Programmatic Environmental Assessment

Indiana Conservation Reserve Enhancement Program (CREP)

Farm Service Agency
United States Department of Agriculture

September 2004

Cover Sheet

Mandated Action:

The United States Department of Agriculture, Commodity Credit Corporation (USDA/CCC) and the State of Indiana have agreed to implement the Indiana Conservation Reserve Enhancement Program (CREP), a component of the national Conservation Reserve Program (CRP).

The Farm Service Agency (FSA) of the USDA proposes to authorize a CREP agreement in the State of Indiana covering the counties of Benton, Boone, Carroll, Cass, Delaware, Fulton, Gibson, Hamilton, Hancock, Henry, Jasper, Kosciusko, Madison, Marion, Marshall, Miami, Noble, Pike, Posey, Pulaski, Randolph, Starke, Tippecanoe, Tipton, Vanderburgh, Warrick, White, and Whitley.

USDA is provided the statutory authority by the provisions of the Food Security Act of 1985, as amended (16 U.S.C. 3830 et seq.), and the regulations at 7 CFR 1410. In accordance with the 1985 Act, USDA/CCC is authorized to enroll lands through December 31, 2007.

The State of Indiana, through the Indiana Department of Natural Resources (IDNR), is authorized to enter into this Agreement pursuant to Indiana Code (IC) 14-11-1-1. Additional support for the State's entry into this Agreement is provided under IC 14-11-1-2.

The Nature Conservancy (TNC) and Ducks Unlimited, Inc. shall be authorized to perform some of the obligations in this CREP. These groups are provided the authority through this Agreement.

CREP is a voluntary program for State agricultural landowners.

Type of Document: Programmatic Environmental Assessment

Lead Agency: United States Department of Agriculture, Farm Service Agency

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Comments: This Environmental Assessment was prepared in accordance with USDA FSA National Environmental Policy Act Implementation Procedures found in 7 CFR 799.4, Subpart G, as well as the National Environmental Policy Act of 1969, Public Law 91-190, 42 U.S.C. 4321-4347, 1 January 1970, as amended. Once this document is finalized a Notice of Availability will be printed in the Federal Register. Following the Notice of Availability FSA will provide a public comment period prior to any FSA decision.

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1.0 Purpose of and Need for Action

1.1 Introduction

1.1.1 Conservation Reserve Enhancement Program Overview

The U.S. Department of Agriculture (USDA) /Commodity Credit Corporation (CCC) and the State of Indiana propose to implement the Indiana Conservation Reserve Enhancement Program (CREP), administered by the USDA's Farm Service Agency (FSA). The CREP enrollment period will run from the signing of the agreement in 2004 through 2007.

CREP is a component of USDA's Conservation Reserve Program (CRP) that targets the specific environmental needs of each State. CRP was established under subtitle D of the Food Security Act of 1985. The purpose of CRP is to cost-effectively assist owners and operators in conserving and improving soil, water, and wildlife resources on their farms and ranches. Highly erodible land (HEL) and other environmentally sensitive acreage, normally devoted to the production of agricultural commodities, are converted to a long term resource conservation cover. CRP participants enter into contracts for periods of 10 to 15 years in exchange for annual rental payments and cost-share assistance for installing certain conservation practices (CPs).

The initial goal of CRP was to reduce soil erosion on highly erodible cropland. Subsequent amendments of the CRP regulations have made certain cropland and pastureland eligible for CRP based on its benefits to water quality and wildlife habitat. The environmental impact of this program shift was studied in the 1996 Environmental Assessment for Selected Amendments of the Conservation Reserve Program. The Farm Security and Rural Investment Act of 2002 authorized CRP through 2007 and raised the overall enrollment cap to 39.2 million acres.

In 1997, the Secretary of Agriculture initiated CREP as a joint Federal-State partnership that provides agricultural producers with financial incentives to install USDA-approved CPs. CREP is authorized pursuant to the 1996 Federal Agriculture Improvement and Reform Act. CREP agreements are done as partnerships between USDA, State and/or tribal governments, other Federal and State agencies, environmental groups, wildlife groups, and other non-government organizations (NGOs). This voluntary program uses financial incentives to encourage farmers and ranchers to enroll in contracts of 10 to 15 years in duration to remove lands from agricultural production. Through CREP, farmers can receive annual rental payments and cost-share assistance to establish long term, resource conserving covers on eligible land. The two primary objectives of CREP are to:

- Coordinate Federal and non-Federal resources to address specific conservation objectives of a State (or Tribal) government and the nation in a cost-effective manner.

- Improve water quality, erosion control, and wildlife habitat related to agricultural use in specific geographic areas.

This programmatic environmental assessment (PEA) has been conducted in accordance with the National Environmental Policy Act of 1969 (NEPA), as amended (42 USC 4321–4347); the NEPA implementing regulations of the Department of Agriculture (7 CFR Part Ib); and the FSA NEPA implementation procedures found in 7 CFR Part 799. This PEA does not address individual site specific impacts.

CRP and CREP are administered by FSA in cooperation with the Natural Resource Conservation Service (NRCS), Cooperative State Research and Education Extension Service, State forestry agencies, and local Soil and Water Conservation Districts (SWCD). FSA is the lead agency developing this PEA.

1.1.2 Purpose of Using an Environmental Assessment to Analyze this Action

FSA's regulations for NEPA are found at 7 CFR Part 799 Farm Programs. These environmental regulations classify the Agency's actions into levels of environmental review such as Categorical Exclusions, Environmental Assessments, and Environmental Impact Statements. National Historic Preservation Act (NHPA) compliance and other cultural resource and environmental considerations are also incorporated into FSA's NEPA process.

FSA is preparing this PEA to address the implementation of the CREP to comply with NEPA, Council on Environmental Quality Regulations (CEQ), and 7 CFR 799.4: Environmental Quality and Related Environmental Concerns—Compliance with the National Environmental Policy Act.

FSA has a framework in place to ensure NEPA compliance at the field level where site specific NEPA evaluations will take place prior to implementing a CREP contract. The review will consist of completing a site specific Environmental Evaluation (EE) that will tier from this PEA and the CRP Programmatic Environmental Impact Statement (PEIS).

A PEA allows FSA to reduce paperwork and identify potential impacts at a State level. From a State level, FSA can then be aware of potential impacts at a site specific level. Regulations promulgated by the CEQ state the following:

Sec. 1500.4 Reducing paperwork:

> (i) Using program, policy, or plan environmental impact statements and tiering from statements of broad scope to those of narrower scope, to eliminate repetitive discussions of the same issues (Secs. 1502.4 and 1502.20).

Sec. 1502.4 Major Federal actions requiring the preparation of environmental impact statements:

> (b) Environmental impact statements may be prepared, and are sometimes required, for broad Federal actions such as the adoption of new agency programs or regulations (Sec. 1508.18). Agencies shall prepare statements on broad actions so that they are relevant to policy and are timed to coincide with meaningful points in agency planning and decision-making.
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> (c) When preparing statements on broad actions (including proposals by more than one agency), agencies may find it useful to evaluate the proposal(s) in one of the following ways:
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> > 1. Geographically, including actions occurring in the same general location, such as body of water, region, or metropolitan area.
> >
> > 2. Generically, including actions which have relevant similarities, such as common timing, impacts, alternatives, methods of implementation, media, or subject matter.
> >
> > 3. By stage of technological development including Federal or Federally assisted research, development or demonstration programs for new technologies which, if applied, could significantly affect the quality of the human environment. Statements shall be prepared on such programs and shall be available before the program has reached a stage

of investment or commitment to implementation likely to determine subsequent development or restrict later alternatives.

FSA plans to use this PEA to address similar actions in the implementation of this program, and to tier from this document and the PEIS that has been prepared for the CRP for site specific implementation of the program whenever NEPA analysis is required.

1.2 Purpose of the Proposed Action

The purpose of the Indiana CREP is to enhance the water quality of three major watersheds in the State by reducing the amount of nutrients, sediments, and chemical runoff from agriculture sources while increasing terrestrial and wetland habitat for wildlife, migrating waterfowl, and aquatic organisms. Implementation of approved CPs is designed to improve the water quality of discharges coming from agricultural land. The three major watershed areas (see Figure 1) that would be included are:

- Highland/Pigeon
- Tippecanoe
- Upper White River

The primary goal of the Indiana CREP agreement is to provide an opportunity, through financial and technical assistance within these targeted watersheds, for eligible producers in Indiana to voluntarily establish riparian buffers, filter strips, grass waterways, hardwood tree plantings, permanent wildlife habitat, wetlands, and other approved CPs that improve the water quality of agricultural nonpoint discharges.

1.2.1 Project would measurably improve water quality and nonpoint source pollution

Atrazine is applied to approximately 90 percent of Indiana's corn crop. In 1999, over 6.6 million pounds of atrazine, 3.8 million pounds of metolachlor, and 2.9 million pounds of acetochlor were applied to Indiana cropland. The selected watersheds typically experience atrazine levels that exceed U.S. Environmental Protection Agency (EPA) Maximum Contaminant Level (MCL) criteria during the months of May through July; however, annual average concentrations do not exceed the MCL (IDNR, 2003b).

Nitrogen is applied in these watersheds as fertilizer to corn and wheat crops. Nitrate-nitrogen (Nitrate-N) is the most common form of nitrogen in Indiana's rivers, streams and groundwater. Nitrate-N in streams originates from a variety of sources. Agricultural sources include nitrogen fertilizer, animal manure, mineralization of soil nitrogen, and nitrogen-fixing crops. Other sources include human waste from sewage treatment plants, septic systems and landfills, and nitrogen produced as a waste or by-product of some industrial processes. Rainfall also contributes some nitrate-N. In a largely agricultural state such as Indiana, agricultural sources predominate. Nitrate-N concentrations are typically higher in more intensively row-cropped watersheds. Excess concentrations in streams may lead to algal blooms and eutrophication, conditions which can affect aquatic life locally as well as downstream. Nitrate-N is also the most common form of nitrogen carried to the Gulf of Mexico by the Mississippi River. An increased delivery of nitrogen and other nutrients by the Mississippi appears to contribute to hypoxic, or low-oxygen, conditions in the Gulf, which in turn affect aquatic life. Nitrate-N is a public concern primarily because of its adverse effects on human health. Nitrate-N concentrations in excess of 10 mg/L in drinking water may cause methemoglobinemia or "blue baby" syndrome in infants, and there are other potential health concerns with nitrate-N in drinking water. Therefore, the EPA has set the MCL for nitrate-N at 10

mg/L. Some aquifers in these watersheds, particularly those associated with sand and gravel substrates, exhibited nitrate-N concentrations exceeding this level (IDNR, 2003b).

CREP CPs would reduce the amount of these agricultural chemicals that migrate to streams in three watersheds.

1.2.2 Project would provide significant restoration of Federally Threatened and Endangered Species

The U.S. Fish and Wildlife Service (FWS) has determined that the entire state of Indiana is within the summer range of the Indiana bat (*Myotis sodalis*), a Federal and State listed endangered species. Woodlands and riparian corridors serve as the primary summer roosting and foraging habitats for *Myotis sodalis*. Due to the intensity of crop production and associated land clearing, woodland and riparian habitat are extremely limited and highly fragmented within these watersheds. Statewide, fewer than 1,300 acres of riparian buffer (CP22) have been enrolled in CRP, even with current incentives. One of the objectives of this proposal would be to enroll 5,000 acres of riparian buffer and 2,500 acres of hardwood tree establishment. In addition, the selected watersheds contain six species of federally endangered mussels that require a high degree of water quality for their existence (IDNR, 2003b).

1.2.3 Project would mitigate adverse agricultural impacts on segments of regional economy (recreation, transportation, fisheries)

Sedimentation and lack of riparian cover are serious problems impacting the fisheries of the selected watersheds. On average, approximately 82.6 percent of the land devoted to corn and 50.6 percent of the land devoted to soybeans in the selected watersheds is eroding in excess of tolerable soil loss (T) (IDNR, 2003b).

1.3 Need for the Proposed Action

The CREP watersheds are located in an area where agriculture is an important element of the regional economy. The three watersheds (see Figure 1 below) are highly agricultural with over 90 percent of all agricultural lands devoted to corn and soybean production. These watersheds fall within the Middle Mississippi or Lower Ohio basins of the Mississippi-Atchafalaya River Basin, which contributes some of the heaviest concentrations of nitrate-N, orthophosphate, and phosphorus (P) discharges to the Gulf of Mexico, significantly impacting the hypoxia crisis. Approximately three million tons of fertilizer is applied to Indiana's agricultural lands each year. The nutrients cause excessive weed and algae growth that can impair recreational uses of the waters. Also located within these watersheds are a substantial number of confined livestock feeding operations that may have inadequate waste storage facilities, waste utilization plans, and acreage for manure distribution (IDNR, 2003b).

Without the implementation of conservation efforts, agricultural activity can generate a significant amount of nonpoint source pollution, impacting water quality and use and impairing and threatening Indiana State rivers, lakes, and reservoirs (EPA, 2000a). Current agricultural practices in Indiana continue to contribute to poor water conditions within the targeted watersheds (Section 1.2). Agricultural runoff may contain high amounts of P, nitrate-N, other nutrients, silt, and pathogens (FSA, 2003).

In addition, many unique natural features are located within the watershed boundaries in the proposed CREP area. According to The Nature Conservancy's (TNC) "Rivers of Life, Critical Watersheds for Protecting Freshwater Biodiversity," the Tippecanoe River is listed as the eighth most important freshwater site in North America for the protection of imperiled aquatic species. Recent studies show that the Tippecanoe River supports 70 species of fish and 55 species of freshwater mussels. Protection of this

watershed is extremely important, not only for preserving current diversity, but for recovering, potentially, several species of endangered mussels. Programs such as CREP, which provide incentives to landowners to develop, enhance, or maintain riparian zones, could help mitigate and restore the degradation of riparian habitat along this and other waterways (IDNR, 2003b).

The selected watersheds also contain:

- Jasper-Pulaski State Fish and Wildlife Area (SFWA)
- Winamac SFWA
- Tri-County SFWA
- Hovey Lake SFWA
- Tippecanoe River State Park
- Wesselman Park Woods and Hemmer Woods (National Natural Landmarks)
- Numerous State Nature Preserves and State Wetland Conservation Areas, all of which are located on major waterways and impacted by agriculturally related nonpoint source pollution. (IDNR, 2003b)

1.4 Objectives of the Indiana CREP

The primary goal of the Indiana CREP is to provide financial and technical assistance to eligible producers within targeted areas of Indiana. This assistance will help to establish permanent native grass, filter strips, riparian buffers, hardwood tree plantings, wildlife habitat, wetland areas, and/or other approved CPs that improve the water quality of agricultural stormwater discharges. The primary objectives of this agreement are to achieve, to the extent practicable, the following:

- **Objective #1:** Protect a minimum of 2,000 linear miles of watercourses through the installation of conservation buffer practices.
- **Objective #2:** Enroll 30 percent of the watersheds' farmed riparian acreage into CREP.
- **Objective #3:** Secure agreements on 26,250 acres of cropland, frequently flooded agricultural lands, and restorable wetlands.
- **Objective #4:** Enroll 2,000 acres of CP3A, CP4D, CP22, and CP23 in ten-year contract extensions with local SWCDs in the Tippecanoe watershed.
- **Objective #5:** Enroll 3,000 acres of CP3A and CP22 in permanent easements in the Tippecanoe watershed.
- **Objective #6:** Complete a minimum of 5,000 CREP agreements and associated Conservation Plans.

Acreage Enrollment Targets:

- 12,000 acres of filter strips
- 6,250 acres of riparian buffers
- 2,500 acres of hard wood tree planting
- 2,500 acres of permanent native grass

- 2,500 acres of permanent wildlife habitat
- 500 acres of wetland restoration

1.5 Area Covered by Indiana CREP

1.5.1 Highland/Pigeon Watershed

The Highland/Pigeon watershed is located in the lower Southwest corner of Indiana and includes the counties of Gibson, Pike, Posey, Vanderburgh, and Warrick. The primary water body in the watershed is Pigeon Creek. The watershed is 335,501 acres in size and contains 661.89 miles of rivers, streams, and tributaries. Land use is predominantly agricultural (61.10 percent). Lands dedicated to agriculture are predominantly cropland (90.07 percent) and pasture (3.69 percent). Corn and soybeans are the major crops grown. A total of 94 confined animal feeding operations occur in the five counties associated with this watershed. Hogs and pigs make up the largest number of domestic animals raised in the watershed. According to a recent study completed by NRCS ("Manure Nutrients Relative to the Capacity of Cropland and Pastureland to Assimilate Nutrients"), Gibson County produces more N and P from manure than can be utilized on cropland (IDNR, 2003b).

The main stem of Pigeon Creek flows 30 miles through Gibson, Warrick, and Vanderburgh counties before emptying into the Ohio River. The landscape changes from moderately steep in the north, to gently rolling terrain in the south. Flooding occurs annually in the bottomland located along the Ohio River. The largest water impoundment in the watershed is Hovey Lake, a natural lake 1,400 acres in size. Evansville is the largest metropolitan area in the watershed, with a population of over 123,000 people (IDNR, 2003b).

The Highland/Pigeon watershed covers a vast landscape of various landforms. The area is underlain with sandstone and shale of the Pennsylvanian age (bedrock formed during the youngest geologic age represented in Indiana – approximately 290-320 million years old). The soils of this watershed are predominantly silt loams, which are very susceptible to erosion. There are approximately 64,300 acres in the watershed considered HEL of which nearly all are eroding above the T level. Fifty percent of this acreage is at twice T or more. On the average, approximately 73.4 percent of the land devoted to corn production and 58.8 percent of the land devoted to soybean production is eroding in excess of T (IDNR, 2003b).

Upland soils are mostly formed from loess over sandstone and shale. The dominant soil types are Hosmer, Zanesville, and Wellston. These soils are mostly used for cropland and, to a lesser extent, pasture and woodland. Parts of Warrick, Vanderburgh, and Posey Counties have large areas of lacustrine, or lake bed terraces--the soils formed in slack water deposits of silts and clays. The dominant soil types are Zipp, Evansville, and McGary. These soils are used mainly for cropland. Posey and Vanderburgh Counties also have areas of river terraces associated with the Ohio River. These areas consist of water deposited loamy and silty material underlain with sand. The dominant soil types are Weinbach, Wheeling, Elkinsville, and Grant. The soils are used mainly as cropland and, to a lesser extent, woodland and urban land. Floodplains in the area are adjacent to either smaller tributaries associated with the uplands or border areas along the Ohio River. The smaller tributaries are dominated by silty alluvium. The main soil types are Stendal, Wakeland, Bonnie, or Birds. The soils along the Ohio River formed mostly from silty non-acid alluvium. The main soil types are Huntington, Nolin, and Newark (IDNR, 2003b).

Average annual precipitation is approximately 43.0 inches. Of this, approximately 23 inches (60 percent) fall between April and September.

The watershed is identified in Indiana Department of Environmental Management's (IDEM) *Unified Watershed Assessment for Indiana* as one of the highest ranked watersheds in need of restoration.

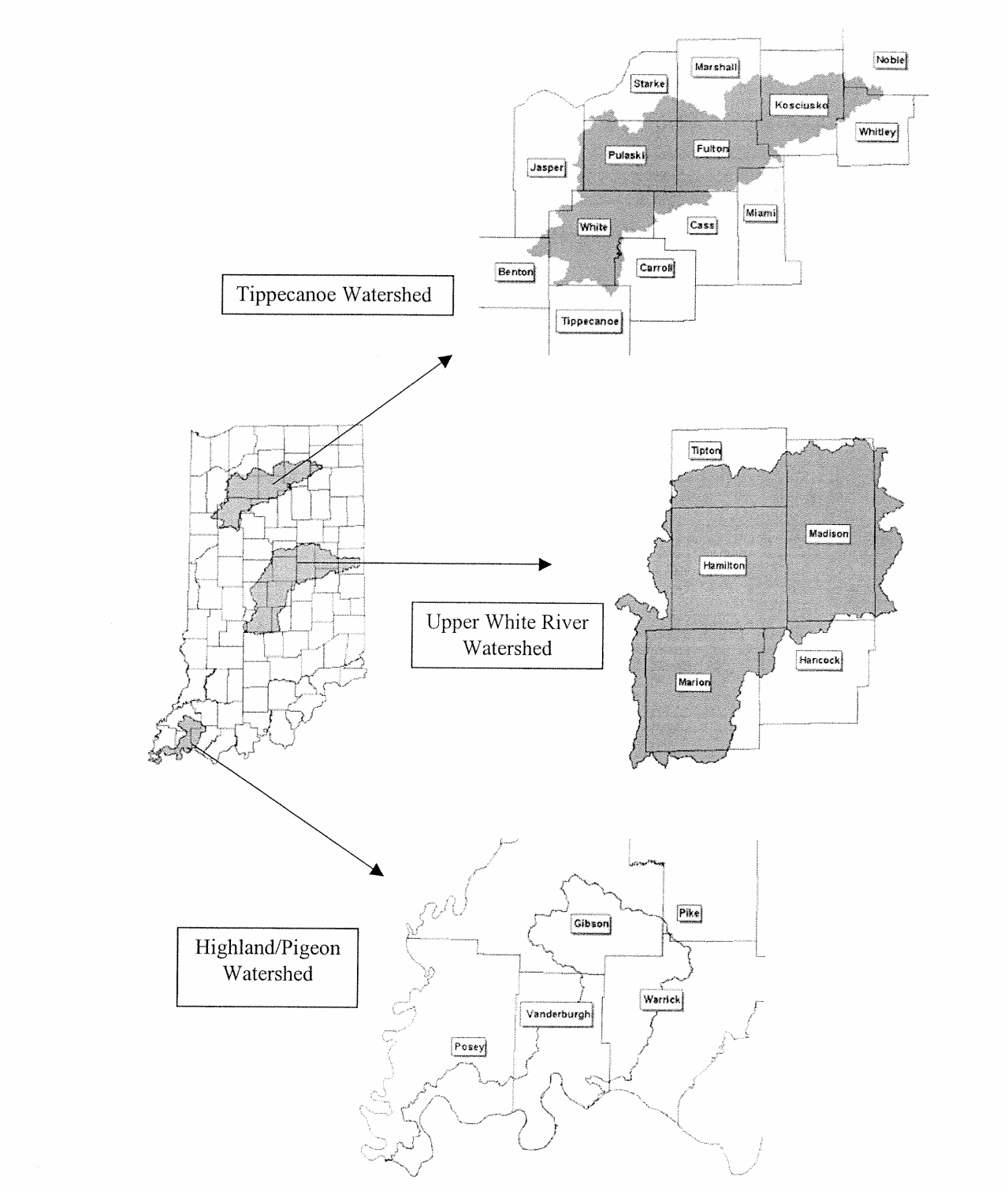

Figure 1. CREP area watersheds.

Sediment is the largest source of nonpoint source pollution in this watershed, resulting in a lack of aquatic species diversity. Water quality analysis revealed supersaturated dissolved oxygen (DO) concentrations, generally high nutrient and suspended solids concentrations, and high fecal coliform bacteria counts. Supersaturated oxygen levels indicate high levels of production (e.g., algal blooms), as stimulated by nutrient loading from the watershed (IDNR, 2003b).

An additional source of nonpoint source pollution reported by IDEM includes chlordane, a pesticide that was used in the U.S. from 1948-1988. It is a persistent, bioacculumative, and toxic pollutant targeted by EPA. Extensive runoff and the lack of riparian buffers are primary concerns in this watershed (IDNR, 2003b).

The Highland/Pigeon watershed is contained within the Four Rivers North American Waterfowl Management Plan project area and is a State Wetlands Reserve Program (WRP) Priority Area. Areas of high ecological importance include Cypress Slough Creek, designated by the Indiana Natural Resources Commission as an "Outstanding River," and Hovey Lake SFWA, which includes several unusual plant species, including bald cypress, pecan, southern red oak, swamp privet, and mistletoe (IDNR, 2003b).

One Federally endangered species exists in the watershed: the Indiana bat (*Myotis sodalis*). In addition, the watershed is host to 14 bird, 6 mammal, 2 reptile, 1 amphibian, and 1 fish species listed as State endangered species (IDNR, 2003b).

1.5.2 Tippecanoe Watershed

The Tippecanoe watershed is located in north central Indiana and includes the counties of Benton, Carroll, Cass, Fulton, Jasper, Kosciusko, Marshall, Miami, Noble, Pulaski, Starke, Tippecanoe, White, and Whitley. The Tippecanoe is a post-glacial stream basin that follows the basic bedrock valley of a pre-glacial river. The Tippecanoe originates in the Indiana Northern Lakes Natural Region in the northeastern part of the state. In this area, the river is characterized by a gravel and cobble substrate that forms long runs and riffles. This area of the river, which encompasses nearly one-third of the river's length, is particularly rich in fish and unionid fauna. Parts of this area are being negatively impacted by sediment from both urban and agricultural areas and other nonpoint sources of pollution (IDNR, 2003b).

As the Tippecanoe enters the Grand Prairie Natural Region, sandy glacial outwash becomes the dominant substrate. At the downstream end of this segment, the Tippecanoe forms Lake Shafer and Lake Freeman, which are manmade impoundments that provide flood control and public water supplies. The landscape is characterized by sandy-loam soils with some isolated wetlands. This section of the river is also impacted by sediment from both urban and agricultural areas and other nonpoint sources of pollution. Sedimentation has led to problems within the lakes Shafer and Freemen. The lower one-third of the river is located in the Tipton Till Plain and is characterized by a stony, gravel river substrate. The land in this area is characterized by intensive row cropping and confined animal feeding operations on the flat black prairie soils (IDNR, 2003b).

It is identified in IDEM's *Unified Watershed Assessment for Indiana* as a watershed in need of protection. The Tippecanoe watershed is 1,246,819 acres in size and contains 2,569.89 miles of rivers, streams, and tributaries. Land use is predominantly agricultural (86.94 percent). Lands dedicated to agriculture are predominantly cropland (95.32 percent) and pasture (4.67 percent). A total of 199 confined feeding operations occur in the 14 counties associated with this watershed. There is a large concentration of duck and poultry production in the middle portion of the watershed, with many smaller cattle and swine operations scattered throughout. According to a recent study completed by NRCS (*Manure Nutrients Relative to the Capacity of Cropland and Pastureland to Assimilate Nutrients*), Pulaski, White, Fulton, Kosciusko, Miami, and Cass Counties produce more nitrate-N and P from manure than can used on

cropland. Corn and soybeans are the major crops grown. Originally, this watershed contained many wetlands and natural open drainage systems. Since then, many of these hydrologic features have been moved, straightened, drained, dredged, or tiled to support the area's intensive agricultural practices. On average, approximately 84.2 percent of the land devoted to corn and 52.9 percent of the land devoted to soybeans is eroding in excess of T (IDNR, 2003b).

According to TNC's *Rivers of Life, Critical Watersheds for Protecting Freshwater Biodiversity*, the Tippecanoe River is listed as the eighth most important freshwater site in North America for the protection of imperiled aquatic species. Recent studies show that the Tippecanoe River supports 70 species of fish and 55 species of freshwater mussels. Protection of this watershed is extremely important, not only to preserve current diversity, but for the potential recovery of several species of endangered mussels. Federally endangered species include the Indiana bat (*Myotis sodalis*); the eastern sand darter (*Ammocrypta pellucida*); and five species of mussels, including the eastern fanshell (*Cyprogenia stegaria*), northern riffleshell (*Epioblasma torulosa rangiana*), clubshell (*Pleurobema clava*), rough pigtoe (*Pleurobema plenum*), and fat pocketbook (*Potamilus capax*). In addition, the watershed is host to 18 bird, 5 mammal, 8 reptile, 1 amphibian, 6 mussel, and 4 fish species listed as State endangered species (IDNR, 2003b).

In 1998, the FWS's Ohio River Valley Ecosystem Team designated the Tippecanoe River as a focus area for a study of the declining native mollusk. The results of a recently completed study conducted by FWS, "Tippecanoe River, Indiana: Defining Point Source Threats to Rare and Endangered Mussels," indicated that excessive erosion, siltation, sedimentation, and agricultural chemical inputs are a more serious threat to the mussel community than point-source pollution (IDNR, 2003b).

1.5.3 Upper White River Watershed

The Upper White River watershed in Indiana's CREP proposal includes all or portions of nine counties including Boone, Delaware, Hamilton, Hancock, Henry, Madison, Marion, Randolph, and Tipton. The project area drains approximately 22.6 square miles. The Upper White River watershed is the headwaters of the West Fork of the White River, which runs through the major cities of Anderson, Noblesville, and Indianapolis. Below Indianapolis, waters from the White River flow in a southwesterly direction into the Wabash River, then into the Ohio River, and ultimately into the Mississippi River. Dominant soil types in the project area include Brookston, Crosby, Miami, and Parr formed in thin loess over loamy glacial till, and Blount, Pewano, and Morley formed in a glacial till. Average annual precipitation is approximately 42.0 inches (IDNR, 2003a).

Agriculture represents approximately 76 percent of the watershed's land use with approximately 92 percent of all agricultural lands devoted to intensive corn and soybean production. An additional three percent of the agricultural lands in the watershed are devoted to pasture. The majority of cropland devoted to winter wheat production is typically double-cropped with soybeans. Due to the intensity of crop production, the watershed transports exceedingly high levels of sediment, nutrients, and pesticides; these pollutants contribute significantly to hypoxia in the Gulf of Mexico. According to U.S. Geographic Survey (USGS) data, median nitrate concentrations generally range from 2 to 6 mg/L, which is much higher than those of other U.S. watersheds monitored by USGS. In addition, during the months of May through July, the watershed typically experiences atrazine levels that exceed EPA MCL criteria; however, annual average concentrations do not exceed MCL (IDNR, 2003a).

As with the other watersheds, the endangered Indiana bat (*Myotis sodalis*) occurs in the Upper White River watershed (IDNR, 2003b). Other Federally endangered species include the northern riffleshell mussel (*Epioblasma torulosa rangiana*) and the clubshell mussel (*Pleurobema clava*). In addition, the

watershed is host to 14 bird, 5 mammal, 6 reptile, 6 mussell, 2 amphibian, and 1 fish species that are State endangered species (IDNR, 2003a).

1.6 Relevant Laws, Regulations, and Other Documents

1.6.1 Clean Water Act of 1972

The Clean Water Act (CWA) was passed in 1972. The Act's goal was to "restore and maintain the chemical, physical, and biological integrity of the Nation's waters." The Act contains a number of provisions that affect agriculture:

Clean Lakes Program Authorized by Section 314 of the CWA, it authorizes EPA grants to States for lake classification surveys, diagnostic/feasibility studies, and for projects to restore and protect lakes.

Nonpoint Source Pollution Program Established by Section 319 of the CWA, it requires States and U.S. territories to identify navigable waters that cannot attain water quality standards without reducing nonpoint source pollution, and then develop management plans to reduce such nonpoint source pollution.

National Estuary Program Established by Section 320 of the CWA, it provides for the identification of nationally significant estuaries that are threatened by pollution for the preparation of conservation and management plans and calls for Federal grants to States, interstate, and regional water pollution control agencies to implement such plans.

National Pollutant Discharge Elimination System Permit Program Established by Section 402 of the CWA, this program controls point-source discharge from treatment plants and industrial facilities (including large animal and poultry confinement operations).

Dredge and Fill Permit Program Established by Section 404 of the CWA and administered by the U.S. Army Corps of Engineers, it regulates dredging, filling, and other alterations of waters and wetlands jointly with EPA, including wetlands owned by farmers. Under administrative agreement, NRCS has authority to make wetland determinations pertaining to agricultural land.

1.6.2 Endangered Species Act of 1973

The Endangered Species Act (ESA) of 1973 was enacted to protect and conserve threatened or endangered species and the ecosystems in which they exist. When a species is designated as threatened with extinction, a recovery plan that includes restrictions on cropping practices, water use, and pesticide use is developed to protect species populations from further declines.

1.6.3 Executive Order 11988: Floodplain Management Floodplains and Wetlands

Floodplain Management: Floodplains and Wetlands, Executive Order (E.O.) 11988, restricts Federal support of development in floodplains by requiring Federal projects located within a floodplain to meet National Flood Insurance Program standards, consider alternatives, and require agencies to inform all participants of the dangers involved in floodplain activities.

1.6.4 Executive Order 11990: Protection of Wetlands

Protection of Wetlands, E.O. 11990, restricts Federal support of development in wetlands and outlines the use of the NEPA process in determining whether building in a wetland is necessary.

1.6.5 Federal Insecticide, Fungicide, and Rodenticide Act of 1947

The Federal Insecticide, Fungicide, and Rodenticide Act of 1947 provides the legal basis under which pesticides are regulated. A pesticide can be restricted or banned if it poses unacceptable risks to human health or the environment. The re-registration process, mandated in 1988 for all active ingredients then on the market, has resulted in manufacturers dropping many less profitable products rather than paying the registration fees.

1.6.6 Food Security Act of 1985

The CCC is authorized under the Food Security Act of 1985, as amended, and 7 CFR 1410 to institute the actions contemplated in the proposed action. The CCC is authorized to enroll land through December 2007. Sections 1230, 1234, 1242 of the Act and 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 given State and of the nation. The following provisions are especially applicable to the implementation of CREP:

> HEL Conservation Compliance Provisions require that all persons that produce agriculture commodities must protect all cropland classified as being highly erodible from excessive erosion. The provisions have been amended in the 1990, 1996, and 2002 Farm Bills. The purpose of these provisions is to remove the incentive to produce annually tilled agricultural commodity crops on HEL unless it is protected from excessive soil erosion.
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> Wetland Conservation Provisions (Swampbuster) help preserve the environmental functions and values of wetlands, including flood control, sediment control, groundwater recharge, water quality, wildlife habitat, recreation, and aesthetics. The 1996 Farm Bill modified Swampbuster to give USDA participants greater flexibility to comply with wetland conservation requirements and to make wetlands more valuable and functional. The new Farm Bill changed the other Swampbuster provisions, including those associated with wetland determinations, mitigation (offsetting losses), "Minimal Effect" determinations, abandonment, and program eligibility.

1.6.7 National Environmental Policy Act of 1969

NEPA is intended to help Federal officials make decisions that are based on consideration of the environmental consequences of their actions, and to take actions that protect, restore, and enhance the environment. NEPA mandates that the FSA consider and document the impacts major projects and programs will have on the environment.

1.6.8 National Historic Preservation Act of 1966

The National Historic Preservation Act, as amended (16 USC 470, P.L. 95-515), Sections 101, 106, 110-112, 304, establishes as Federal policy the protection of historic properties or places and their values in cooperation with other nations and with State and local governments. Subsequent amendments designated the State Historic Preservation Office (SHPO) or the Tribal Historic Preservation Office (THPO) as the parties responsible for administering programs in the States or on reservations.

The Act also creates the Advisory Council on Historic Preservation (ACHP). Federal agencies are required to consider the effects of their undertakings on historic resources, and to give SHPO/THPO and, if necessary, ACHP a reasonable opportunity to comment on those undertakings.

Section 106 requires Federal agencies to identify historic properties their actions could affect; determine whether there could be a harmful or adverse effect; and, if so, try to avoid or reduce it. The Federal agency consults with SHPO/THPO and, in many cases, ACHP to accomplish the goal. This consultation process normally results in a legally binding agreement document that spells out how the historic property will be treated to avoid or reduce potential harm. Regulations implementing Section 106 (36 CFR Part 800) require that this be done through a process of identification, consultation with SHPO/THPO and other concerned parties, and execution and implementation of agreements about how adverse effects will be addressed. Before beginning any undertaking that might affect historic properties, the agency should consult SHPO/THPO and, if necessary, ACHP.

The NHPA regulation with the most impact on agency planning and operations is 36 CFR Part 800, Protection of Historic Properties. This regulation, governing compliance with Section 106, must be followed in planning any agency activity and in the ongoing management of agency resources. Another regulation of broad applicability is 36 CFR Part 79, Curation of Federally Owned and Administered Archeological Collections, which sets legally mandated standards for the maintenance of such collections.

1.6.9 Safe Drinking Water Act of 1974

The Safe Drinking Water Act requires EPA to set standards for drinking water quality and requirements for water treatment of public water systems; it also requires states to establish a wellhead protection program (WHPP) to protect public water system wells from contamination by chemicals, including pesticides, nutrients, and other agricultural chemicals.

1.6.10 CRP Programmatic Environmental Impact Statement

The Federal Register (FR) dated April 24, 2002 announced the Notice of Intent of CCC to prepare a PEIS for CRP and its components. The Final PEIS was published in January 2003 and provides FSA decision makers with programmatic level analyses that provides context for State specific EAs. The Record of Decision (ROD) was published in the FR on May 8, 2003 (68 FR 24847-24854).

1.6.11 Existing Federal Programs

Comprehensive State Groundwater Protection Program

The Comprehensive State Groundwater Protection Program was initiated by EPA in 1991. It coordinates the operation of all Federal, State, tribal, and local programs that address groundwater quality. States have the primary role in designing and implementing the program based on distinctive local needs and conditions (IDNR, 2003b).

Environmental Quality Incentives Program

The Environmental Quality Incentives Program (EQIP) is a USDA program that offers financial and technical help to assist eligible participants install or implement structural and management practices on eligible agricultural land. EQIP offers contracts that provide incentive payments and cost-shares to implement conservation practices. Producers who are engaged in livestock or agricultural production on eligible land may participate in the EQIP program. For example, 28,595 acres are under EQIP contracts in the Highland/Pigeon watershed alone (IDNR, 2003b).

Floodplain Easement Program

The Floodplain Easement Program (FEP) is a USDA voluntary program that offers landowners the means and the opportunity to protect, restore and enhance lands subject to repeated flooding and flood damage. The Floodplain Easement is funded through the Emergency Watershed Protection Program. The NRCS manages the program as well as provides technical and financial support to help landowners that participate in FEP.

Partners for Fish and Wildlife Program

Since 1988, the FWS has been working with landowners through the Partners for Fish and Wildlife (PFW) program, a nationwide effort to restore declining wildlife populations by developing cooperative agreements with landowners to restore wetlands, reestablish bottomland hardwood forests, and plant native prairie. Restoration projects are usually done at no cost to cooperating landowners, who agree to maintain the area for a minimum of 10 years (15 years for tree plantings), although longer-term agreements are increasingly more common. In fact, over 90 percent of respondents to a 1995 Indiana PFW survey indicated they intended to maintain their projects indefinitely, indicating a high degree of project success and landowner satisfaction. This level of landowner interest has led to the completion of nearly 1,300 restoration projects throughout Indiana since 1988, totaling more than 7,900 acres of wildlife habitat, including more than 5,500 acres of restored wetland. The program is strictly voluntary, and landowners retain all rights to their property, including the right to control public access. Past efforts include targeting restoration efforts to specific watersheds to achieve multiple benefits, such as floodwater storage, water quality improvement, and migratory bird conservation. The majority of the restoration work to date has been in the northern part of the state, especially in the wetland region of northeastern Indiana (IDNR, 2003b).

Southwest Indiana Four Rivers Project

The Southwest Indiana Four Rivers Project (SIFRP) is a North American Waterfowl Management Plan project, a multi-phase effort to acquire, restore, and enhance wetlands and wetland-associated uplands in southwest Indiana, particularly those associated with the Patoka, White, Wabash, and Ohio River floodplains, which includes Gibson, Posey, Pike, and Warrick Counties in the Highland/Pigeon watershed. This area contains some of the largest contiguous blocks of bottomland hardwood forest remaining in the Midwest. The focus of the project is on wetland- and forest-dependent migratory birds such as waterfowl, neotropical migrant songbirds, and shorebirds; it also includes efforts to enhance habitat for State and federally listed species such as the least tern. The project area is located in the Upper Mississippi River and Great Lakes Joint Venture Area, and includes all or parts of 15 counties in southwest Indiana.

The project is currently in its third phase, with a goal through Phase III to acquire, restore, and enhance more than 12,400 acres of wetland and associated upland. More than 15 funding partners have been involved, representing State and Federal agencies, private conservation organizations, and both small and large businesses and corporations. Land has been acquired primarily in fee title, and is owned by several partners, including the Indiana Department of Natural Resources (IDNR), TNC, and the FWS. Habitat restoration projects have included floodplain reforestation, shallow marsh restoration, moist soil unit construction, and native prairie restoration (IDNR, 2003b).

Wetlands Reserve Program

Wetlands Reserve Program (WRP) is a USDA voluntary program that offers landowners the means and the opportunity to protect, restore, and enhance wetlands on their property. The NRCS manages the

program as well as provides technical and financial support to help landowners that participate in WRP. Program objectives are: 1) to purchase conservation easements from, or enter into cost-share agreements with willing owners of eligible land, 2) help eligible landowners, protect, restore, and enhance the original hydrology, native vegetation, and natural topography of eligible lands, 3) restore and protect the functions and values of wetlands in the agricultural landscape, 4) help achieve the national goal of no net loss of wetlands, and to improve the general environment of the country. For example, Tippecanoe watershed has 207 acres enrolled in WRP (IDNR, 2003b).

1.6.12 Indiana State Laws

All State programs must comply with the Indiana Code (IC), Indiana Administrative Rules, and related EOs. Specific laws of the State pertaining to the IDNR and the IDEM are located in the IC.

Noxious Weeds/Exotic Species

Indiana has few provisions restricting the introduction of exotic species. Several species of noxious weeds have been identified (IC §15-3-4.6-2) as requiring control, including: Canada thistle (*Cirsium arvense*), Johnson grass (*Sorghum halepense* (L.) Pers.), bur cucumber (*Sicyos angulatus*), and shattercane (*Sorghum bicolor* (L.) Moench sorghum). These noxious weeds must be controlled on CRP contracted lands. In addition, no wild animal may be brought into the State for sale or release without a permit (IC §14-22-25-2). The State authorizes the introduction of some exotic species for game purposes.

Habitat Acquisition

Indiana has a number of programs and funds targeted for wildlife habitat acquisition and biodiversity. Under the Nature Preserves Act, lands may be acquired by the state as a nature preserve (IC §§14-31-1-1 et seq.). Among other purposes, the Heritage Trust Program (IC §14-12-2-1) acquires land based on biological diversity, conservation, wildlife, T&E species, and rare and unique ecosystems. License plate sales fund the program, which raised $2 million in the last three years. A Natural Heritage Protection Campaign uses private and State funds and plans to acquire $8 million worth of natural areas for nature preserves. A State nongame fund is also used in part for wildlife habitat acquisition (IC §14-22-34-20).

Impact Assessment

Indiana has a "little NEPA," requiring State agencies to assess their activities for impact on biological resources. The Indiana Environmental Policy Act (IC §§13-1-10-1 et seq.) is similar to NEPA, but exempts State issuance of licenses and permits.

Private Land Conservation

Indiana has some private land conservation programs. Conservation easements are authorized by statute (IC §14-8-2-52). Property tax reductions are available for land classified by the State as forest or fish and wildlife habitat (IC §§6-1.1-6-1 et seq.). The state-funded Lake and River Enhancement Program (LARE) offers technical and financial assistance to watershed landowners to reduce erosion and pollution. The USDA's Forest Stewardship Program (FSP), administered through IDNR Division of Forestry, provides landowners with technical assistance in developing a management plan for their lands. Finally, cost-share incentives for habitat improvements on private lands are offered by the Division of Fish and Wildlife.

Restricted Use Pesticides

Based on a 1993 Indiana rule that regulates recordkeeping of restricted-use pesticides (RUP) applications, the Office of the Indiana State Chemist performs randomly selected farm recordkeeping inspections. Though the recordkeeping rule pertains only to RUP, many producers insist that keeping records of all their pesticide applications is vital to their business. Accurate records aid in application timing and product selection, and can help the grower maximize yield and profit.

State-owned Lands

The Indiana Heritage Trust program requires that state parks, nature preserves, state forests, fish and wildlife areas, wetlands, trails, and river corridors be managed in a manner that preserves and enhances these areas for succeeding generations (IC §14-12-2-1).

1.6.13 Indiana Counties

County jurisdiction must comply with laws enacted at the local, State, and Federal level. In Indiana, many laws pertaining to drainage, zoning, and construction practices are enforced at the county level of government.

1.6.14 Existing State Programs

The state has many recently initiated and ongoing water quality improvement programs that would enhance and complement CREP implementation.

The IDNR, Division of Soil Conservation provides soil and water conservation-related technical, educational, and financial assistance to agricultural land users. The division's activities are carried out via a partnership arrangement with soil and water conservation districts, NRCS, and the Purdue University Cooperative Extension Service. Clean Water Indiana (CWI) is the initiative that encompasses all of the division's programs. CWI was statutorily established in 1999 and provides funding for division and SWCD initiatives. Another CWI element, the Lake and River Enhancement (LARE) program, receives approximately $1.1 million per year from a State-imposed boat fee. About half of that money is dedicated each year to watershed land treatment (WLT) projects on more than 20 watersheds throughout the State. The money is channeled from the division, through SWCD cooperative efforts, as 70-80 percent cost-share with individual land users for implementation of CPs. Of the counties proposed for CREP, LARE WLT projects have been carried out, or are currently underway, in Cass, Fulton, Gibson, Kosciusko, Marshall, Miami, Noble, Posey, Tippecanoe, and Whitley Counties. The program also provides an interactive Internet web site where monitoring data can be posted and evaluated.

SWCDs implement agricultural and urban nonpoint source pollution control projects in each county. SWCDs also promote the use of resource conservation best management practices (BMPs) through educational materials, field days, media outlets, test plots, equipment rental, and technical and financial assistance programs in cooperation with other resource agencies and conservation partners. SWCDs are the main force driving the development of local needs, assessments, and action plan development at the local watershed management level. Numerous SWCDs have hired watershed coordinators to assist in planning, promoting, and implementing watershed needs. Technical assistance and educational programs are supported with funding from local governmental units, 319 grants, IDNR, and other funding sources.

IDNR's Division of Fish and Wildlife assists landowners in developing, restoring, and managing permanent wildlife habitat through technical and financial assistance provided by 22 private lands management biologists. The Division uses a significant portion of its Game Bird Habitat Development

Program and Wildlife Habitat Cost-Share Program funds to encourage farm operators to enroll and/or manage CRP, EQIP, WRP, and Wildlife Habitat Incentive Program (WHIP) acreage in wildlife-friendly cover. The Division provides technical assistance to NRCS for the development of conservation plans for all USDA programs where wildlife is a primary purpose of the practice or program. Division biologists routinely promote and encourage landowner participation in USDA programs. The Division also enrolls a large amount of CRP, WHIP, and WRP acreage in the Classified Wildlife and Riparian Habitat Act program, which provides property tax incentives for long-term retention of wildlife habitats. The Division anticipates that many parcels enrolled in CREP will qualify for this property tax incentive.

The IDNR Division of Forestry provides technical assistance to NRCS for the development of conservation plans for all USDA programs where forestry is a primary purpose of the practice or program. Division foresters routinely promote and encourage landowner participation in USDA programs. The Division also enrolls a large amount of CRP and WRP acreage in the Classified Forest Act program, which provides property tax incentives for long-term retention of forestlands. The Division anticipates that many parcels enrolled in CP3 practices through CREP will qualify for this property tax incentive.

The IDEM Office of Water Quality (OWQ) Water Quality Assessment Branch is responsible for assessing the quality of Indiana's surface waters (rivers, streams, and lakes). A field sampling strategy has been designed to describe the overall environmental quality of each major river basin and to identify what parts of the river basins are impaired or do not meet water quality standards. Elements of the program include fixed station monitoring; sampling from statistically selected sites; fish community, fish tissue, and sediment contaminant sampling programs; pesticide monitoring; bacteriological sampling; macroinvertebrate sampling; and site specific sampling in support of EPA's National Pollutant Discharge Elimination System (NPDES) permitting program. The program is designed to sample each basin once every five years.

IDEM's OWQ Planning and Restoration Branch is responsible for assisting the other branches of OWQ in identifying program goals and objectives as well as assisting them with the effective implementation of program priorities. This branch administers the Section 319 Nonpoint Source Grant Program for Indiana. From 1999 to 2001, a total of $1.8 million in 319 funds have been awarded to projects within the selected watersheds. In addition, this branch compiles watershed-specific information to assist with watershed planning at the local level and the development of Watershed Restoration Action Strategy plans. A Watershed Restoration Action Strategy has been developed for each of the selected watersheds. To help address the need for watershed planning assistance at the local level, IDEM employs three regional watershed conservationists. In order to meet watershed group needs, regional watershed conservationists assist local groups understand the planning process; gather watershed information; apply resource inventory methods; provide training on water quality issues; and coordinate activities between federal, state, and local partners.

IDEM is also currently implementing a $2 million grant program in conjunction with the Division of Soil Conservation and SWCDs to provide cost-share assistance to livestock and poultry producers to implement practices that are effective in reducing soil erosion and nutrient runoff.

1.7 Decisions that Must be Made

The FSA must determine if the selected alternative would or would not constitute a major Federal action significantly affecting the quality of the human environment. If the FSA determines that it would not significantly affect the quality of the human environment, then a Finding of No Significant Impact

(FONSI) would be prepared and signed. Pending CREP applications would then go through the approval process.

Additional analyses would be required to evaluate site specific impacts.

1.8 Scoping and Resource Issues

1.8.1 Scoping

CREP was initiated in 1997 and is a joint Federal and State land conservation program. CREP uses authorities of the CRP in combination with Indiana State resources to target specific conservation and environmental objectives of Indiana and the nation.

Scoping for the initial CREP proposal was conducted internally. Development of the existing proposal was the result of consultation over a five year period, from 1998 to 2003, between FSA, NRCS, FWS, IDNR, IDEM, TNC, Ducks Unlimited, and other public interest groups.

The Indiana CREP steering committee, comprised of representatives from several Federal and State agencies and private organizations, including FSA, NRCS, FWS, Indiana Office of the Commissioner of Agriculture, IDNR, Indiana Farm Bureau, Indiana Association of Soil and Water Conservation Districts, Pheasants Forever, TNC, and Ducks Unlimited, first began meeting on an occasional basis in September of 1998. The steering committee spent a considerable time collecting watershed data and assessing watershed needs throughout the State. The committee began a concentrated effort to develop a CREP proposal in 2000 when the Indiana Unified Watershed Assessment, conducted by IDEM, was released. In January of 2001, three public meetings were held with SWCDs to provide information about Indiana's proposal and to obtain feedback, cooperation, and support. The meetings were held in the communities of Knox, Evansville, and Noblesville; and initially targeted the Kankakee, Iroquois, Tippecanoe, Wildcat, Upper White, and Highland/Pigeon watersheds. Responses gleaned from the three public meetings were overwhelmingly in support of moving forward with an Indiana CREP. Letters of support for CREP have been received and forwarded to the FSA national office, including letters from FWS; NRCS; Indiana Farm Bureau, Inc; Indiana Pork Producers; Crooked Lake Association; TNC; Ducks Unlimited; and Pheasants Forever.

In order to comply with Section 7 of the ESA, informal consultation with FWS occurred during the development of the proposal and PEA. Due to the programmatic, therefore, general nature of the PEA, FWS will not offer a biological opinion; however, future coordination will be required on all site specific rental actions implemented under the CREP when FSA determines that an action has the potential to affect a listed T&E species.

The PEA will be made available to the public in accordance with NEPA requirements and FSA regulations. The public will have 15 calendar days to comment. Following the public comment period, FSA will analyze and prepare appropriate responses and the PEA will be finalized.

1.8.2 Relevant Resource Issues

The following resources studied would be affected by the Indiana CREP: State water quality standards, wetlands, floodplains, drinking water, critical habitat or T&E species, cultural resources, and socioeconomic issues. Chapter 3 discusses each of the issues in more detail. Affected resources issues are introduced below.

Issue #1: State Water Quality susceptibility to agricultural practices

There are about 90,000 miles of rivers, streams, ditches, and drainage ways in Indiana. The State has more than 600 inland lakes, ponds, wetlands, and reservoirs; together, these waters cover 1,073,445 acres. Indiana's waters are used for multiple purposes, including drinking, industry and agriculture, fisheries, aquatic resources, recreation (e.g., boating, swimming), and wastewater disposal. Surface water quality in the State varies from severely degraded by pollutants, to clean enough for fishing, swimming, or drinking. The Indiana 2002 Section 303(d) List identifies 428 water body/pollutant combinations still requiring total maximum daily load (TMDL) development. Issues affecting State water quality in the targeted watersheds are discussed in Section 3.4.1 (IDEM, 2002a).

Issue #2: Wetland susceptibility to agricultural practices

Wetlands occur in and provide benefits to every county in Indiana. Indiana had approximately 813,000 acres of wetland habitat in the mid-1980s, but wetland loss or gain since then is unknown. Wetlands function as filters, removing excess nutrients and sediments from the water that flows through them. Current issues affecting wetlands are discussed in Section 3.5.1 (IDNR, 1996).

Issue #3: Floodplain susceptibility to agricultural practices

According to the Indiana 305(b) assessment database, over 200 miles of Indiana streams are categorized as impaired due to hydromodification. The prevention of flooding in sensitive areas or the utilization of floodwater retention practices to mitigate nutrient and sediment inflows to watersheds should be addressed. Construction activities in floodplains have the potential to modify flowage and storage capacity and should be analyzed. Issues affecting floodplains are discussed in Section 3.6.1 (IDEM, 2002a).

Issue #4: Drinking Water susceptibility to agricultural practices

Indiana has a plentiful groundwater resource; it provides drinking water for approximately 50 percent of the state's population, and fills many of the water needs for business, industry, and agriculture (EPA, 2000a). Among other sources, agricultural practices can introduce pollutants into watersheds. Contaminated water may seep into aquifers. Section 3.7.1 discusses current issues affecting both drinking water and wellheads.

Issue #5: Critical Habitat or T&E Species susceptibility to agricultural practices

There are 27 Federal T&E species in the State of Indiana (FWS, 2003a, 2003b). The IDNR has identified 134 species that are endangered or of special concern. Habitat degradation from human population growth, habitat fragmentation, invasive exotic species, and pollution continue to threaten species populations. Current trends and issues affecting critical habitat and T&E species are discussed in Section 3.8.1.

Issue #6: Cultural Resource susceptibility to agricultural practices

There are approximately 45,000 prehistoric and historic archaeological sites documented in Indiana. The state also has a rich vernacular rural landscape (IDNR, 1998). To analyze potential impacts at a statewide level is unrealistic for purposes of this PEA. However, site specific cultural reviews would ensure protection of these vital resources. A discussion of State cultural resources is found in Section 3.9.1.

Issue #7: Socioeconomic impacts from agricultural practices

The Indiana CREP proposes the potential enrollment of 25,000 acres that are spread across three watersheds. These 25,000 acres represent an insignificant percentage of the total acres of cropland that are harvested each year (NASS, 1999). Current issues affecting socioeconomic concerns are discussed in Section 3.10.1.

1.8.3 Resources/Issues Eliminated from Detailed Study

The Indiana CREP would not affect the following resources:

Air Quality

The CREP would have no discernable affect on Indiana's air quality. While the potential exists for minor localized improvements of air quality due to some of the proposed CPs, the potential benefits would be so minor and unquantifiable that it would not be practicable to analyze them within this PEA. Since the implementation of the CREP program would not result in impacts to the attainment, non-attainment, or maintenance status of any of the State's airsheds, this issue has been eliminated from further study in this PEA.

Coastal Zone

Indiana's Coastal Zone Management Plan takes a watershed approach in determining compatibility of land uses within the coastal program area. Water from all three CREP watersheds drain to the south away from Lake Michigan and, ultimately, into the Mississippi River. The coastal program area itself does not extend beyond the border counties of Lake, Porter, and La Porte. Therefore, there would be no direct, indirect, or cumulative impacts to the State's coastal zone resources.

Noise

There would be no perceptible impacts from noise as a result of CREP implementation. Following the short term construction noise, as the CPs are installed, there would be no continual impacts on the local soundscape. With the permanent easements and long term nature of the CPs, which will result in decreased agricultural activities on CREP lands, noise level can be expected to decrease slightly. As a result, FSA eliminated noise from further analysis as part of this PEA.

Wild and Scenic Rivers

Within the selected watersheds, there are no rivers listed as part of the National Wild and Scenic Rivers system. Therefore, the issue was eliminated from further analysis in this PEA.

Wilderness

There are no designated wilderness areas located within the targeted watersheds of the affected environment. Therefore, wilderness was eliminated from further analysis in this PEA.

Existing conditions and an evaluation of the effects of CREP are discussed in Sections 3.4 – 3.10.

2.0 Alternatives Including the Proposed Action

2.1 Introduction

This chapter describes the actions proposed in the PEA, beginning with the No Action Alternative—Continue Current Agricultural Practices, and ending with the Proposed Action Alternative—Implement Indiana CREP. Alternatives will be compared in terms of their individual environmental impacts and their achievement of objectives.

2.2 Description of Alternatives

2.2.1 Alternative A (No Action)—Continue Current Agricultural Practices

Alternative A would allow the continued degradation currently occurring within the three watersheds. Agriculture is the predominant land use in the selected watersheds (approximately 75 percent) with approximately 93 percent of all agricultural lands devoted to intensive corn and soybean production. An additional 4 percent of the agricultural lands in the selected watersheds are devoted to pasture. The majority of cropland devoted to winter wheat production is typically double-cropped with soybeans. Due to the intensity of crop production, the selected watersheds transport exceedingly high levels of sediment, nutrients, and pesticides; these pollutants contribute significantly to hypoxia in the Gulf of Mexico. According to USGS data, median nitrate concentrations generally range from 2 to 6 mg/L, which is much higher than those of other watersheds monitored by USGS in the U.S. In addition, during the months of May through July these watersheds typically experience atrazine levels that exceed EPA MCL criteria; however, annual average concentrations do not exceed the MCL (IDNR, 2003b).

Current agricultural practices utilize pesticides and fertilizers, which have a negative impact on wetlands and surface waters. In addition, pesticides and fertilizers contribute to declines in native wildlife populations (FSA, 2003).

With the selection of the No Action Alternative, modes of agricultural production would remain as they have for decades. There would be no additional incentives to implement USDA CPs. The installation of filter strips, riparian buffers, and other CPs that provide natural methods of water purification would not be funded. High levels of pesticides, pathogens, and nutrients would continue to accumulate and pollute watershed systems, furthering the degree of negative ecological impacts.

2.2.2 Alternative B—Implement the Indiana CREP

Implementing CREP would improve water quality; the installation of riparian buffers, filter strips, hardwood tree plantings, permanent wildlife habitat, native grass establishment, and wetland restoration as watercourse buffer practices would reduce sediment, nutrient, and pesticide loading from agricultural field runoff. The improved water quality would enhance terrestrial and aquatic wildlife habitat for federally listed and state listed endangered species.

CREP would provide the financial and technical assistance necessary to assist eligible Indiana farmers and ranchers voluntarily establish conservation practices to control water runoff and nonpoint source pollution, including nutrient loading, soil erosion, and sedimentation. Landowners would be provided funding for the installation of USDA-approved CPs. The project would be jointly funded by the USDA/CCC and the State of Indiana. USDA would pay 140 percent of the rental rate payment for the 15-year contracts, 50 percent of practice establishment costs, a one-time Practice Incentive Payment (PIP) equivalent to 40 percent of the practice establishment cost, a one-time Sign-up Incentive Payment (SIP) of

$150, and a $5 maintenance fee per acre enrolled. IDNR would pay a one-time $100 or $400 per acre incentive, depending on the CPs that would be employed. Additional incentives, contract extensions, and permanent easements would be offered by TNC for specific practices enrolled in the Tippecanoe watershed. Riparian buffers, permanent wildlife habitat, hardwood tree planting, and native grass establishments may be offered up to 180 ft, and filter strips may be offered up to 120 ft along watercourses and up to 300 ft on alluvial floodplain soils. CRP practices to be installed include CP2 – Native Grasses, CP3A – Hardwood Tree Planting, CP4D – Permanent Wildlife Habitat, CP21 – Filter Strips, CP22 – Riparian Buffer, and CP23 – Wetland Restoration (Agreement, 2003). Since the initial proposal, additional CPs have been added. CP23 has been changed to reflect restoration efforts in the 100-year floodplain. CP23A incorporates upland wetland areas. The other CPs include: CP29 – Marginal Pastureland Wildlife Habitat Buffer, CP30 – Marginal Pastureland Wetland Buffer, and CP31 – Bottomland Timber Establishment on Wetlands.

The project's goal would be to enroll 26,250 acres over the next 10 years. Total FSA payments would be approximately $58,000,000. The State of Indiana would contribute 20 percent to the overall project cost, which includes approximately $9,900,000 in direct payments to enrollees with the remainder in in-kind services and contributions (Agreement, 2003).

Eligible Land Determination and Conservation Practices

All cropland acreage within 300 ft of a watercourse, if the soil type criteria are met, could be enrolled in CREP. Acreage enrolled may be wider than 300 ft, or the acreage may be narrower, provided the average width does not exceed 300 ft. A watercourse is defined as a perennial or seasonal stream, a ditch, or a permanent body of water. All acreage enrolled from 180 ft to 300 ft must be on alluvial floodplain soils. Certain upland acreage with potential to deliver sediments, pesticides, and nutrients to a watercourse may be enrolled as CP23 (wetland restoration) regardless of distance from the affected watercourse.

FSA CPs proposed for Indiana have been selected as the best option to improve conditions in the watersheds. Available CPs are based on eligibility criteria. Out of the 30 possible CPs, these were selected as the best methods for achieving Indiana's CREP objectives. Detailed rental and incentive payments, cost-share and maintenance payments, and technical requirements and operating procedures for each practice are outlined in the FSA Handbook 2 CRP and are included in Appendix D of this PEA.

Figure 2. An example of a permanent native grass planting.

A coordinated effort of agencies from both Federal and State governments would be required for successful implementation of the CREP.

Permanent Native Grass (CP2) – This conservation practice establishes a permanent stand of native grasses and forbs that help filter agricultural runoff, enhance wildlife habitat, and reduce soil loss from erosion. The following criteria applies to implementation of this CP as it relates to Indiana CREP contracts:

- The land must be adjacent to a watercourse to be eligible.

- The maximum total width would be 120 ft (300 ft in alluvial soils).
- The minimum width would be 50 ft.

The FSA goal for establishing permanent native grass is the enrollment of 2,500 acres.

Figure 3. A hardwood tree planting (CP3A).

Hardwood Tree Planting (CP3A) – This practice establishes a stand of predominantly hardwood trees in a timber planting that would enhance environmental benefits. Hardwood trees benefit the environment by providing permanent cover for wildlife and by preventing soil erosion. Preventing soil erosion would improve water quality by preventing nutrient-laden soil from entering the water system. Targeted for hardwood tree planting would be 2,500 acres. The following criteria would apply to implementing this CP related to Indiana CREP contracts:

- The land must be adjacent to a watercourse to be eligible.
- The minimum width would be 35 ft.
- The maximum total width of the stand would be 180 ft (300 ft in alluvial soils).

Figure 4. Pheasant foraging.

Permanent Wildlife Habitat (CP4D) – Creating permanent wildlife habitat enhances environmental benefits for wildlife of the designated or surrounding areas. Providing wildlife cover would meet CREP objectives by planting vegetation in areas that may be susceptible to erosion or sedimentation. Vegetation would aid in the uptake of nutrients from runoff and prevent introduction of nutrients to the watershed. Habitat components may include seeding, including shrubs and trees, establishing permanent water sources for wildlife, providing temporary cover, and the addition of minerals. FSA's goal would be to create 2,500 acres of permanent wildlife habitat on CREP lands. The following criteria would be observed:

- The land must be adjacent to a watercourse to be eligible.
- The maximum total width of the habitat would be 180 ft (300 ft in alluvial soils).
- The minimum width would be 35 ft.

Filter Strip (CP21) – The purpose of filter strips (see Figure 5) is to remove nutrients, sediment, organic matter, pesticides, and other pollutants from surface runoff and subsurface flow through deposition, absorption, plant uptake, denitrification, and other processes. Removing nutrients and other matter from agricultural runoff would reduce the loads being introduced to the watershed system. Filter strips help to reduce pollution, protect surface water and subsurface water quality, and enhance the ecosystem of the

Figure 5. Agricultural filter strip.

water body. FSA's goal would be to enroll 12,000 acres of CREP lands as filter strips. The following criteria would be applied:

- The filter strips' maximum total width would be 120 ft (300 ft in alluvial soils) and minimum width would be 35 ft.

Riparian Buffer (CP22) – This practice (see Figure 6) reduces pollution and protects surface water and subsurface water quality while enhancing the aquatic ecosystem. Riparian buffers would contribute to meeting CREP objectives. Riparian communities provide outstanding filtration benefits and serve the following ecological purposes:

- Removes nutrients, sediment, organic matter, pesticides, and other pollutants from surface runoff and subsurface flow by deposition, absorption, plant uptake, denitrification, and other natural processes.
- Creates shade to lower water temperature, thus improving habitat for aquatic organisms.
- Provides a source of detritus and large woody debris for aquatic organisms and habitat for wildlife.

Approximately 6,250 acres would be enrolled and converted to riparian buffer CPs to reduce sedimentation and nutrient loading and to provide habitat for wildlife. Riparian buffers function to remove pollutants naturally from surface runoff before the pollutants enter the watershed.

- The maximum total buffer width would be 180 ft (300 ft in alluvial soils) and minimum width would be 35 ft.

Wetland Restoration (100-year floodplain, CP23) – This practice restores the functions and values of wetland ecosystems devoted to agricultural use. It demonstrates excellent phosphorus reduction efficiency and improves quality of downstream waters. These benefits would contribute to meeting CREP objectives and improving conditions in the watersheds, within the 100 year floodplain. The level of restoration of the wetland ecosystem would be determined by the following eligibility requirements:

- Prevent recurrent degradation of the wetland.
- Increase sediment trapping efficiencies.
- Improve surface and ground water quality.
- Prevent recurrent erosion.
- Provide habitat for waterfowl and other wildlife.
- Reduce flood flows

Figure 6. An example of a riparian buffer.

Figure 7. CREP acreage converted to wetland.

CP23 would be used for restoration of isolated wetlands and for construction of larger wetland treatment systems as site conditions and opportunity allows.

- CREP lands converted to wetlands must also enroll associated buffer areas around the wetland for a minimum width of 25 ft, not to exceed 100 ft.
- FSA's goal would be to enroll 500 acres for wetland restoration, including acres implementing CP23 and CP23A.

Wetland Restoration (Non-floodplain, CP23A) – This CP restores the functions and values of wetland ecosystems that have been devoted to agricultural use. Degraded wetlands will be rehabilitated where the soils, hydrology, vegetative community, and biological habitat are returned to the natural condition to the extent practicable. This CP restores the functions and values of wetland ecosystems devoted to agricultural use. It demonstrates excellent phosphorus reduction efficiency and improves quality of downstream waters. These benefits would contribute to meeting CREP objectives and improving conditions in the three watersheds. Eligibility is determined by the following:

- Lands must include wetlands that have been cropped or considered cropped four of the six years from 1996 through 2001, and adjacent upland acreage.
- Wetlands do not need to be drained to be eligible.

- Four acres of adjacent upland acreage can be enrolled for every acre of wetland.
- FSA's goal would be to enroll 500 acres for wetland restoration, including acres implementing CP23 and CP23A.

Marginal Pastureland Wildlife Habitat Buffer (CP29) – The purpose of this CP is to remove nutrients, sediment, organic matter, pesticides, and other pollutants from surface runoff and subsurface flow by deposition, absorption, plant uptake, denitrification, and other processes, and thereby reduce pollution and protect surface water and subsurface water quality while enhancing the ecosystem of the water body. By restoring native plant communities, characteristics for the site will assist in stabilizing stream banks, reducing flood damage impacts, and restoring and enhancing wildlife habitat. Implementation of this CP would augment CREP objectives for the State. Land to be enrolled must meet the following criteria:

- All marginal pastureland eligibility requirements are met.
- The natural vegetation for the site is primarily a mix of grasses, shrubs, and forbs.
- Marginal pastureland offered is immediately adjacent and parallel to either a stream having perennial flow or a seasonal stream.
- In addition, the maximum average buffer width would be 120 feet.
- The minimum buffer width would be 20 feet.

Marginal Pastureland Wetland Buffer (CP30) – The purpose of this CP is to remove nutrients, sediment, organic matter, pesticides, and other pollutants from surface runoff and subsurface flow by deposition, absorption, plant uptake, denitrification, and other processes, and thereby reduce pollution and protect surface water and subsurface water quality while enhancing the ecosystem of the water body. The CP will enhance and/or restore hydrology and plant communities associated with existing or degraded wetland complexes. The goal is to enhance water quality, reduce nutrient and pollutant levels, and improve wildlife habitat. CP30 would contribute to meeting Indiana's CREP objectives. Enrollment criteria include:

- All marginal pastureland eligibility requirements are met.
- The natural vegetation for the site is primarily a mix of grasses, shrubs, and forbs.
- Marginal pastureland offered is immediately adjacent and parallel to either a stream having perennial flow or a seasonal stream.
- The maximum average width of wetland buffers would be 120 feet.
- The minimum acceptable wetland buffer width would be 20 feet.

Bottomland Timber Establishment on Wetlands (CP31) – The Implementation of this CP improves air and water quality as well as increases wildlife habitat along wetland areas. Producers enroll lands suitable for growing bottomland hardwood trees or adapted shrubs that will provide multipurpose forest and wildlife benefits. The purpose of the CP is to establish a stand of trees that will:

- Control sheet, rill, scour, and other erosion;
- Reduce water, air, or land pollution;

- Restore and enhance the natural and beneficial functions of wetlands;
- Promote carbon sequestration; and
- Restore and connect wildlife habitat.

CREP Payments

FSA Payments--For all CPs, FSA would pay participants:

- 140 percent of the soil rental rate per acre for all CPs;
- 50 percent of the practice establishment cost for all CPs;
- A one time PIP equal to 40 percent of the practice establishment cost for CP21, CP22, CP29, CP30, and CP31;
- A one time SIP for land enrolled in CP21, CP22, CP29, CP30, and CP31, equal to $150;
- A $5 maintenance fee per acre for all CPs; and
- A payment to participants implementing the wetland restoration practice (CP23) equal to 25 percent of the eligible reimbursable hydrology restoration costs.

IDNR Payments--In addition, owners of enrolled acreage would receive a one-time incentive payment of $400 per enrolled acre from the Division of Soil Conservation (DOSC) for lands implementing CPs that use trees (i.e., CP3A, CP22, CP23, CP23A, CP31). For lands implementing CPs that do not use trees (i.e., CP2, CP4d, CP21, CP23A, CP29, CP30) landowners would receive $100 per enrolled acre. This incentive payment would be made to the landowner once CPs are installed. There are no caps on these payments, other than the 25,000 total CREP acreage.

Ducks Unlimited Payments--Ducks Unlimited would provide an initial, one-time 10 percent cost-share (up to $5,000) to landowners in the Highland/Pigeon watershed who enroll eligible land into wetland restorations (CP23 and CP23A).

TNC Payments (Tippecanoe Watershed Only)—If landowners that meet all technical specifications and requirements for CP3A, CP4D, CP22, CP23, and CP23A practices enrolled through this CREP project and voluntarily enroll in an additional 10-year contract with the local SWCA; then TNC would make a one-time payment of $250 per acre to landowners. The SWCA contract extension would be limited to the first 2,000 acres of the CPs enrolled in the Tippecanoe Watershed. The practices must lie along the main stem of the Tippecanoe River, or be positioned within two miles of the river and adjacent to a tributary that drains water to the Tippecanoe River, except CP23 and CP23A practices that can be located anywhere within the Tippecanoe watershed. Given the initial CREP contract for 14-15 years, this contract extension program would encourage landowners to maintain CPs on their lands for up to 25 years total.

Further, TNC would pay landowners a one-time fee of $500 per acre for CP22 acreage enrolled through this CREP project if they voluntarily enter into a permanent conservation easement held by TNC or another approved conservation organization. This payment is also applicable to any existing forestland that lies between CREP enrolled acreage and the water body to be protected. This payment would be limited to the first 3,636 acres of riparian forest placed under permanent easement with TNC. The permanent easement option would be limited to a priority area defined as that portion of the Tippecanoe River from Tippecanoe Lake downstream to the Pulaski and White County boundary line, and from the Oakdale Dam downstream to the Tippecanoe River's confluence with the Wabash River in Tippecanoe

County. The CP must lie along the main stem of the Tippecanoe River or be positioned within two miles of the river and adjacent to a tributary that drains water to the Tippecanoe River within the priority area. The maximum easement width would be 300 feet on either side of the river or tributary.

Role of Federal and State Agencies in Implementing CREP

The December 2003 Agreement between the State of Indiana and USDA/CCC, concerning implementation of the Indiana CREP, is the source for the following information.

USDA/CCC--USDA/CCC is one of the financial partners of the Indiana CREP and, as such, has extensive roles in overseeing program compliance. The USDA/CCC, through FSA, bears the responsibility of determining producer eligibility; paying incentive, bonus, and annual rental payments; and coordinating with the State of Indiana and other vendors to provide technical assistance to farmers.

State of Indiana--The responsibilities of the State of Indiana would include the overall administration of the program, including the responsibility to:

- Make direct, one-time payments equal to the appraised value per acre for CP22 voluntarily enrolled in permanent easements in a priority area within the Upper White River watershed.
- Provide for additional technical assistance in the development of conservation plans.
- Enter into agreements with private partners to coordinate the portion of the program that would provide non-state funding.
- Seek applicants willing to offer eligible and appropriate land for enrollment in CREP.
- Assist local SWCDs and other conservation cooperators in providing technical assistance to develop conservation plans for applicants offering to enroll eligible acreage in CREP.
- Establish a CREP advisory group to meet at least annually to review the State program.
- Appoint a Program Director responsible for administering the State's obligations under this Agreement. This person shall be appointed by the Director of IDNR, DOSC.
- Implement a plan for outreach to landowners, and provide public information and education regarding the CREP.
- Ensure that the CREP is coordinated with other agricultural and natural resource conservation programs at the State and Federal level.

NRCS--NRCS would play a technical role in the CREP implementation process by reviewing contracts, visiting each site, determining eligibility, and ultimately developing conservation plans according to minimum specifications.

FWS--FWS would be consulted and would provide guidance if T&E species or critical habitat issues are revealed.

2.3 Comparison of Alternatives

The two alternatives both respond to project objectives in varying degrees. Implementing either alternative also has specific environmental implications for the State's watersheds. The following two tables provide an alternative comparison summary. To provide consistency, the following impact terminology will be used in the comparison table below and throughout the document.

- No Effect--A change to a resource's condition, use, or value that is not measurable or perceptible.

- Beneficial Effect--An action that would improve the resource's condition, use, or value compared to its current condition, use, or value.

- Minor Adverse Effect--A measurable or perceptible, minor localized degradation of a resource's condition, use, or value that is of little consequence.
- Moderate Adverse Effect--A localized degradation of a resource's condition, use, or value that is measurable and of consequence.
- High Adverse Effect--A measurable degradation of a resource's condition, use, or value that is large and/or widespread and could have permanent consequences for the resource.
- Short term Effect--An effect that would result in the change of a resource's condition, use, or value lasting less than one year.
- Long term Effect--An effect that would result in the change of a resource's condition, use, or value lasting more than one year and probably much longer.

Table 2. Alternatives Summary Comparison of Achievement of Project Objectives.

Objectives	Indicators	Alternative A: No Action	Alternative B: Implement CREP
Objective #1: Protect a minimum of 2,000 linear miles of watercourses through the installation of conservation buffer practices.	Enrollment of up to 24,500 acres. Implementation of CPs 2, 3A, 4D, 21, 22, 29, and 30.	Current agricultural practices would continue. Incentives for enrolling agricultural lands and installing conservation buffers would not be implemented or funded.	Up to 24,500 acres would be enrolled in various buffer CPs as a part of CREP implementation. CPs would be implemented to reduce contaminants entering the watersheds. Water quality would be improved.
Objective #2: Enroll 30 percent of the watersheds' farmed riparian acreage into CREP.	Enrollment of up to 6,250 acres. Implementation of CP22.	Current agricultural practices would continue. Incentives for enrolling additional riparian acreage in the targeted watersheds would not be implemented or funded.	Incentives to enroll additional riparian acreage would be implemented, resulting in the enhancement and protection of riparian corridors, habitat values, and water quality.
Objective #3: Secure agreements on 26,250 acres of cropland, frequently flooded agricultural lands, and restorable wetlands.	Enrollment of up to 26,250 acres. Implementation of CPs 2, 3A, 4D, 21, 22, 23, 23A, 30, and 31.	Current agricultural practices would continue. Marginal quality agricultural lands and restorable wetlands would remain in production, excluding possible enhancements to water quality and watershed ecological integrity.	Frequently flooded agricultural lands and restorable wetland areas could potentially be enrolled in CREP, helping to improve water quality and the ecological integrity of the targeted watersheds.

Objectives	Indicators	Alternative A: No Action	Alternative B: Implement CREP
Objective #4: Enroll 2,000 acres of CP3A, CP4D, CP22, and CP23 in 10-year contract extensions with local SWCDs in the Tippecanoe watershed.	Enrollment of up to 2,000 acres in ten-year contract extensions. Implementation of CPs 3A, 4D, 22, 23, and 23A.	Current agricultural practices would continue in the Tippecanoe watershed.	Enrollment of up to 2,000 acres in 10-year contract extensions would help correct the ecological trajectory of the Tippecanoe watershed, thereby reducing watershed contaminants and prolonging anticipated long term beneficial effects.
Objective #5: Enroll 3,000 acres of CP3A and CP22 in permanent easements in the Tippecanoe watershed.	Enrollment of up to 3,000 acres. Implementation of CPs 3A and CP22.	Current agricultural practices would continue in the Tippecanoe watershed. Incentives to protect riparian corridors and other wooded areas with conservation easements would not be available. Without a focus on the use of this conservation tool, sensitive lands may be degraded or lost.	Incentives to protect riparian corridors and other wooded areas in perpetuity through the use of permanent conservation easements would be enhanced.
Objective #6: Complete a minimum of 5,000 CREP agreements and associated CPs.	Completion of up to 5,000 CREP agreements with producers. Implementation of CPs 2, 3A, 4D, 21, 22, 23, 23A, 29, 30, and 31.	Current agricultural practices would continue. CPs would not be implemented or funded. Benefits would not be as dispersed and would not provide leverage to beneficially affect many more acres within the targeted watersheds.	CREP would make CPs and incentives available to qualifying producers throughout the targeted watersheds, providing opportunity to better disperse benefits.

Table 3. Summary Comparison of the Effects of Alternatives A and B on the Resources that are issues.

Issues	Alternative A: No Action	Alternative B: Implement CREP
Issue #1: State Water Quality Standard susceptibility to agricultural practices.	Long term, moderate adverse effect--State water quality values would continue to decline. Any improvement in water quality would be dependant upon existing programs. However, because these programs may not directly address agricultural practices, runoff from farms may continue to introduce pollutants into the system.	Long term, moderate to high beneficial effect--Implementation of CREP would provide significant localized impacts on water quality and would help to achieve CREP's goals of reducing suspended solids, P, N, and all water-borne pollutants. These improvements would occur throughout the targeted watersheds.
Issue #2: Wetland susceptibility to agricultural practices.	Long term, moderate adverse effect--Wetland values would continue to slowly decline as a result of existing and projected agricultural runoff. Total wetland acres would likely be stable or slightly reduced.	Long term, moderate beneficial effect--Through program incentives, wetland acreage would likely increase and help create new wildlife habitat for traditional species in the combined watersheds.
Issue #3: Floodplain susceptibility to agricultural practices.	No effect--Since floodplains are routinely used for agricultural production and normally have little adverse affect on flowage areas or floodways, these effects are considered to be negligible.	Minor long term improvements would be made to floodplains and stream values. CPs would assist in controlling flood events.
Issue #4: Drinking Water susceptibility to agricultural practices.	Long term, minor adverse effect--Drinking water quality would continue to decline as a partial result of polluted agricultural runoff.	Long term, minor beneficial effect--Minor positive effects would occur. CPs would directly improve the quality of runoff. Wellheads and recharge areas would be indirectly improved, benefiting the aquifers.
Issue #5: Critical Habitat or Threatened and Endangered Species susceptibility to agricultural practices.	Long term, minor adverse effect--Wildlife and habitat values would not benefit from the leveraged effects of habitat restoration and watershed improvement CPs and may continue to decline.	Long term, moderate beneficial effect--CPs would improve habitat values. Improvements to water quality alone would have beneficial effects for all wildlife as well as potential increases in critical habitat.

Issues	Alternative A: No Action	Alternative B: Implement CREP
Issue #6: Cultural resources susceptibility to agricultural practices.	Without a mandated assessment process, minor to moderate adverse impacts would continue to occur on cultural resources. These include disturbance and destruction of prehistoric and historic sites and structures, either through ongoing land conversion for development or agricultural use.	Minimal to no impact would occur. If cultural resources are discovered on enrolled lands, coordination with the SHPO, etc. would occur to properly mitigate potential impacts.
Issue #7: Socioeconomic impacts from agricultural practices.	Long term, minor effect--No FSA actions are required or necessary to address existing or ongoing issues relating to environmental justice.	Long term, minor beneficial effect--By enrolling marginal, less productive agricultural lands, landowners should be able to reduce overall input costs for farming operations and maintain or increase production by being able to concentrate resources on the remaining farmland. Disproportionate affects on minority or underrepresented groups are unlikely.

3.0 Affected Environment and Environmental Consequences

3.1 Introduction

The analyses of Affected Environment and Environmental Consequences have been combined in this section to simplify the document. Relevant resource issues related to the Indiana CREP are discussed below in Sections 3.4 through 3.11. This section will explore the environmental resources affected by the No Action Alternative and the Proposed Action Alternative (Implementation of the Indiana CREP).

This chapter discusses the resources most likely to receive impacts from the alternatives and compares the impacts of the alternatives on the resource issue. Resources discussed in this chapter include State water quality (3.4); wetlands (3.5); floodplains (3.6); drinking water (3.7); critical habitat or threatened/endangered species (3.8); cultural resources (3.9); and socioeconomic issues (3.10).

The general nature of this PEA limits discussion of the resources to a broad scale. An in depth site specific EE would be performed by FSA for each farm contract as part of the conservation plan. As impacts become clear at each site, the appropriate steps would be taken to ensure compliance with NEPA and related environmental and cultural resource laws and regulations.

3.2 General Description

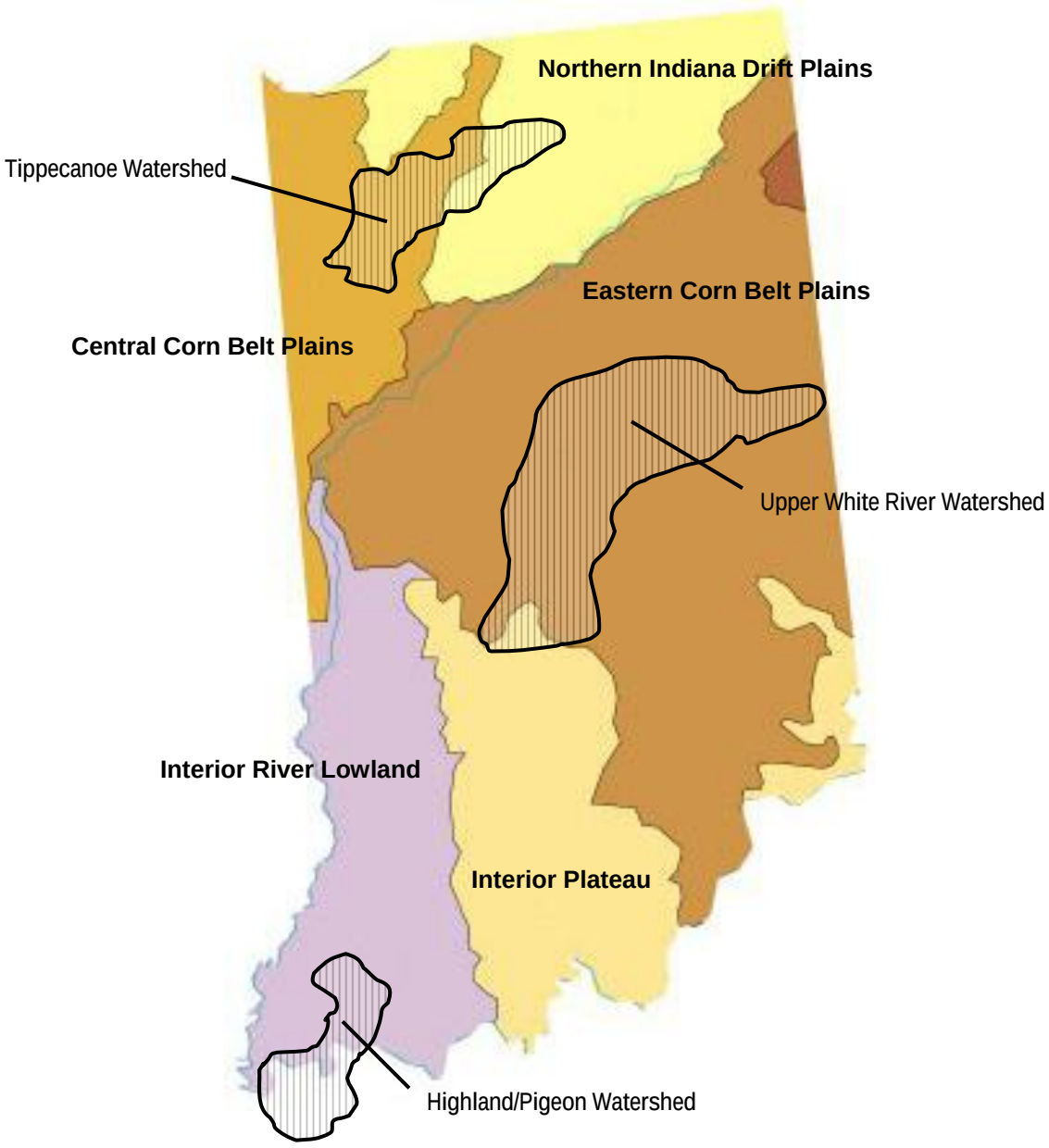
The State of Indiana may be divided into a number of ecoregions (see Figure 8) that are fairly homogenous in terms of physiography and land use.

The Tippecanoe Watershed covers a portion of the Central Corn Belt Plains ecoregion. This area was comprised of extensive prairie communities intermixed with oak hickory forests on the glaciated plains and were a stark contrast to the hardwood forests that grew on the drift plains to the east. Ecoregions to the west were mostly treeless except along larger streams. Beginning in the 19th century, the natural vegetation was gradually replaced by agriculture. Farms are now extensive on the dark, fertile soils of the Central Corn Belt Plains and mainly produce corn and soybeans; cattle, sheep, poultry, and especially hogs are also raised in the region. Agriculture has affected stream chemistry, turbidity, and habitat.

Bordered by Lake Michigan on the west, the Northern Indiana Drift Plains ecoregion is less agricultural than those to the south. The Tippecanoe Watershed also covers a portion of this region. The region is characterized by many lakes and marshes as well as an assortment of landforms, soil types, soil textures, and land uses. Broad till plains with thick and complex deposits of drift, paleobeach ridges, relict dunes, morainal hills, kames, drumlins, meltwater channels, and kettles occur. Feed grain, soybean, and livestock farming as well as woodlots, quarries, recreational development, and urban-industrial areas are common.

The Eastern Corn Belt Plains ecoregion in Indiana includes both the Tippecanoe and Upper White watersheds and is primarily a rolling plain with local end moraines. It has more natural tree cover and has lighter colored soils than the Central Corn Belt Plains. Glacial deposits of Wisconsin age are extensive. They are not as dissected nor as leached as the pre-Wisconsin till that is restricted to the southern part of the region. Originally, beech forests were common on Wisconsin soils while beech forests and elm-ash

Figure 8. State of Indiana Ecoregions and Approximate Watershed Locations.



swamp forests dominated the wetter pre-Wisconsin soils. Today, extensive corn, soybean, and livestock production occurs, affecting stream chemistry and turbidity.

The Upper White Watershed reaches down slightly into the northern portion of the Interior Plateau. This is a diverse ecoregion extending across southern Indiana. Rock types are distinctly different from the coastal plain sands and alluvial deposits to the west, and elevations are lower than the Appalachian

ecoregions to the east. Landforms of open hills, irregular plains, and tablelands are common. The natural vegetation is primarily oak-hickory forest with areas of bluestem prairie and cedar glades. The region has a diverse fish fauna.

The Interior River Lowland is made up of many wide, flat-bottomed terraced valleys; forested valley walls; and dissected glacial till plains. The Highland/Pigeon Watershed occurs here. In contrast to the generally rolling to slightly irregular plains in adjacent ecological regions to the north, east, and west, where most of the land is cultivated for corn and soybeans, a little less than half of this area is in cropland, and about 30 percent is in pasture.

3.3 Leveraged Benefits

An understanding of the planned effect of the 26,250 acres proposed for the Indiana CREP is essential to the discussion of resource impacts. CREP implementation is designed to leverage and multiply effects. Adding one acre through CREP benefits more than that one acre in the watershed. Each acre enrolled in CREP could potentially benefit many acres. For example, if 10 acres were enrolled in CREP and CP 23 (wetland restoration) was implemented, the new wetland could intercept agricultural runoff from a hundred, or even thousands of acres, reducing P and pesticide loads significantly. Wetlands can maintain good water quality and improve degraded water quality conditions by intercepting and treating surface runoff. Suspended sediments and contaminants in the water are trapped, retained, and/or transformed through a variety of natural biological and chemical processes before they reach downstream water bodies. Forested riparian wetland areas in predominantly agricultural watersheds have been shown to remove approximately 80 percent of the P and 90 percent of the nitrate-N from water runoff (EPA, 1995). Streams in a Wisconsin basin, which was comprised of 40 percent wetlands, had sediment loads that were 90 percent lower than a comparable basin with no wetlands (USGS, 1997). Implementing such CPs allows the relatively small footprint of CREP acreage to leverage much greater benefits for the watershed downstream.

In another example, a producer can enroll three or four acres of agricultural land bordering a stream or wetland in CREP and provide restorative and retention properties that may filter discharges and regulate water flow from several hundred acres; thus, small enrollments in CREP can have large impacts on watersheds.

Specific impacts and the degree to which CPs can be effective would depend on site specific analysis of each CREP contract. Acreage is limited for some of the CPs, yet overall benefits are measured as impacts to larger acreage. For each implementation area, mitigation measures are in place, and outlined steps would be followed to ensure compliance with NEPA and other Federal regulations.

3.4 State Water Quality

Agriculture is a leading industry in the State of Indiana and one of the largest land uses. Livestock operations are important. Since agricultural land is often managed intensively, runoff can cause water quality problems. Poor land management and intensive production activities on agricultural land can result in pollution of waters by sediment, nutrients and agricultural chemicals.

Agricultural nonpoint source pollution can be classified into two groups: land use and management operations. The first group relates to the actual use of a parcel of land (e.g., row crops, pasture land, and truck farms). The second group relates to the intensity of agricultural operations (e.g., cultural techniques, pesticide and fertilizer applications, grazing techniques, and manure utilization). Agricultural nonpoint source pollution is not a result of agricultural operations or land use themselves, but the

inappropriate use of land (e.g., growing row crops on land not suited for intensive cultivation) and/or improper management of agricultural operations (e.g., over-fertilization or misapplication of pesticides), which increase the opportunity for contaminants to reach either ground or surface waters (IDEM, 2002a).

OWQ is responsible for protecting public health and the environment by assessing the quality of surface water and groundwater through biological and chemical testing and regulating and monitoring drinking water supplies (including wellhead protection), wastewater treatment facilities and the construction of such facilities (IDEM, 2003c).

The CWA requires OWQ to monitor and report on the water quality of the State's water bodies. Under Section 303(d) of the CWA, OWQ is required to biennially develop a Water Quality Limited Segments List (commonly called a 303(d) list). This is a list of water bodies where water quality does not meet surface water quality standards. The OWQ is required to develop the 303(d) list using all appropriate readily available data.

Some of the types of data gathered to create the 303(d) list include:

- Physical/chemical water results (lakes and streams)
- Fish community assessments (streams)
- Benthic aquatic macroinvertebrate community assessments (streams)
- Fish tissue and surficial aquatic sediment contaminant results (lakes and streams)
- E. coli monitoring results (streams)
- Indiana Trophic State Index (lakes) (IDEM, 2002a)

Section 303(d) requires a TMDL for waters that do not meet State water quality standards. TMDL is described as a "pollution budget" for a specific river, lake, or stream, and establishes wasteload allocations for point sources such as wastewater discharges from treatment plants or industrial facilities and load allocations for nonpoint sources such as stormwater runoff or snow melt. Each TMDL also includes a margin of safety and, if appropriate, a reserve capacity. Water bodies that require TMDLs are reported to EPA as required in Section 303(d) of the CWA (IDEM, 2002a).

In order to implement TMDL requirements, OWQ characterizes the extent and magnitude of the impairment and develops TMDLs that ensure the attainment of water quality standards. Throughout this process, OWQ encourages public participation in all TMDL activities (IDEM, 2003a).

Under Section 305(b) of the CWA, the OWQ is required to biennially report to the EPA on the quality of Indiana's waterbodies. Compliance with the reporting requirements of the CWA necessitates extensive monitoring of the water condition of the state. Indiana has an extensive state-wide system of water monitoring. In 2001, 99 percent of the State's total stream miles were assessed utilizing EPA assessment guidelines. Indiana's Watershed Monitoring Program uses a watershed approach to monitoring. Focusing on watersheds allows environmental protection to move beyond political boundaries to more effectively understand and manage difficult issues (IDEM, 2003a).

In November 2001, EPA issued guidance that encourages states to integrate the 305(b) report and the 303(d) list into one report. Following EPA's guidance, Indiana's first Integrated Water Quality Monitoring and Assessment Report met the reporting requirements of Sections 106, 303(d), 305(b), 314, and 319 of the CWA. Many of the findings of that report are summarized below (IDEM, 2002a).

3.4.1 Existing Conditions

Surface water in the northern one-quarter of the State flows north into the Great Lakes and then through the St. Lawrence River to the Atlantic Ocean. Water from the southern three quarters of the state drains into the Ohio or Illinois River; both of these flow into the Mississippi River, which drains south into the Gulf of Mexico. There are about 90,000 miles of rivers, streams, ditches, and drainage ways in Indiana of which 35,673 miles are listed in the EPA River Reach File 3 (IDEM, 1998). These streams drain into the state's nine major drainage basins. The State has more than 600 inland lakes, ponds, wetlands, and reservoirs that cover 1,073,445 acres. Indiana's waters are used for multiple purposes such as drinking, industry and agriculture, fisheries, aquatic resources, recreation (e.g., boating, swimming), and wastewater disposal. Surface water quality in the state varies from severely degraded by pollution to clean enough for fishing, swimming, or drinking.

The Indiana 2002 Section 303(d) list identifies 428 water body/pollutant combinations still requiring TMDLs. The top ten most common impairments, and the number of water bodies affected were:

- Impaired Biotic Communities–180
- E. coli--174
- Fish Consumption Advisory–167
- DO--27
- Nutrients (excess P and/or N)–22
- Total Dissolved Solids–19
- Algae–14
- Sulfates–12
- Taste and Odor–10
- Ammonia–7

The EPA's Atlas of America's Polluted Waters (2000) includes maps of water bodies (streams, rivers, coastlines, estuaries, and lakes) within each state that does not meet state water quality standards. The Atlas shows miles of waters that are impaired/threatened within an eight digit Hydrologic Unit Code (HUC) divided by the total number of water miles within the HUC. This information is summarized in Figure 9 below.

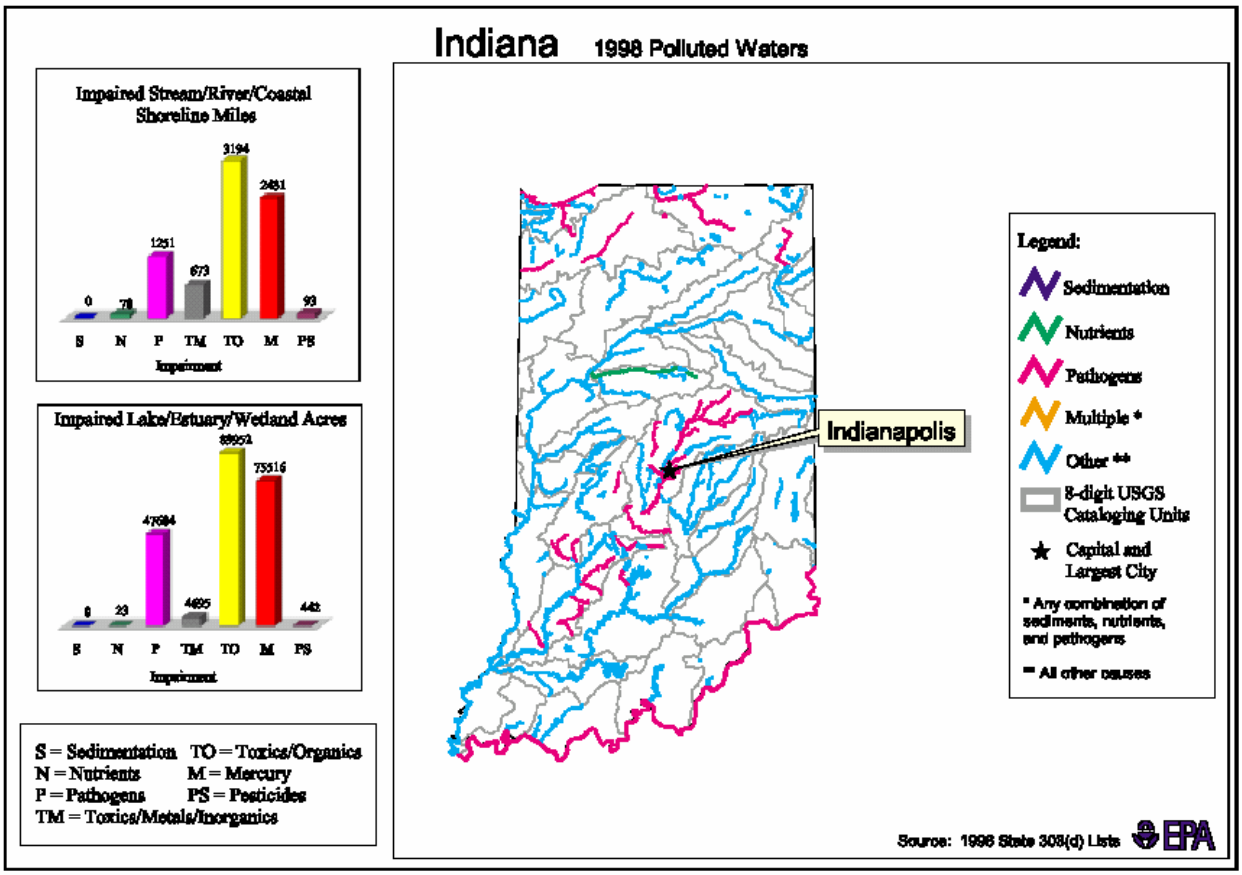
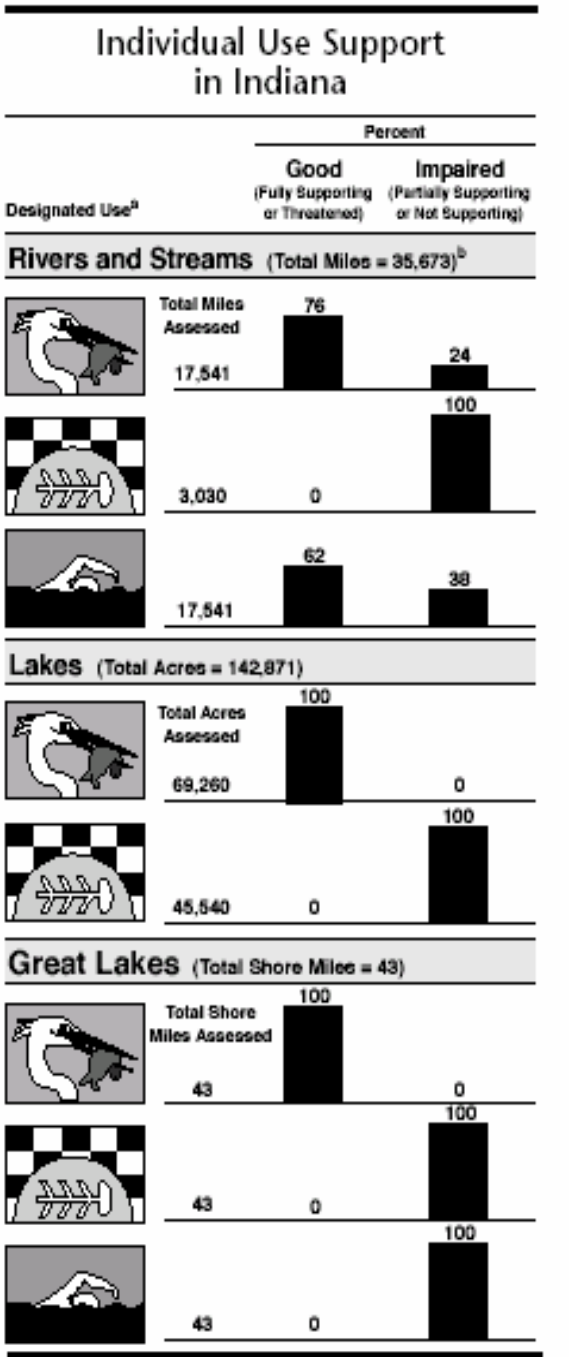
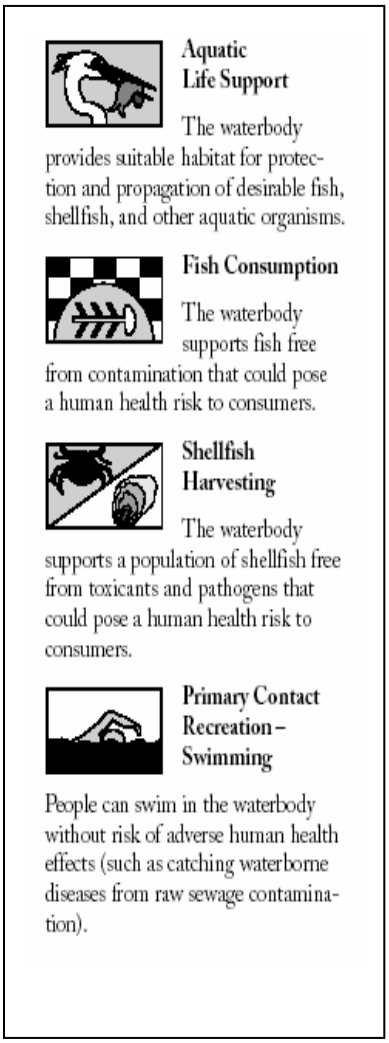


Figure 9. 1998 Indiana's Polluted Waters (EPA, 2000b).

In 2000, the EPA prepared *The National Water Quality Inventory: 2000 Report*. This report compiled information from each state's Section 305(b) report and summarized the findings into a national water quality inventory in order to provide an accurate picture of the nation's water quality. The Indiana information, summarized in Figure 10, outlines the ability of the state's waters to support specific designated uses.





[a]A subset of Indiana's designated uses appear in this figure. Refer to the state's 305(b) report for a full description of the state's uses.
[b]Includes nonperennial streams that dry up and do not flow all year.

Note: Figures may not add to 100% due to rounding.

Figure 10. Indiana's Impaired Waterbodies (EPA, 2000b).

The Annual State of the Environment Report for 2003 detailed the State of Indiana's water quality. The findings of that report, along with other sources, are summarized below.

Rivers and Streams

The Annual State of the Environment Report looked at the State's rivers and streams to determine if they met Indiana's water quality standards for designated uses or other natural resource goals such as aquatic life support, fish consumption, and recreational use. For example, the report states that of the 8,660 stream miles surveyed for recreational use, about 59 percent were found to support boating and full body contact recreational use like swimming. However, 38 percent of the surveyed river miles do not support swimming due to high concentrations of bacteria (EPA, 2000a). IDEM's Assessment Branch measures E. coli bacteria in stream samples as an indicator of the possible presence of pathogens (disease-causing microorganisms). E. coli bacteria indicated unsafe recreational levels in over 3,500 stream miles (IDEM, 2003a).

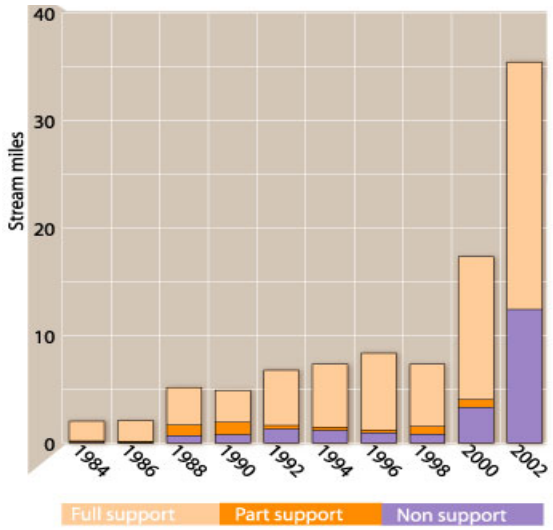


Figure 11. Stream miles assessed for aquatic life.

Source: State of the environment (IDEM, 2003a)

Of the 35,430 stream miles assessed, approximately 64.5 percent were estimated to fully support the maintenance of well-balanced aquatic communities, while more than 12,000 stream miles were classified as not fully supporting aquatic life using the fish and macroinvertebrate community responses (IDEM, 2003a).

IDEM collects fish tissue and surficial, recently deposited, upper layer sediments for analysis to determine concentrations of pollutants. The Indiana State Department of Health (ISDH) reviews the data and issues fish consumption advisories for Indiana water bodies. All of the waters of the State are under a limited consumption advisory for at least some species of fish based on concentrations of polychlorinated biphenyls (PCBs) and mercury (EPA, 2000a). Indiana has almost 3,000 stream miles impaired because of PCBs in fish and about 2,600 stream miles with fish consumption advisories due to mercury. The pollutants most frequently identified in Indiana waters include PCBs, metals (predominantly mercury), and pathogens (EPA, 2000a).

Lakes and Reservoirs

Lakes are often plagued with water quality issues because they frequently serve as "sinks" for pollutants that are transported downstream from higher up within the watershed. A sink in a hydrologic system refers to a waterbody that has a net retention of nutrients, chemicals, or organic materials transported downstream within a watershed--that is, the input of water and pollutants is greater than the output of water and pollutants.

While all of the lake areas sampled supported recreational use and have good water quality that fully supports aquatic life, all of the waters of the State are under a limited consumption advisory for at least some species of fish (EPA, 2000a); almost 20,000 lake acres are impaired because of PCBs in fish and about 5,700 lake acres are impaired due to mercury (IDEM, 2003a).

One of the primary problems facing lakes in Indiana is the natural process known as eutrophication. The process of adding nutrients and sediments to a lake occurs naturally over the course of many centuries. It is only when this process is accelerated by the artificial addition of nutrients and sediments from human activities within the watershed that damage can be done to the aquatic ecosystem.

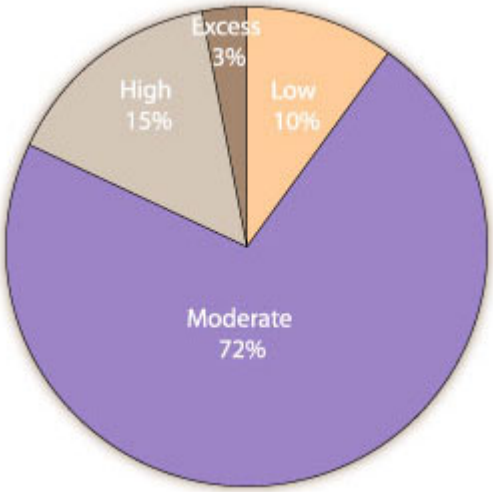


Figure 11. Nutrient levels in public lakes and reservoirs, 1997-2001.

Source: State of the environment (IDEM, 2003a)

Of the more than 106,000 lake acres sampled from the beginning of 1997 through 2001, about ten percent have low nutrient levels and exhibit related effects. Seventy-two percent of lakes in the State fall into the moderate range of the eutrophication scale (see Figure 11). Lakes in this category should have no problem maintaining a healthy, well-balanced aquatic community comprised of diverse planktonic (free floating), plant, macroinvertebrate (e.g., insects, crayfish, mussels, and snails), and vertebrate (e.g., fish, turtle, frog and duck) species.

Fifteen percent of the public lakes and reservoirs in the state have high levels of nutrients. This may be a natural occurrence in a few of these lakes. However, many lakes have advanced to this stage due to human impacts on the surrounding watersheds. The final three percent of public lakes in the State are in advanced stages of aging.

The primary plant nutrients, N and P, are of particular interest to IDEM during lake surveys. These nutrients are found in fertilizers, human and animal wastes, and yard waste. It is far easier to control these nutrients at their source, before they enter a lake, than to remove them afterwards (IDEM, 2003a).

Targeted Watersheds

The three watersheds (see Section 1.5) targeted by the proposed Indiana CREP program have many water quality issues, some of which may be traced to current agricultural practices. Specific water quality issues affecting each of the three watersheds are discussed below.

Highland-Pigeon--Within the Highland-Pigeon watershed (Figure 1; Section 1.5.1), approximately 70 percent of the land is involved in agricultural production. These practices impact the watershed's many ponds, lakes, rivers, streams, aquifers, and wetlands. The Tippecanoe watershed provides drinking water, along with recreational areas and wildlife habitat. Some of the major stressors/pollutants in the watershed are agriculturally induced and include bacteria, N, noxious weeds, open spaces, pesticide(s), P, salinity, and sediment. The Conservation Technology Information Center (CTIC) determined that efforts to improve water quality within the watershed should be directed at cropland and riparian areas (CTIC, 2003a).

According to the 1998 Section 303(d) List Fact Sheet for Indiana, the Highland-Pigeon watershed was ranked the 21st most polluted of the 35 watersheds on the list (by total number of waters on the list), accounting for 1.44 percent of the waters on the list.

Table 4. Highland-Pigeon Watershed waterbody impairments.

Impairment Name	Impairments Reported	Percent of Reported
FCA (PCBS)		21.43
E. COLI		14.29
PCBS		14.29
PRIORITY ORGANICS		14.29
CHLORDANE		7.14
LEAD		7.14
NUTRIENTS		7.14
ORGANICS		7.14
PATHOGENS		7.14
	Total Number of Impairments Reported: 14	**100.00**

Source: EPA, 1998.

The *2002 Indiana Integrated Water Quality Monitoring and Assessment Report* lists agriculturally-induced water quality issues still found within the Highland-Pigeon watershed. These problems are summarized in Table 5.

Table 5. Highland-Pigeon Watershed level of waterbody impairment.

Watershed	Segment Name	Level of Impairment by Pesticides	Level of Impairment by Pathogens
Highland-Pigeon	Pigeon Creek	Moderate-High	Moderate

Source: IDEM, 2002a.

Tippecanoe--Approximately 50 percent of the land within the Tippecanoe watershed is involved in agricultural production (see Figure 1; Section 1.5.2). These practices impact the watershed's many ponds, lakes, rivers, streams, and wetlands. The Tippecanoe watershed provides drinking and irrigation water, along with recreational areas and wildlife habitat. Major agriculturally induced stressors/pollutants in the watershed are N, pesticide(s), P, and sediments. The CTIC determined that efforts to improve water quality within the watershed need to be directed at management of animal manure, cropland, irrigation practices, riparian areas, and streambanks (CTIC, 2003b).

According to the 1998 Section 303(d) List Fact Sheet for Indiana, of the 35 watersheds on the list (by total number of waters on the list), the Tippecanoe watershed was the eighth most polluted, accounting for 4.31 percent of the waters on the list.

Table 6. Tippecanoe Watershed waterbody impairments.

Impairment Name	Impairments Reported	Percent of Reported
FCA (MERCURY)		60.00
FCA (PCBS)		30.00
CYANIDE		10.00
	Total Number of Impairments Reported: 10	**100.00**

Source: EPA, 1998.

The *2002 Indiana Integrated Water Quality Monitoring and Assessment Report* lists a number of agriculturally-induced water quality issues still found within the Tippecanoe watershed. These problems are summarized in Table 7 below.

Table 7. Tippecanoe Watershed level of waterbody impairment.

Watershed	Segment Name	Level of Impairment by Pathogens
Tippecanoe	Tippecanoe River	Slight
Tippecanoe	Collins Ditches	Slight
Tippecanoe	Taylor Ditches	Slight
Tippecanoe	Moss Ditch	Slight
Tippecanoe	Harp Ditch and other tributaries	Slight
Tippecanoe	Big Monon Ditch - outlet	Slight
Tippecanoe	Lake Freeman	Slight

Source: IDEM, 2002a.

Upper White--Approximately 80 percent of the land within the Upper White watershed is involved in agricultural production (see Figure 1; Section 1.5.3). These practices impact the watershed's many ponds, lakes, reservoirs, rivers, streams, aquifers, and wetlands. The Tippecanoe watershed provides drinking and irrigation water, flood retention, along with recreational areas and wildlife habitat. Some of the major agriculturally induced stressors/pollutants in the watershed are bacteria, exotic species, flooding, nitrate-N, noxious weeds, open spaces, pathogen, pesticide(s), P, sediment, temperature, and wildlife habitat. The CTIC determined that efforts to improve water quality within the watershed need to be directed at cropland and streambank areas (CTIC, 2003c).

According to the 1998 Section 303(d) List Fact Sheet for Indiana, the Upper White was the most polluted of the 35 watersheds on the list (by total number of waters on the list) and accounted for 16.75 percent of the waters on the list. The following table lists the individual impairments of the Upper White watershed, many of which are caused by current agricultural practices.

Table 8. Upper White Watershed waterbody impairments.

Impairment Name	Impairments Reported	Percent of Reported
E. COLI		27.40
FCA (PCBS)		23.29
FCA (MERCURY)		21.92
IMPAIRED BIOTIC COMMUNITIES		15.07
CYANIDE		5.48
DISSOLVED OXYGEN		2.74
PH		2.74
AMMONIA		1.37
	Total Number of Impairments Reported: 73	**100.00**

Source: EPA, 1998.

The *2002 Indiana Integrated Water Quality Monitoring and Assessment Report* lists a number of agriculturally-induced water quality issues still found within the Upper White watershed. These problems are summarized below in Table 9.

Table 9. Upper White Watershed level of waterbody impairment.

Watershed	Segment Name	Level of Impairment by Pathogens
Upper White	Dollar Hide Creek	Slight
Upper White	Duck Creek	Slight
Upper White	Eagle Creek	High
Upper White	Fall Creek	High
Upper White	Indian Creek	Slight
Upper White	Indianapolis Tributaries	Moderate
Upper White	Lambs Creek	Slight
Upper White	Mars Ditch	Moderate
Upper White	Minnie Creek Tributaries	Moderate
Upper White	Pipe Creek	Slight-Moderate
Upper White	Pleasant Run	Moderate-High
Upper White	Poques Run	Moderate
Upper White	White River	Slight-Moderate

Source: IDEM, 2002a.

Probable Causes

Indiana's water bodies are impaired by a number of contaminants. Most of these contaminants have a direct link to agricultural practices. Below is a discussion of the link between agricultural practices and water impairment. For a more complete discussion, see the FSA 2003 "Conservation Reserve Program Final Programmatic Environmental Impact Statement."

According to the EPA's 2000 National Water Quality Inventory, runoff from agricultural lands across the U.S. is a major source of nonpoint source pollution, causing significant water quality degradation. Agricultural nonpoint source pollution that has the greatest effect on water quality is runoff containing sediment, nitrate-N, P, and/or pesticides (FSA, 2003). EPA has stated that in Indiana the most often identified sources of water pollution include nonpoint sources, agricultural runoff, municipal point sources, and hydrologic modification (EPA, 2000a).

The EPA water quality inventory identifies agriculture runoff as the largest source of water quality degradation in the nation. Agricultural activities have the potential to introduce siltation, nutrients, pesticides, and organic matter that deplete oxygen. These pollutants can have severe negative impacts on a wide range of aquatic ecosystems because of their potential to degrade habitat and remove the food base (EPA, 2000a).

Agriculture Practices that Cause Nonpoint Source Pollution

Soil Disturbance:

- Cultivation can result in erosion that will cause sedimentation to streams, lakes, or estuaries.

Nutrients and Animal Wastes:

- Results in runoff laden with plant nutrients that can lead to excessive algal growth.
- Nitrates and nitrites can contaminate groundwater.
- Organic wastes in high concentrations can deplete dissolved oxygen in water, resulting in fish kills.
- Nutrient pollution can accelerate eutrophication.
- Coliform bacteria pollution.

Pesticides:

- Can be carried off by runoff, contributing to toxic pollution of the receiving waters.
- Can contaminate groundwater.

Grazing Animals:

- Can over-graze grass, exposing soil and creating erosion problems.
- Can damage stream banks and riparian areas by wallowing.

Figure 12. Agricultural Pollution.

Source: FSA, 2003.

Ground disturbing activities like construction and farming also result in significant erosion and sedimentation of nearby water bodies. Agricultural activities result in a loss of approximately 1.3 billion tons of soil per year across the U.S. This results in a substantial burden on the nation's water bodies and leads to concerns about sediments, nutrients, and pesticides impacting water quality (NRCS, 2000).

The extent of the impact that agriculture has on water quality can be seen in the Indiana Integrated Water Quality Monitoring and Assessment Report that lists the total miles of streams affected by each cause/stressor in Indiana. Many causes/stressors listed are associated with agricultural activities. For example, the report states that 540 miles of Indiana streams are impacted by agriculture, 2,952 miles by pathogens, 70 miles by unionized ammonia, and 277 miles by nutrients. The report also states that six miles of Great Lakes shoreline are affected by nonpoint source/unknown origin and 58 miles by pathogens. It also states that 1,350 acres of Indiana's lakes and reservoirs have been impacted by nutrients. Each of these causes/stressors can be directly linked to agricultural practices (IDEM, 2002a).

3.4.2 Effects of Alternative A (No Action) on State Water Quality

Implementation of the No Action alternative would have a long term, moderate adverse effect on State water quality values as these values would continue to decline. Agricultural runoff introduces contaminants into the waters of Indiana and any improvements in water quality would be dependant upon existing and proposed programs. However, because few of these programs directly address agricultural practices, runoff from farms would continue to introduce pollutants into the State's water system.

Selection of Alternative A would not contribute to achieving any of the six CREP Objectives listed in section 1.4.

3.4.3 Effects of Alternative B (CREP Agreement) on State Water Quality

Implementation of CREP would provide long term, moderate to high beneficial effects on water quality and would help to lower the amounts of suspended solids, P, N, and many other water-borne pollutants in Indiana's waters. These improvements would most likely result in water quality improvements across the State, but most heavily in the three watersheds where CREP will be focused. Additionally, the agricultural runoff discharging into nearby states would be filtered serving to protect downstream water quality.

One acre in CREP can have a positive impact on tens and hundreds of acres upstream (Section 3.3). CPs implemented on those limited acres can have a significant impact on downstream water quality by not only filtering runoff from adjacent agricultural acreage, but siphoning upstream flows into the filtering system to be returned downstream with reduced pollutants. Implementation of CREP CPs would result in immediate reductions of pollutant loads in areas that were previously cropped.

All of the CPs are designed to have a direct or indirect effect on water quality. For example, CP2 (planting permanent native grasses) would provide soil erosion protection as well as excellent habitat for a variety of wildlife, including game and song birds. CP3A (hardwood tree planting) would reduce soil erosion, and helps reduce suspended solids in water flows. CP4D (permanent wildlife habitat) would reduce soil erosion by planting native vegetation to create habitat for wildlife. CP21 (filter strips) would reduce sediment, nutrients, pesticides, and other contaminants. Filter strips slow the velocity of water, allowing the settling out of suspended soil particles, the infiltration of runoff and soluble pollutants, the absorption of pollutants on soil and plant surfaces, and the uptake of soluble pollutants by plants. CP22 (riparian buffers) remove nutrients, sediment, organic matter, pathogens, pesticides, and other pollutants from surface runoff and subsurface flow. Riparian buffers also create shade to lower water temperature, improving habitat for aquatic organisms; providing a source of detritus and large woody debris for aquatic organisms; and stabilizing and restoring damaged stream banks, thus reducing erosion. CP23 and CP23A (wetland restoration) would provide larger areas for retention of solids and removal of nutrients. CP29 (marginal pastureland – wildlife habitat buffer) and CP30 (marginal pastureland – wetland buffer) would help stabilize marginal pasture and fallow lands to reduce erosion and runoff potential. CP31 (bottomland timber established on wetlands) would reduce or even eliminate sheet and rill erosion. Permanent woody vegetation slows water flow and captures sediment. Decreased sediment load would improve water quality dramatically.

These practices would combine to enhance the quality of water throughout the State of Indiana, including some of the State's impaired waterbodies. In addition, the CPs would facilitate meeting current and future nutrient discharge limits under current TMDLs and other State water quality programs.

Implementation of Alternative B would result in significant reductions in non-point source pollution throughout the state. The beneficial impacts of the CPs discussed above would provide cumulative benefits and assist in achieving all CREP Objectives (Section 1.4).

3.5 Wetlands

Section (a) (16) of the Food Security Act, Public Law 99-198, December 23, 1985 defines a wetland as:

> The term "wetland," except when such term is part of the term "converted wetland," means land that has a predominance of hydric soils and that is inundated or saturated by surface or ground water at a frequency and duration sufficient to support, and that under normal circumstances does support, a prevalence of hydrophytic vegetation typically adapted for life in saturated soil conditions.

Numerous laws exist that govern FSA program actions in relation to wetlands. Included are the following:

- E.O. 11990, Protection of Wetlands
- Clean Water Act
- Food Security Act

Wetlands perform numerous functions, such as removing excess nutrients from the water that flows through them. These functions, in turn, provide benefits to the environment and the citizens of the State. For example, the benefit derived from nutrient removal is improved or maintained water quality. This in turn benefits society in a number of ways such as clean drinking water, safe recreation, and secure fish and wildlife habitat.

Following are some of the wetlands functions and benefits that are important in Indiana:

Water Quality Maintenance

Wetlands have been shown to remove organic and inorganic nutrients and toxic materials from water (runoff) that flows across or through them. Through biogeochemical processes that are unique to wetlands, water outflow is frequently cleaner than water inflow. Wetlands are able to accomplish this through several ecological mechanisms:

- Reduced water velocity causes sediments and chemicals sorbed to sediments to drop out of the water column;
- Aerobic and anaerobic processes promote denitrification, chemical precipitation, and other chemical reactions that remove chemicals from water;
- High wetland productivity can lead to high rates of mineral and nutrient uptake by vegetation and subsequent burial in sediments when the plants die;
- Wetland sediments support a diversity of decomposers and decomposition processes; and
- Accumulation of organic peat in many wetland systems can cause the permanent burial of chemicals (Mitsch and Grosselink, 1993).

Wetlands also protect fresh groundwater supplies in coastal areas by preventing saltwater intrusion.

Flood Protection and Abatement

During storms and periods of heavy rain or spring snow melt, wetlands serve as natural reservoirs or channels for conveying excess water, slowing the movement of water through the watershed. Filling in wetlands often results in increased flooding, both downstream, by speeding water along, and upstream, by blocking water flow.

Erosion and Sedimentation Control

Wetland vegetation helps filter sediment by decreasing water velocity. Suspended particles settle in the wetland and do not enter navigational channels, lakes, and reservoirs. In much the same manner, wetlands also help prevent the erosion of shorelines and valuable agricultural land by serving as buffers between wave or stream activity and adjacent lands.

Recharging Groundwater Supplies

Certain types of wetlands may be helpful in recharging groundwater. If the wetland is perched (water level in the wetland is higher than the water table of its surroundings), water will flow into the groundwater system (Mitsch and Grosselink, 1993). This is called a recharge wetland. This function is especially important where groundwater is the sole source of drinking water or constitutes the major source of usable water.

Maintaining Surface Flows

When the surface water of a wetland is hydrologically lower than the water table of the surrounding land, wetlands may serve as groundwater discharge sites (discharge wetlands), thereby maintaining the quality and quantity of surface water supplies (Mitsch and Grosselink, 1993).

Fish and Wildlife Habitats

Many species of fish and wildlife depend on wetlands for critical parts of their life cycle. By providing breeding, nesting, and feeding grounds, and cover, wetlands are recognized as one of the most valuable habitats for wildlife. Young fish find food and shelter in the protective vegetation. Many species of endangered, threatened, or special concern fish and wildlife depend on wetlands.

Open Space

Wetlands are often the only undeveloped areas along crowded riverfronts and coastal regions or in urbanized areas. Because of the increased amount of hard surfaces in these developed areas, contaminated runoff (from streets, parking lots, etc.) becomes an issue. Functioning wetlands are able to filter some of the organic and inorganic pollutants before water is discharged downstream. Wetlands are often valued in more developed watersheds as “green oases” for aesthetic reasons. In some areas, real estate near these types of open space command significantly higher prices.

Educational and Scientific Research

Wetlands provide readily accessible outdoor biophysical laboratories, living classrooms, and vast training and education resources.

Biological Diversity

Society is becoming increasingly concerned about local, regional, and global biological diversity. Wetlands are important components of the landscape and contribute significantly to the State's overall

biological diversity. Wetlands are habitat for many rare and indigenous species of plants and animals and many in themselves represent unique natural communities.

3.5.1 Existing Conditions

Wetlands occur in and provide benefits to every county in Indiana. The lack of current quantitative information on some aspects of Indiana's wetland resources is a major obstacle to improving wetland conservation efforts.

The best estimate of the wetlands in Indiana before settlement 200 years ago is an assessment based on hydric soils (soils indicative of wetlands) conducted by NRCS. Based on an analysis of this data by IDNR, there were approximately 5.6 million acres of wetlands in Indiana 200 years ago. Combining the information from the National Wetlands Inventory (NWI) and the IDNR yields the following summary (IDNR, 1996).

- Estimated wetlands circa 1780s 5,600,000 acres
- Percent of surface area in wetlands circa 1780s 24.1 percent
- Existing wetlands 813,000 acres
- Percent of surface area in wetlands today 3.5 percent
- Percent of wetlands lost 85 percent

The most extensive database on wetland resources in Indiana is the NWI developed by FWS. In 1985, IDNR entered into a cooperative agreement with FWS to share the costs of mapping Indiana's wetlands. Indiana's NWI maps were produced primarily from interpretation of high-altitude color infrared aerial photographs (scale of 1:58,000) taken of Indiana during spring and fall of 1980 through 1987. Map production also included field investigations, reviews of existing information, quality assurance, draft map production, interagency review of draft maps, and final map production (IDNR, 1996).

NWI maps indicate wetlands by type, using the Cowardin et al. classification scheme (1979). The minimum size of a given wetland on NWI maps is typically one to three acres. Very narrow wetlands in river corridors and wetlands under cultivation at the time of mapping are generally not depicted, and forested wetlands are poorly discriminated (IDNR, 1996).

The most recent and complete analysis of this database was conducted in 1991 by IDNR. According to the report, *Wildlife Management and Research Notes, #532, Indiana's Wetland Inventory,* Indiana had approximately 813,000 acres of wetland habitat in the mid-1980s when the data were collected. Wetland loss or gain since then is unknown (IDNR, 1996).

Table 10. Acreage of wetland resources identified from the NWI maps during 1980-1987 and organized by CREP watershed and county.

COUNTY	WETLAND HABITATS*							Total Wetland Habitats
	Scrub-Shrub	Forested	Wet Meadow	Shallow Marsh	Deep Marsh	Open Water	Other**	
Highland / Pigeon Watershed								
Gibson	1,251	18,182	682	552	597	1,868	369	23,500
Pike	1,693	13,362	446	541	421	3,915	130	20,510
Posey	966	16,155	465	232	88	1,181	950	20,036
Vanderburgh	121	2,650	110	145	8	1,319	38	4,391
Warrick	1,522	11,618	364	417	433	5,473	130	19,957
Subtotal	5,553	61,967	2,067	1,887	1,547	13,756	1,617	88,394
Tippecanoe Watershed								
Benton	80	467	474	312	19	123	1	1,475
Carroll	322	4,085	928	380	40	355	154	6,264
Cass	395	4,600	1,460	957	145	436	0	7,993
Fulton	944	4,982	2,012	2,685	579	694	95	11,990
Jasper	582	3,256	1,249	1,960	322	574	364	8,307
Kosciusko	3,104	11,332	3,042	3,706	1,942	1,350	2,706	27,172
Marshall	574	10,598	1,732	3,246	559	1,166	166	18,039
Miami	192	2,729	567	713	53	417	100	4,771
Noble	3,651	11,389	2,109	4,829	776	1,359	3,354	27,467
Pulaski	374	7,241	2,204	1,383	123	335	65	11,725
Starke	312	7,940	1,187	1,312	254	414	0	11,419
Tippecanoe	300	7,521	1,317	902	220	471	150	10,880
White	539	2,270	2,265	1,057	35	344	536	7,046
Whitley	634	4,923	561	1,328	158	870	1,465	9,939
Subtotal	12,003	83,333	21,107	24,770	5,225	8,908	9,156	164,487

Upper White River Watershed								
Boone	143	3,460	610	195	25	552	1	4,985
Delaware	185	3,709	310	553	98	803	0	5,657
Hamilton	109	5,240	302	445	96	651	7	6,848
Hancock	37	2,447	117	138	36	404	3	3,182
Henry	104	2,446	274	239	56	603	2	3,723
Madison	225	5,155	472	393	73	696	0	7,014
Marion	55	1,622	74	151	11	1,629	18	3,560
Randolph	125	5,996	264	122	23	428	4	6,962
Tipton	96	3,103	201	144	9	103	0	3,656
Subtotal	1,079	33,178	2,624	2,380	427	5,869	35	45,587
TOTAL	**18,635**	**178,478**	**25,798**	**29,037**	**7,199**	**28,533**	**10,808**	**298,468**

Source: IDEM, 2002b.
*NWI habitat types were combined based on a scheme developed by the Illinois Natural History Survey.
**Includes palustrine emergent with undetermined water regime, littoral lake, and riverine unconsolidated shore.

The IDNR project confirmed that the major concentration of wetlands statewide was in the northeastern portion of Indiana, along river floodplains in southwestern Indiana, and in the Lake Michigan shoreline region in northwestern Indiana. Noble County in the Tippecanoe Watershed contained the greatest number of wetland acres with approximately 27,500 acres or 3.38 percent of the State's total wetland acreage. The counties in the three CREP watersheds account for nearly 40 percent of the State's 813,032 acres of wetlands. Forested wetlands were the most common type of wetland in Indiana.

3.5.2 Effects of Alternative A (No Action) on Wetlands

With the selection of the No Action Alternative, wetland values (e.g., vegetation, water quality, and habitat) would continue their slow decline. As agriculture has been identified as a major nonsource pollutant, existing and projected agricultural runoff would likely continue to affect wetland functions (EPA, 2000a). Given ongoing Federal involvement, total wetland acres would likely be stable or slightly reduced under No Action because Section 404 of CWA and other Federal laws are very restrictive in allowing draining or conversion of existing wetlands for other uses. E.O. 11990, Protection of Wetlands, applies to private lands and would also promote the stability of wetland acreage.

Alternative A would result in long term, moderate adverse effects to State wetlands and would not achieve any of the CREP objectives listed in Section 1.4.

3.5.3 Effects of Alternative B (CREP Agreement) on Wetlands

Wetlands acreage across the state would likely increase, if only a moderate amount. The amount of actual acreage that would be gained is undetermined at this time; however, to achieve the project objectives, it is expected that wetlands will be a significant part of the CREP enrolled lands.

Implementation of CP 23 and CP23A (wetland restoration) in the affected Indiana counties could greatly improve water quality upstream of stormwater treatment areas. Marginal acres would be removed from agricultural production or converted from fallow land to constructed wetlands. Though not used in conjunction with CP23 or 23A, CP30 (marginal pastureland – wetland habitat buffer) would provide additional protection to CREP enrolled lands by encouraging the development of wetland buffers on marginal lands. CP31 (bottomland timber establishment on wetlands) would stabilize wetland substrate and reduce sheet and rill erosion in these areas.

Another direct effect of Alternative B would be the creation of new wildlife habitat for riparian species in the combined watersheds. CREP implementation would provide long term, moderate beneficial effects to wetlands across the State.

3.6 Floodplains

3.6.1 Existing Conditions

All Federal actions must meet the standards of E.O. 11988, Floodplain Management. The purpose of the E.O. is to avoid incompatible development in floodplain areas. It states, in part, that:

> "Each agency shall provide leadership and shall 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 in carrying out its responsibilities for (1) acquiring, managing, and disposing of Federal lands and facilities; (2) providing Federally undertaken, financed, or assisted construction and improvements; and (3) conducting Federal activities and programs affecting land use, including but not limited to water and related land resources planning, regulating, and licensing activities."

In accordance with the E.O. and prior to any action, Federal Emergency Management Agency (FEMA) floodplain maps will be reviewed to determine if the proposed action is located in or will affect a 100 or 500-year floodplain. Soil survey maps, aerial photography, and topographical maps should be used where no FEMA maps are available. FSA should complete surveys in areas where no flood hazard or flood elevation data are available and the amount of Federal investment in the proposed action is significant if the action could create a significant adverse effect on a floodplain. Most of the CPs allowed under CRP would have little to no effect on the functions and values of a floodplain. For example, CP 2 (Establishment of Permanent Native Grass) would not have any measurable effect on floodplain flowage, capacity, or other functions. CPs that involve construction activities, substantial earth movement, diking, or other means of altering the flowage area (i.e., CP 23--Wetland Restoration) would need to be reviewed and appropriate public notice provided. According to the Indiana 305(b) assessment database, over 200 miles of Indiana streams are categorized as impaired due to hydromodification.

Applicable development permits must be obtained from local authorities prior to construction activities within a floodplain.

3.6.2 Effects of Alternative A (No Action) on Floodplains

Floodplain areas would not change, and stream profiles (a major factor in the determination of floodplain areas) would not change based on Federal actions. Under the No Action Alternative, CREP funds would not be available to implement CPs that may have beneficial effects on floodplain conditions, especially the ability of floodplains to store floodwaters. Some construction may occur that would alter floodplain flowage, capacity, or other functions. Without FSA oversight, poor design of structures could affect flowage areas, shifting the floodplain, and impacting areas outside the 100-year floodplain.

Alternative A would not contribute to the achievement any of the objectives listed in Section 1.4 and would result in little change to the State's floodplains.

3.6.3 Effects of Alternative B (CREP Agreement) on Floodplains

Minor improvements in floodplain areas and stream profiles would occur. CREP funds would be used to increase floodwater storage capacity through wetland restoration, stabilize floodplains and improve habitat through restorative plantings, and install structures within existing floodplains. Construction projects may be implemented that would alter floodplain flowage, capacity, or other functions. Appropriate FSA oversight would help ensure the proper design and installation of structures, thus limiting adverse effects to flowage areas and minimizing indirect effects to areas outside the 100-year floodplain. Analysis of the impact on floodplains, per E.O. 11988, would require the structures to be able to withstand 100-year flood events and remain functioning. These practices would help control flood events and improve floodplain values.

Areas outside of the 100-year floodplain could be indirectly affected if FSA does not ensure proper design of structures. Poor design could potentially alter the flowage area and shift the floodplain. Alternatives will be carefully considered by FSA at the time that site specific EEs are developed for each CREP contract. The direct impacts of all CPs would be generally positive, result in no to minor, long term improvements to floodplains, and would contribute to achieving the CREP Objectives discussed in Section 1.4.

3.7 Drinking Water

3.7.1 Existing Conditions

There are approximately 4,468 active public water supplies in Indiana. Drinking water in Indiana comes from groundwater sources via wells or surface water systems such as lakes and rivers. Some public water systems purchase water from other public water supplies and distribute the water to their customers. Ninety-seven percent of all public water systems are served by groundwater systems. However, only 55 percent of the total population is served by systems utilizing groundwater (IDEM, 2003b). With the importance placed on groundwater resources, it is critical that CREP effects be carefully assessed.

Indiana has a plentiful groundwater resource serving approximately 50 percent of the State's population for drinking water and filling many of the water needs of business, industry, and agriculture. In 1998, the State began sampling nearly 400 wells representing 22 hydrogeologic setting types. The major sources of groundwater contamination in Indiana are commercial fertilizer application, confined animal feeding operations, underground storage tanks, surface impoundments, landfills constructed prior to 1989, septic systems, shallow injection wells, industrial facilities, materials spills, and salt storage and road salting. Contaminants from these sources include nitrates, salts, pesticides, petroleum compounds, metals, radionuclides, and bacteria. The State is currently developing groundwater quality standards. In addition,

the source water assessment program will identify the watersheds and wellheads that supply drinking water, and 4,300 source water assessments are scheduled to be completed by May 2003 (EPA, 2000a).

Sole Source Aquifer

The primary source of drinking water in Indiana is groundwater, through aquifers (IDEM, 2003b). An aquifer is a permeable geological formation that stores and/or transmits water, such as to wells and springs. Aquifers are used by human populations as a source for drinking water.

In addition, the EPA defines a sole source aquifer (SSA) as one that supplies at least 50 percent of the drinking water consumed in the area overlying the aquifer. To be designated a SSA, the area must not have an alternative drinking water source, which could supply all who depend on the aquifer for drinking water. The SSA Protection Program is authorized by Section 1424(e) of the Safe Drinking Water Act of 1974 (Public Law 93-523, 42 U.S.C. 300 et. seq). Proposed Federal financially assisted projects that have the potential to contaminate the designated sole source aquifer are subject to EPA review.

The St. Joseph Aquifer System (53 FR 23682) is the only SSA in the State and falls outside of the proposed CREP watersheds.

Wellhead Protection

The 1986 Federal Safe Drinking Water Act Amendments direct all states to develop a WHPP Plan to protect water-supply wells. Each state was asked to develop, with public participation, a WHPP Plan to be reviewed and approved by EPA. Sates are required to submit to EPA a Biennial Wellhead Protection Report summarizing their accomplishments. Some of the goals of WHPP Plans include:

- Preventing contamination of ground-water resources
- Cleaning up groundwater contamination
- Delineating a wellhead protection area based on ground water flow and other hydrogeologic information
- Inventorying pollution sources
- Developing and implementing BMPs to protect ground water
- Promoting proper land-use planning
- Educating the public to promote awareness of each person's role in protecting ground-water resources

On November 13, 1995, EPA approved Indiana's Wellhead Protection Program contingent on the final adoption of the State's Wellhead Protection Rule, which was adopted on July 10, 1996 (effective March 28, 1997) and codified at 327 IAC 8-4.1 (IDEM, 1999).

The Safe Drinking Water Act Amendments of 1996 established the need for more comprehensive state Source Water Assessment Programs (SWAP), which seek to accomplish many of the same goals as WHPP plans.

Wellhead area protection is an approach to protecting groundwater that supplies specific wells. These areas can be protected from nonpoint source pollution by planting grasses or other permanent vegetation to filter and reduce the sediment, nutrients, pesticides, and other contaminants from percolating into the soil profile and reaching groundwater sources. For example, Filter Strips (CP21) can be located on cropland or degraded pastures immediately adjacent and parallel to streams, lakes, ponds, ditches, sinkholes, wetlands, or groundwater recharge areas. Filter strips intercept undesirable contaminates from runoff before they enter a waterbody or recharge area. Filter strips slow the velocity of water, allowing

the settling out of suspended soil particles, infiltration of runoff and soluble pollutants, absorption of pollutants on soil and plant surfaces, and the uptake of soluble pollutants by plants.

3.7.2 Effects of Alternative A (No Action) on Drinking Water

Agricultural practices have the potential to constitute a moderate impact on State drinking water resources through the nonpoint discharge of nutrients, chemical residues, and microbial contaminants. Pollutants, including agricultural runoff, would continue to negatively impact water resources; pesticides, excessive nutrients (N and P), and waterborne pathogens from animal waste are the primary concerns.

The No Action alternative would lose the cumulative effect for wellhead and recharge area protection afforded by implementation of CREP. Without the use of filter strips and other CPs, there would be minor, long term adverse effects on groundwater resources by allowing groundwater contaminants to continue to run into wellhead areas.

Selection of Alternative A would not contribute materially to the achievement of any of the CREP Objectives cited in Section 1.4.

3.7.3 Effects of Alternative B (CREP Agreement) on Drinking Water

Some positive, long term effects on groundwater sources would occur. These effects would be the result of several CREP-funded practices. For example CP2 (Establishment of Permanent Native Grasses), CP3A (Hardwood Tree Planting), CP21 (filter strips), CP22 (riparian buffers), CP23 and CP23A (wetland restoration), CP30 (marginal pastureland – wetland buffer), and CP31 (bottomland timber establishment on wetlands) would all offer long term, beneficial effects to groundwater resource integrity and, by extension, State drinking water supplies. All the practices would directly improve water quality of surface water, thus indirectly improving water that would recharge aquifers. Wellhead areas and those that contribute to aquifer recharge may be enrolled in CREP, adding a small positive impact on the preservation of recharge areas.

The implementation of program CPs would be positive for groundwater and contribute to achieving the CREP Objectives discussed in Section 1.4.

3.8 Critical Habitat or Threatened / Endangered Species

The ESA was enacted to protect endangered and threatened species and to provide a means to conserve critical habitat. All Federal agencies were mandated to protect species and preserve their habitats by ensuring that Federal actions do not jeopardize the continued existence of listed species.

ESA defines an endangered species as one that is in danger of extinction throughout all, or a significant portion of, its range. Threatened means a species is likely to become endangered within the foreseeable future. T&E designations may be applied to all species of plants and animals except pest insects. A species may be threatened at the State level, but that same designation does not automatically apply nationwide, as species numbers may be greater in other States.

Critical habitat is defined by the ESA as areas that are essential to the conservation of listed species. Private, city, and State lands are generally not affected by critical habitat until the property owner needs a Federal permit or requests Federal funding. Because the Indiana CREP is partially funded by Federal dollars, consultation with FWS will be required when critical habitat is encountered for CREP contracts. FWS has recently proposed rules that would help remove disincentives from private landowners that wish to manage their property for the benefit of listed species (64 FR 32706-32716). This would entail the

development of Safe Harbor Agreements and Candidate Conservation Agreements with Assurances (CCAAs). These agreements would ensure agricultural landowners that traditional agricultural uses could continue alongside habitat improvements. They would also address the issue of "incidental take" with regard to activities such as habitat restoration.

Section 7 of the ESA, called Interagency Cooperation, is the mechanism by which Federal agencies ensure the actions they take, including those they fund or authorize, do not jeopardize the existence of any listed species.

Under Section 7, consultation with FWS is initiated when any action the agency carries out, funds, or authorizes may affect a T&E species. This process usually begins as an informal consultation. In the early stages of project planning, a Federal agency approaches FWS and requests informal consultation. Discussions between the two agencies may include what types of listed species may occur in the proposed action area, and what effect the proposed action may have on those species. This process begins with the EE process completed jointly by FSA and NRCS for each contract.

If the Federal agency, after discussions with FWS, determines that the proposed action is not likely to affect any listed species in the project area, and if FWS concurs, the informal consultation is complete and the proposed project moves ahead. If it appears that the agency's action may affect a listed species, that agency may then prepare a biological assessment (BA) to assist in its determination of the project's effect on a species.

When a Federal agency determines, through a BA or other review, that its action is likely to adversely affect a listed species, the agency submits a request to FWS for formal consultation. During formal consultation, the FWS and the agency share information about the proposed project and the species likely to be affected. Formal consultation may last up to 90 days, after which FWS will prepare a biological opinion on whether the proposed activity will jeopardize the continued existence of a listed species. The Service has 45 days after completion of formal consultation to write the opinion.

In making a determination on whether an action will result in jeopardy, FWS begins by looking at the current status of the species, or "baseline." Added to the baseline are the various effects--direct, indirect, interrelated, and interdependent--of the proposed Federal action. The FWS also examines the cumulative effects of other non-Federal actions that may occur in the action area, including state, tribal, local, or private activities that are reasonably certain to occur in the project area (FWS, 2003b).

3.8.1 Existing Conditions

There are 27 Federal T&E species in the State of Indiana (FWS, 2003a, 2003b). Of these, 23 are animals and four are plants. The IDNR has identified 134 species that are endangered or of special concern, all of which are animals. A complete list of Federal and State listed species are included in Appendix C.

3.8.2 Effects of Alternative A (No Action) on Critical Habitat or Threatened/Endangered Species

Under the No Action alternative, new T&E listings would continue as newly jeopardized species are identified. These new listings and the declining habitat conditions of the currently listed species suggest that overall impacts on T&E species reflect a slow decline as human actions conflict with and adversely affect both species and their habitat. Under Alternative A, the following negative impacts would occur:

- Habitat values would continue to degrade
- Population growth would continue to crowd natural ecosystems

- Pollution levels in agricultural runoff would remain high

Under the No Action alternative, long term, minor adverse effects would continue. Wildlife and habitat values in Indiana would not benefit from the leveraged effects of habitat restoration and watershed improvement CPs and may continue to decline.

3.8.3 Effects of Alternative B (CREP Agreement) on Critical Habitat or Threatened/Endangered Species

Many of the CREP CPs could potentially affect Federally listed species. Implementing Alternative B would result in strong, long term beneficial effects to wildlife habitat values in the CREP enrolled acreage across the 12 watersheds. Improvements to water quality alone would have beneficial effects for all wildlife as well as potential increases in critical habitat.

As part of the CREP enrollment process, a contract involving appropriate CPs would be developed for each individual site. Each contract would have a site specific EE completed by FSA and NRCS to determine if any threatened or endangered species are present and be potentially affected by the proposed action. If so, consultation with the FWS would be initiated. In addition, any CREP activity that may result in the disturbance of non-cropped areas adjacent to a proposed project site would be coordinated with FWS.

In general terms, direct benefits for wildlife would accrue by implementing any of the CPs. CP3A (hardwood tree planting) provides permanent cover and possible nesting areas for wildlife and reduces soil erosion, thus supporting water quality for downstream habitat areas. CP4D (permanent wildlife habitat--non-easement) creates permanent habitat and movement corridors--both critical in an increasingly fragmented landscape. CP21 (filter strips) would remove nutrients and sediment, and contribute to overall health of waterbodies and habitat for local species. CP22 (riparian buffer) would provide for removal of nutrients and sediment in areas created for wildlife and aquatic organisms. It would also enhance the potential for wildlife movement along the riparian corridor by buffering the connective habitat from adjacent land uses. CP23 and CP23A (wetland restoration) would provide large areas for retention of solids and removal of nutrients, while also restoring habitat for species. Filtering provided by all the CPs would contribute to cleaner water entering the watersheds and cleaner various water bodies used by wildlife. CP29 (marginal pastureland – wildlife habitat buffer) would enhance existing habitat by providing buffers from surrounding land uses and other habitat impacts, such as noxious weed encroachment.

Each contract would be evaluated by FSA to determine if the actions would affect the resources. Consultation with the FWS by FSA would occur when developing a treatment plan where critical habitat or T&E species may be encountered.

3.9 Cultural Resources

Cultural resources include prehistoric and historic archaeological sites, architectural structures and designs, and other evidences of past human culture. Prehistoric archaeological resources include the physical remnants of human activity that predate written records. They include archaeological sites, structures, artifacts, and other evidence of prehistoric human activities.

Historic resources can include materials, properties, or locations that postdate written records. These resources can include archaeological sites, structures, artifacts, documents, and other evidence of human behavior. They can also include locations of events that were important in history or that are associated with the lives of historically significant persons. Resources must normally be greater than 50 years old to

be considered as historic and eligible for the National Register of Historic Places. However, it is possible for a resource less than 50 years old to be eligible. Properties that are of exceptional importance to a community, State, tribe, region, or the nation may be eligible.

3.9.1 Existing Conditions

Currently, there are approximately 45,000 prehistoric and historic archaeological sites documented in Indiana. These sites range from Paleoindian through Mississippian and include a variety of site types such as: mound and earthwork groups, towns, villages, hamlets, special use/activity areas, quarries, and nut and food processing sites. Currently, there are 33 archaeological sites in the State that are listed in the NRHP. These include sites such as: the Early Archaic Swan's Landing site, the Early-Middle Woodland New Castle mounds complex, the territorial Fort Knox II site, and the Muskegon shipwreck (IDNR, 1998).

Many Indiana farms witnessed the so-called Golden Age of Agriculture during the early 20th century. As demand for products and farm prices increased, many farmers were able to expand and modernize family farms. Larger barns with the new gambrel style roof were built. Indiana's vernacular rural landscape includes several easily identifiable architectural styles and practices. Round and polygonal barns, most constructed between 1900 and 1920, were promoted by land grant colleges and experimental agricultural stations. Researchers at Midwestern colleges perfected the storage of silage, and silos became an accepted part of nearly every Indiana farm. Large wood-framed Queen Anne houses, and later bungalow style farmhouses, departed from the homespun vernacular homes of the past. Many Indiana farms still retain collections of specialized outbuildings, such as chicken coops, hog sheds, milk houses, summer kitchens, smoke houses, fruit cellars, corn cribs, tool sheds, and livestock or dairy barns. Unfortunately, countless barns and other historic agricultural buildings disappear from the State's rural landscape each year. As farms continue to become less diversified, many of these buildings are rendered obsolete. The high cost of maintaining aging structures and paying property taxes on them often leads farmers to either pull them down or let them fall into severe dilapidation (IDNR, 1998).

Indiana is known for its covered bridges scattered on country roads across the State. Today, bridges of all construction types are significantly threatened in Indiana. Most of the remaining timber and iron bridges are located on lightly-traveled country roads. Since the public usually sees the "quaintness" of covered bridges as an asset to local tourism, communities are more likely to move and save them than to demolish them outright when public safety and transportation needs require bridge replacement (IDNR, 1998).

The destruction of rural properties and landscapes ranks third on the list of threats identified by IDNR to these cultural resources. This threat has resulted from a number of factors: the economics of present-day farming, an increase in the physical size of today's Indiana farms, and the pressures of urban sprawl (IDNR, 1998).

3.9.2 The Effects of Alternative A (No Action) on Cultural Resources

Minor to moderate adverse impacts on cultural resources would continue to occur. These include disturbance and destruction of prehistoric and historic sites and structures, either through ongoing land conversion for development or agricultural use. Sites and structures, if discovered on private land, may often not be reported to anyone. In some instances, destruction of a site or structure may occur before a professional is able to assess its significance. On Federal land or for actions requiring a Federal permit, cultural resources reviews must be completed before the Federal agency can implement, fund, or permit a proposed action.

Without implementation of CREP, areas that could have been enrolled in CREP will not likely be evaluated for cultural resources.

3.9.3 The Effects of Alternative B (CREP Agreement) on Cultural Resources

There would be minimal to no adverse effects on cultural resources with the implementation of CREP. FSA will assess potential impacts to cultural resources as the result of any CREP contract and take appropriate actions to ensure that any adverse impacts are properly mitigated. As part of this process, a cultural resource survey of the property may be required. The review must take into account that deeply buried sites may be present and that CREP CPs may affect them.

Site specific cultural resource evaluations will be completed when the EE is completed for each contract.

3.10 Socioeconomic and Environmental Justice Issues

NEPA, and its implementing regulations and guidelines, require consideration of the socioeconomic impacts of Federal actions in preparation of environmental documents. Section 1508.8 of the CEQ's Regulations for Implementing NEPA states that:

> Indirect effects may include growth inducing effects and other effects related to induced changes in the pattern of land use, population density or growth rate, and related effects on air and water and other natural systems, including ecosystems.
>
> Effects and impacts as used in these regulations are synonymous. Effects includes ecological (such as the effects on natural resources and on the components, structures, and functioning of affected ecosystems), aesthetic, historic, cultural, economic, social, or health, whether direct, indirect, or cumulative. Effects may also include those resulting from actions which may have both beneficial and detrimental effects, even if on balance the agency believes that the effect would be beneficial.

This PEA will present regional and local information on the socioeconomic conditions in Indiana that are relevant to the implementation of CREP, and the potential impacts of the proposed project on these conditions.

3.10.1 Existing Conditions

State Economy

Indiana produces and exports many agricultural products, but is primarily known for its corn and soybean crops. In 1997, there were 57,916 Indiana farms which produced and sold about $5.3 billion worth of farm products. The amount of agricultural land harvested was 11.7 million acres. Of this, 244,413 acres of cropland remained idle. Cropland on which all crops failed included 23,690 acres. Most of the active farms rent additional lands. In fact, over 7.9 million acres were leased or rented in farms statewide. Commercial fertilizers were applied to agricultural lands across the State at a cost to producers of over $451.8 million. Expenditures for the application of agricultural chemicals accounted for an additional $291.8million (NASS, 1999).

Indiana’s Gross State Product, the value of all goods and services produced in the State during a given year, totals $189.9 billion. The total State production in the agriculture, forestry, and fishing sector in 2001 was approximately $2.5 billion (USDC, 2003). Agriculture in Indiana accounts for a small fraction (less than one percent) of the overall State economy.

Another important segment of Indiana's economy with the potential to be impacted by the Indiana CREP is the leisure and recreation industry. The State boasts an active outdoor recreation industry. The 2001 National Survey of Fishing, Hunting, and Wildlife-Associated Recreation revealed that 2.4 million Indiana residents and nonresidents 16 years old and older fished, hunted, or wildlife watched in Indiana. Of the total number of participants, 874,000 fished, 290,000 hunted, and 1.9 million participated in wildlife-watching activities, including observing, feeding, and photographing wildlife. The sum of anglers, hunters, and wildlife watchers exceeds the total number of participants in wildlife-related recreation because many individuals engaged in more than one wildlife activity (USCB, 2003).

In 2001, state residents and nonresidents spent $1.5 billion on wildlife recreation in Indiana. Of that total, trip-related expenditures were $317 million and equipment purchases totaled $940 million. The remaining $231 million was spent on licenses, contributions, land ownership and leasing, and other items and services (USCB, 2003). Lands enrolled in CREP would certainly augment this industry as most of the CPs would enhance wildlife habitat quantity and quality as well as water-based recreation opportunities. Other resource-based recreation activities in the watersheds would similarly be affected by CREP implementation.

Environmental Justice

All Federal programs, including CREP, must comply with E.O. 12898, Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations. Federal agencies are required to incorporate environmental justice as part of the overall agency mission.

The E.O. details that environmental justice ensures that all people, regardless of race, color, national origin, or income, receive the following treatment:

- Are provided with fair treatment and meaningful involvement with respect to the development, implementation, and enforcement of environmental laws, regulations, and policies;
- Have the opportunity to express comments or concerns before decisions are rendered on the Federal programs, policies, procedures, or activities affecting them; and
- Share in the benefits of, are not excluded from, and are not adversely or disproportionately affected by Federal programs, procedures, policies, or activities.

Application for the Indiana CREP will require the completion of Form FSA-850, the Environmental Evaluation Checklist, or its equivalent used by NRCS (SCS-52). Environmental justice issues are addressed on the FSA-850 in question 9. If the proposed action is found to cause any adverse human health or environmental effects to minority or low-income communities, a discussion of the negative impacts must be attached.

State Minorities – Indiana is a racially diverse state. A small number of farm across the State are operated by minorities (NASS, 1999):

African American	6,761 acres
American Indian	8,553 acres
Asian / Pacific Island	1,731 acres
Latino / Hispanic	67,245 acres
Other	2,517 acres
Total	**86,807 acres**

Migrant Farm Workers – According to Indiana Health Centers, Inc., there were approximately 4,595 migrant seasonal agricultural workers in Indiana during the 2002 harvest season (IHC, 2002). That number varies from year to year according to the size of the State's crops which are in large part determined by weather conditions throughout the growing season.

Pay rates vary depending on whether the worker is paid an hourly wage or piece rate. Federal laws require that workers earn a minimum wage of $5.15 per hour. Workers paid by piece rate can earn more money based on their individual productivity. On the whole, farm laborers in the Cornbelt 1 Region (which includes Indiana) were paid close to the national averages. Nationally, farm operators paid their hired workers 31 cents more, on average, than a year earlier (USDA, 2003).

3.10.2 The Effects of Alternative A (No Action) on Socioeconomic and Environmental Justice Issues

Under Alternative A, agricultural practices would continue as they have for years. The degradation of water quality that currently results from agricultural practices, which leads to ancillary impact to wetlands, wildlife, tourism, etc, would continue into the future. Alternative A would not result in any State water quality improvements, unless existing programs (see Section 1.6.15) are greatly expanded.

Implementation of Alternative A would likely have the following effects:

- The total amount of agricultural production in Indiana would continue to respond to market forces and the economy of the State.
- The rental rates and land values of Indiana acreage would continue to be affected by development values and population density.
- The total number of Indiana farms would continue to respond to market forces and the economy of the State.
- Because agriculture contributes a relatively small amount to the State's Gross State Product, the State's economy would continue to be affected by market forces. Agriculture would continue to contribute roughly the same value to the overall economy.
- Any trends or cycles evident in the labor market would continue and provide the same number of jobs, with fluctuations due to market conditions.
- Alternative A would not offer mechanisms to improve the water quality of Indiana. Because of the significant income provided by tourism, recreation, fishing, boating, and other water-related businesses, this continued degradation has the potential to negatively impact existing and future growth in the recreation and tourism sector.
- Alternative A offers no additional land preservation than the current programs offer. This may result in continued land use changes in the State (i.e., agricultural land conversion) and the socioeconomic impacts associated with these changes would continue.
- Environmental justice would be an ongoing compliance problem because migrant workers and other low income or ethnically distinct populations have historically experienced more environmental impacts than the general population. This condition is likely to continue under the No Action alternative. Under this alternative, there would be no CREP funds available for any producers (including minorities). No FSA actions are required or necessary under the No Action alternative to address existing or ongoing issues with environmental justice.

The No Action Alternative would not meet any of the CREP objectives outlined in Section 1.4.

3.10.3 The Effects of Alternative B (CREP Agreement) on Socioeconomic and Environmental Justice Issues

Though ultimately beneficial, long term Statewide economic effects from CREP implementation would be minimal. The Indiana CREP proposes the potential enrollment of up to 26,250 acres across the three watersheds. These 26,250 acres are inconsequential when compared to the total acres of cropland that are harvested each year (11.7 million). Implementation of Alternative B would result in general improvement to the water quality of Indiana. The degradation of water quality that currently results from agricultural practices, which leads to ancillary impact to wetlands, wildlife, and tourism, would decline as a result of implementing CREP.

Implementation of Alternative B would likely have the following effects:

- If CREP was intensively implemented in a small geographic region, it could create a localized and artificial shift in rental rates and land values. CREP contains safeguards to prevent this from happening. For instance, there is a 25 percent acreage cap on CREP enrollments within a county, limiting the amount of cropland enrolled in CREP in a certain geographical region. In addition, the acres enrolled in CREP would likely be spread across the State, since participating landowners typically enroll partial farms or fields.

  CREP could also create a situation where land enrolled in CREP has a greater value than surrounding lands. This is unlikely to happen in Indiana as income earned through CREP would remain less than the average development value of nearby land. CREP-enrolled lands are also lands that are marginally productive agricultural lands that are non-developable so there is no opportunity cost to enrollees. All of these factors would limit the acres of cropland taken out of production in a given area and, consequently, the local economic impact due to implementation of CREP would be minimal to non-existent. These rental rates and land values of Indiana acreage would continue to be affected by development values and population density and would not be impacted by the Alternative B.

- Alternative B would not result in changes to total number of Indiana ranches/farms. The 25 percent acreage cap on CREP and the practice of participating landowners to enroll partial farms or fields means that entire ranches and farms would not be enrolled in CREP. This total would continue to respond to market forces and the economy of the State and not be impacted by Alternative B.

- CREP implementation would not substantially impact the State's economy. Agriculture would continue to contribute roughly the same value to the overall economy. CREP enrolled lands would provide residual income to enrollees, supporting the overall local economy although possibly at a slightly reduced rate. However, this slight reduction, spread across the entire state, would have an inconsequential effect on the total economy. Indiana's economy would continue to be driven by market forces and would not be impacted by Alternative B.

- Any trends or cycles evident in the labor market would continue and provide the same number of jobs, with fluctuations due to market conditions. CREP enrollments would be spread across the entire State and have only little to no effects to agricultural labor markets.

- Implementation of Alternative B has the potential to slightly reduce total agricultural acreage across the State because the CREP-enrolled land is removed from production. However, even at full enrollment, CREP would affect a fraction of one percent of the State's harvested cropland.

Additionally, the lands (partial fields, strips, or buffers) enrolled in CREP would most likely be less productive areas of a given farm. As noted above, 265,079 acres of cropland remained idle during the year while cropland on which all crops failed was 40,684 acres (NASS, 1999). By enrolling these areas, the landowner may be able to reduce the overall input costs of farming operations, and in some cases, actually maintain or increase production by being able to concentrate resources on the remaining farmland. These two factors would likely result in minimal to no effects across the State. There would likely be no displacement of migrant farm workers. Agricultural production would continue to respond to market forces and the economy of the State and not be significantly impacted by Alternative B.

- There is a possibility for a slight beneficial effect to farm incomes from the steady and guaranteed receipt of CREP funds by enrolled producers. As discussed above, producers are more likely to enroll marginally productive lands and the residual income from CREP may result in slightly more or at least consistent income than the acreage was capable of producing as farmland. These values, if they occur, would not have a significant impact across the State.

- With the addition of filter strips, buffers, tree plantings, and shallow water areas and wetlands, wildlife habitat would be improved and expanded. This has the potential to increase opportunities for hunting and fishing in these areas and may lead to localized increases in the sale of hunting and fishing equipment and licenses. Similar effects may occur in other local resource-based recreation industries.

- Alternative B offers an additional land preservation program to the State's producers, the benefits of which can be added to those provided by the current programs. This may slow the future rate of large scale land use changes in the State (i.e., agricultural land conversion) and the socioeconomic impacts associated with these changes.

  Another potential effect is the financial incentive for producers to maintain open space which may help enhance the value and desirability of surrounding residential and commercial land.

- Disproportionate effects on minority or underrepresented groups are unlikely, because most CREP agreements are likely to be widely separated by intervening non-CREP land holdings.

Alternative B would assist the State in their efforts to meet the CREP objectives outlined in Section 1.4.

3.11 Cumulative Effects

3.11.1 Alternative A (No Action)

Existing State programs (see Section 1.6.21) would strive, collectively, to have a positive impact on the State's resources. CREP, a powerful tool that would otherwise benefit Indiana's conservation efforts, would remain unavailable. Observable current trends in nonpoint source pollution and resource degradation would continue.

3.11.2 Alternative B (CREP Agreement)

Working in conjunction with existing State programs (see Section 1.6.15), CREP implementation would contribute to the cumulative improvement of the State's water quality. Likewise, the enhancement of wildlife habitat across CREP watersheds would add to the State's resources and provide additional protection for listed State and Federal species. The same may be said for all of the CPs that would be implemented. Wetlands, groundwater, wildlife, cultural resources, etc. would all benefit from the

cumulative effects that CREP would bring to bear. CREP is designed to augment and enhance resource conservation and to promote the improvement of water quality. CREP would work in conjunction with other conservation efforts being implemented at both the State and Federal level.

3.12 Unavoidable Adverse Impacts

The following sections describe those effects which are adverse and cannot be avoided without mitigation.

3.12.1 Alternative A (No Action)

Nonpoint source pollution attributed to agriculture would increase over time. Continued agricultural practices would likely contribute to long term water quality degradation in the selected watersheds. There is the probability of increased seasonal erosion accompanied by increased sedimentation in regional streams immediately following harvests. Nutrient loading and waterborne pathogens would continue to impact downstream ecosystems and human populations.

3.12.2 Alternative B (CREP Agreement)

Alternative B would reduce the unavoidable adverse impacts listed under Alternative A by providing filter strips to reduce sedimentation, creating wetlands to help filter contaminants, and reducing the overall use of fertilizers and pesticides.

3.13 Relationship of Short Term Uses and Long Term Productivity

3.13.1 Alternative A (No Action)

This alternative would maximize the short term uses of the environment, but would not enhance the long term productivity of eligible lands. Marginal croplands and pasturelands, that might otherwise be enrolled in CREP, would stay in production and would drain landowners' resources for continued use. Fertilizers and pesticides used on these lands would continue to pollute the watersheds.

3.13.2 Alternative B (CREP Agreement)

Under Alternative B, the short term uses of the human environment would be maximized and long term productivity would be simultaneously enhanced. Marginal croplands would be enrolled in CREP and would provide leveraged benefits to other lands and waterbodies in affected watersheds. Resources used to sustain the marginal lands would be diverted to help maximize the productivity of prime croplands. Potential overuse of fertilizers used to increase productivity on marginal lands would be reduced.

3.14 Irreversible and Irretrievable Commitments of Resources

3.14.1 Alternative A (No Action)

Irreversible and irretrievable commitments of resources include fuel and time spent conducting agricultural practices. The irreversible loss of soil resources from the State's agricultural lands would continue at the current or perhaps an accelerated rate due to splash, rill, and streambank erosion.

3.14.2 Alternative B (CREP Agreement)

As with Alternative A, the irreversible and irretrievable commitments of resources including fuel and time spent conducting agricultural practices would continue, though perhaps at a decreased rate. Agricultural soil loss would likely continue, but at a much reduced rate as appropriate CPs are implemented.

4.0 List of Preparers

Table 11. Name, education, and years experience of those who contributed as part of the interdisciplinary team.

Name	Area of Expertise	Education	Experience
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7.0 Appendix A: Acronyms and Abbreviations

ACHP	Advisory Council on Historic Preservation
BA	Biological Assessment
BMP	Best Management Practice
CCAA	Candidate Conservation Agreement with Assurances
CCC	Commodity Credit Corporation
CEQ	Council on Environmental Quality Regulations
CFR	Code of Federal Regulations
CP	Conservation Practice
CREP	Conservation Reserve Enhancement Program
CRP	Conservation Reserve Program
CTIC	Conservation Technology Information Center
CWA	Clean Water Act
CWI	Clean Water Indiana
DO	Dissolved Oxygen
DOSC	Division of Soil Conservation
EE	Environmental Evaluation
E.O.	Executive Order
EPA	United States Environmental Protection Agency
EQIP	Environmental Quality Incentives Program
ESA	Endangered Species Act
FEMA	Federal Emergency Management Agency
FEP	Floodplain Easement Program
FONSI	Finding of No Significant Impact
FR	Federal Register
FSA	Farm Service Agency

FWS	United States Fish and Wildlife Service
HEL	Highly Erodible Land
HUC	Hydrologic Unit Code
IC	Indiana Code
IDEM	Indiana Department of Environmental Management
IDNR	Indiana Department of Natural Resources
ISDH	Indiana State Department of Health
LARE	Lake and River Enhancement
MCL	Maximum Contaminant Level
N	Nitrogen
NEPA	National Environmental Policy Act
NGO	Non-government Organization
NHPA	National Historic Preservation Act
NPDES	National Pollutant Discharge Elimination System
NRCS	Natural Resources Conservation Service
NWI	National Wetlands Inventory
OWQ	Office of Water Quality
P	Phosphorus
PCBs	Polychlorinated Biphenyls
PEA	Programmatic Environmental Assessment
PEIS	Programmatic Environmental Impact Statement
PFW	Partners for Fish and Wildlife (program)
PIP	Practice Incentive Payment
ROD	Record of Decision
RUP	Restricted-use Pesticides
SFWA	State Fish and Wildlife Area
SHPO	State Historic Preservation Office
SIFRP	Southwest Indiana Four Rivers Project

SIP	Signing Incentive Payment
SSA	Sole Source Aquifer
SWAP	Source Water Assessment Programs
SWCD	Soil and Water Conservation Districts
T	Tolerable Soil Loss
T&E	Threatened and Endangered (species)
THPO	Tribal Historic Preservation Office
TMDL	Total Maximum Daily Load
TNC	The Nature Conservancy
USDA	United States Department of Agriculture
USGS	United States Geographic Survey
WHIP	Wildlife Habitat Incentive Program
WHPP	Wellhead Protection Program
WLT	Watershed Land Treatment
WRP	Wetlands Reserve Program

8.0 Appendix B: Glossary

Airshed: A geographic area or region defined by settlement patterns or topography that shares the same air mass and results in discrete atmospheric conditions.

Aquifer: A geologic formation that is water bearing. A geological formation or structure that stores and/or transmits water, such as to wells and springs. Use of the term is usually restricted to those water-bearing formations capable of yielding water in sufficient quantity to constitute a usable supply for people's uses.

Categorical Exclusions: An agency-defined category of actions that do not individually or cumulatively have a significant effect on the human environment and have been found to have no such effect in procedures adopted by the agency pursuant to NEPA. Projects qualifying for a "categorical exclusion" are not required to undergo additional NEPA analysis or documentation.

Conservation Practices: A series of NRCS approved agricultural practices and management techniques designed to control nonpoint pollution.

Decomposers: Organisms (e.g., bacteria, fungi) that break down dead plants and animals and release substances usable by consumers.

Denitrification: The process whereby bacteria reduce nitrate or nitrite to gaseous products such as nitrogen.

Environmental Assessment: A concise public document, prepared in compliance with NEPA, that briefly discusses the purpose and need for an action, alternatives to such action, and provides sufficient evidence and analysis of impacts to determine whether to prepare an environmental impact statement or FONSI.

Environmental Impact Statement: A detailed written statement required by section 102(2)(C) of NEPA, analyzing the environmental impacts of a proposed action, adverse effects of the project that cannot be avoided, alternative courses of action, short term uses of the environment versus the maintenance and enhancement of long term productivity, and any irreversible and irretrievable commitment of resources. A *programmatic* EIS or EA: covers general matters in broader terms and analyzes conceptual or planning alternatives. In such cases, at least one more level of site specific NEPA analysis is necessary before implementation can proceed.

Erosion: A geomorphic process that describes the wearing away of the land surface by wind, water, ice or other geologic agents. Erosion occurs naturally from weather or runoff but is often intensified by human land use practices.

Eutrophication: The natural and artificial addition of nitrogen and phosphorous (nutrients) to bodies of water, increasing algal growth. As the algae die, the decomposing microorganisms consume dissolved oxygen in the water, reducing the amount available to fish and other aquatic organisms. Ultimately, this can result in a dead lake or pond: a system where no larger aquatic organisms can survive.

Exotic species: A species occurring in an area outside of its historically known natural range as a result of intentional or accidental dispersal by human activities. Also known as an *introduced species*.

Groundwater: The supply of fresh water found beneath the Earth's surface, usually in aquifers, which supply wells and springs. Because ground water is a major source of drinking water, there is growing concern over contamination from leaching agricultural or industrial pollutants or leaking underground storage tanks.

Hydric soils: Soil that, in its undrained state, is flooded long enough during a growing season to develop anaerobic (lacking air – saturated) conditions that support the growth and regeneration of hydrophytic vegetation.

Hydrophytic vegetation: Plants specialized to grow in water or in soil too waterlogged for most plants to survive.

Listed species: Under the Endangered Species Act, or similar state statute, those species officially designated as threatened or endangered through all or a significant portion of their range. See also: *Threatened and endangered species*.

Nonpoint source (pollution): Cause of water pollution that is not associated with point (fixed) sources. Nonpoint sources include runoff from agricultural, urban, construction, and mining sites, as well as septic systems and landfills.

Nutrients: Chemical compounds in a usable form and have nutritive value for plants and/or animals.

Recharging groundwater: Refers to water entering and replenishing an underground aquifer through faults, fractures, or direct absorption.

Riparian: Refers to a stream and all the vegetation on its banks.

Sediment loading: Describes the excessive inputs of sediment into a waterbody.

Siltation: The deposition of finely divided soil and rock particles upon the bottom of stream and river beds and reservoirs.

Soundscape: The natural sound environment of a place. Also, the amalgam of natural ambient sounds created by more or less continuous processes in the natural environment.

Stormwater runoff: Water from precipitation that runs straight off the ground without first soaking into it. It does not infiltrate into the ground or evaporate due to impervious land surfaces, but instead flows onto adjacent land or water areas.

Threatened and endangered species: Under the Endangered Species Act, those species officially designated by the National Marine Fisheries Service or U.S. Fish and Wildlife Service as being in danger of extinction (i.e., endangered) or likely to become endangered (i.e., threatened) within the foreseeable future through all or a significant portion of their range. Threatened and endangered species are protected by law. See also: *Listed species*.

Traditional Cultural Properties: Places that are eligible for inclusion in the National Register of Historic Places because of their "association with cultural practices or beliefs of a living community that are rooted in that community's history and are important in maintaining the continuing cultural identity of the community."

Unionid: Refering to mollusks or mussel species.

Watershed: 1.) Describes a cohesive, hydrologically-linked landscape that is drained by a waterway leading to a lake or reservoir. 2.) A geographic area delineated by its peaks and ridgelines, which divide surface water flow into two or more directions.

9.0 Appendix C: Listed Threatened and Endangered Species in Indiana

Common Name	Scientific Name	Status	
		Federal	IN State
Mammals			
Allegheny woodrat	*Neotoma magister*		E
American badger	*Taxidea taxus*		E
Bobcat	*Lynx rufus*		E
Evening bat	*Nycticeius humeralis*		E
Franklin's ground squirrel	*Spermophilus franklinii*		E
Gray bat	*Myotis grisescens*	E	E
Gray wolf (eastern distinct pop.)	*Canis lupus*	T	
Indiana bat	*Myotis sodalis*	E	E
Northern river otter	*Lutra canadensis*		E
Puma, eastern	*Puma concolor couguar*	E	
Southeastern bat	*Myotis austroriparius*		E
Swamp rabbit	*Sylvilagus aquaticus*		E
Birds			
American bittern	*Botaurus lentiginosus*		E
Bachman's sparrow	*Aimophila aestivalis*		E
Bald eagle	*Haliaeetus leucocephalus*	T	E
Barn owl	*Tyto alba*		E
Bewick's wren	*Thryomanes bewickii*		E
Black rail	*Laterallus jamaicensis*		E
Black tern	*Chlidonias niger*		E
Black-crowned night-heron	*Nycticorax nycticorax*		E

Golden-winged warbler	*Vermivora chrysoptera*		E
Henslow's sparrow	*Ammodramus henslowii*		E
Interior least tern	*Sterna antillarum athalassos*	E	E
King rail	*Rallus elegans*		E
Kirtland's warbler	*Dendroica kirtlandii*	E	E
Least bittern	*Ixobrychus exilis*		E
Loggerhead shrike	*Lanius ludovicianus*		E
Marsh wren	*Cistothorus palustris*		E
Northern harrier	*Circus cyaneus*		E
Osprey	*Pandion haliaetus*		E
Peregrine falcon	*Falco peregrinus*		E
Piping plover (Great Lakes watershed)	*Charadrius melodus*	E	E
Sedge wren	*Cistothorus platensis*		E
Short-eared owl	*Asio flammeus*		E
Trumpeter swan	*Cygnus buccinator*		E
Upland sandpiper	*Bartramia longicauda*		E
Virginia rail	*Rallus limicola*		E
Whooping crane	*Grus americana*	E	E
Yellow-crowned night-heron	*Nyctanassa violacea*		E
Yellow-headed blackbird	*Xanthocephalus xanthocephalus*		E
Reptiles			
Alligator snapping turtle	*Macroclemys temminckii*		E
Blanding's turtle	*Emydoidea blandingii*		E
Butler's garter snake	*Thamnophis butleri*		E
Eastern massasauga	*Sistrurus catenatus catenatus*		E
Eastern mud turtle	*Kinosternon subrubrum subrubrum*		E
Hieroglyphic river cooter	*Chrysemys concinna hieroglyphica*		E

Kirtland's snake	*Clonophis kirtlandii*		E
Northern copperbelly water snake	*Nerodia erythrogaster neglecta*	T	E
Northern scarlet snake	*Cemophora coccinea copei*		E
Ornate box turtle	*Terrapene ornata*		E
Smooth green snake	*Opheodrys vernalis*		E
Southeastern crowned snake	*Tantilla coronata*		E
Spotted turtle	*Clemmys guttata*		E
Timber rattlesnake	*Crotalus horridus*		E
Western cottonmouth	*Agkistrodon piscivorus leucostoma*		E
Amphibians			
Four-toed salamander	*Hemidactylium scutatum*		E
Green salamander	*Aneides aeneus*		E
Hellbender	*Cryptobranchus alleganiensis alleganiensis*		E
Northern crawfish frog	*Rana areolata circulosa*		E
Northern red salamander	*Pseudotriton ruber ruber*		E
Fish			
Bluebreast darter	*Etheostoma camurum*		E
Gilt darter	*Percina evides*		E
Greater redhorse	*Moxostoma valenciennesi*		E
Harlequin darter	*Etheostoma histrio*		E
Lake sturgeon	*Acipenser fulvescens*		E
Northern cavefish	*Amblyopsis spelaea*		E
Redside dace	*Clinostomus elongatus*		E
Southern cavefish	*Typhlichthys subterraneus*		E
Spottail darter	*Etheostoma squamiceps*		E
Southern cavefish	*Typhlichthys subterraneus*		E
Spottail darter	*Etheostoma squamiceps*		E

Spotted darter	*Etheostoma maculatum*		E
Tippecanoe darter	*Etheostoma tippecanoe*		E
Variegate darter	*Etheostoma variatum*		E
Mollusks			
Clubshell	*Pleurobema clava*	E	E
Fanshell	*Cyprogenia stegaria*	E	E
Fat pocketbook	*Potamilus capax*	E	E
Longsolid	*Fusconaia subrotunda*		E
Northern riffleshell	*Epioblasma torulosa rangiana*	E	E
Orangefoot pimpleback	*Plethobasus cooperianus*	E	E
Pearlymussell	*Hemistena lata*	E	
Pink mucket	*Lampsilis abrupta*	E	E
Pyramid pigtoe	*Pleurobema rubrum*		E
Rabbitsfoot	*Quadrula cylindrica cylindrica*		E
Ring Pink	*Obovaria retusa*	E	
Rough pigtoe	*Pleurobema plenum*	E	E
Sheepnose	*Plethobasus cyphyus*		E
Snuffbox	*Epioblasma triquetra*	E	E
Tubercled blossom	*Epioblasma torulosa torulosa*	E	E
White catspaw	*Epioblasma obliquata perobliqua*	E	E
White wartyback	*Plethobasus cicatricosus*	E	E
Insects			
Karner blue butterfly	*Lycaeides melissa samuelis*	E	
Mitchell's satyr butterfly	*Neonympha mitchellii mitchellii*	E	
Plants			
Mead's Milkweed	*Asclepias meadii*	T	
Pitcher's Thistle	*Cirsium pitcheri*	T	
Running buffalo clover	*Trifolium stoloniferum*	E	

Short's goldenrod	*Solidago shortii*	E	

10.0 Appendix D: FSA Handbook 2 CRP Conservation Practices