Cost Share Program, in accordance with 2-CRP handbook:

Alternative Water Supplies for Livestock:

a. Limited point access to streams for livestock
b. Water lines and tanks
APPENDIX C
KENTUCKY CREP
RELEVANT LAWS AND REGULATIONS
<table>
<thead>
<tr>
<th>Mandate</th>
<th>Administering Agency</th>
<th>Purpose</th>
</tr>
</thead>
<tbody>
<tr>
<td>Council on Environmental Quality Regulations, as amended; 40 CFR Parts 1500-1508</td>
<td>All Federal agencies</td>
<td>Implements NEPA and provides guidance to Federal agencies in the preparation of environmental documents identified under NEPA.</td>
</tr>
<tr>
<td>Watershed Protection and Flood Prevention Act of 1954 (P.L. 83-566; 16 U.S.C. 1001-1008)</td>
<td>USDA-NRCS</td>
<td>Prior to FY 1996, watershed planning activities and the cooperative river basin surveys and investigations authorized by Section 6 of the Act were operated as separate programs.</td>
</tr>
<tr>
<td>Flood Control Act (P.L. 78-534)</td>
<td>USDA-NRCS</td>
<td>Authorized the Secretary of Agriculture to install watershed improvement measures to reduce flooding, sedimentation, and erosion damages, and to further the conservation, development, use and disposal of water and the proper utilization of land.</td>
</tr>
<tr>
<td>Food Security Act of 1985. as amended (16 U.S.C. 3830 et seq.); 7 CFR 1410</td>
<td>USDA-CCC</td>
<td>CCC is authorized to enroll land in the CRP. 7 CFR 1410.50 authorizes CCC to enter into agreements with States to use the CRP in a cost-effective manner to further specific conservation and environmental objectives of a State and the nation.</td>
</tr>
<tr>
<td>Mandate</td>
<td>Administering Agency</td>
<td>Purpose</td>
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<tr>
<td>Farm Security and Rural Investment Act of 2002 (P.L. 107-171; 2002 Farm Bill)</td>
<td>USDA-NRCS</td>
<td>The 2002 Farm Bill enhances the long-term quality of our environment and conservation of our natural resources. Published Conservation Reserve Program rule and launched CRP. Provides funding for conservation programs on working farm lands.</td>
</tr>
<tr>
<td>Clean Water Act (CWA) of 1977, as amended (33 U.S.C. 1251, et seq.)</td>
<td>U.S. Environmental Protection Agency; U.S. Army Corps of Engineers</td>
<td>Sec. 401 regulates water quality requirements specified under the CWA. Section 402 requires a National Pollutant Discharge Elimination System (NPDES) permit for discharges into waters of the U.S. Sec. 404 requires a permit before dredging or filling wetlands can occur. Requires States to review, modify and submit the Section 303(d) listing of State impaired waters to the EPA. Clarified President George W. Bush Administration’s policies on wetland loss and mitigation.</td>
</tr>
<tr>
<td>Section 303(d)</td>
<td>U.S. Environmental Protection Agency</td>
<td></td>
</tr>
<tr>
<td>U.S. Army Corps of Engineers Regulatory Guidance Letter and National Wetlands Mitigation Action Plan, dated 12/24/02</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Fish and Wildlife Coordination Act of 1934 (16 U.S.C. 661-666c; 48 Stat. 401), as amended</td>
<td>U.S. Fish &amp; Wildlife Service</td>
<td>Requires Federal agencies to coordinate with the FWS when any project involves impoundment, diversion, channel deepening or other modification of a stream or water body.</td>
</tr>
<tr>
<td>Mandate</td>
<td>Administering Agency</td>
<td>Purpose</td>
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</tr>
<tr>
<td>Federal Water Pollution Control Act of 1972 (33 U.S.C. 1251-1376, et seq.)</td>
<td>U.S. Environmental Protection Agency</td>
<td>Establishes standards for the restoration and maintenance of the chemical, physical and biological integrity of the nation’s waters through prevention, reduction, and elimination of pollution.</td>
</tr>
<tr>
<td>National Wild and Scenic Rivers Act, Sec. 5(d) (16 U.S.C. 1271-1287)</td>
<td>National Park Service</td>
<td>Requires that “In all planning for the use and development of water and related land resources, consideration shall be given by all Federal agencies involved to potential national wild, scenic and recreational river areas.” The NPS maintains a Nationwide Rivers Inventory (NRI) of river segments that potentially qualify as national wild, scenic or recreational river areas.</td>
</tr>
<tr>
<td>Executive Order 11990, <em>Protection of Wetlands</em></td>
<td>U.S. Fish &amp; Wildlife Service; USDA-NRCS; U.S. Army Corps of Engineers; U.S. Environmental Protection Agency</td>
<td>Requires Federal agencies to consider all practicable alternatives to impacting wetlands.</td>
</tr>
<tr>
<td>Executive Order 11988, <em>Floodplain Management</em></td>
<td>Federal Emergency Management Agency; USDA-NRCS; U.S. Army Corps of Engineers</td>
<td>To restore and preserve the natural and beneficial values served by floodplains.</td>
</tr>
<tr>
<td>Executive Order 13112, <em>Invasive Species</em></td>
<td>All Federal agencies</td>
<td>Prevents introduction of invasive species and provides for their control to minimize the economic, ecological and human health effects that invasive species cause.</td>
</tr>
<tr>
<td>Mandate</td>
<td>Administering Agency</td>
<td>Purpose</td>
</tr>
<tr>
<td>------------------------------------------------------------------------</td>
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</tr>
<tr>
<td>Executive Order 13186, Responsibilities of Federal Agencies to Protect Migratory Birds</td>
<td>Departments of Agriculture, Commerce, Defense, Energy, Interior, State, Transportation and U.S. Environmental Protection Agency</td>
<td>Creates comprehensive strategy for conservation of migratory birds by Federal agencies. Enhances coordination among agencies regarding their responsibilities under the treaties on the conservation of migratory birds.</td>
</tr>
<tr>
<td>National Historic Preservation Act of 1966, as amended; Sec. 106 and Sec. 110; 16 U.S.C. 470; 36 CFR Parts 60, 63, 65, 78-79, 800</td>
<td>National Park Service; State Historic Preservation Offices</td>
<td>Protects and preserves districts, sites, structures, architectural, archaeological, and cultural resources. Sec. 106 requires consultation with the SHPO. Sec. 110 requires that NPS identify and nominate all eligible resources under its jurisdiction to the National Register of Historic Places.</td>
</tr>
<tr>
<td>Archaeological and Historic Preservation Act of 1974, as amended; 16 U.S.C. 469-469c; 74 Stat. 220</td>
<td>National Park Service; all Federal agencies</td>
<td>Requires survey, recovery, and preservation of significant scientific, prehistorical, historical, archaeological, or paleontological data when such data may be destroyed due to Federal activities.</td>
</tr>
<tr>
<td>Executive Order 12898, Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations</td>
<td>All Federal agencies</td>
<td>To avoid Federal actions that cause disproportionately high, adverse impacts on minority and low-income populations with respect to human health and environment.</td>
</tr>
</tbody>
</table>

**Commonwealth of Kentucky Statutes**

<table>
<thead>
<tr>
<th>Mandate</th>
<th>Administering Agency</th>
<th>Purpose</th>
</tr>
</thead>
<tbody>
<tr>
<td>KRS Chapter 146.080</td>
<td>Environmental and Public Protection Cabinet</td>
<td>Authorizes the Secretary for Natural Resources and EPPC to divide the State into nine soil and water conservation areas, to be approved by the Kentucky Soil and Water Conservation commission.</td>
</tr>
<tr>
<td>KRS Chapter 262.020</td>
<td>Environmental and Public Protection Cabinet</td>
<td>States that the purpose of the Kentucky Soil and Water Conservation Districts (CD) to</td>
</tr>
<tr>
<td>Mandate</td>
<td>Administering Agency</td>
<td>Purpose</td>
</tr>
<tr>
<td>---------</td>
<td>----------------------</td>
<td>---------</td>
</tr>
<tr>
<td>KRS Chapter 262.700</td>
<td>Environmental and Public Protection Cabinet</td>
<td>Authorizes the State, through the CDs, to form sub-districts of a CD, called Watershed Conservancy Districts, for the purpose of developing and executing plans and programs relating to any phase of conservation of water, water usage, erosion prevention and control of erosion, and sediment damages.</td>
</tr>
<tr>
<td>KRS Chapter 224.10-100</td>
<td>Environmental and Public Protection Cabinet</td>
<td>Authorizes the State to provide for the prevention, abatement and control of all water, land and air pollution, including, but not limited to, that related to pesticides, nutrients and other contaminants; and advise, consult and cooperate with other agencies of the Commonwealth, other States, the Federal Government and interstate and local agencies, and affected persons, groups and industries.</td>
</tr>
<tr>
<td>KRS Chapter 224.70-100</td>
<td>Environmental and Public Protection Cabinet</td>
<td>States that the policy of the Commonwealth of Kentucky is to conserve the waters of the State for public water supplies; provide a comprehensive program for the public interest for the prevention, abatement and control of pollution; to cooperate with other States or Federal agencies in carrying out these objectives; to safeguard from pollution the uncontaminated waters of the Commonwealth; to prevent the creation of any new pollution of the waters of the Commonwealth; and to abate existing pollution.</td>
</tr>
<tr>
<td>Mandate</td>
<td>Administering Agency</td>
<td>Purpose</td>
</tr>
<tr>
<td>---------</td>
<td>----------------------</td>
<td>---------</td>
</tr>
<tr>
<td>KRS Chapter 224.71-100 to 140</td>
<td>Environmental and Public Protection Cabinet</td>
<td>Kentucky Agriculture Water Quality Act, created the Agriculture Water Quality Authority to establish statewide and regional agriculture water quality plans and to generally promote soil and water conservation activities that protect waters of the Commonwealth from the adverse impacts of agriculture operations within the Commonwealth.</td>
</tr>
<tr>
<td>KRS Chapter 146</td>
<td>Environmental and Public Protection Cabinet</td>
<td>Contains statutes relating to the Division of Conservation, the Kentucky Soil and Water Conservation Commission, the Kentucky Wild Rivers System and the Nature Preserves Commission. Under this statute, the Kentucky Soil Erosion and Water Quality Cost-Share Fund was added, the Kentucky Heritage Land Conservation Fund was amended, and a section relating to endangered and threatened plants was added. The Division of Water is authorized to coordinate activities with those affected agencies to assure protection of water quality.</td>
</tr>
<tr>
<td>KRS Chapter 151</td>
<td>Environmental and Public Protection Cabinet</td>
<td>Addresses water supply plans, water withdrawals, dams and reservoirs, floodplain construction and water resources policy.</td>
</tr>
<tr>
<td>KRS Chapter 223</td>
<td>Environmental and Public Protection Cabinet</td>
<td>Provides for the certification program for water and sewage plant operators and water well drillers.</td>
</tr>
<tr>
<td>Mandate</td>
<td>Administering Agency</td>
<td>Purpose</td>
</tr>
<tr>
<td>-------------------------------------------</td>
<td>------------------------------------------</td>
<td>----------------------------------------------------------------------------------------------------------------------------------------</td>
</tr>
<tr>
<td>KRS Chapter 224A</td>
<td>Environmental and Public Protection Cabinet</td>
<td>Creates the Kentucky Infrastructure Authority which provides financial assistance to Kentucky government agencies for water treatment and water distribution projects and other water resource projects.</td>
</tr>
<tr>
<td>KRS Chapter 74</td>
<td>Environmental and Public Protection Cabinet</td>
<td>Establishes water districts</td>
</tr>
<tr>
<td>KRS Chapter 217B</td>
<td>Environmental and Public Protection Cabinet</td>
<td>Addresses fertilizer and pesticide application</td>
</tr>
<tr>
<td>KRS Chapter 235</td>
<td>Environmental and Public Protection Cabinet</td>
<td>Addresses boating</td>
</tr>
<tr>
<td>Kentucky Wild Rivers Act</td>
<td>Environmental and Public Protection Cabinet</td>
<td>Identifies portions of nine rivers of exceptional quality and aesthetic character that have been designated as Kentucky Wild Rivers.</td>
</tr>
<tr>
<td>KRS Chapter 146</td>
<td>Environmental and Public Protection Cabinet</td>
<td></td>
</tr>
<tr>
<td>KRS Chapter 150.183, 990 (1978)</td>
<td>Importing, Transporting or Possessing Endangered Species of Wildlife</td>
<td>Unlawful to import, transport, possess or sell any endangered species of wildlife, or any article made in whole or in part from a species of wildlife designated as an endangered.</td>
</tr>
<tr>
<td>302 KAR Chapter 27</td>
<td>Kentucky Dept. of Agriculture</td>
<td>Applies to agricultural animal and plant pest control and forest pest control.</td>
</tr>
</tbody>
</table>

APPENDIX D
KENTUCKY CREP
AGENCY CORRESPONDENCE
Pursuant to §1501.7 of the Council on Environmental Quality regulations (40 CFR 1501.7), a scoping process was conducted to gather information in preparing the PEA for the Kentucky Green River CREP. Correspondence received during this process is included in its entirety in this appendix and summarized in section 2.2, Chapter 2.

1. Leah MacSwords, State Forester, Kentucky Division of Forestry, Environmental and Public Protection Cabinet
2. William J. Byron, Water Management Team Leader, U.S. Army Corps of Engineers
4. David L. Morgan, Chief, Kentucky Heritage Council and State Historic Preservation Officer, Commerce Cabinet
5. Virgil Lee Andrews, Jr., Field Supervisor, U.S. Fish and Wildlife Service
Dear Joyce:

RE: USDA Commodity Credit Corporation/Farm Service Agency Notice of Intent to Prepare a Programmatic Environmental Assessment (PEA) for the Kentucky Conservation Reserve Enhancement Program (CREP) and Request for Preliminary Scoping Comments

The Kentucky Division of Forestry supports expanding the Conservation Reserve Enhancement Program (CREP), to include the additionally proposed counties containing the Green River watershed to restore riparian areas and decrease non-point source water pollution. Although we fully support the proposal we also recognize the following potential impacts to our agency:

- The proposed land area expansion eligible for enrollment will negatively impact the Division of Forestry by challenging our ability to maintain other stewardship program services with limited personnel. We may need to seek additional funding, perhaps through an EPA 319(h) grant, to support the CREP assistance.

- Meeting the increased demand of tree seedlings for restoring the riparian areas within the 99,500 acre project area is a concern. Pre-planning for the increased demand to support the program will be vital to ensure that we can meet the demand from our two tree nurseries. We would need as much notice as possible.

- The demand for the Division of Forestry’s tree planting machines are currently at the maximum, thus more machines will be needed to cover the additional demand. Under our current budget as well as the recently passed budget for the next biennium, our ability to purchase new planters has been greatly reduced.

- The increase in establishing warm season grasses in riparian areas may also increase the wildland fire risk. We would certainly prefer more trees planted in the riparian areas to create permanent buffers, which we believe would be more beneficial to water quality.

- In the proposal it is stated that all fourth order and higher streams within the CREP area will have a maximum of 1,000-foot buffer widths. This appears to be excessive when comparing streamside management zone (SMZ), width requirements in the southeastern United States. (Please note the table below.)

(Harvesting in the Stream Side Management Zone: A Study of Soil Disturbance and Canopy Cover Changes; Thesis by Christine Lamb Hodges of Virginia Polytechnic Institute and State University, February 18, 2005)
<table>
<thead>
<tr>
<th>State</th>
<th>Perennial (All widths ft)</th>
<th>Intermittent (0-20 ft)</th>
<th>Cold Water Fisheries* (ft)</th>
<th>Wetlands (ft)</th>
<th>Municipal Waters (ft)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Alabama</td>
<td>35</td>
<td>35</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Arkansas</td>
<td>35-80sc</td>
<td>35-80sc</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Florida</td>
<td>35</td>
<td>75-300sc</td>
<td>35-300sc</td>
<td>50</td>
<td>200</td>
</tr>
<tr>
<td>Georgia</td>
<td>40-100sc</td>
<td>25-50sc</td>
<td>100</td>
<td>50-150</td>
<td></td>
</tr>
<tr>
<td>Kentucky</td>
<td>25-55sc</td>
<td>0</td>
<td>60</td>
<td>50</td>
<td></td>
</tr>
<tr>
<td>Louisiana</td>
<td>50</td>
<td>100</td>
<td>35</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Mississippi</td>
<td>30-60sc</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>No. Carolina</td>
<td>50</td>
<td>50</td>
<td>50-125sc</td>
<td></td>
<td></td>
</tr>
<tr>
<td>So. Carolina</td>
<td>40-160sc</td>
<td>40-160sc</td>
<td>40-200sc</td>
<td></td>
<td></td>
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<tr>
<td>Tennessee</td>
<td>25-145sc</td>
<td>25-145sc</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Virginia</td>
<td>50</td>
<td>50</td>
<td>60-120sc</td>
<td>50</td>
<td>100-200sc</td>
</tr>
</tbody>
</table>

sc=slope class dependent

The table shows that for municipal waters the maximum SMZ is 200 feet dependent upon slope. Most of the Green River watershed has minimal slope gradient especially in the agricultural areas.

Thank you for allowing the division to comment on the proposal.

**Leah W. MacSwords**

**Director/State Forester**

Kentucky Division of Forestry  
627 Comanche Trail  
Frankfort, KY 40601  
ph: 502-564-4496, 800-866-0555  
fax: 502-564-6553
I am sending you these comments based on a letter I received from Jeff Hall dated 27 March 2006 regarding the subject matter.

We have no issues or concerns regarding the CREP program along the Green River below the Green River Lake. So far, the CREP program has benefited our lake operations at Green River Lake by allowing our project to make releases as it was designed. Prior to the CREP program and other environmental enhancements by the Nature Conservancy, encroachments had occurred along the river corridor that inhibited our discharge capabilities from the lake.

There are similar encroachments below our Barren River Lake in Warren County that inhibit our outflow capabilities and farther downstream near the mouth of the Mud River which I believe is outside your considered area.

Good luck in your program. If you need any other information regarding our flood control projects, feel free to call me.

Bill Byron
Water Management Team Leader
CELRL-ED-TH
(502) 315-5390
April 19, 2006

Joyce Hobbs  
State Environmental Coordinator  
Kentucky State FSA Office  
771 Corporate Drive, Ste 100  
Lexington, KY 40503-5478

Dear Ms. Hobbs,

I have reviewed information provided in your agency’s letter of March 27, 2006, regarding proposed expansion of CREP in the upper Green River basin. Goals of Kentucky CREP are complimentary of the Corps of Engineers Environmental Operating Principles, especially as regards environmental sustainability.

In December 2002, Louisville District began a three-year experiment using a revised operating guide curve for Green River Lake, a Corps reservoir just upstream of the original CREP. This project was done in partnership with The Nature Conservancy. A critical factor in success of this effort was early enrollment of lowest lying properties. This eliminated many problems that the District had experienced over 32 years of lake operations with discharges impacting downstream landowners. This operating guide curve is contributing to improvements in the downstream aquatic ecosystem, the same resource that CREP is designed to protect and enhance. This joint effort has subsequently led to a national effort, i.e., Sustainable Rivers Project. FSA should recognize benefits of CREP to the Corps efforts to protect the same resources in its programmatic EA.

The Green is rated the fourth most bio-diverse stream in the United States. CREP covers the longest stretch of “exceptional surface water” in Kentucky. Expansion to will assist in protection of additional “exceptional and reference reaches” of surface waters in the area. Further, such expansion will only benefit Corps efforts to operate projects in a more environmentally sustainable manner.

If you have any questions or need of assistance contact me at your convenience.

Sincerely,

/s/

Michael Turner  
Chief, Economics and Environmental Resources  
USACE-CELRL-PM-P-E
April 19, 2006

Ma. Joyce Hobbs
State Environmental Coordinator
Farm Service Agency
United States Department of Agriculture
771 Corporate Drive, Suite 100
Lexington, KY 40503-5478

Dear Ms. Hobbs,

I am writing in response to Jeffrey S. Hall’s letter of March 27, 2006 concerning the USDA’s Conservation Reserve Enhancement Program which is a voluntary program for agricultural landowners. The USDA is preparing a Programmatic Environmental Assessment addressing the alternatives and potential effects of changing the existing Conservation Reserve Enhancement Program in Kentucky. The program would allow the enrollment of up to 99,500 acres of cropland and pastureland along the main stem of the Green River and its tributaries. The expansion will include all or parts of Allen, Barren, Butler, Edmonson, Grayson, Logan, Simpson, and Warren counties. Current counties include Adair, Barren (partial), Edmonson (partial), Green, Hart, Metcalfe, Russell, and Taylor. In order to accomplish the 10 goals of the program, several practices are proposed. These practices include introduced grasses and legumes; native grasses, legumes and forbs; tree planting; hardwood tree planting; permanent wildlife habitat (corridors), non-escape; permanent wildlife habitat, non-escape; grasses waterways, non-escape; shallow water areas for wildlife; vegetative cover-grass, already established; vegetative cover-trees, already established; wildlife food plots; permanent vegetative cover (contour grass strip), non-escape; filter strips; riparian buffers; wetland restoration; rare or declining habitat, and marginal pastureland wildlife habitat buffer.

The Green River and its tributaries have a high density of significant archaeological sites. Some of the proposed practices (tree plantings, shallow water areas, wetland restorations, etc.) have potential for impacting both recorded and unrecorded archaeological sites (both prehistoric and historic). Consequently, archaeological surveys should be conducted of all tracts where ground-disturbing activities are proposed by a professional archaeologist to determine if there are any sites eligible for listing in the National Register of Historic Places which might be affected.

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Draft PEA for Kentucky Green River CREP
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The archaeological reports must be submitted for my review, comment, and approval. Also, if any structures 50 years of age or older are to be affected by this program, the USDA should provide photographs of these buildings that are keyed to maps. Once the photographs have been reviewed, we will advise you of any potential effects to significant buildings from the program.

Should you have any questions, feel free to contact Charles Hockenmiller of my staff at (502) 564-7001!

Sincerely,

[Signature]

David L. Morgan, Director
Kentucky Heritage Council and
State Historic Preservation Officer
United States Department of the Interior
FISH AND WILDLIFE SERVICE
700 12th Street NW
Washington, D.C. 20240

June 28, 2005

Mr. Jeff Hall
USDA Farm Service Agency
771 Corporate Drive
Suite 100
Lexington, Kentucky 40503

Subject: FWS 406-1117, Proposed Expansion and Improvements to the Green River Conservation Reserve Enhancement Program in Kentucky

Dear Mr. Hall:

Our office recently received a letter and supporting information from your office that requested our review and comment on the Farm Service Agency's (FSA) proposal to expand and improve the Green River Conservation Reserve Enhancement Program (CREP) in Kentucky. We have reviewed the information that you provided, and we are fully supportive of FSA's proposal to expand and improve the Green River CREP.

As you know, the Green River watershed is perhaps the most biologically diverse watershed in Kentucky, particularly for aquatic species. This watershed contains at least 10 federally listed species, with 8 of those being aquatic species. As the lead federal agency for the recovery and conservation of these species, the Fish and Wildlife Service is keenly interested in supporting any conservation efforts that would help remove or reduce the threat to these and other species.

We believe the existing Green River CREP does just that. Therefore, we believe an expansion of the program to other locations in the watershed will improve an already successful program by providing added benefits to these species through improved water quality and habitat conditions and reduced sediment loads in streams.

In addition, we are also supportive of the proposed programmatic changes to the Green River CREP that you have proposed. In particular, we believe that the proposals to: (a) include sinkhole protection as a primary objective of the program; (b) increase riparian buffer width; eligibility on many of the larger Green River tributaries within the program area; and (c) provide landowners with "whole field" eligibility under specified circumstances, will prove to be very important aspects of the program. We believe these additions to the program will increase enrollment in the program, provide additional opportunities for leveraging and partnering with new program landowners, and expand the wildlife, water quality, and other benefits the Green River CREP currently provides.

We believe the sinkhole protection proposal is particularly noteworthy. The large area south of the Green River, known as the sinkhole plain, is an important groundwater recharge area for the

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Green River. These sinkholes often feed extensive underground aquifers that are connected, directly or indirectly, to the Green River. As a result, land uses in and around these sinkholes can degrade water quality in the Green River, so it is important that we buffer as many sinkholes as possible in this area to reduce the input of sediments and other contaminants into the groundwater system, and ultimately the Green River.

Also, protection of the sinkholes in this area would improve habitat conditions for the federally endangered Kentucky cave shrimp. This species is endemic to Kentucky and only lives in the underground aquifers associated with Mammoth Cave National Park. Protection of the water quality ensuring these aquifers could help ensure this species' survival.

We also see significant benefits from the other two programmatic improvements to the program: increased buffers on larger Green River tributaries and "whole field" eligibility. These improvements make the program more "landowner friendly" which, in turn, ensures that we will achieve greater conservation benefits from the program. We consider these proposals by FSA to improve the flexibility of the program for landowners to be equally important to the other proposals, because they have already demonstrated themselves to be key decision-making issues for landowners who are deciding whether to enroll in the program or not. With these provisions as part of the program, we believe additional landowners will enroll that would not otherwise enroll.

Again, we are pleased that FSA has proposed to expand and improve the Green River CREP, and we offer our assistance and full support to FSA and FSA's partner agencies in the program.

Thank you for the opportunity to provide comments on this important conservation opportunity. If you have any questions, please call me at (302) 695-0408.

Sincerely,

[Signature]

Virgil Lee Andrews, Jr.
Field Supervisor
February 17, 2006

Jay Nelson
Kentucky Division of Conservation
375 Versailles Road
Frankfort, Kentucky 40601

Dear Mr. Nelson,

We have reviewed the document “Green River Conservation Reserve Enhancement Program, Subproject Amendment: Area Expansion and Programmatic Requests to Enhance Resource Protection and Landowner Participation”. Mammoth Cave National Park has been an active partner in the Green River Conservation Reserve Enhancement Program (CREP) since days of the early draft proposals. Central to the mission of the National Park Service is the conservation and protection of natural resources within our boundaries. Of course, many threats to these resources originate from beyond the park. Water resources can be thought of as a paradigm to external stressors as land use activities far upstream of the park can directly affect the park’s aquatic resources.

We believe that proposed amendments to the Green River CREP detailed in your document will enhance program goals relative to improving water quality to Mammoth Cave National Park. While nearly all the additional land area is downstream of the park, there are two main changes to the program that are of keen interest to us. First, sinkholes; either by inclusion as marginal pastureland or as whole fields, addresses a general land use throughout much of Mammoth Cave’s recharge area. This, if approved, would affect large portions of the Pennyroyal Plateau. Second, the increased stream corridor, from 300 to 1000 feet would seem to benefit wildlife habitat, water quality, and perhaps most importantly, landowner participation.
Mammoth Cave National Park, as the primary recipient of land conservation practices of the Green River CREP fully support your proposal. We anticipate continued cooperation with the Commonwealth, the US Department of Agriculture, and The Nature Conservancy in this next phase of the program. If you have any questions, please contact park Hydrogeologist Joe Meiman at 270-758-2137.

Sincerely,

Sgn/Bruce Powell, Acting

Patrick H. Reed
Superintendent
APPENDIX E
FEDERALLY AND STATE-PROTECTED SPECIES
BY KENTUCKY CREP COUNTY
Federally Protected Species by CREP County

**Adair County**
Gray bat - *Myotis grisescens* (E)
Indiana bat - *Myotis sodalis* (E)

**Barren County**
Gray bat - *Myotis grisescens* (E)
Indiana bat - *Myotis sodalis* (E)
Kentucky cave shrimp - *Palaemonias ganteri* (E)
Fanshell - *Cyprogenia stegaria* (E)
Eggert's sunflower - *Helianthus eggertii* (T)

**Edmonson County**
Gray bat - *Myotis grisescens* (E)
Indiana bat - *Myotis sodalis* (E)(CH)
Bald eagle - *Haliaeetus leucocephalus* (T)
Red-cockaded woodpecker - *Picoides borealis* (E)(h)
Bachman's warbler - *Vermivora bachmanii* (E)(h)
Kentucky cave shrimp - *Palaemonias ganteri* (E)(CH)
Pink mucket pearly mussel - *Lampsilis orbiculata* (E)(h)
Ring pink - *Obovaria retusa* (E)(h)
Rough pigtoe - *Pleurobema plenum* (E)
Fat pocketbook - *Potamilus capax* (E)(h)
Tuberculed-blossom pearly mussel - *Epioblasma torulosa torulosa* (E)(h)
Cracking pearly mussel - *Hemistena lata* (E)(h)
Fanshell - *Cyprogenia stegaria* (E)
Northern riffleshell - *Epioblasma torulosa rangiana* (E)(h)
Clubshell - *Pleurobema clava* (E)
Price's potato bean - *Apios priceana* (T)
Eggert's sunflower - *Helianthus eggertii* (T)(h)

**Green County**
Gray bat - *Myotis grisescens* (E)
Rough pigtoe - *Pleurobema plenum* (E)
Fat pocketbook - *Potamilus capax* (E)(h)
Northern riffleshell - *Epioblasma torulosa rangiana* (E)(h)
Clubshell - *Pleurobema clava* (E)
Tuberculed-blossom pearly mussel - *Epioblasma torulosa torulosa* (E)(h)
Fanshell - *Cyprogenia stegaria* (E)

**Hart County**
Gray bat - *Myotis grisescens* (E)
Indiana bat - *Myotis sodalis* (E)
Kentucky cave shrimp - *Palaemonias ganteri* (E)
Pink mucket pearly mussel - *Lampsilis orbiculata* (E)(h)
Rough pigtoe - *Pleurobema plenum* (E)
Tuberculed-blossom pearly mussel - *Epioblasma torulosa torulosa* (E)(h)
Fat pocketbook - *Potamilus capax* (E)(h)
Cracking pearly mussel - *Hemistena lata* (E)(h)
Ring pink - *Obovaria retusa* (E)
Purple cat's paw pearly mussel - *Epioblasma sulcata sulcata* (E)
Northern riffleshell - *Epioblasma torulosa rangiana* (E)
Clubshell - *Pleurobema clava* (E)
Fanshell - *Cyprogenia stegaria* (E)
Cumberlandian combshell - *Epioblasma brevidens* (E)(h)
Eggert's sunflower - *Helianthus eggertii* (T)
Scaleshell - *Leptodea leptodon* (C)(h)

**Metcalf County**
Gray bat - *Myotis grisescens* (E)
Eggert's sunflower - *Helianthus eggertii* (T)

**Russell County**
Bald eagle - *Haliaeetus leucocephalus* (T)
Red-cockaded woodpecker - *Picoides borealis* (E)(h)
Orange-footed pearly mussel - *Plethobasus cooperianus* (E)(h)
Dromedary pearly mussel - *Dromus dromas* (E)(h)
Yellow-blossom pearly mussel - *Epioblasma florentina florentina* (E)(h)
Cumberland bean pearly mussel - *Villosa trabalis* (E)(h)
Tan riffleshell - *Epioblasma walkeri* (E)(h)
Pink mucket pearly mussel - *Lampsilis orbiculata* (E)
Rough pigtoe - *Pleurobema plenum* (E)
Ring pink - *Obovaria retusa* (E)(h)
Cracking pearly mussel - *Hemistena lata* (E)(h)
Fanshell - *Cyprogenia stegaria* (E)
Cumberlandian combshell - *Epioblasma brevidens* (E)
Oyster mussel - *Epioblasma capsaeformis* (E)(h)
Scaleshell - *Leptodea leptodon* (C)(h)

**Taylor County**
Gray bat - *Myotis grisescens* (E)
Indiana bat - *Myotis sodalis* (E)
Bald eagle - *Haliaeetus leucocephalus* (T)
Rough pigtoe - *Pleurobema plenum* (E)(h)
Fat pocketbook - *Potamilus capax* (E)(h)
Clubshell - *Pleurobema clava* (E)
Tubercled-blossom pearly mussel - *Epioblasma torulosa torulosa* (E)(h)
Northern riffleshell - *Epioblasma torulosa rangiana* (E)(h)
Eggert's sunflower - *Helianthus eggertii* (T)

C=Candidate Species, (h)=Historic (pre-1970), E=Endangered Species, T=Threatened Species
State-Listed Plant Species by CREP County

**Adair County**
- Mountain maple - *Acer spicatum*
- Spreading false foxglove - *Aureolaria patula*
- Svenson's wildrye - *Elymus svenssonii*
- Eggert's sunflower - *Helianthus eggertii*
- Grassleaf mud-plantain - *Heteranthera dubia*
- Round-head bush-clover - *Lespedeza capitata*
- Carolina anglepod - *Matelea carolinensis*
- Large-leaved grass-of-parnassus - *Parnassia grandifolia*
- September elm - *Ulmus serotina*

**Barren County**
- Spreading false foxglove - *Aureolaria patula*
- American chestnut - *Castanea dentata*
- Sharp-scaled manna-grass - *Glyceria acutiflora*
- Plains frostweed - *Helianthemum bicknellii*
- Eggert's sunflower - *Helianthus eggertii*
- Blue mud-plantain - *Heteranthera limosa*
- Round-head bush-clover - *Lespedeza capitata*
- Tall bush-clover - *Lespedeza stuevei*
- Hairy Ludwigia - *Ludwigia hirtella*
- Rough dropseed - *Sporobolus clandestinus*
- Barrens silky aster - *Symphyotrichum pratense*
- Narrowleaved bluecurls - *Trichostema setaceum*
- Buffalo clover - *Trifolium reflexum*

**Edmonson County**
- Spreading false foxglove - *Aureolaria patula*
- Epiphytic sedge - *Carex decomposita*
- French's shooting star - *Dodecatheon fenchii*
- Prairie gentian - *Gentiana puberulenta*
- Plains frostweed - *Helianthemum bicknellii*
- Eggert's sunflower - *Helianthus eggertii*
- Blue mud-plantain - *Heteranthera limosa*
- Western dwarf dandelion - *Krigma occidentalis*
- Tall bush-clover - *Lespedeza stuevei*
- Hairy Ludwigia - *Ludwigia hirtella*
- Crossleaf milkwort - *Polygala cruciata*
- Spotted pondweed - *Potamogeton pulcher*
- Grassleaf arrowhead - *Sagittaria graminea*
- Sessile-fruitied arrowhead - *Sagittaria rigida*
- Fringed nutrush - *Scleria ciliata*
- Barrens silky aster - *Symphyotrichum pratense*
- Buffalo clover - *Trifolium reflexum*
- Wood's bunchflower - *Veratrum woodii*

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Eggleston's violet- *Viola septemloba var. egglestonii*

**Green County**
- Southern maidenhair-fern - *Adiantum capillus-veneris*
- Spreading false foxglove - *Aureolaria patula*
- White walnut - *Juglans cinerea*
- Hairy Ludwigia - *Ludwigia hirtella*
- September elm - *Ulmus serotina*

**Hart County**
- Southern maidenhair-fern - *Adiantum capillus-veneris*
- Spreading false foxglove - *Aureolaria patula*
- Epiphytic sedge - *Carex decomposita*
- Straw sedge - *Carex straminea*
- Small enchanter's nightshade - *Circaea alpina*
- French's shooting star - *Dodecatheon frenchii*
- Prairie gentian - *Gentiana puberulenta*
- Sharp-scaled manna-grass - *Glyceria acutiflora*
- Short's hedgeyssop - *Gratiola viscidula*
- Plains frostweed - *Helianthemum bicknellii*
- Eggert's sunflower - *Helianthus eggertii*
- Slender blazingstar - *Liatris cylindracea*
- Threadfoot - *Podostemum ceratophyllum*
- Pickerel-weed - *Pontederia cordata*
- Spotted Pondweed - *Potamogeton pulcher*
- Tall Beaked-rush - *Rhynchospora macrostachya*
- Royal Catchfly - *Silene regia*
- Tansy Rosinweed - *Silphium pinnatifidum*
- Barrens Silky Aster - *Symphyotrichum pratense*
- Buffalo Clover - *Trifolium reflexum*
- Eggleston's Violet - *Viola septemloba var. egglestonii*

**Metcalf County**
- Eggert's sunflower - *Helianthus eggertii*
- Hairy Ludwigia - *Ludwigia hirtella*
- Carolina anglepod - *Matelea carolinensis*
- Spotted pondweed - *Potamogeton pulcher*
- September elm - *Ulmus serotina*

**Russell County**
- Spreading false foxglove - *Aureolaria patula*
- Spoon-leaved sundew - *Drosera intermedia*
- Mercury spurge - *Euphorbia mercurialina*
- St. Peter's-wort - *Hypericum crux-andreae*
- Round-head bush-clover - *Lespedeza capitata*
- Plains Muhly - *Muhlenbergia cuspidata*
- Canby's mountain-lover - *Paxistima canbyi*
- Crossleaf milkwort - *Polygala cruciata*
- Northern white cedar - *Thuja occidentalis*
- Least trillium - *Trillium pusillum*
- September elm - *Ulmus serotina*
Taylor County
Spreading false foxglove- *Aureolaria patula*
Eggert's sunflower- *Helianthus eggertii*
## Appendix E-State-Listed Plant Species by CREP County

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<td>Trillium pusillum</td>
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Source: Kentucky State Nature Preserves Commission, Rare Plants Database.  
C=Candidate Species  
(h)=Historic (pre-1970)  
E=Endangered Species  
T=Threatened Species
APPENDIX F
LISTING OF NATIONAL REGISTER SITES
AND
NATIONAL HISTORIC LANDMARKS
### National Register of Historic Places Sites, by CREP County, Kentucky

#### Adair County

<table>
<thead>
<tr>
<th>County</th>
<th>Resource Name</th>
<th>Address</th>
<th>City</th>
<th>Listed</th>
<th>Multiple</th>
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<tr>
<td>Adair</td>
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<td>Glens Fork</td>
<td>1978-11-16</td>
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<td>Adair</td>
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<td>111 E. Fortune St.</td>
<td>Columbia</td>
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<td>100 S. High St.</td>
<td>Columbia</td>
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<td>SE of Columbia on KY 55</td>
<td>Columbia</td>
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#### Allen County

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<td>Scottsville</td>
<td>1991-11-07</td>
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<td>3293 and 3109 Big Springs Rd.</td>
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<td>2004-07-12</td>
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<td>Dumont Hill</td>
<td>0.25 mi. N of KY 1386</td>
<td>Scottsville</td>
<td>2003-12-04</td>
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<td>Graves, Dr. Pellie G., House</td>
<td>301 N 4th St.</td>
<td>Scottsville</td>
<td>2001-08-02</td>
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<td>Public Square and extending roughly one block N and S on Court St., and one block E and W on Main</td>
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<td>2001-08-02</td>
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<td>1983-07-20</td>
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<td>Beckton</td>
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<td>Washington and Broadway</td>
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<td>2nd and Caldwell Sts.</td>
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<td>Hart</td>
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<td>KY 218, roughly bet. US 31W and Edwards Ave.,</td>
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<td>Hart</td>
<td>Munford Inn</td>
<td>109 Washington St.</td>
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<td>Auburn Historic District</td>
<td>Roughly, along E. and W. Main, N. Lincoln,</td>
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<td>1994-03-28</td>
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<td>Perkins, Pearl, Caldwell, Wilson, Maple</td>
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<td>and Viers Sts.</td>
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<td>Brodnax--Conn House</td>
<td>3288 Conn Rd.</td>
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<td>Confederate Monument in Russellville</td>
<td>Town Square. Jct. of US 431 and US 68</td>
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<td>1997-07-17</td>
<td>Civil War Monuments of</td>
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<td>Davidson, G. W., House and Bank</td>
<td>Main St.</td>
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<td>1982-10-29</td>
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<td>Logan</td>
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<td>Cornelius Ave.</td>
<td>Russellville</td>
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<td>Longview Farm House</td>
<td>Bores Rd.</td>
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<td>Logan</td>
<td>McCutchen Meadows</td>
<td>Off U.S. 68</td>
<td>Auburn</td>
<td>1984-11-23</td>
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<tr>
<td>Logan</td>
<td>McGready, Rev. James, House</td>
<td>W of Russellville off U.S. 68</td>
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<td>Lewisburg</td>
<td>1985-11-14</td>
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<td>Logan</td>
<td>Pleasant Run Methodist Church</td>
<td>SE of Russellville on KY 663</td>
<td>Russellville</td>
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<td>Logan</td>
<td>Red River Presbyterian Meetinghouse Site and</td>
<td>NE of Adairville off KY 663</td>
<td>Adairville</td>
<td>1976-06-18</td>
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<td>190 S. Winter St.</td>
<td>Russellville</td>
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<td>Logan</td>
<td>Savage Cave Archeological Site</td>
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<td>Logan</td>
<td>Sawyer, David, House</td>
<td>Off KY 103</td>
<td>Chandler's Chapel</td>
<td>1987-01-08</td>
<td>Early Stone Buildings of Kentucky Outer Bluegrass and Pennyrile TR</td>
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<tr>
<td>Logan</td>
<td>South Union Shaker Center House and Preservatory</td>
<td>U.S. 68</td>
<td>South Union</td>
<td>1974-06-28</td>
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<td>Logan</td>
<td>South Union Shakertown Historic District</td>
<td>KY 73 at Louisville and Nashville RR tracks, and jct. of U.S. 68</td>
<td>South Union and vicinity</td>
<td>1975-04-03</td>
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**Metcalfe County**

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<tr>
<td>Metcalfe</td>
<td>Metcalfe County Jail</td>
<td>Corner of East</td>
<td>Edmonston</td>
<td>2004-08-04</td>
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<td>Metcalfe County Kentucky Courthouse</td>
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<td>Edmonston</td>
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### Russell County

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<tr>
<td>Russell</td>
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<td>Jamestown</td>
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### Simpson County

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<tr>
<td>Simpson</td>
<td>Cedars, The</td>
<td>812 E. Cedar St.</td>
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<td>Simpson</td>
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<td>200 S. Main and 207 S. College Sts.</td>
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<td>Goodnight House</td>
<td>201 S. Main St.</td>
<td>Franklin</td>
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<td>Hampton Hall</td>
<td>6240 Bowling Green Rd.</td>
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<td>Roughly bounded by Walker Ave., Bell St., W. Washington St. and West St.</td>
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<td>SE of Franklin on KY 31W</td>
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<td>Simpson</td>
<td>Sinking Creek Cave System</td>
<td>Address Restricted</td>
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<td>5945 Bowling Green Rd.</td>
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<td>W. Cedar St., N and S sides, between N. High and West Sts.</td>
<td>Franklin</td>
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### Taylor County

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<tr>
<td>Taylor</td>
<td>Battle of Tebb's Bend Monument</td>
<td>Romine Loop Rd. 0.5 mi. N of jct. of Romine Loop Rd. and KY 55</td>
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<td>1997-07-17</td>
<td>Civil War Monuments of Kentucky MPS</td>
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<tr>
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<td>Campbellsville Historic Commercial District</td>
<td>Roughly bounded by Columbia Ave., Broadway, 1st, Hotchkiss Sts., Central Ave. (both sides), and RR tracks</td>
<td>Campbellsville</td>
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<td>Campbellsville</td>
<td>1987-01-08</td>
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<td>Taylor</td>
<td>Clay Hill</td>
<td>5 mi. N of Campbellsville on KY 55</td>
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<td>Smiths Grove</td>
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<td>Fort Lytle</td>
<td>Western Kentucky</td>
<td>Bowling Green</td>
<td>1984-12-05</td>
<td>Warren County MRA</td>
</tr>
<tr>
<td>Warren</td>
<td>Fort Webb</td>
<td>Country Club Dr.</td>
<td>Bowling Green</td>
<td>1984-12-05</td>
<td>Warren County MRA</td>
</tr>
<tr>
<td>Warren</td>
<td>Gossom, William, House</td>
<td>SR 31W</td>
<td>Plum Springs</td>
<td>1979-12-18</td>
<td>Warren County MRA</td>
</tr>
<tr>
<td>Warren</td>
<td>Grider House</td>
<td>1320 Park St.</td>
<td>Bowling Green</td>
<td>1979-12-18</td>
<td>Warren County MRA</td>
</tr>
<tr>
<td>Warren</td>
<td>Grider, Tobias, House</td>
<td>864A Fairview Ave.</td>
<td>Bowling Green</td>
<td>1979-12-18</td>
<td>Warren County MRA</td>
</tr>
<tr>
<td>Warren</td>
<td>Hall House</td>
<td>104 W. Main St.</td>
<td>Bowling Green</td>
<td>1979-12-18</td>
<td>Warren County MRA</td>
</tr>
<tr>
<td>Warren</td>
<td>Hays, James, House</td>
<td>US 68 and SR 259</td>
<td>Hays</td>
<td>1979-12-18</td>
<td>Warren County MRA</td>
</tr>
<tr>
<td>Warren</td>
<td>Health Buildings-Gymnasium</td>
<td>Normal Dr., Western</td>
<td>Bowling Green</td>
<td>1979-12-18</td>
<td>Warren County MRA; Davis, Brinton B., Buildings on the Western Kentucky University</td>
</tr>
<tr>
<td>Warren</td>
<td>Heating Plant</td>
<td>Dogwood Dr., Western</td>
<td>Bowling Green</td>
<td>1979-12-18</td>
<td>Warren County MRA</td>
</tr>
<tr>
<td>County</td>
<td>Resource Name</td>
<td>Address</td>
<td>City</td>
<td>Listed</td>
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<tr>
<td>Warren</td>
<td>Hines House</td>
<td>1103 Adams St.</td>
<td>Bowling Green</td>
<td>1979-12-18</td>
<td>Warren County MRA</td>
</tr>
<tr>
<td>Warren</td>
<td>Home Economics Building</td>
<td>State St., Western Kentucky University campus</td>
<td>Bowling Green</td>
<td>1979-12-18</td>
<td>Warren County MRA; Davis, Brinton B., Buildings at Western Kentucky University campus TR</td>
</tr>
<tr>
<td>Warren</td>
<td>Oakland--Freeport Historic District</td>
<td>Vine, Young, Lee, Mills, Rasdall,Church,Main,Oakland,Kelly, Burnett, Oakland-Smiths Grove, Cooke, Grimes and Mansfield St</td>
<td>Oakland</td>
<td>2004-08-02</td>
<td></td>
</tr>
<tr>
<td>Warren</td>
<td>Magnolia Street Historic District</td>
<td>Magnolia St. between Broadway and Tenth St.</td>
<td>Bowling Green</td>
<td>1989-11-16</td>
<td></td>
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<tr>
<td>Warren</td>
<td>Merritt-Hardin House</td>
<td>SR 31W</td>
<td>Bowling Green</td>
<td>1979-12-18</td>
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<td>Warren</td>
<td>Middleton, Jesse, House</td>
<td>Tuckertown Rd.</td>
<td>Oakland</td>
<td>1979-12-18</td>
<td>Warren County MRA</td>
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<tr>
<td>Warren</td>
<td>Moore, Maria, House</td>
<td>801 State St.</td>
<td>Bowling Green</td>
<td>1972-06-20</td>
<td>Warren County MRA (AD)</td>
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<tr>
<td>Warren</td>
<td>Mount Olivet Cumberland Presbyterian Church</td>
<td>SR 526</td>
<td>Bowling Green</td>
<td>1979-12-18</td>
<td>Warren County MRA</td>
</tr>
<tr>
<td>Warren</td>
<td>Murrell, Samuel, House</td>
<td>8 mi. NE of Bowling Green on U.S. 31W</td>
<td>Bowling Green</td>
<td>1976-03-26</td>
<td>Warren County MRA (AD)</td>
</tr>
<tr>
<td>Warren</td>
<td>Newton-Kemp Houses</td>
<td>804--806 Chestnut St.</td>
<td>Bowling Green</td>
<td>1979-12-18</td>
<td>Warren County MRA</td>
</tr>
<tr>
<td>Warren</td>
<td>Nine Hearths</td>
<td>1244 Park St.</td>
<td>Bowling Green</td>
<td>1979-12-18</td>
<td>Warren County MRA</td>
</tr>
<tr>
<td>Warren</td>
<td>Old Log Church</td>
<td>W of Riverside</td>
<td>Riverside</td>
<td>1979-12-18</td>
<td>Warren County MRA</td>
</tr>
<tr>
<td>County</td>
<td>Resource Name</td>
<td>Address</td>
<td>City</td>
<td>Listed</td>
<td>Multiple</td>
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<tr>
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<tr>
<td>Warren</td>
<td>Perry, William F., Monument</td>
<td>Fairview Cemetery. N of jct. of KY 234 and Collette Lane</td>
<td>Bowling Green</td>
<td>1997-07-17</td>
<td>Civil War Monuments of Kentucky MPS</td>
</tr>
<tr>
<td>Warren</td>
<td>Pioneer Log Cabin</td>
<td>Kentucky St., near jct. with University Dr.</td>
<td>Bowling Green</td>
<td>2004-08-04</td>
<td></td>
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<tr>
<td>Warren</td>
<td>Polk House</td>
<td>Ring Rd.</td>
<td>Woodburn</td>
<td>1979-12-18</td>
<td>Warren County MRA</td>
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<tr>
<td>Warren</td>
<td>President's Home</td>
<td>State St., Western Kentucky University campus</td>
<td>Bowling Green</td>
<td>1979-12-18</td>
<td>Warren County MRA; Davis, Brinton B., Buildings on the Western Kentucky University campus TR</td>
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<tr>
<td>Warren</td>
<td>Richardsville Road Bridge</td>
<td>Spans Barren River</td>
<td>Bowling Green</td>
<td>1980-11-26</td>
<td>Warren County MRA</td>
</tr>
<tr>
<td>Warren</td>
<td>Riverview</td>
<td>Hobson Grove Park at end of Main St.</td>
<td>Bowling Green</td>
<td>1972-02-23</td>
<td>Warren County MRA</td>
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<tr>
<td>Warren</td>
<td>Robb, Dr. William, House</td>
<td>Market St.</td>
<td>Woodburn</td>
<td>1979-12-18</td>
<td>Warren County MRA</td>
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<tr>
<td>Warren</td>
<td>Seeley, Edward B., House</td>
<td>Beech Bend Rd.</td>
<td>Plum Springs</td>
<td>1979-12-18</td>
<td>Warren County MRA</td>
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<tr>
<td>Warren</td>
<td>Shake Rag Historic District</td>
<td>Roughly bounded by US 31W Bypass, Chestnut St., E. 5ht Ave. and College St.</td>
<td>Bowling Green</td>
<td>2000-08-18</td>
<td></td>
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<tr>
<td>Warren</td>
<td>Shobe, Moses, House</td>
<td>SR 31W</td>
<td>Smiths Grove</td>
<td>1979-12-18</td>
<td>Warren County MRA</td>
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<tr>
<td>Warren</td>
<td>Sloss, John, House</td>
<td>Old Springfield</td>
<td>Bowling Green</td>
<td>1979-12-18</td>
<td>Warren County MRA</td>
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<tr>
<td>Warren</td>
<td>Smiths Grove Baptist Church</td>
<td>Main and 5th Sts.</td>
<td>Smiths Grove</td>
<td>1979-12-18</td>
<td>Warren County MRA</td>
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<td>Warren</td>
<td>Smiths Grove District</td>
<td>1st and Main Sts.</td>
<td>Smiths Grove</td>
<td>1979-12-18</td>
<td>Warren County MRA</td>
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<tr>
<td>Warren</td>
<td>Smiths Grove Historic District</td>
<td>NW corner of Second and Main Sts.</td>
<td>Smiths Grove</td>
<td>1987-05-20</td>
<td>Warren County MRA</td>
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<tr>
<td>Warren</td>
<td>Smiths Grove Presbyterian Church</td>
<td>College and 2nd Sts.</td>
<td>Smiths Grove</td>
<td>1979-12-18</td>
<td>Warren County MRA</td>
</tr>
<tr>
<td>County</td>
<td>Resource Name</td>
<td>Address</td>
<td>City</td>
<td>Listed</td>
<td>Multiple</td>
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<tr>
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<tr>
<td>Warren</td>
<td>Snell, Perry, Hall</td>
<td>State St., Western Kentucky University campus</td>
<td>Bowling Green</td>
<td>1979-12-18</td>
<td>Warren County MRA; Davis, Brinton B., Buildings on the Western Kentucky University campus TR</td>
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<tr>
<td>Warren</td>
<td>St. James Apartments</td>
<td>1133 Chestnut St.</td>
<td>Bowling Green</td>
<td>1984-08-02</td>
<td>Warren County MRA</td>
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<tr>
<td>Warren</td>
<td>St. Joseph Roman Catholic Church</td>
<td>430 Church St.</td>
<td>Bowling Green</td>
<td>1975-07-03</td>
<td></td>
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<tr>
<td>Warren</td>
<td>Stadium</td>
<td>Russellville Rd., Western Kentucky University campus</td>
<td>Bowling Green</td>
<td>1979-12-18</td>
<td>Warren County MRA; Davis, Brinton B., Buildings on the Western Kentucky University campus TR</td>
</tr>
<tr>
<td>Warren</td>
<td>Sterrett House</td>
<td>SR 526</td>
<td>Plum Springs</td>
<td>1979-12-18</td>
<td>Warren County MRA</td>
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<tr>
<td>Warren</td>
<td>Underwood-Jones House</td>
<td>506 State St.</td>
<td>Bowling Green</td>
<td>1978-07-07</td>
<td>Warren County MRA (AD)</td>
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<tr>
<td>Warren</td>
<td>Upper East Main Street District</td>
<td>E. Main and Elm Sts.</td>
<td>Bowling Green</td>
<td>1979-12-18</td>
<td>Warren County MRA</td>
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<tr>
<td>Warren</td>
<td>Van Meter Hall</td>
<td>15th St., Western Kentucky University campus</td>
<td>Bowling Green</td>
<td>1979-12-18</td>
<td>Warren County MRA; Davis, Brinton B., Buildings on the Western Kentucky University campus TR</td>
</tr>
<tr>
<td>Warren</td>
<td>Walnut Lawn</td>
<td>W of Bowling Green on Morgantown Rd.</td>
<td>Bowling Green</td>
<td>1983-10-20</td>
<td>Warren County MRA</td>
</tr>
<tr>
<td>County</td>
<td>Resource Name</td>
<td>Address</td>
<td>City</td>
<td>Listed</td>
<td>Multiple</td>
</tr>
<tr>
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<tr>
<td>Warren</td>
<td>Warlaw, Andrew James, House</td>
<td>Off SR 31W</td>
<td>Oakland</td>
<td>1979-12-18</td>
<td>Warren County MRA</td>
</tr>
<tr>
<td>Warren</td>
<td>Warren County Courthouse</td>
<td>429 E. 10th St.</td>
<td>Bowling Green</td>
<td>1977-08-02</td>
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<tr>
<td>Warren</td>
<td>West Hall</td>
<td>Virginia Garrett Ave., Western Kentucky University campus</td>
<td>Bowling Green</td>
<td>1979-12-18</td>
<td>Warren County MRA; Davis, Brinton B., Buildings on the Western Kentucky University campus TR</td>
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<tr>
<td>Warren</td>
<td>Wilson, Gordon, Hall</td>
<td>15th St., Western Kentucky University campus</td>
<td>Bowling Green</td>
<td>1979-12-18</td>
<td>Warren County MRA; Davis, Brinton B., Buildings on the Western Kentucky University campus TR</td>
</tr>
<tr>
<td>Warren</td>
<td>Wright, J. L., House</td>
<td>1st St.</td>
<td>Smiths Grove</td>
<td>1979-12-18</td>
<td>Warren County MRA</td>
</tr>
<tr>
<td>Warren</td>
<td>Young's Ferry House</td>
<td>Ferry Rd.</td>
<td>Bowling Green</td>
<td>1979-12-18</td>
<td>Warren County MRA</td>
</tr>
</tbody>
</table>

Source: National Park Service, National Register Information System (NRIS).
# Listing of National Historic Landmarks by State

**Kentucky (30)**
- Beard, Daniel C., Boyhood Home - Covington, Kenton County, Kentucky - 06/23/65
- Belle of Louisville (River Steamboat) - Louisville, Jefferson County, Kentucky - 09/30/89
- Burks' Distillery - Marion County, Kentucky - 01/11/90
- Churchill Downs - Louisville, Jefferson County, Kentucky - 10/21/86
- Clay, Henry, Home (Ashland) - Lexington, Fayette County, Kentucky - 12/19/90
- Covington and Cincinnati Suspension Bridge (AJD 9-38) - Covington, Kenton County, Kentucky and Cincinnati, Hamilton County, Ohio - 05/15/75
- Fort Boonesborough - Madison County, Kentucky - 08/19/96
- Green River Shell Middens Archaeological District - Butler, Henderson, McLean, Muhlenberg & Ohio Counties, Kentucky - 05/08/94
- Indian Knoll - Ohio County, Kentucky - 09/23/64
- Jacob's Hall, Kentucky School for the Deaf - Danville, Boyle County, Kentucky - 12/21/86
- Keeneland Race Course - Lexington, Fayette County, Kentucky - 09/24/86
- Labrot & Graham's Old Oscar Pepper Distillery - Versailles, Woodford County, Kentucky - 05/16/00
- Liberty Hall - Frankfort, Franklin County, Kentucky - 11/11/71
- Lincoln Hall, Berea College - Berea, Madison County, Kentucky - 12/07/74
- Locust Grove - Louisville, Jefferson County, Kentucky - 05/23/86
- Louisville Water Company Pumping Station - Louisville, Jefferson County, Kentucky - 11/11/71
- Mayor Andrew Broaddus' Lifesaving Station - Louisville, Jefferson County, Kentucky - 09/30/89
- Middle Creek Battlefield - Prestonsburg, Floyd County, Kentucky - 10/6/92
- Mill Springs Battlefield - 04/19/94
- Old Bank of Louisville - Louisville, Jefferson County, Kentucky - 11/11/71
- Old Morrison, Transylvania College - Lexington, Fayette County, Kentucky - 12/11/85
- Old State House - Frankfort, Franklin County, Kentucky - 11/11/71
- Perryville Battlefield - Boyle County, Kentucky - 12/19/60
- Pine Mountain Settlement School - 12/04/61
- Shaker Town at Pleasant Hill Historic District - Mercer County, Kentucky - 11/11/71
- Taylor, Zachary, House - Louisville, Jefferson County, Kentucky - 07/16/61
- United States Marine Hospital - Louisville, Jefferson County, Kentucky - 09/25/07
- Wendoover (Frontier Nursing Service Headquarters) - Leslie County, Kentucky - 07/17/91
- Young, Whitney M., Birthplace and Boyhood Home - Shelby County, Kentucky - 04/27/84

APPENDIX G
NATIONWIDE RIVERS INVENTORY
BY KENTUCKY CREP COUNTY
<table>
<thead>
<tr>
<th>River</th>
<th>County</th>
<th>Reach</th>
<th>Length (miles)</th>
<th>Year Listed/Updated</th>
<th>ORVs</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cumberland River</td>
<td>Monroe, Cumberland, Clinton, Russell</td>
<td>RM 385, one mile below town of Vernon, to RM 462, US 127 bridge over Wolf Creek Dam</td>
<td>77</td>
<td>1982</td>
<td>S, R, G, F, W</td>
<td>Extensively wooded, high bluffs, remote and rugged; corridor area excellent for canoeing, hiking and camping.</td>
</tr>
<tr>
<td>Green River</td>
<td>Edmonson, Hart, Green</td>
<td>RM 189, Mammoth Cave National Park and Lock No. 6, to RM 290, Greensburg</td>
<td>101</td>
<td>1982</td>
<td>S, R, G, F, W, H, C</td>
<td>Designated Kentucky Wild River; habitat for numerous rare or endangered species; abundance and variety of wildlife; most productive muskellunge fishery in</td>
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<td>-------------------</td>
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<td>----------------------------------------------------</td>
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</tr>
<tr>
<td>Nolin River</td>
<td>Edmonson</td>
<td>RM 0, confluence with Green River, to RM 8, Nolin River Dam</td>
<td>8</td>
<td>1982</td>
<td>S, R, G, F, W</td>
<td>Flows through attractive forested shoreline and backcountry woodlands of Mammoth Cave National Park; especially scenic with high exposed bluffs; plentiful and diverse wildlife.</td>
</tr>
<tr>
<td>Nolin River</td>
<td>Edmonson</td>
<td>RM 0, confluence with Green River, to RM 8, Nolin River Dam</td>
<td>8</td>
<td>1982</td>
<td>S, R, G, F, W</td>
<td>Flows through attractive forested shoreline and backcountry woodlands of Mammoth Cave National Park; especially scenic with high exposed bluffs; plentiful and diverse wildlife.</td>
</tr>
<tr>
<td>Nolin River</td>
<td>Edmonson</td>
<td>RM 0, confluence with Green River, to RM 8, Nolin River Dam</td>
<td>8</td>
<td>1982</td>
<td>S, R, G, F, W</td>
<td>Flows through attractive forested shoreline and backcountry woodlands of Mammoth Cave National Park; especially scenic with high exposed bluffs; plentiful and diverse wildlife.</td>
</tr>
</tbody>
</table>

ORV=Outstandingly Remarkable Value; C=Cultural; F=Fish; G=Geology; H=History; R=Recreation; S=Scenery; W=Wildlife
APPENDIX H
KENTUCKY HISTORIC, PARK AND RECREATION AREAS
<table>
<thead>
<tr>
<th>Historic/Recreation Areas</th>
<th>State</th>
<th>Managing Authority</th>
</tr>
</thead>
<tbody>
<tr>
<td>Abraham Lincoln Birthplace National Historic Site</td>
<td>KY</td>
<td>National Park Service</td>
</tr>
<tr>
<td>Barren River Lake</td>
<td>KY</td>
<td>US Army Corps of Engineers</td>
</tr>
<tr>
<td>Buckhorn Lake</td>
<td>KY</td>
<td>US Army Corps of Engineers</td>
</tr>
<tr>
<td>Capt Anthony Meldahl Locks And Dam</td>
<td>OH/KY</td>
<td>US Army Corps of Engineers</td>
</tr>
<tr>
<td>Carr Creek Lake</td>
<td>KY</td>
<td>US Army Corps of Engineers</td>
</tr>
<tr>
<td>Cave Run Lake</td>
<td>KY</td>
<td>US Army Corps of Engineers</td>
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<tr>
<td>Clarks River National Wildlife Refuge</td>
<td>KY</td>
<td>Fish and Wildlife Service</td>
</tr>
<tr>
<td>Cumberland Gap National Historical Park</td>
<td>KY</td>
<td>National Park Service</td>
</tr>
<tr>
<td>Daniel Boone National Forest</td>
<td>KY</td>
<td>USDA Forest Service</td>
</tr>
<tr>
<td>Dewey Lake</td>
<td>KY</td>
<td>US Army Corps of Engineers</td>
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<tr>
<td>Fishtrap Lake</td>
<td>KY</td>
<td>US Army Corps of Engineers</td>
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<tr>
<td>Fishtrap Lake</td>
<td>KY</td>
<td>US Army Corps of Engineers</td>
</tr>
<tr>
<td>Grayson Lake</td>
<td>KY</td>
<td>US Army Corps of Engineers</td>
</tr>
<tr>
<td>Green River +2 Locks</td>
<td>KY</td>
<td>US Army Corps of Engineers</td>
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<tr>
<td>Green River Lake</td>
<td>KY</td>
<td>US Army Corps of Engineers</td>
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<tr>
<td>Greenup Locks And Dam &lt;Ohio River&gt;</td>
<td>KY</td>
<td>US Army Corps of Engineers</td>
</tr>
<tr>
<td>Greenup Locks And Dam</td>
<td>KY, OH</td>
<td>US Army Corps of Engineers</td>
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<tr>
<td>Headley-Whitney Museum</td>
<td>KY</td>
<td>Smithsonian Institution Affiliations Program</td>
</tr>
<tr>
<td>Kentucky River +4 Locks</td>
<td>KY</td>
<td>US Army Corps of Engineers</td>
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<tr>
<td>Lake Barkley</td>
<td>KY</td>
<td>US Army Corps of Engineers</td>
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<tr>
<td>Laurel River Lake</td>
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<td>US Army Corps of Engineers</td>
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<tr>
<td>Mammoth Cave National Park</td>
<td>KY</td>
<td>National Park Service</td>
</tr>
<tr>
<td>Markland Lock and Dam +Ohio River</td>
<td>KY</td>
<td>US Army Corps of Engineers</td>
</tr>
<tr>
<td>Martins Fork Lake</td>
<td>KY</td>
<td>US Army Corps of Engineers</td>
</tr>
<tr>
<td>McAlpine Lock And Dam +Ohio River</td>
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<tr>
<td>Nolin River Lake</td>
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<td>Paintsville Lake</td>
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<td>Rough River Lake</td>
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<td>US Army Corps of Engineers</td>
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<td>Taylorsville Lake</td>
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<td>Wolf Creek Dam Lake Cumberland</td>
<td>KY</td>
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<td>Wolf Creek National Fish Hatchery</td>
<td>KY</td>
<td>Fish and Wildlife Service</td>
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<tr>
<td>Yatesville Lake</td>
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</table>

Source: [http://www.recreation.gov/advancedsearch.cfm?StartRow=1&UnitName=&States=KY](http://www.recreation.gov/advancedsearch.cfm?StartRow=1&UnitName=&States=KY)
APPENDIX I
KENTUCKY EXOTIC AND INVASIVE SPECIES
<table>
<thead>
<tr>
<th>Name</th>
<th>Type</th>
<th>Origin</th>
<th>Extent</th>
<th>Damage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Zebra mussel</td>
<td>Mollusk</td>
<td>Caspian Sea region of Asia; accidentally released into Lake St. Clair in 1988 in ship ballast water</td>
<td>Kentucky River and throughout length of Ohio River</td>
<td>Voracious filter feeders; out-compete native animals; fouls boats &amp; clogs intake pipes at power plants and municipal water sources</td>
</tr>
<tr>
<td>Chestnut blight</td>
<td>Fungus</td>
<td>China; probably introduced on nursery stock in the 1890s. It was first detected in New York city in 1904.</td>
<td>By 1926, the disease had devastated chestnuts from Maine to Alabama</td>
<td>Chestnut once comprised one-fourth to one-half of eastern U.S. forests, and was prized for its durable wood, and as a food for humans, livestock and wildlife. Today, only stump-sprouts from killed trees remain.</td>
</tr>
<tr>
<td>Dutch elm disease</td>
<td>Fungus</td>
<td>Asia; one strain of the disease arrived in the 1930s in Cleveland, OH on infected elm logs from Europe; a more virulent strain arrived in 1940s</td>
<td>American elm originally ranged in all states east of Rockies - most of this area is infested</td>
<td>Elms were once the nation’s most popular urban street tree, have now largely disappeared from both urban and forested landscapes. It is estimated that “Dutch” elm disease has killed over 100 million trees.</td>
</tr>
<tr>
<td>West Nile virus</td>
<td>Virus</td>
<td>Uganda; first reported in NY and CT in 1999</td>
<td>Documented in 85 of Kentucky’s 120 counties</td>
<td>Disease has affected several hundred horses in Kentucky and killed over 150.</td>
</tr>
<tr>
<td>Multiflora rose</td>
<td>Plant</td>
<td>Japan &amp; China; promoted in 1900s as a “living fence”</td>
<td>Found in 37 counties in Kentucky</td>
<td>Forms dense thickets that crowd out native species, also a weed in crop and pasture lands</td>
</tr>
<tr>
<td>Canada thistle</td>
<td>Plant</td>
<td>Despite the name, Canada thistle is native to Eurasia</td>
<td>Found in 17 counties in Kentucky</td>
<td>Aggressive and highly competitive, competes with crops and forage plants</td>
</tr>
<tr>
<td>Purple loosestrife</td>
<td>Wetland plant</td>
<td>Europe and Asia; introduced in 1800s as ornamental and medicinal plant in 1800s</td>
<td>Discovered in KY in 2002, now in 21 counties</td>
<td>Displaces native wetland plants; has less food and habitat value for waterfowl and other wildlife</td>
</tr>
</tbody>
</table>