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ENVIRONMENTAL QUALITY INCENTIVES PROGRAM

Programmatic Environmental Assessment

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1 INTRODUCTION

The Environmental Quality Incentives Program (EQIP) is a voluntary program that provides financial and technical assistance to agricultural producers to help them plan and implement conservation practices to address natural resource concerns on agricultural land, nonindustrial private forest land, and Tribal land. The Agricultural Improvement Act of 2018 (2018 Farm Bill) modified the EQIP program from that authorized in previous Farm Bills, so the Natural Resources Conservation Service (NRCS) is publishing an interim final rule to implement those changes.[1]

The National Environmental Policy Act of 1969 (NEPA) requires that Federal agencies prepare environmental impact statements (EIS) for major Federal actions significantly affecting the quality of the human environment. When a proposed Federal action is not likely to result in significant impacts requiring an EIS, but the activity has not been categorically excluded from NEPA, an agency can prepare an environmental assessment (EA) to assist them in determining whether there is a need for an EIS.[2] The Council on Environmental Quality (CEQ) has defined "major Federal action" to include activities over which Federal agencies have control. Often, agencies exercise considerable discretion when promulgating a regulation. In the case of the 2018 Farm Bill, Congress has prescribed the program changes that must be made, and there is little discretion remaining for NRCS to exercise. NRCS has prepared this programmatic EA to review the effects of activities that will occur on the ground when EQIP is implemented following 2018 Farm Bill requirements. This will provide a programmatic analysis to which those site-specific actions may tier, when appropriate, for purposes of complying with NEPA.[3]

CEQ has indicated that because an EA is a concise document, the purpose of which is to determine the need for an EIS, it should not contain long descriptions or detailed data which the agency may have gathered. Rather, it should contain a brief discussion of the need for the proposal, alternatives to the proposal, the environmental impacts of the Proposed Action and alternatives, and a list of agencies and persons consulted.[4] In addressing these requirements, this EA also incorporates by reference relevant analysis from the 2009 and 2016 EQIP Programmatic EAs[5] as well as other existing analysis.

1.1 Overview of EQIP under the 2014 Farm Bill

EQIP was initially authorized by the Federal Agriculture Improvement and Reform Act of 1996 (Public Law 104-127, Apri1 4, 1996). The program promotes the voluntary application of conservation practices that maintain or improve the condition of soil, water, air, and other natural resources. The program assists owners and operators of agricultural and nonindustrial private forest land with identification of natural resource problems and opportunities to improve their condition and provides technical and financial assistance to address natural resource concerns in an environmentally beneficial and cost-effective manner. The purposes of EQIP under the 2014

[1] Sections 2301–2309 of the Agriculture Improvement Act of 2018 (the 2018 Farm Bill) (Public Law 115-334) re-authorized and amended EQIP (16 U.S.C. 3839aa), created by the Food Security Act of 1985 as amended by the Federal Agriculture Improvement and Reform Act of 1996 (P.L. 104-127, Apri14, 1996) and the Farm Security and Rural Investment Act of 2002 (Public Law 107-171, May 13, 2002). The Commodity Credit Corporation funds EQIP.
[2] See 40 CFR 1501.4, 1508.9; 7 CFR 650.8.
[3] CEQ regulations at 40 CFR 1501.3(b) states that an agency may prepare an EA at any time in order to assist agency planning and decisionmaking.
[4] See 40 CFR 1508.9(b) and Forty Most Asked Questions Concerning CEQ's NEPA Regulations, 23 March 1981.
[5] https://www.nrcs.usda.gov/wps/portal/nrcs/detail/national/technical/ecosciences/ec/?cid=nrcseprd387616.

Farm Bill were to promote agricultural production, forest management, and environmental quality as compatible goals, and to optimize environmental benefits by—

- Assisting producers in complying with local, State, and national regulatory requirements concerning—
  - soil, water, and air quality;
  - wildlife habitat; and
  - surface and ground water conservation;
- Avoiding, to the maximum extent practicable, the need for resource and regulatory programs by assisting producers in protecting soil, water, air, and related natural resources and meeting environmental quality criteria established by Federal, State, Tribal, and local agencies;
- Providing flexible assistance to producers to install and maintain conservation practices that sustain food and fiber production while—
  - enhancing soil, water, and related natural resources, including grazing land, forestland, wetland, and wildlife;
  - developing and improving wildlife habitat; and
  - conserving energy; and
- Assisting producers to make beneficial, cost effective changes to production systems (including conservation practices related to organic production), grazing management, fuels management, forest management, nutrient management associated with livestock, pest or irrigation management, or other practices on agricultural and forested land.

Under the 2014 Farm Bill, EQIP national priorities used to target program funding to achieve its purposes were the following:

- Reductions of nonpoint source pollution, such as nutrients, sediment, pesticides, or excess salinity in impaired watersheds, consistent with total daily maximum loads (TMDLs), where available; the reduction of surface and ground water contamination; and reduction of contamination from agricultural point sources, such as animal feeding operations (AFO);
- Conservation of ground and surface water resources that result in water savings;
- Reduction of on-farm emissions, that contribute to air-quality impairment violations of the National Ambient Air Quality Standards or other State or local air quality regulations;
- Reduction in soil erosion and sedimentation from unacceptable levels on agricultural land;
- On-farm energy conservation; and
- Promotion of at-risk species habitat conservation including development and improvement of wildlife habitat.

Information about the types of conservation practices implemented under the 2014 Farm Bill and the effects of those practices are discussed in section 5.

1.2 Overview of EQIP 2018 Farm Bill Changes

Under the 2018 Farm Bill, EQIP remains a voluntary program providing both technical and financial assistance to agricultural producers and nonindustrial private forest landowners across the Nation. In the 2018 Farm Bill, Congress retained the purposes of EQIP from the 2014 Farm Bill and expanded the purposes to address other agricultural and forest production concerns. Table 1 summarizes changes to EQIP made by the 2018 Farm Bill.

Table 1. Selected Statuary Requirements of the Environmental Quality Incentives Program

Program Elements	2014 Farm Bill	2018 Farm Bill
Funding by fiscal year (FY)	FY 2014 - $1,350 million FY 2015 - $1,600 million FY 2016 - $1,650 million FY 2017 - $1,650 million FY 2018 - $1,750 million less 7% reserved for the Regional Conservation Partnership Program (RCPP)	FY 2019 - $1,750 million FY 2020 - $1,750 million FY 2021 - $1,800 million FY 2022 - $1,850 million FY 2023 - $2,025 million with no decrease for RCPP
Purposes	EQIP purposes included assisting producers in complying with regulatory requirements and providing flexible assistance to producers for conservation practices that sustain food and fiber production while enhancing soil, water, and related natural resources, including grazing land, forest land, wetland, and wildlife.	Retains previous EQIP purposes and expands purposes to include assisting producers to address identified, new, or expected resource concerns; and adapting to, and mitigating against increasing weather volatility and drought resiliency measures.
Definitions	Defined eligible land, organic system plan, payment, practice, and program.	Adds definitions for conservation planning assessment, incentive practice, priority resource concern, soil testing, and soil remediation; adds environmentally sensitive areas to the definition of eligible lands.
Advance Payments for Certain Producers	Provided for advanced payments of not more than 50% for limited resource, socially disadvantaged, veteran, or beginning farmers or ranchers. If funds provided in advance were not expended during the 90-day period beginning on the date of receipt of the funds, the funds would be returned within a reasonable timeframe.	Retains authority to provide advance payments. Requires notification to limited resource, socially disadvantaged, veteran, or beginning farmers or ranchers of the advanced payment option and documentation of producer's election to accept or decline advance payments
Increased payments for high-priority practices	No authority for increased payments for certain practices.	Authorizes NRCS to designate at the State level up to 10 practices to be eligible for increased payments, not to exceed 90% of the costs.

Program Elements	2014 Farm Bill	2018 Farm Bill
Allocation of Funding for Livestock and Wildlife Habitat	Required 60% of funds made available for payments under the program to be targeted at practices relating to livestock production and at least 5% of the funds made available for payments under the program to be targeted at practices benefitting wildlife habitat.	Decreases livestock funding target from 60 to 50% and increases wildlife funding target from 5 to 10%.
Water Conservation or Irrigation Efficiency Practice	Contract payments authorized to producers.	In addition to payments to producers, introduces authority for contract payments to a State, irrigation district, ground water management district, acequia, land grant-mercedes, or similar entity to implement water conservation or irrigation practices under a watershed-wide project that will effectively conserve water, provide fish and wildlife habitat, or provide for drought-related environmental mitigation.
Payments for Conservation Practices Related to Organic Production	Payments limited to $20,000 per year or $80,000 during any 6-year period.	Increases organic initiative payment limit to $140,000 during the period of FY 2019 through 2023 with no annual payment limitation.
Conservation Incentive Contracts	No authority for Conservation Incentive Contracts.	Introduces authority for Conservation Incentive Contracts of 5 to 10 years which can address up to three priority resource concerns for each of the relevant land uses within State-identified watersheds or other areas of high priority.

2 PURPOSE AND NEED FOR ACTION

NRCS needs to promulgate regulations to implement EQIP as it has been modified by the 2018 Farm Bill. When these changes are implemented, NRCS must ensure it does so in a manner that achieves the purposes for which EQIP has been authorized.

As stated in the legislation, the purpose of EQIP under the 2018 Farm Bill is to promote agricultural production, forest management, and environmental quality as compatible goals, and to optimize environmental benefits by:

- Assisting producers in complying with local, State, and national regulatory requirements concerning—
  - soil, water, and air quality,
  - wildlife habitat, and
  - surface and ground water conservation;
- Avoiding, to the maximum extent practicable, the need for resource and regulatory

programs by assisting producers in protecting soil, water, air, and related natural resources and meeting environmental quality criteria established by Federal, State, Tribal, and local agencies;

- Providing flexible assistance to producers to install and maintain conservation practices that sustain food and fiber production while:
  - enhancing soil, water, and related natural resources, including grazing land, forest land, wetland, and wildlife,
  - developing and improving wildlife habitat, and
  - conserving energy; and
- Assisting producers to make beneficial, cost effective changes to production systems (including addressing identified, new, or expected, resource concerns related to organic production, grazing management, fuels management, forest management, nutrient management associated with crops and livestock, pest management, irrigation management, adapting to, and mitigating against, increasing weather volatility, drought resiliency measures, or other practices on agricultural and forested land.

In addition, a 2017 U.S. Government Accountability Office (GAO) report (GAO 2017) identified the need to more effectively target EQIP delivery to maximize the environmental benefits achieved.

3 ALTERNATIVES

3.1 Alternative 1: No Action – Continuation of EQIP as implemented under the 2014 Farm Bill.

This No Action alternative involves continuing EQIP as it was implemented under the 2014 Farm Bill. This alternative assumes conservation practices would be funded based on processes used under the 2014 Farm Bill and that as a result, similar conservation practices would be implemented. This alternative provides a baseline against which to compare the effect of the 2018 Farm Bill changes. CEQ's NEPA implementing regulations require analysis of a No Action alternative for this purpose.

3.2 Alternative 2: Proposed Action – Implement EQIP as modified by the 2018 Farm Bill.

The Proposed Action alternative incorporates the changes required by the 2018 Farm Bill. The changes with potential to affect the human environment include the expanded purposes, incentive payments for high-priority practices, changes in livestock and wildlife-targeted funding, water conservation and irrigation efficiency contracts with entities, and Conservation Incentive Contracts.

4 EFFECTS OF ALTERNATIVES

4.1 Approach to Impact Analysis

This analysis concentrates on the environmental impacts of conservation practices likely to be implemented under the No Action and Proposed Action alternatives and the resource concerns and land uses in which the public historically has been most interested—cropland soil quality, fish and

wildlife habitat, forest land conservation, grazing land conservation, irrigation efficiency, water quality, and wetlands. Program and conservation practice impacts described in the March 2016 and the January 2009 EQIP Programmatic EAs[6] are incorporated by reference and updated as appropriate in this document. This EA also incorporates by reference the findings of the RCA Appraisal: Soil and Water Resources Conservation Act,[7] the Conservation Effects Assessment Project (CEAP) findings described in a series of CEAP cropland, wildlife, wetlands, and grazing lands assessment reports,[8] and the 2015 National Resources Inventory (NRI).[9]

There are over 160 conservation practice standards in the NRCS National Handbook of Conservation Practices (NHCP).[10] In many cases, the same conservation practice may be used on more than one type of agricultural operation. Table 2 provides examples of conservation practices used by EQIP participants on cropland, rangeland, pastureland, and forest lands.

Table 2: Examples of NRCS Conservation Practices and Applicability by Land Use

Practice Name	Code	Crop	Pasture	Range	Forest
Brush Management	314		X	X	X
Conservation Crop Rotation	328	X			
Residue & Tillage Management, No-Till/Strip Till/ Direct Seed	329	X			
Prescribed Burning	338		X	X	X
Cover Crop	340	X			
Critical Area Planting	342	X	X	X	X
Residue & Tillage Management, Reduced Till	345	X			
Windbreak/Shelterbelt	380/650	X	X	X	
Establishment/Renovation					
Fuel Break	383		X	X	X
Woody Residue Treatment	384				X
Field Border	386	X			
Riparian Herbaceous Cover/Forest Buffer	390/391	X	X	X	
Filter Strip	393	X			
Firebreak	394		X	X	X
Stream Habitat Improvement & Management	395	X	X	X	X

[6] https://www.nrcs.usda.gov/wps/portal/nrcs/detail/national/technical/ecosciences/ec/?cid=nrcseprd387616.
[7] "RCA Appraisal: Soil and Water Resources Conservation Act," USDA, 2011. http://www.nrcs.usda.gov/Internet/FSE_DOCUMENTS/stelprdb1044939.pdf.
[8] See https://www.nrcs.usda.gov/wps/portal/nrcs/main/national/technical/nra/ceap/ for a description of CEAP and links to related studies and reports. See also Appendix D.
[9] See https://www.nrcs.usda.gov/wps/portal/nrcs/main/national/technical/nra/nri/
[10] For information on specific conservation practices approved for use at the national level. https://www.nrcs.usda.gov/wps/portal/nrcs/main/national/technical/cp/ncps/.

Irrigation Water Management	449	X	X		
Forage Harvest Management	511		X		
Forage and Biomass Planting	512		X		
Prescribed Grazing	528		X	X	X
Range Planting	550			X	
Tree/Shrub Establishment	612				X
Restoration/Mgmt of Rare & Declining Habitats	643	X	X	X	X

This EA analyzes potential environmental impacts at a broad program scale, identifying the qualitative effects that are a reasonably foreseeable result of each alternative. These qualitative assessments are based on a review of the best available scientific studies and methodological approaches, as well as professional judgment. NRCS has developed network effects diagrams to illustrate the chain of expected direct, indirect, and cumulative effects of applying each conservation practice according to the standard for the land use on which it is intended to be applied and the other practices to be considered in conjunction. Copies of the network effects diagrams are available on the NRCS website.[11] The methodologies used to develop the network effects diagrams and determine the effects of NRCS conservation programs are described in appendix A.

4.2 Environmental Considerations in NRCS Conservation Program Delivery

In addition to this programmatic review, NRCS undertakes environmental review at subsequent stages of program implementation consistent with NEPA requirements, other requirements for protection of the environment, and NRCS regulations. This additional review includes conducting an onsite environmental evaluation (EE) and documenting the results on an EE worksheet before funding is provided to eligible recipients. The EE assesses the site-specific effects of conservation alternatives and provides information for the Responsible Federal Official (RFO) to determine the need for consultation or to develop additional EAs or EISs consistent with NEPA, other requirements for environmental protection, and NRCS regulations.

In situations where a single conservation practice may result in increased risk to the condition of another resource, additional conservation practices are integrated into the conservation plan to avoid creating new resource concerns. The EE process helps to ensure that all potential impacts to natural resources are identified and appropriate alternatives and practices are available to the program participant. Appendix B describes the development of NRCS conservation practice standards and how environmental considerations, including compliance with NEPA, the Endangered Species Act (ESA), and National Historic Preservation Act (NHPA), are integrated into NRCS conservation planning and program delivery.

4.3 Conservation Treatment Needs and Predicted Conservation Practices

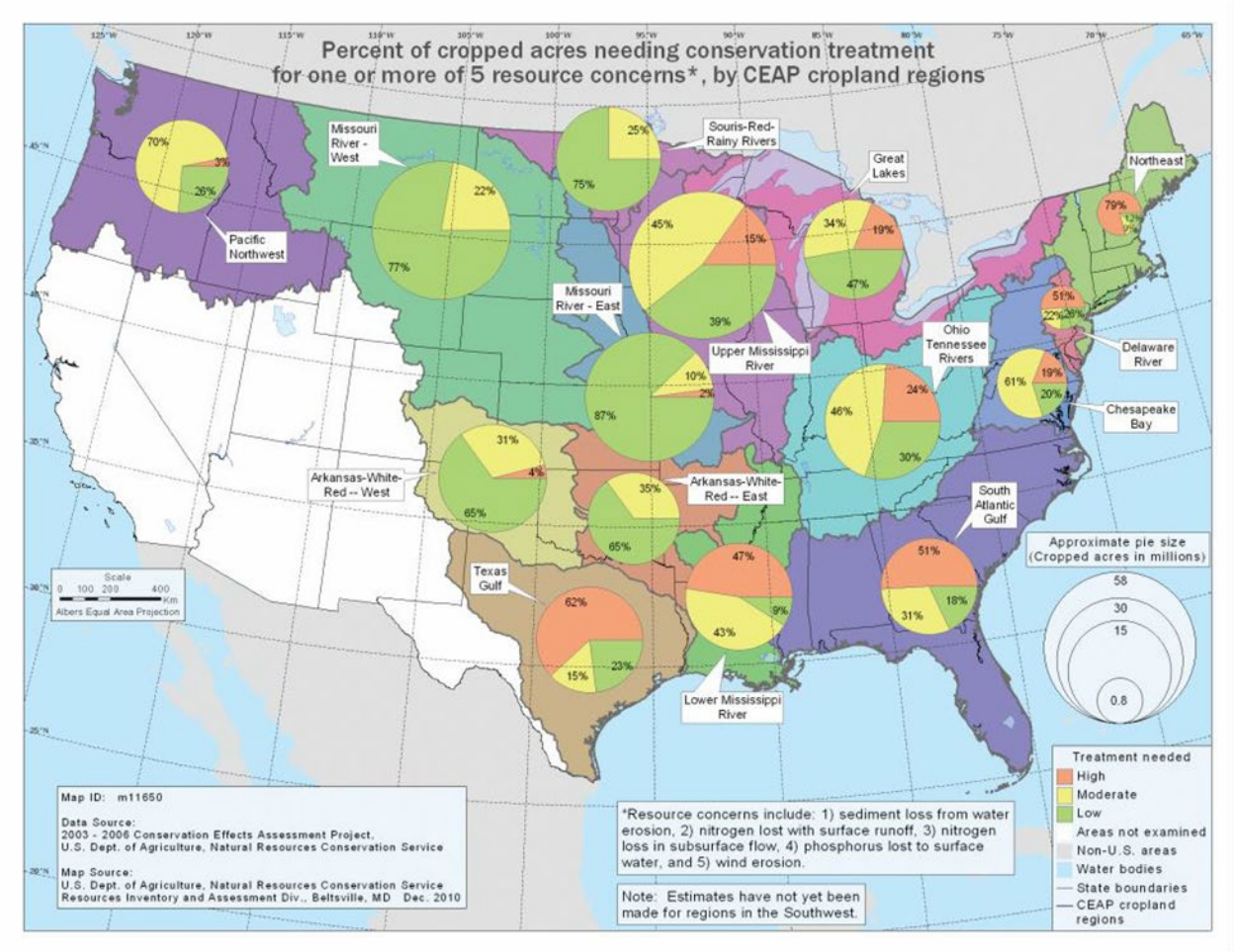
The CEAP cropland regional watershed studies have assessed the effects of agricultural conservation practices on cultivated cropland. Specifically, they estimated practice effects on soil

[11] Practice Network Effect Diagrams are available at https://www.nrcs.usda.gov/wps/portal/nrcs/detailfull/national/technical/cp/ncps/?cid=nrcs143_026849

loss and excess nutrient delivery to surface waters, in the context of natural resource conditions such as climate, soils, slope, and other physical characteristics. The CEAP cropland studies assessed the effects of applied conservation practices on mediating inherent vulnerability threats associated with cultivated cropland. Results highlight which areas need additional treatment to address outstanding natural resource concerns. Figure 1 shows available CEAP cropland regional results according to conservation treatment needs. The numbers in each circle show the percentage of cropland acres in the associated region that fall within each treatment needs category. Acres that require extra attention are represented by orange; acres that have low remaining treatment needs are represented by green; and acres with moderate treatment needs are in yellow. The data presented in Figure 1 are based on the conservation condition during the mid-2000s (CEAP-1).

An updated CEAP survey has been conducted to represent effects of conservation treatment and remaining needs in recent years (CEAP-2), however, analysis is in process and results are not available for this EA.

Figure 1: Conservation Treatment Needs Identified by Initial CEAP Cropland (CEAP-1) Modeling[12]



Findings from the CEAP-1 study were coupled with agency practice application data to produce a Soil Vulnerability Index (SVI) and an index to rank remaining treatment needs—the CEAP Conservation Benefits Identifier (CCBI)—on the most vulnerable soils given the known

[12] RCA Appraisal, 2011.

conservation condition. The CCBI is a geospatial data layer that attempts to translate core CEAP Cropland study findings about conservation treatment needs into actionable information suitable for supporting agency landscape planning and program delivery at the field level. It is intended to address the general desire within and outside NRCS to utilize scientific findings from CEAP by effective integration into agency conservation implementation efforts. These data reveal the extent to which inherent potential vulnerability exists on cultivated cropland and what treatment needs remain beyond the current conservation condition. Targeting fields and landscapes where additional conservation treatment is needed stands to produce the greatest environmental benefits. Thus, the SVI is used to determine inherent potential vulnerability and the CCBI identifies remaining treatment needed through practices that avoid excessive erosion or nutrient applications, control losses of sediment and nutrients from farm fields, and trap sediment and nutrients that do leave the fields before they reach surface waters.

Cropland treatment needs can be described using categories related to potential for nitrogen and phosphorus runoff and leaching as well as sediment runoff. Although many inherently vulnerable acres have received various levels of conservation treatment, the CCBI helps to identify outstanding treatment needs at various spatial scales. Figures 2 and 3 display priorities for remaining cropland treatment needs regarding nitrogen leaching and runoff, respectively. These figures reveal relative differences in remaining treatment needs among hydrologic unit code (HUC) 8 watersheds (medium-sized river basins; about 2200 of which exist in the United States.) For sediment loss concerns, Figure 4 illustrates where treatment has been applied as well as where treatment needs remain. While these figures illustrate treatment needs at the HUC 8 watershed scale, the CCBI can be used by NRCS to identify remaining treatment needs down to the individual field scale, useful for on-the-ground conservation planning.

Figure 2: Priority Acres to be Treated for Nitrogen Leaching

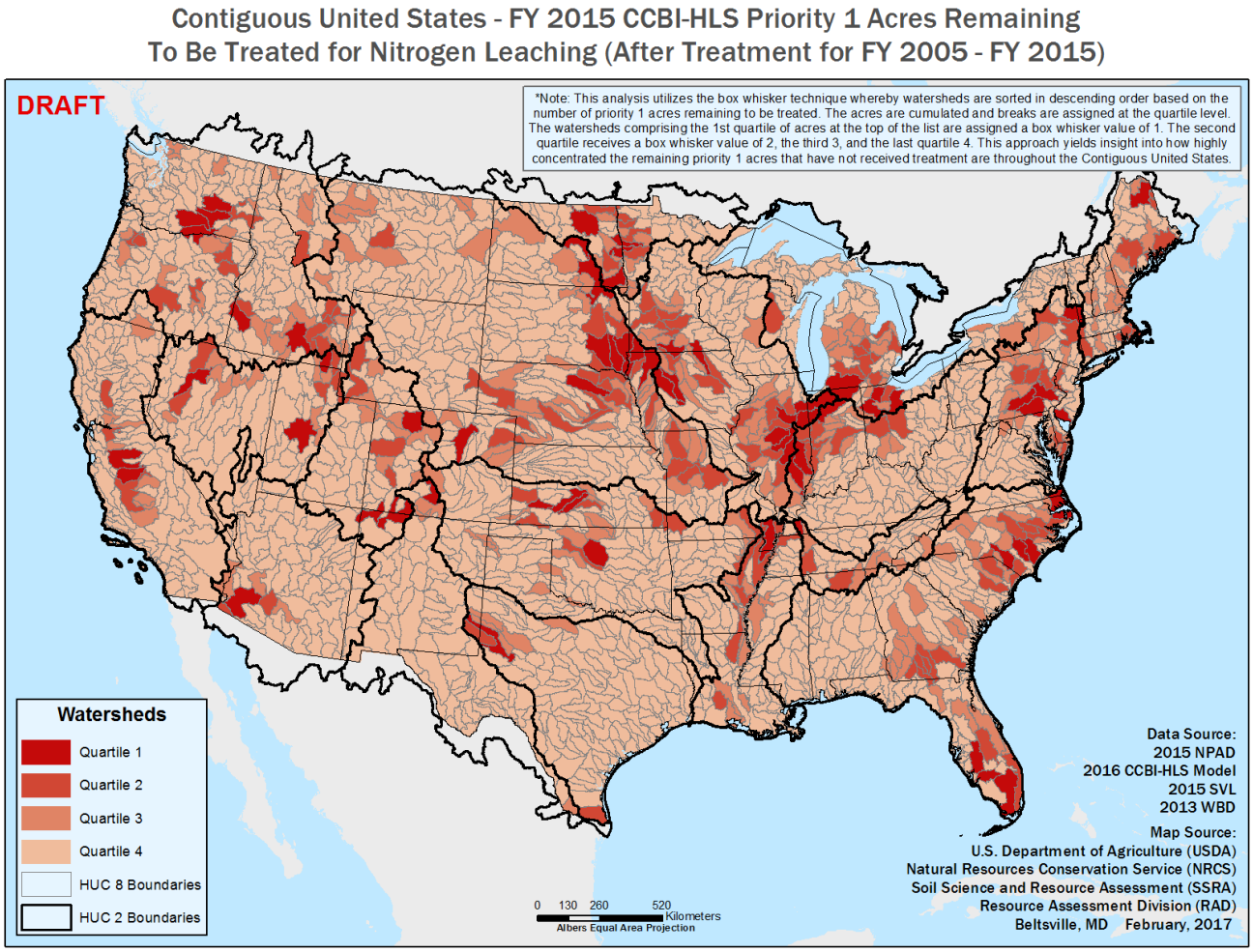


Figure 3: Priority Acres to be Treated for Nitrogen Runoff

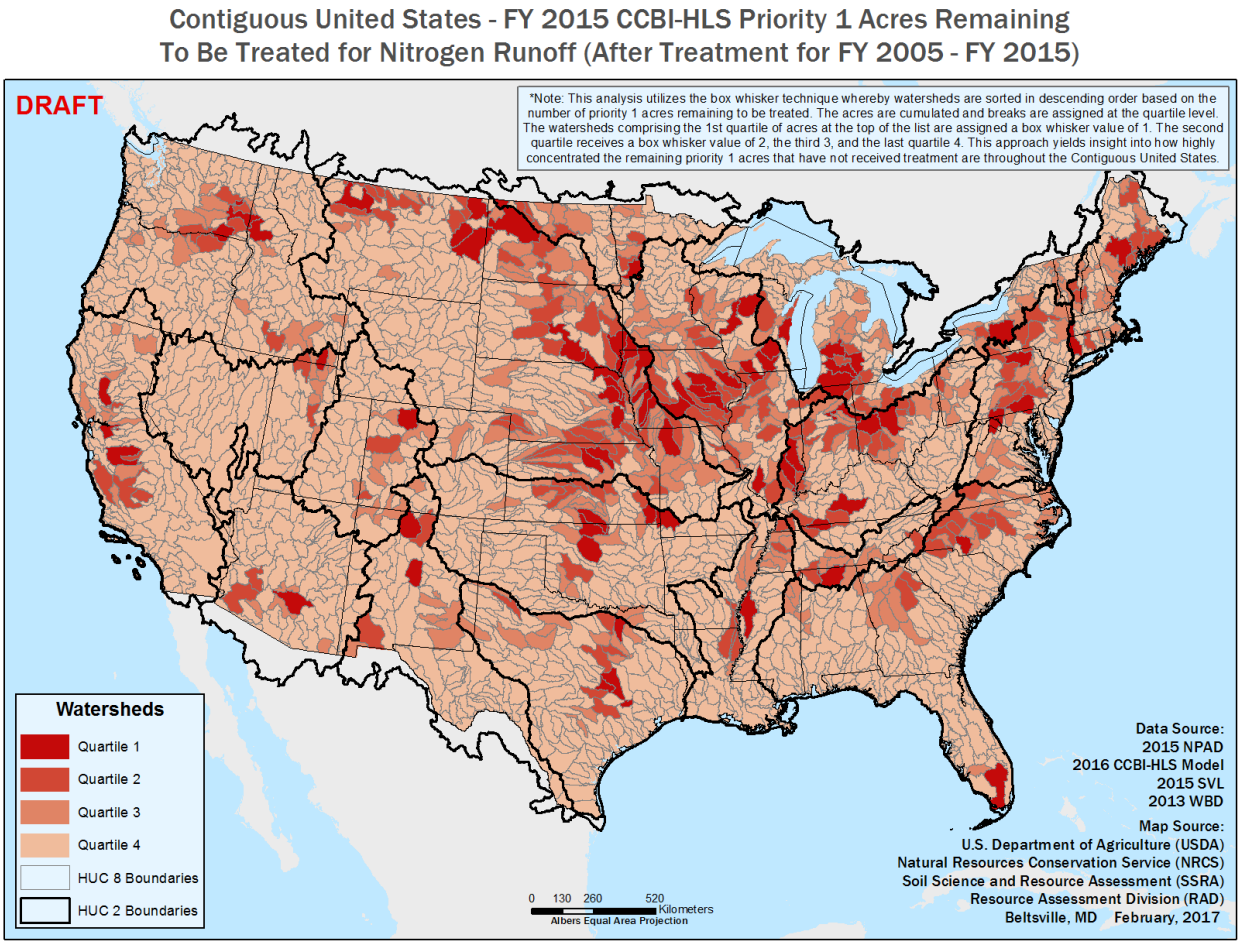
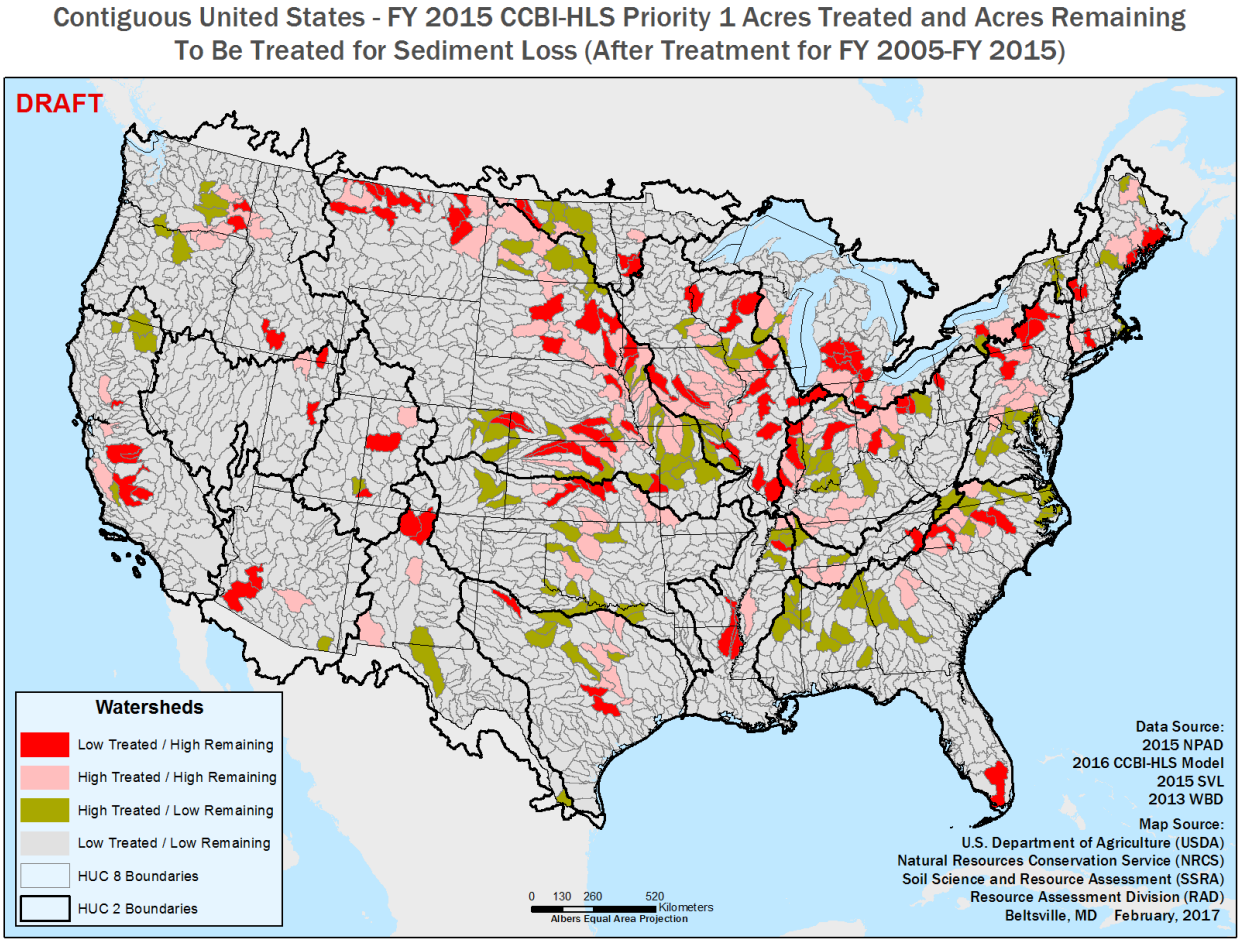


Figure 4: Priority Acres to be Treated for Sediment Loss

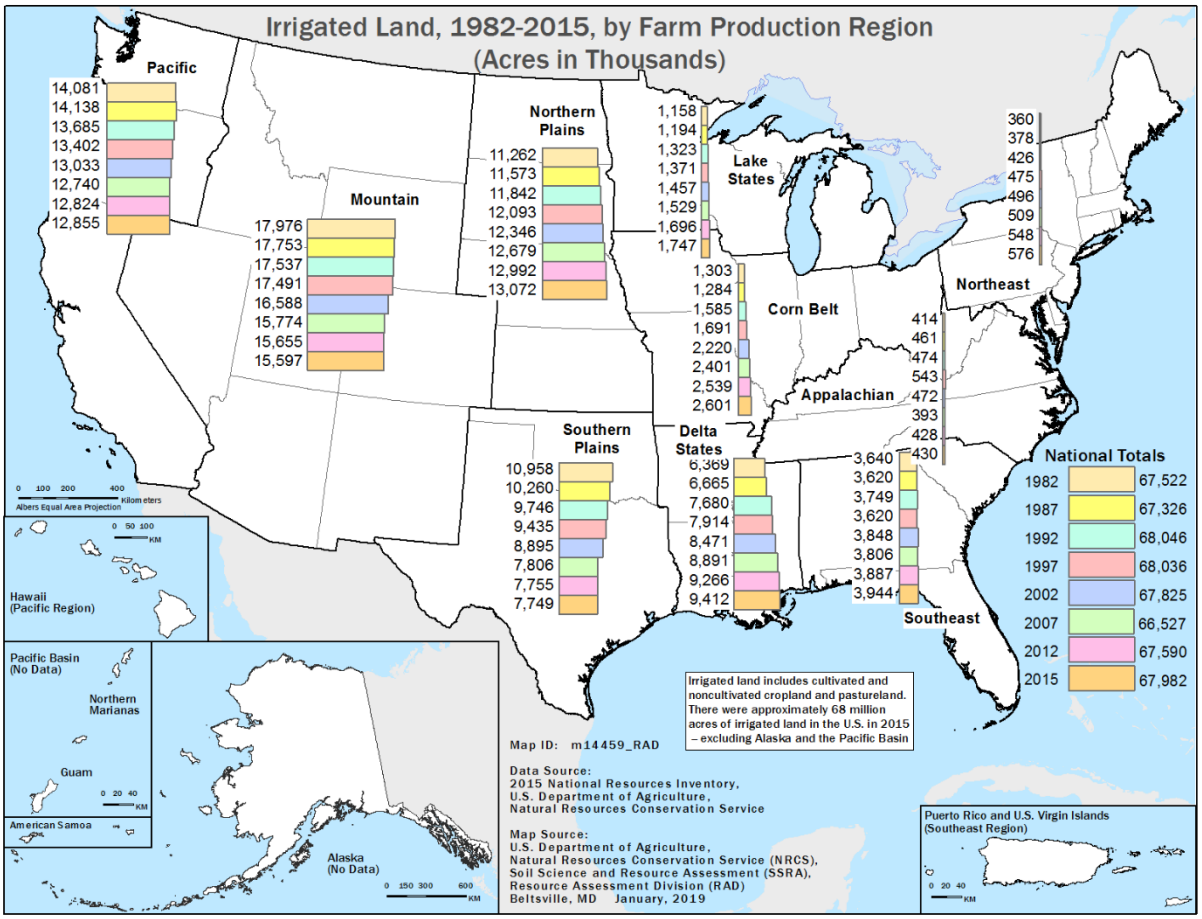


In response to the GAO report (2017) NRCS has stated its intent to better integrate CEAP findings into NRCS and EQIP decision making, including how CEAP findings may be used to optimize environmental benefits achieved. For example, NRCS anticipates that the CEAP-2 cropland data and modeling currently underway will provide new insight for targeting EQIP investments in the future. Use of the SVI and CCBI can also help focus EQIP efforts to optimize environmental benefits associated with soil and water conservation in cropland systems.

The 2015 National Resources Inventory (NRI) is the latest in a series of natural resource inventories conducted by NRCS. It provides updated information on the status, condition, and trends of land, soil, water, and related resources on the Nation's non-Federal lands. Non-Federal lands include privately owned lands, Tribal and trust lands, and lands controlled by State and local governments. The NRI database consists of over 800,000 points on the ground across the United States along with measures at each of those points from 1982, 1987, 1992, 1997, and annually from 2000–2015. Data is collected at each point to allow aggregate estimates on: (1) Land Cover/Use (details on cropland, pasture, rangeland, forest, and developed land), (2) Soil (soil characteristics at the points from the Soil Survey Geographic Database), (3) Erosion by water and wind (measures of sheet and rill, and saltation and surface creep erosion), (4) Water and Wetlands, and (5) Conservation Methods.

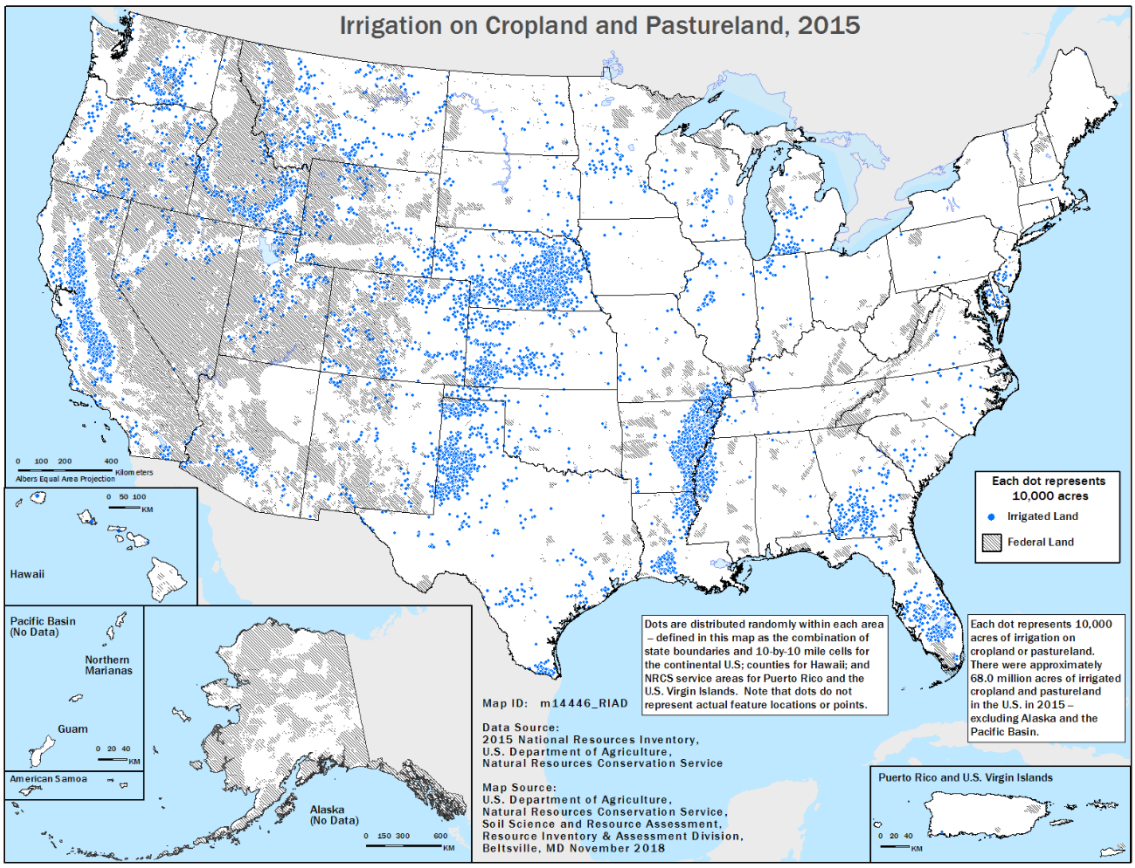
Figures 5 and 6 present 2015 NRI data on the amount and distribution of the Nation's irrigated cropland and pastureland. Figure 5 shows the acres of irrigated land in the continental United States by farm production region and how the extent of irrigated land has changed in each from 1982 through 2015. In general, the number of acres under irrigation has decreased in areas where potential evapotranspiration exceeds annual average precipitation (Pacific, Mountain, Southern Plains) and increased in other regions, while the national total of irrigated land acreage has remained about the same. Even so, about 72 percent of irrigated lands occur in the 17 Western States, including 30 percent in the semiarid Northern and Southern Plains, while the remaining 28 percent are in the humid Eastern Regions. Figure 6 shows the relative distribution of irrigated cropland and pastureland in the continental United States, Hawaii, and Puerto Rico, including the Pacific and U.S. Virgin Islands.

Figure 5: Irrigated Cropland and Pastureland[13]



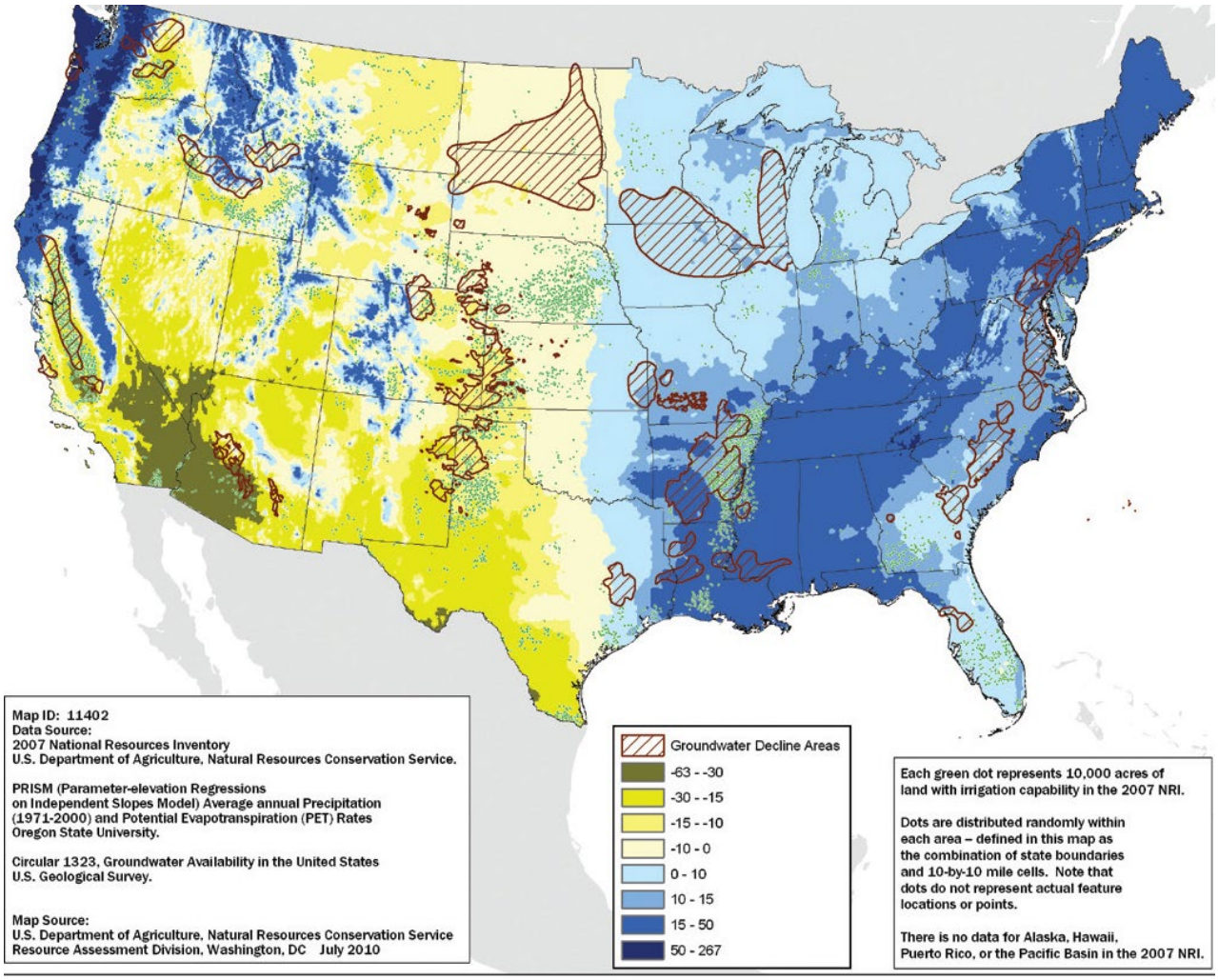
[13] 2015 National Resources Inventory, https://www.nrcs.usda.gov/Internet/NRCS_RCA/maps/m14459irrig_fpr.png

Figure 6: Irrigation on Cropland and Pastureland, 2015



NRCS expects the areas depicted in Figures 5 and 6 correspond to areas of high demand for water conservation and irrigation system efficiency payments under EQIP. Figure 7 additionally depicts areas of aquifer decline (brown cross-hatching), where such practices are especially needed. More information on water supply and use for irrigation is available in the 2011 RCA Appraisal and incorporated herein by reference.

Figure 7: Indicators of Water Availability and the Locations of Irrigated Land



4.4 Environmental Effects of Alternatives

The discussion of the No Action alternative below describes how EQIP conservation practices under the 2014 Farm Bill affected the environment and projects future effects if EQIP continues unchanged. The discussion of the Proposed Action, under which EQIP would be implemented according to the requirements of the 2018 Farm Bill including expanded purposes, changes in livestock and wildlife targeted funding, increased payments for high priority practices, water conservation and irrigation efficiency contracts with entities, and Conservation Incentive Contracts, focuses on the likely differences in practices used and impacts to the quality of the human environment as compared to the No Action alternative.

Although EQIP specifically addresses resource concerns on working farms and ranches, nonindustrial private forest land, and Tribal lands, implementation of the program creates benefits that extend well beyond the land on which EQIP is used. Conservation practices funded through EQIP accrue environmental benefits including improved grazing lands, improved air quality, enhanced fish and wildlife habitat, sustainable plant and soil conditions, improved water quality and quantity, reduced soil erosion, and energy conservation that provide important ancillary economic and social benefits. Such impacts are considered in the network effects diagrams that

illustrate the direct, indirect, and cumulative effects of NRCS conservation practices and are also considered in the Conservation Practice Physical Effects (CPPE) assessments and CEAP studies described in appendix A and discussed below.

4.4.1 Alternative 1: No Action – Continuation of EQIP as Implemented Under the 2014 Farm Bill.

The No Action alternative assumes EQIP would continue to be implemented as it was under the 2014 Farm Bill, and as a result, conservation practices similar to those funded under the 2014 Farm Bill EQIP program would continue to be applied into the future. In addition, this alternative assumes annual EQIP funding would be available in amounts ranging from $1.35 billion to $1.75 billion, less the 7 percent of these amounts reserved for the Regional Conservation Partnership Program (RCPP), as was the case under the 2014 Farm Bill.

The following analysis reviews the conservation practices implemented through EQIP under the 2014 Farm Bill, and the types of effects resulting from those practices, as well as the effects that would be anticipated from a continuation of the same program provisions.

From FY 2014 to 2017, between 15 and nearly 19.5 million acres were treated under EQIP contracts each year.[14] Data from FY 2018 will be added to this analysis when it becomes available. The following sections discuss the EQIP conservation practices used under the 2008 and 2014 Farm Bills to achieve improvements in soils, with a focus on cropland soil quality; fish and wildlife habitat; forest land conservation; grazing land conservation; water quantity with a focus on irrigation efficiency; water quality; and wetlands.[15] Note that there is some overlap between these groupings because some practices address multiple resource concerns. Land unit acres shown below are counted each time a practice is applied on that land unit in the fiscal year, therefore, land unit acres may be counted multiple times across practices, practice groupings, and fiscal years.

4.4.1.1 *Soils*

The 2009 EQIP Programmatic EA describes typical problems related to soils, such as prime and unique agricultural lands and forest lands, soil quality, and erosion. This EA incorporates by reference pages 27 to 34 of the 2009 EQIP Programmatic EA which characterize prime and unique agricultural lands and forest lands, and pages 36 and 37, which characterize soil resources. The section below provides additional information and describes the past and predicted future impacts of EQIP when implemented according to 2014 Farm Bill rules.

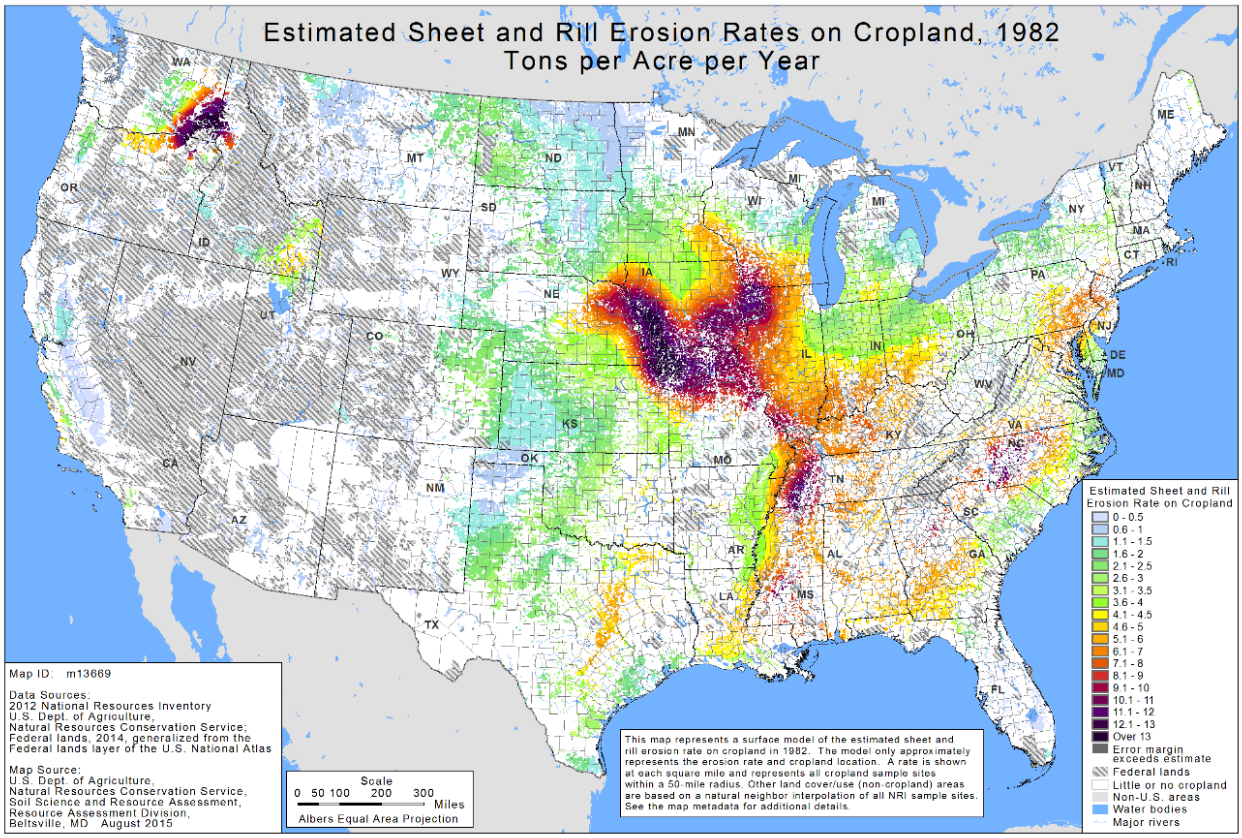
4.4.1.1.1 Cropland Soil Quality

Between 1982 and 2012, there was a 44-percent decline in soil erosion on cropland.[16] Water (sheet and rill) erosion declined from 1.59 billion tons per year to .96 billion tons per year, and

[14] RCA Report Interactive Data Viewer, EQIP Data (FY 2018 data will be added when available); https://www.nrcs.usda.gov/Internet/NRCS_RCA/reports/fb08_cp_eqip.html
[15] Any practices not included in one of these groups are included in an All Other category.
[16] U.S. Department of Agriculture. 2015. Summary Report: 2012 National Resources Inventory, Natural Resources Conservation Service, Washington, DC, and Center for Survey Statistics and Methodology, Iowa State University, Ames, Iowa. http://www.nrcs.usda.gov/technical/nri/12summary.

erosion due to wind decreased from 1.38 billion tons per year to .71 billion tons per year (figs. 8 and 9).[17]

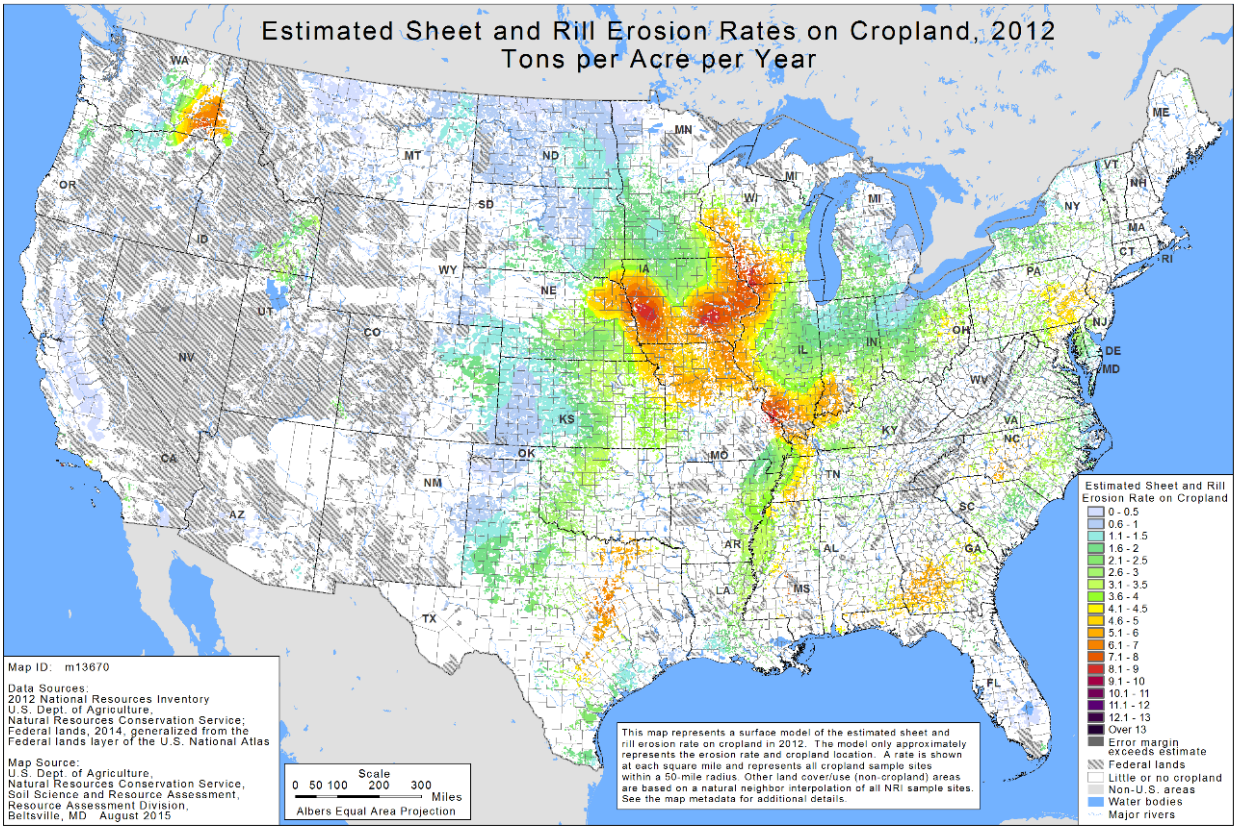
Figure 8: Estimated Sheet and Rill Erosion Rates on Cropland, 1982



During that period, EQIP was an important tool available to provide farmers with technical and financial assistance to help reduce soil erosion and improve soil quality.

17 Ibid.

Figure 9: Estimated Sheet and Rill Erosion Rates on Cropland, 2012.



4.4.1.1.2 Conservation Practices Related to Improving Cropland Soil Quality, Including Erosion Reduction

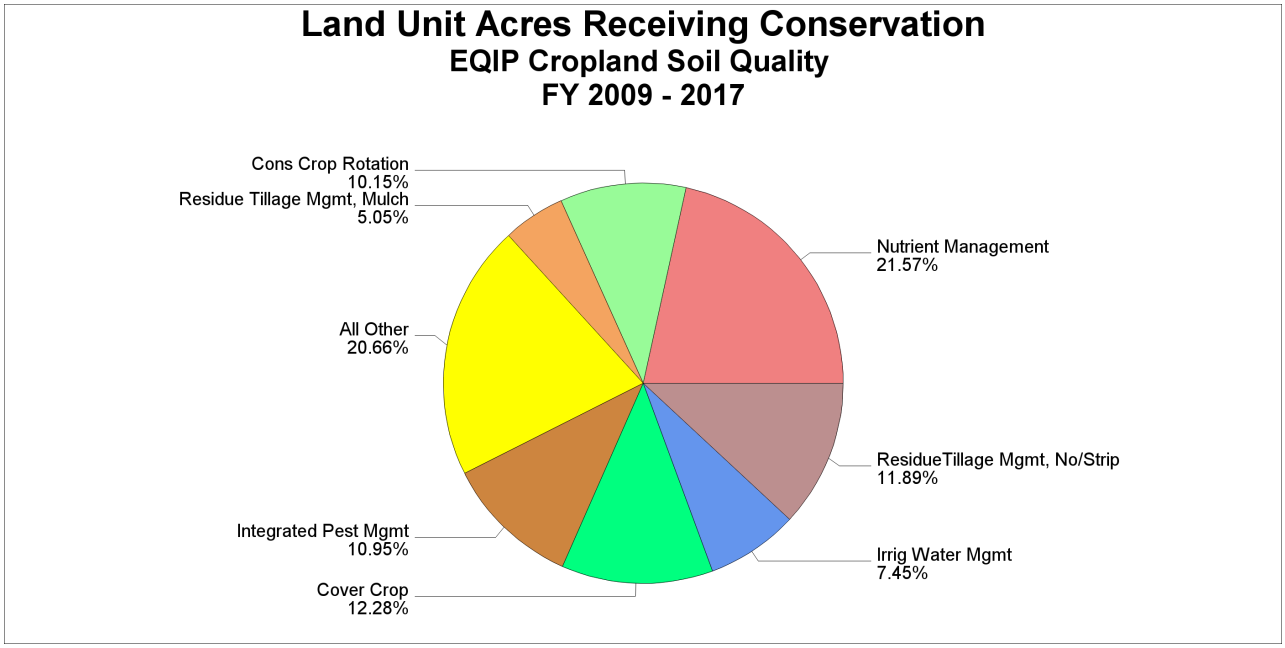
Figure 10 identifies the most frequent conservation practices applied through EQIP to improve cropland soil quality. Each year of the 2014 Farm Bill, between 2.67 and 3.05 million acres of cropland and hayland, about 17 percent of the total acres under EQIP contract, were treated with one or more soil quality improvement practices.

The six components of soil quality management are enhancing organic matter, avoiding excessive tillage and erosion, managing pests and nutrients efficiently, preventing soil compaction, keeping the ground covered, and diversifying cropping systems. Consistent with this, seven conservation practices that directly align with these components—Nutrient Management, Integrated Pest Management (IPM), Residue and Tillage Management (No-till, Strip-till or Direct Seeding) (Residue Management), Conservation Crop Rotation (CCR), Irrigation Water Management (IWM), Residue and Tillage Management (Mulch-till), and Cover Crop—were used on about 80 percent of cropland acres treated under EQIP to address soil quality concerns from FY 2009 to 2017 (fig. 7). Approximately 30 other conservation practices make up the remaining 21 percent of cropland soil quality treatments applied through EQIP over the course of the 2008 and 2014 Farm

Bills.[18] Many of the same conservation practices used to improve soil quality are also used to reduce soil erosion.

Because there is a clear need to continue to address soil quality concerns, it is likely similar practices would continue to be installed in the future if EQIP were to continue to be implemented as it was under the 2014 Farm Bill, though the number of practices implemented might change based on the amount of available funding. NRCS initiatives to improve soil quality would likely continue as well, but EQIP practices implemented as part of those initiatives are included in the information in figure 10.

Figure 10: EQIP 2008 and 2014 Farm Bills Soil Quality Improvement Practices



*Only practices representing a substantial portion of the total for the period are included in the above chart. Practices not included are summed into the All Other category. Note that only practices applied on cropland or hayland are included.

The CEAP-1 cropland regional assessments indicated that soil conservation practices on cropland reduce losses of sediment, nitrogen, and phosphorous from cropland fields.[19] In some areas, treatment of soil erosion alone can exacerbate the nitrogen leaching problem by rerouting surface runoff to subsurface flow pathways, but suites of practices that include nutrient management and other conservation practices as required by site-specific conditions, as well as soil erosion control practices, can simultaneously address soil erosion and nutrient losses by wind, runoff, and through leaching. Recognizing this, NRCS often implements conservation practices in "systems" of

[18] As previously indicated, more than one conservation practice may be applied on the same land unit or across multiple years, so there is some double-counting included. See also http://www.nrcs.usda.gov/Internet/NRCS_RCA/reports/fb08_cp_EQIP.html.

[19] See River Basin Cropland Modeling Study Reports for the Upper Mississippi River Basin, Ohio-Tennessee River Basin, Missouri River Basin, Arkansas-White-Red Basin, Lower Mississippi River Basin, Great Lakes Region, and Chesapeake Bay. http://www.nrcs.usda.gov/wps/portal/nrcs/detail/national/technical/nra/ceap/na/?cid=nrcs143_014144.

associated practices to mitigate such unintended consequences. As stated above, cropland treatment systems typically involve a mix of practices intended to *avoid* excessive erosion or nutrient applications, *control* losses of sediment and nutrients from farm fields, and *trap* sediment and nutrients that do leave the fields before they reach surface waters. Table 3 summarizes the results of CEAP-1 findings related to NRCS conservation practice effects on reducing cropland losses of sediment as of 2006.[20] Results of the CEAP-2 assessment are not yet available for this EA.

Table 3: Summary of CEAP-1 River Basin Cropland Modeling Study Report Findings for Sediment Losses

Sediment Losses

	Wind	**Runoff**
CEAP STUDY	*% reduction in losses*	
Upper Mississippi River Basin (Aug 2012)	**64**	**61**
Ohio-Tennessee River Basin (Jan 2012)	*n/a*	**52**
Missouri River Basin (Aug 2012)	**58**	**73**
Arkansas-White-Red Basin (March 2013)	**31**	**61**
Lower Mississippi River Basin (Aug 2013)	*n/a*	**27**
Great Lakes Region (Sept 2011)	**44**	**47**
Chesapeake Bay (Mar 2011)	*n/a*	**55**

Based on the results of CEAP-1 cropland studies, by 2006 the greatest reduction in sediment losses from the land had generally occurred in the Missouri and Arkansas-White-Red River Basins. The least reductions were obtained in the Lower Mississippi River Basin.

NRCS soil quality practices, as illustrated in the network effects diagrams associated with each practice and further supported by the results of CEAP studies improve soil quality by applying the right amount of pesticides and nutrients of the right form in the right place at the right time and at the right rate, resulting in reducing erosion, and increasing soil organic matter through improved residue management and use of conservation cover crops. See the RCA EQIP Report for a list of NRCS soil quality practices implemented under the 2008 and 2014 Farm Bills and the network effects diagrams.

4.4.1.2 *Fish and Wildlife Habitat*

The 2009 EQIP Programmatic EA describes typical issues related to fish and wildlife resources. This EA incorporates by reference pages 61 to 65 of the 2009 EQIP Programmatic EA which characterizes biological resources including fish and wildlife habitat. The section below provides additional information and describes the past and predicted future impacts of EQIP when implemented according to 2014 Farm Bill rules.

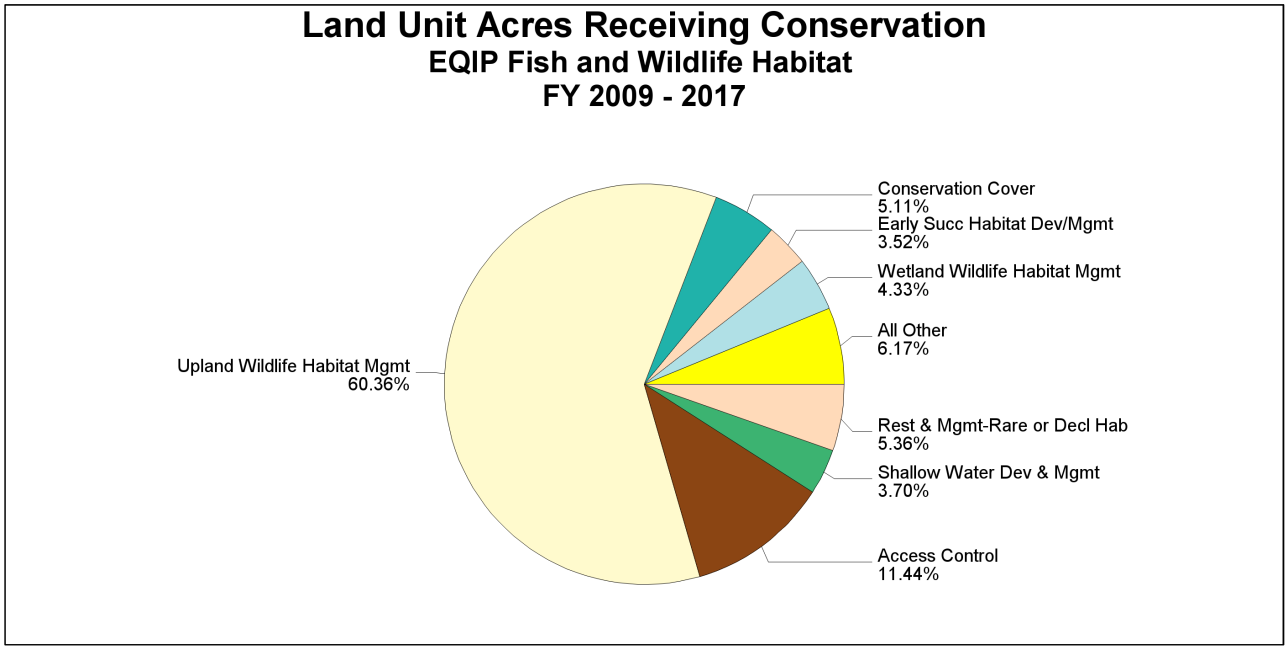
4.4.1.2.1 Conservation Practices Related to Improving Fish and Wildlife Habitat

Figure 11 identifies the top practices used through EQIP to improve fish and wildlife habitat. Farmland, ranch land, and forest land can all provide habitat for fish and wildlife and other biological resources and through EQIP, NRCS can provide technical and financial assistance when a client wants to conserve, maintain, and improve this habitat. While every practice and

[20] CEAP results related to nitrogen and phosphorous loadings are discussed in "Water Quality."

management action taken on the land has some effect on biological resources, approximately 16 conservation practices have improvement of fish and wildlife habitat as a primary purpose.

Figure 11: EQIP 2008 and 2014 Farm Bills Fish and Wildlife Habitat Improvement Practices



*Only practices representing a substantial portion of the total for the period are included in the above chart. Practices not included are summed into the All Other category.

Of these, seven practices—Upland Wildlife Habitat Management, Access Control, Restoration and Management of Rare or Declining Habitat, Conservation Cover, Wetland Wildlife Habitat Management, Shallow Water Development and Management and Early Successional Habitat Development and Management—were applied on 94 percent of the acres with conservation practices used to improve fish and wildlife habitat on EQIP-treated acres from 2009 through 2017. Approximately 10 other conservation practices make up the remaining 6 percent of fish and wildlife habitat improvement acres applied through EQIP over the course of the 2008 and 2014 Farm Bills.[21]

Upland Wildlife Habitat Management was applied to about 60 percent of the acres on which fish and wildlife habitat concerns were addressed. Because there is a clear need to continue to address habitat concerns, it is likely this and other similar practices would continue to be installed in the future if EQIP were to continue to be implemented as it was under the 2014 Farm Bill, though the number of fish and wildlife practices implemented might change based on the amount of available funding. NRCS' Working Lands for Wildlife (WLFW) initiatives would likely continue, but practices implemented through EQIP as part of those initiatives are included in the practice information above.

General conclusions of a 2007 literature synthesis of studies documenting effects of Farm Bill conservation practices on fish and wildlife (Haufler 2007) included:

[21] See https://www.nrcs.usda.gov/Internet/NRCS_RCA/reports/fb08_cp_eqip.html

- Cropland conservation practices targeted at reducing soil erosion reduce sediment delivery and run-off of agricultural pollutants, thereby resulting in positive effects on aquatic systems and species (Brady, *in* Haufler 2007). The author noted that such practices may also benefit terrestrial wildlife populations when properly planned but may have little or no benefits without this planning due to the importance of providing appropriate plant communities and habitat elements within agricultural landscapes. NRCS incorporates the use of wildlife habitat evaluations into its application of conservation practices intended to benefit wildlife.
- The complexities of conservation practice effects on stream fishes and aquatic macroinvertebrates leave many questions unanswered; there are insufficient data from evaluation of completed aquatic restoration projects to be able to make broad conclusions. For example, while snagging and clearing is generally considered detrimental to aquatic fauna because of the important role large wood plays in providing habitat and carbon, removal of some material may prevent bank erosion and failure, thus reducing suspended sediment loads and benefiting aquatic habitat. Similarly, stream crossings, bank protection, and livestock exclusion improve water quality, and therefore, should benefit aquatic fauna; however, existing studies focus primarily on cool water species and documentation remains a significant gap (Knight and Boyer, *in* Haufler 2007.)
- Linear practices such as filter strips, grassed waterways, contour strips, riparian buffers, and windbreaks and shelterbelts that are used primarily in croplands for water and soil conservation can provide some wildlife benefits, particularly as compared with having the areas in row crops. However, the small area and high edge-interior ratios of these practices can limit benefits for area-sensitive species and landscape influences need additional study (Clark and Reeder, *in* Haufler 2007).

Application of conservation practices on cropland has been shown to improve habitat conditions for fish communities within the watershed. For example, Keitzer et al., (2016) quantified the potential for common cropland conservation practices typically applied though EQIP to be used to meet nutrient management goals for Lake Erie while simultaneously improving stream biological conditions throughout the Western Lake Erie Basin (WLEB) watershed. The work showed that implementation of practices on farm acres in critical and moderate treatment need categories, representing nearly half of the watershed, would be needed to reduce spring/early summer total phosphorus loads from the WLEB watershed to acceptable levels. This widespread practice implementation also would improve potential stream biological conditions in more than 11,000 km of streams and reduce the percentage of streams where water quality is limiting biological conditions from 31 to 20 percent (Keitzer et al., 2016).

Conservation practices designed to control soil erosion, such as no-till or cover crops, provide better environments for microorganisms, invertebrates, small mammals, and birds. Fostering ecological habitats suitable for particular species can also benefit a host of other species.

NRCS conservation practices designed to improve wildlife habitat, as illustrated in the network effects diagrams associated with each practice and further supported by the results of CEAP studies, provide wildlife benefits by specifically keeping both habitat requirements and agricultural production in mind while addressing conservation opportunities on cropland and grazing land. However, there is potential for adverse impacts to terrestrial species to occur, particularly in the short term, as a result of implementing certain other conservation practices such

as Recreation Area Improvement, Land Clearing, Access Control, and Fence.[22] Similarly, certain conservation practices have more potential than others to have adverse impacts on aquatic species, particularly in the short run, such as Dam, Diversion; Diversion; Dike; and Spring Development. However, NRCS regulations and policies require that plans minimize adverse effects before providing technical and financial assistance (7 CFR 650.3(b)(4)) and avoid adverse effects on species of concern by recommending alternatives that avoid or minimize adverse impacts.

NRCS also consults with U.S. Fish and Wildlife Service (USFWS), National Marine Fisheries Service (NMFS), and State and Tribal wildlife agency experts as necessary to avoid harm to any species that is protected under the ESA, State or Tribal law, or is a candidate for listing. NRCS' commitment to wildlife habitat conservation is demonstrated by its WLFW efforts which use multiple conservation program authorities, including EQIP, to restore habitat with the goal of avoiding the need for future regulation. Overall, conservation practices implemented through EQIP and other NRCS programs have been shown to produce important benefits for wildlife habitats. See RCA EQIP Report for a list of NRCS fish and wildlife habitat practices implemented during the 2008 and 2014 Farm Bills and the network effects diagrams.

4.4.1.3 *Forest land*

The 2009 EQIP Programmatic EA discusses typical concerns related to the natural resources associated with forest lands. This EA incorporates by reference page 77 of the 2009 EQIP Programmatic EA which characterizes private forest land ownership and pages 122 through 124 which describe the effects of commonly-used NRCS forestry practices. In addition, this EA incorporates by reference pages 36 to 38 of the 2011 RCA Appraisal which describes the state of forest health in the United States**,** indicating that much of this forest land is in need of treatment to reduce the risk of disease, pests, and wildfires, in particular. The section below provides additional information and describes the past and predicted future impacts of EQIP on forest land when implemented according to 2014 Farm Bill rules.

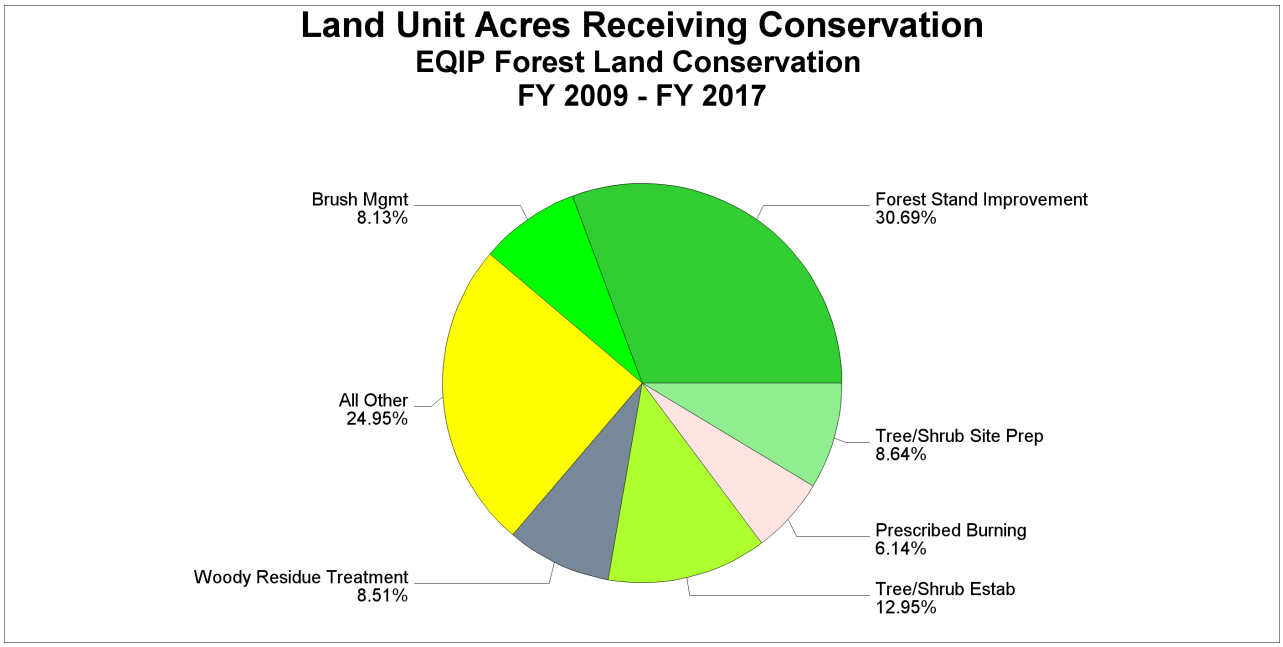
4.4.1.3.1 Conservation Practices Related to Forestland Conservation

Figure 12 below identifies the top EQIP practices used under the 2008 and 2014 Farm Bills for forest land conservation. The goals of these practices are primarily to restore and protect forest health and improve fish and wildlife habitat, and they include activities such as tree planting; forest stand improvement; thinning; prescribed burning; and controlling invasive plants. Of the 21 conservation practices used to improve forest land, 6 practices—Forest Stand Improvement, Tree/Shrub Establishment, Tree/Shrub Site Preparation, Woody Residue Treatment, Brush Management, and Prescribed Burning—made up about 75 percent of the forest land conservation practices used from FY 2009 to 2017. (See RCA EQIP Report.)

Forest land is a land use on which various types of natural resource concerns may exist. Because the same resource concerns exist on forest lands now, it is likely the same practices will continue to be used on forest lands, though in different numbers based on the amount of available funding.

[22] Comer, P., D. Diamond, S. Sowa, K. Goodin, D. Purcell, D. Butler, E. Cook, C. Hamilton, G. Hammerson, L. Master, T. Nigh, M. Ormes, D. True, and B. White. 2007. Using NatureServe Information to Assess Farm Bill Practice Effects on At-risk Species and Habitats. Report to the Natural Resource Conservation Service, Washington, D.C. 53pp. plus appendices at pp. 15, 20.

Figure 12: EQIP 2008 and 2014 Farm Bill Forest Land Conservation Practices



*Only practices representing a substantial portion of the total for the period are included in the above chart. Practices not included are summed into the All Other category.

NRCS conservation practices used on private forest land benefit forest health, water quality, and fish and wildlife habitat, decrease soil erosion, reduce invasive species, and enhance carbon sequestration. See the network effects diagrams illustrating the effects expected from implementing those practices consistent with NRCS conservation practice standards and RCA EQIP Report for a list of NRCS forest land practices implemented during the 2008 and 2014 Farm Bills. It is likely that if the program were to continue being implemented in the future as it has in the past, similar forestry practices will be applied, and similar beneficial effects will result. There is potential for some short-term adverse impacts to occur as a result of conservation practices used on forest land, particularly as a result of implementing certain practices such as Prescribed Burning, Firebreak, or Forest Trails and Landings. Such effects are expected to be minimal because of NRCS policies that require plans minimize adverse effects when providing technical and financial assistance.[23]

NRCS expects that if EQIP were to continue to be implemented as it was under the 2014 Farm Bill, the same types of forestry practices would also continue to be implemented and the same types of forest health and other environmental benefits would result. As a result of improved forest heath, forests will become better able to resist diseases and pests and to withstand wildfires.

4.4.1.4 *Grazing Lands*

The 2009 EQIP Programmatic EA discusses typical problems related to the natural resources associated with grazing lands. This EA incorporates by reference the section on page 68 of the 2009 EQIP Programmatic EA titled "Benefits of Farm Bill Grassland Conservation Practices to Wildlife," and pages 120–122 which summarize the types of grazing land conservation practices used and their effects.

[23] See 7 CFR 650.3(b)(4).

The 2011 RCA Appraisal indicates that "During the 25-year period 1982 to 2007, the acreage of U.S. grazing lands declined gradually until 2002 and then stabilized; rangeland acreage declined by about 2 percent; pastureland acreage by 9 percent; and grazed forest land acreage by 15 percent."[24] Additional information regarding the conversion of grazing lands to other uses is described on pages 6 and 7 of the 2011 RCA Appraisal and is incorporated by reference. The section below provides additional information and describes the past and predicted future impacts of EQIP when implemented according to 2014 Farm Bill rules.

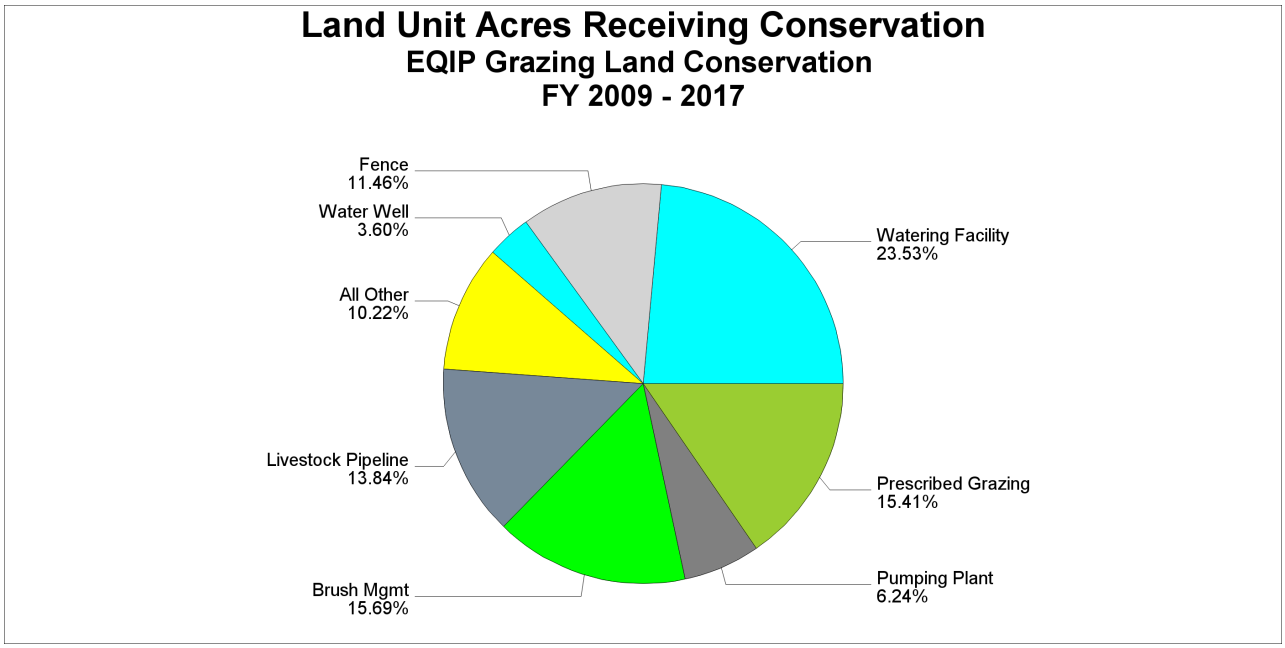
4.4.1.4.1 Conservation Practices Related to Grazing Land Conservation

Figure 13 identifies the top EQIP practices used under the 2008 and 2014 Farm Bills for Grazing Land Conservation. NRCS is committed to conserving and enhancing private grazing land resources. This includes conservation practices that conserve and improve wildlife habitat on private grazing land; conserve and improve fish habitat and aquatic systems through grazing land conservation treatment; protect and improve water quality; improve the dependability and consistency of water supplies; and identify and manage weed, noxious weed, and brush encroachment problems. Of the 29 conservation practices used to improve grazing land, 7 of those practices—Watering Facility, Prescribed Grazing, Brush Management, Livestock Pipeline, Fence, Pumping Plant, and Water Well—made up nearly 90 percent of the grazing land conservation practices used from FY 2009 to 2017. (See RCA EQIP Report.)

As is the case with forest land, grazing land is a land use on which various types of natural resource concerns may exist. NRCS expects that if EQIP were to continue to be implemented as it was under the 2014 Farm Bill, the same types of grazing practices would also continue to be implemented and the same types of rangeland health and other environmental benefits would result. As a result of improved rangeland heath, rangeland will become better able to provide livestock forage and wildlife habitat and to recover from wildfires.

[24] 2011 RCA Appraisal p. 6.

Figure 13: EQIP 2008 and 2014 Farm Bills Grazing Land Conservation Practices



*Only practices representing a substantial portion of the total for the period are included in the above chart. Practices not included are summed into the All Other category.

The NRCS CEAP Grazing Lands component supported a review of the scientific literature related to seven core NRCS conservation practices applied on rangeland and pastureland: Prescribed Grazing, Prescribed Burning, Brush Management, Range Planting, Riparian Herbaceous Cover, Upland Wildlife Habitat Management, and Herbaceous Weed Control. These analyses collectively indicate that NRCS investments in conservation programs are sound. Below is an excerpt of some of the CEAP findings made with respect to two of the most-funded practices reviewed.[25]

Prescribed Grazing

- Stocking rate, as well as appropriate temporal and spatial animal distribution, is the key management variable that influences numerous conservation outcomes.
- Assumptions regarding livestock distribution and preferences for specific sites and conditions are valid, especially with respect to water distribution, steep topography, and high-elevation sites.
- The preponderance of experimental evidence indicates that all systems of grazing are similarly constrained by stocking rate and weather; thus, effective management is more important than the specific system of grazing.
- Hydrological responses of soils to grazing largely parallel those of other ecological variables in that stocking rate is the most important management variable.
- Grazing management recommendations should not be developed exclusively from individual plant responses without partial verification in communities or ecosystems.

[25] For information on the conservation practices themselves and the effects of the remaining five of seven conservation practices reviewed, see USDA NRCS, Conservation Benefits of Rangeland Practices: Assessment, Recommendations, and Knowledge Gaps, Briske, D.D., editor. (2011), Executive Summary: The Next Generation of Conservation Practice Standards, pages 12 and 14, http://www.nrcs.usda.gov/Internet/FSE_DOCUMENTS/stelprdb1045792.pdf.

Brush Management

- Brush management is often critical for the maintenance of grassland and savanna ecosystems and the plants and animals that characterize them.
- Positive grass response varies widely across ecological sites, but most often occurs within 2 years post-treatment and peaks about 5 years post-treatment.
- Retreatment interval varies greatly with woody plant species and ecoregion.
- Over-generalization of brush control recommendations across ecoregions has limited the success of this conservation practice.
- Deep soil water may increase following brush removal, but it is highly dependent on soil and climate conditions.
- Increased stream flow has only been documented for small watersheds receiving winter rainfall.
- Wildlife habitat is species specific and different species and functional groups respond differently to brush management; a clearer criterion of wildlife benefits, including nongame species, and a greater recognition of the potential to adversely affect nontarget species are required.
- Returns on improved livestock production are typically insufficient to justify brush management economically but benefits to nonmarket ecosystem services are increasingly recognized.

In recent years, the brush management practice has been a cornerstone of NRCS's efforts to address the threat of woodland encroachment in sage-steppe and grassland ecosystems. In particular, encroached conifers which have substantially degraded range health and habitat quality for sage-grouse and both lesser and greater prairie-chickens are being removed through the brush management practice in remaining population strongholds for these flagship at-risk species to recover the function, resilience, and integrity of these ecosystems (Miller et al., 2017).

These and other NRCS grazing land practices, as illustrated in the network effects diagrams associated with each practice and further supported by the results of CEAP studies, generally improve grazing land health and the health of natural resources associated with those grazing lands, such as plant communities, wildlife habitat, and soil conservation. (See RCA EQIP Report for a list of NRCS grazing land practices implemented during the 2008 and 2014 Farm Bills and the network effects diagrams.) It is possible for some adverse impacts to occur as a result of conservation practices used on grazing lands, particularly as a result of implementing certain practices such as Brush Management, Prescribed Burning, or Access Road. Such effects are expected to be minimal because of NRCS policies that require plans minimize adverse effects when providing technical and financial assistance.

EQIP practices have been shown to be effective in improving habitat and supporting population increases for at-risk grassland and sage-dependent birds on grazing lands. In a study conducted in partnership among NRCS CEAP-Wildlife, the Intermountain West Joint Venture (IWJV) and the American Bird Conservancy, EQIP practices applied from 2005–2011 were predicted to substantially contribute to meeting species-specific population increase objectives for five priority bird species across a large portion of the intermountain western region of the United States (table 4; NRCS 2017).

Table 4: Net predicted population increases of five focal bird species in response to conservation practices delivered through EQIP from 2005 to 2011 in Bird Conservation Regions (BCR) 9 and 10 and the northern half of BCR16, and the percent of species-specific IWJV population increase objective predicted to have been met through these practices within the study area.

Species	Total for Bird Conservation Regions 9, 10 and northern portion of BCR 16	
	Population Increase	% of Intermountain West Joint Venture Population Increase Objective
Long-billed curlew	474	0.72
Grasshopper sparrow	552	0.43
Brewer's sparrow	566,472	0.91
Sagebrush sparrow	180,181	4.96
Sage thrasher	23,375	0.80

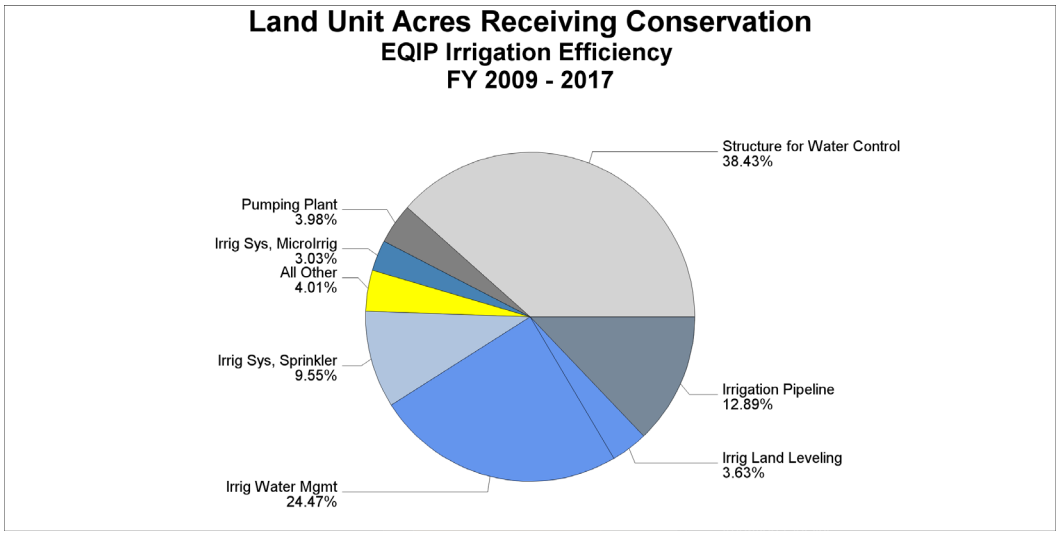
4.4.1.5 *Water Quantity*

This EA incorporates by reference pages 42 and 43 of the 2009 EQIP Programmatic EA, which characterizes the use of ground and surface water for irrigation purposes, and page 46 which recognizes the transport of pathogens through irrigation water. In addition, this EA incorporates by reference the discussion of water supply on pages 80 through 82 of the 2011 RCA Appraisal. The section below provides additional information and describes the past and predicted future impacts of EQIP when implemented according to 2014 Farm Bill rules.

4.4.1.5.1 Conservation Practices Related to Improving Irrigation Efficiency

Figure 14 below identifies the top EQIP practices used under the 2008 and 2014 Farm Bills for improving irrigation efficiency. The goal of these practices is to assist in properly designing, installing, using, and maintaining irrigation systems to ensure uniform and efficient distribution of water, thereby conserving water and protecting water resources. Of the 14 conservation practices used to improve irrigation efficiency, 7 of those practices—Structure for Water Control, Irrigation Water Management, Irrigation Pipeline, Sprinkler System, Pumping Plant, Irrigation Land Leveling, and Microirrigation System—made up almost 96 percent of the conservation practices used from FY 2009 to 2017 to improve irrigation efficiency. (See RCA EQIP Report.)

Figure 14: EQIP 2008 and 2014 Farm Bills Irrigation Efficiency Practices



*Only practices representing a substantial portion of the total for the period are included in the above chart. Practices not included are summed into the All Other category.

Four of the conservation practices identified in figure 14—Irrigation Pipeline, Irrigation Water Management, Structure for Water Control, and Sprinkler System—were applied to over 85 percent of the acres on which excessive or insufficient water concerns were addressed. Because there is a clear need to continue to address water quantity concerns, it is likely these and other similar practices would continue to be installed in the future if EQIP were to continue to be implemented as it was under the 2014 Farm Bill, though the number of practices implemented might change based on the amount of available funding.

Under Alternative 1, a conservation practice would only be funded through EQIP when it addresses an identified resource concern. Therefore, conservation practices supporting use of irrigation water would only be funded through EQIP to improve irrigation efficiency and save water; not to initiate new irrigation where none previously existed. As stated in the 2011 RCA, "[p]otential exists to reduce water application while sustaining yields through implementation of improved technologies and practices that increase water efficiency and productivity."[26] That potential, however, varies widely from basin to basin according to the 2011 RCA.

These and other NRCS irrigation water practices, as illustrated in the network effects diagrams associated with each practice and further supported by the results of CEAP studies, generally improve the efficient use of water and its availability for other uses. (See RCA EQIP Report for a list of NRCS irrigation efficiency practices implemented during the 2008 and 2014 Farm Bills and the network effects diagrams.) There may be some minor short-term adverse impacts to soil erosion during installation of some irrigation equipment, but those effects normally will be minimal. There will be an overall water savings. Other potential adverse impacts may occur depending on the site conditions, such as impacts to migratory birds when moist soil foraging areas are reduced. These types of impacts are dependent on things such as the type of new irrigation system installed, the type of system used previously, and whether the source of irrigation water will change. These site-specific effects are assessed during the NRCS EE process and adverse effects are avoided or minimized consistent with NRCS policy. (See 7 CFR

[26] 2011 RCA, p. 88.

650.3(b)(4).)

4.4.1.6 *Water Quality*

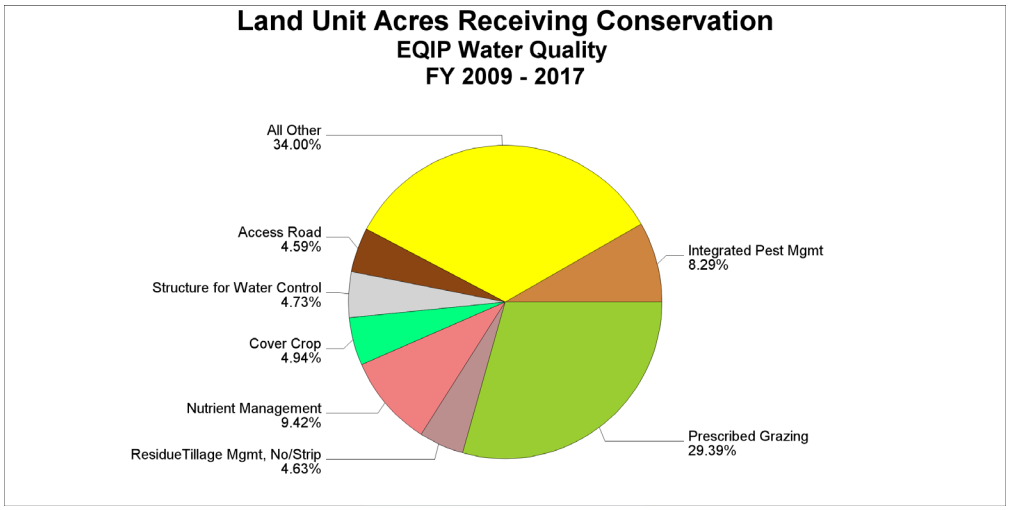
This EA incorporates by reference pages 45 and 46 of the 2009 EQIP Programmatic EA, which characterize water quality issues related to agriculture, and the discussion on page 48 regarding the beneficial impacts of EQIP conservation practices to water quality. The section below provides additional information and describes the past and predicted future impacts of EQIP when implemented according to 2014 Farm Bill rules.

4.4.1.6.1 Conservation Practices Related to Water Quality Improvements

Figure 15 identifies the top EQIP practices used under the 2008 and 2014 Farm Bills to make water quality improvements. Water quality is an indicator of the health of our environment and reflects what occurs on the land. The primary water quality issues from agriculture are sediment, nutrients, pesticides, pathogens, and in some parts of the country, salinity and temperature. Using conservation practices to improve land in an environmentally sound manner will result in better water quality for drinking, recreation, wildlife, fisheries, and industry. Of the 56 conservation practices with water quality improvement as a purpose, seven of those practices – Prescribed Grazing, Nutrient Management, Integrated Pest Management, Cover Crop, No-Till or Strip-Till Residue Management, Structure for Water Control, and Access Road – made up 66 percent of the water quality practices used from FY 2009 to 2017. (See RCA EQIP Report.)

Two of the conservation practices identified in figure 15—Integrated Pest Management and Nutrient Management—were applied to nearly 18 percent of the acres on which water quality concerns were addressed. There are many conservation practices that can be used to improve water quality depending on the type of land use and where in the landscape the problem exists relative to streams and ground water infiltration. Because there is a clear need to continue to address water quality concerns, it is likely the same types of conservation practices would be installed in the future if EQIP were implemented as it was under the 2014 Farm Bill, though the number of practices implemented might change based on the amount of available funding. This also includes an assumption that EQIP practices funded under initiatives similar to those implemented under the 2014 Farm Bill would continue to be implemented, as the EQIP practices implemented through initiatives are included in the information below and in RCA EQIP Report.

Figure 15: EQIP 2008 and 2014 Farm Bills Water Quality Practices



*Only practices representing a substantial portion of the total for the period are included in the above chart. Practices not included are summed into the All Other category.

The water quality improvement practices, as illustrated in the network effects diagrams associated with each practice and further supported by the results of CEAP studies, work to improve water quality by reducing sediment, nitrogen, and phosphorous. Based on the results of CEAP studies thus far, by 2006 the greatest reduction in nitrogen and phosphorous losses from the land had generally occurred in the Missouri River and Arkansas-White-Red Basin. The least reductions were obtained in the Lower Mississippi River Basin.

Table 5: Summary of CEAP-1 River Basin Cropland Modeling Study Report Findings for Nitrogen and Phosphorous

		Nitrogen Losses		Phosphorous Losses	
	Wind	**Runoff**	**Leaching**	**Wind**	**Runoff**
CEAP STUDY		*% reduction in losses*			
Upper Mississippi River Basin (Aug 2012)	*n/a*	**45**	**9**	*n/a*	**44**
Ohio-Tennessee River Basin (Jan 2012)	*n/a*	**35**	**11**	*n/a*	**33**
Missouri River Basin (Aug 2012)	**46**	**58**	**45**	**58**	**59**
Arkansas-White-Red Basin (March 2013)	**27**	**51**	**57**	**40**	**57**
Lower Mississippi River Basin (Aug 2013)	*n/a*	**26**	**5**	*n/a*	**39**
Great Lakes Region (Sept 2011)	*n/a*	**43**	**30**	*n/a*	**39**
Chesapeake Bay (Mar 2011)	*n/a*	**42**	**31**	*n/a*	**41**

See RCA EQIP Report for a list of conservation practices used to improve water quality during the 2008 and 2014 Farm Bills and the associated network effects diagrams.

4.4.1.7 *Wetlands*

This EA incorporates by reference pages 40 through 45 of the 2009 EQIP Programmatic EA, which characterizes wetland impacts related to agriculture. The section below provides additional information and describes the past and predicted future impacts of EQIP when implemented according to 2014 Farm Bill rules.

Overall wetland acreage continues to decline in the United States. However, according to the most recent (2011) report from the USFWS on the "Status and Trends of Wetlands in the Conterminous United States 2004-2009,"[27] the difference in the national estimates of wetland acreage between 2004 and 2009 was not statistically significant. "Certain types of wetland exhibited declines while others increased in area."[28] Wetland acreage declined by an estimated 62,300 acres between 2004 and 2009. However, wetland reestablishment efforts have contributed to an overall reduction in the rate of net wetland loss, particularly on agricultural lands.[29]

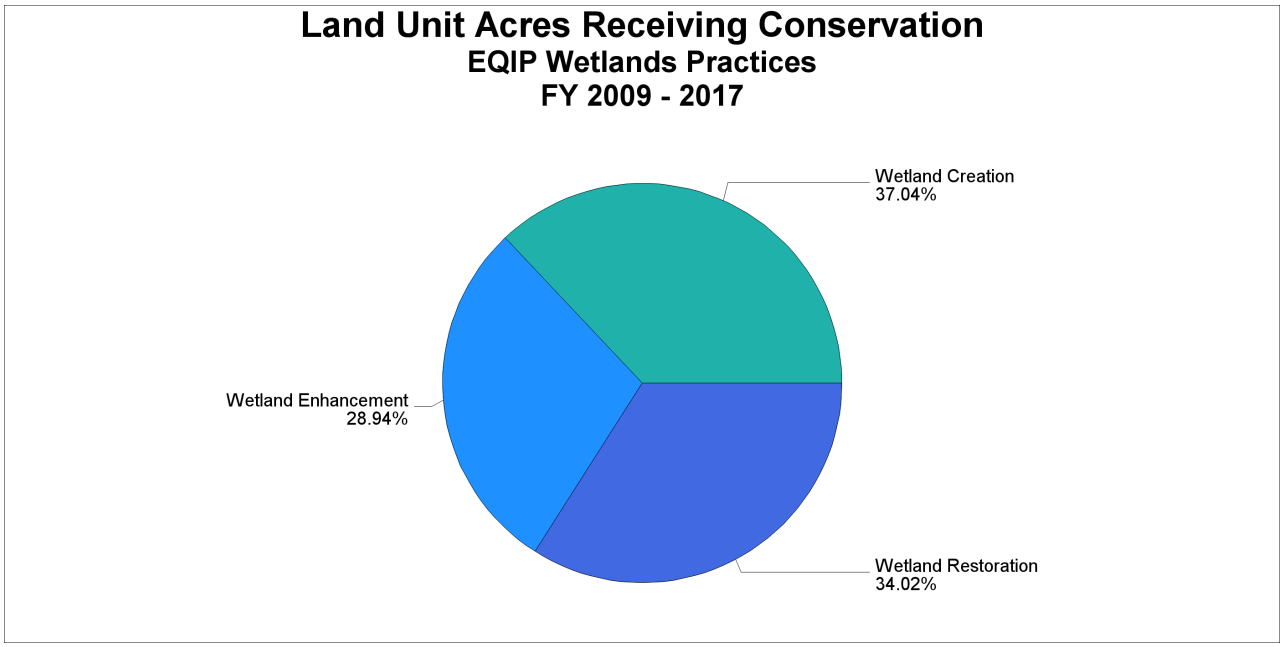
According to the report, between 2004 and 2009, 489,600 acres previously classified as nonwetland, were reclassified as wetland. These increases were attributed in part to wetland reestablishment and creation on agricultural lands enrolled in conservation programs such as the former Wetlands Reserve Program (WRP), a program that focused on wetland restoration and has greater potential wetland benefits than EQIP. The benefits of WRP continue to be realized under the Wetland Reserve Easement component of NRCS' Agricultural Conservation Easement Program.

4.4.1.7.1 Conservation Practices Related to Wetlands

Figure 16 identifies the top EQIP practices used under the 2008 and 2014 Farm Bills for Wetland Conservation. Healthy wetland ecosystems function to modulate drought and floods, provide wildlife habitat, filter pollutants, retain sediment, store carbon, and cycle nutrients. The goal of the wetland conservation practices is to restore, enhance, and protect the quality and quantity of wetlands. Of the three wetland conservation practices available for EQIP funding, Wetland Creation was applied on more than 37 percent of the acres treated for wetland-related concerns followed by Wetland Restoration on over 34 percent, and Wetland Enhancement on nearly 29 percent of wetland acres treated under EQIP from FY 2009 to 2017. (See RCA EQIP Report.)

[27] U.S. Fish and Wildlife Service, Report on the Status and Trends of Wetlands in the Conterminous United States 2004–2009.
[28] Ibid., p. 16.
[29] Ibid., p. 72.

Figure 16: EQIP 2008 and 2014 Farm Bill Wetland Practices



The same practices used during the 2008 and 2014 Farm Bill for wetland conservation will continue to be used to address wetland concerns in EQIP under Alternative 1, though perhaps in different numbers based on the amount of available funding.

The Wetland Creation, Restoration, and Enhancement practices, as illustrated in the network effects diagrams associated with each practice and further supported by the results of CEAP studies that indicate NRCS wetland restoration and enhancement conservation practices do improve ecosystem services, such as improved water quality, floodwater retention, and wildlife habitat.[30]

Additional studies are underway and may provide opportunities to further maximize wetland benefits, including those obtained under EQIP. For example, efforts are currently underway by the CEAP wetland and croplands components to integrate ecosystem services provided by wetlands within agricultural landscapes into CEAP Cropland modeling of water quality effects of conservation practices (NRCS 2018). While USDA programs such as the CRP and ACEP-WRE achieve gains in wetland ecosystem services by protecting and restoring wetlands on crop fields that are withdrawn from farming, there is a need to improve the condition and functioning of wetlands on working lands where retirement from active cropping is not an option. Successful incorporation of wetland practices into the CEAP-Cropland Assessment modeling approach is intended to provide information on how use of appropriate upland buffer practices in programs such as EQIP can enhance the ability of wetland practices to provide multiple ecosystem services within active croplands. See RCA EQIP Report for the wetland conservation practices and the associated network effects diagrams.

[30] See, for example, the 2011 journal supplement by the Ecological Society of America titled, *"Conservation of Wetlands in Agricultural Landscapes of the United States,"* which includes 10 papers summarizing the effects of conservation practices and programs on agricultural wetlands in seven geographic regions of the United States.

4.4.1.8 *Cumulative Effects*

Many of the conservation practices implemented under EQIP were also implemented through other NRCS conservation programs, such as RCPP. The RCPP encourages partners to join in efforts with producers to increase the restoration and sustainable use of soil, water, wildlife, and related natural resources on regional or watershed scales, and made available $100 million per year from 2014 to 2018 to be used according to the rules of EQIP, the Conservation Stewardship Program (CSP), Agricultural Conservation Easement Program (ACEP), and the Healthy Forests Reserve Program (HFRP); and in certain areas the Watershed Operations and Flood Prevention Program. In addition, 7 percent of EQIP, CSP, ACEP, and HFRP funds each year were set aside for RCPP projects.

NRCS landscape initiatives are also illustrative of the cumulative effects of NRCS programs because they focus EQIP and other NRCS program authorities to address specific natural resource concerns in a particular geographic area. In the case of the Mississippi River Basin Initiative (MRBI), program resources were focused in Arkansas, Kentucky, Illinois, Indiana, Iowa, Louisiana, Minnesota, Mississippi, Missouri, Ohio, South Dakota, Tennessee, and Wisconsin to address nutrient loading in priority small watersheds within the Mississippi River Basin where they will do the most good. This emphasis would likely continue under Alternative 1.

In the Chesapeake Bay watershed, EQIP practices have been implemented through initiatives that use EQIP in conjunction with other NRCS conservation programs to reduce nutrients and sediment to improve water quality and habitat for fish and wildlife. Similarly, NRCS used EQIP to promote practices to address water quantity and quality concerns through initiatives in the Ogallala Aquifer, combating declining water tables affecting eight States including Colorado, Kansas, Nebraska, New Mexico, Oklahoma, South Dakota, Texas, and Wyoming. EQIP also promoted practices through the WLFW Initiative to reduce the threats to the habitat of ESA candidates such as sage-grouse and lesser prairie-chicken and to provide critical habitat for migratory birds. As with MRBI, these additional initiatives are likely to continue under Alternative 1.

There are indirect effects associated with application of conservation activities. For example, activities associated with reducing soil erosion on cropland have indirect effects that include decreased sediment and turbidity in surface waters, improved aquatic habitat, improved air quality, improved crop productivity, and often improved energy efficiency. Similar impacts result from improved management of livestock and vegetation on pasture and range lands. Activities applied on forest land may indirectly improve water quantity and quality, improve air quality, and restore or enhance wildlife habitat. Wildlife activities may indirectly improve air and water quality and often result in the creation of potential recreational opportunities.

While the effects of the conservation activities vary depending on the local ecosystem, landscape position, methods of installation, and scope or magnitude of the activity, it is possible to describe the general types of impacts that will occur. Based on the results identified on the network effects diagrams and CEAP studies, there is every reason to expect that under EQIP, soil erosion will decrease; soil, air, and water quality will improve; water will be used more efficiently; plant conditions will improve; needs will be met for domestic animals and wildlife; and energy will be used more efficiently.

Some negative impacts may also occur, since certain practices applied to benefit one resource concern may have adverse impacts on others. For example, conservation tillage applied without a nutrient management plan may improve soil erosion but may simply reroute where excess nutrients end up. Applying suites of conservation practices that consider the impact on all resource concerns is key to resolving such incongruities.

Under this No Action alternative, the effects of EQIP would continue during the 2018 Farm Bill. Overall, the effects of EQIP would be similar to those under the 2014 Farm Bill, with important environmental benefits resulting and no major adverse impacts anticipated.

4.4.2 Alternative 2: Proposed Action – Implement EQIP as modified by the 2018 Farm Bill.

This alternative incorporates the changes required by the 2018 Farm Bill, including expanded purposes, increased payments for high-priority practices, changes in livestock- and wildlife-targeted funding, water conservation and irrigation efficiency contracts with entities, and Conservation Incentive Contracts. It assumes similar conservation practices would be implemented on the land uses described under Alternative 1 because the same set of resource concerns would be addressed, though the emphasis given to certain resource concerns may change over time as a result of incorporation of 2018 Farm Bill provisions into EQIP and changes to NRCS landscape initiatives. This alternative assumes funding will range from $1.75 to $2.025 billion over the course of the 2018 Farm Bill, which cumulatively exceeds the amount authorized over the course of the 2014 Farm Bill by $1.175 billion. If Congress had continued to reserve 7 percent of EQIP funding for RCPP over the 5 years of the 2018 Farm Bill, it would have amounted to a reduction in overall EQIP funding of over $642 million.[31]

The changes to EQIP that could result in environmental impacts are discussed below.

4.4.2.1 *Expanded Purposes*

In the 2018 Farm Bill, the fundamental purpose of EQIP, assisting agricultural producers to implement conservation practices to provide environmental benefits, has been broadened by Congress. EQIP purposes now include authority to address new or expected resource concerns and assisting producers with adapting to and mitigating against increasing weather volatility and drought resiliency measures.

Authority to address new or expected resource concerns is not anticipated to result in additional adverse environmental impacts compared to Alternative 1, due to the nature of NRCS' conservation planning and site-specific environmental evaluation (EE) processes described in section 4.2 above and in appendix B. As under Alternative 1, whenever implementation of a conservation practice may result in unintended adverse impacts to another resource, additional conservation practices or other mitigating measures are integrated into the conservation plan to avoid creating new or expected resource concerns. The EE process helps to ensure that all potential impacts to natural resources are identified and appropriate alternatives and practices are available to the program participant. The extent of conservation practices implemented across the Nation is expected to increase however, due to the increase in available funding.

[31] Under the 2014 Farm Bill, 7 percent of EQIP funding was reserved and made available for RCPP.

NRCS has also already been assisting EQIP participants to adapt to and mitigate against increasing weather volatility and drought through conservation practices planned to increase soil organic matter and microbial activity to improve soil quality. Usually, groups of practices such as diverse crop rotations, cover crops, reduced tillage, and mulching are planned to be implemented as soil health management systems that reduce soil disturbance, keep living roots in the soil for longer periods throughout the year, and keep the soil covered with plant materials. The extent and effects of these practices as implemented under the 2014 Farm Bill are described in section 4.4.1.1 above and are expected to remain the same under Alternative 2, although the extent may increase due to an increase in the amount of available funding.

NRCS has conducted literature reviews (Smith 2016 and 2018) compiled from peer-reviewed papers relating to the impact of conservation practices on soil physical and chemical properties important for soil health. Two of these focused on the effects of soil health practices on infiltration, available water-holding capacity, and water retention.

Conservation practices that generally increase infiltration of water from rainfall, snowmelt, and irrigation are no-till, reduced tillage, cover crops, mulching, crop rotations that include high-residue crops, solid manure applications, and compost applications. The amount of increase in infiltration varies by soil texture, and it can take several years to show improvement. Increased infiltration generally results from improvements to soil structure and development of macropores from earthworm burrows and plant roots. Soil structure improves over time as organic matter increases in the soil and is consumed by microbes and invertebrates. Residue, mulch, and the canopy of cover crops result in cooler soil surfaces during hot times of the year and prevent crusting of the soil surface, which also increases infiltration (Smith 2016.)

Available water-holding capacity (AWC) relates to the total crop available water-holding potential between wilting point and field capacity. Water retention relates to the actual amount of water retained in the soil for crop use. Retained water is a temporal value and AWC is an intrinsic soil property providing an estimate of the ability of the soil to hold water between gravitational loss and the permanent wilting point moisture content for most plants. In general, the same conservation practices that positively affect infiltration can also increase available water-holding capacity and water retention (Smith 2018.)

Retained water is shown in the literature reviewed to be increased as a result of conducting no tillage or reduced tillage over conventional tillage; applying mulch; and/or rotating crops (with early termination) where precipitation amount is sufficient. Subsoiling (deep tillage below the normal tillage depth, used to break up compaction layers) allows improved access to moist soil layers and probably allows moisture to penetrate deeper in the soil profile. Taprooted cover crop species are also shown to be beneficial.

AWC is shown in the literature reviewed to be increased in some cases under no till, with cover crops, use of mulch, organic matter increases, and under pasture. Sandy soils' AWC increases most as soil organic matter increases but AWC may not be affected in high clay content soils. No till appears to increase the proportion of plant available moisture-containing pores (Smith 2018.)

Over all, the soil quality practices discussed in 4.4.1.1 that reduce soil disturbance, provide living roots throughout the year, and keep the soil covered can help offset the effects of projected climate changes on crops and cropland and improve short-term drought tolerance. The systems do so by

increasing infiltration, reducing evaporation, moderating soil temperature changes, increasing rooting depth, increasing nutrient uptake, and improving the water-holding capacity for most soils. These improvements lead to better crop resilience during drought. Additionally, increased infiltration rates decrease runoff, thereby reducing sediment and nutrient loading to streams as well as reducing flood volumes.

4.4.2.2 *Increased Payments for High Priority Practices*

Congress added a provision in the 2018 Farm Bill allowing NRCS in each State to designate up to 10 conservation practices to be eligible for increased payments, not to exceed 90 percent of the costs associated with planning, design, materials, equipment, installation, labor, management, maintenance, or training. These practices must be determined to accomplish at least one of the following: 1) address specific causes of impairment relating to excessive nutrients in ground or surface water, 2) address the conservation of water to advance drought mitigation and declining aquifers, 3) meet other environmental priorities and other priority resource concerns identified in habitat or other area restoration plans, or 4) be geographically targeted to address a natural resource concern in a specific watershed.

Each State will work with the State Technical Committee to identify its 10 high-priority practices and geographic areas to be targeted. Each State is required by the Farm Bill to establish a technical committee composed of agricultural producers and other professionals that represent a variety of disciplines in the soil, water, wetland, and wildlife sciences to assist in the considerations relating to implementation and technical aspects of Farm Bill conservation programs. The availability of higher payments is likely to result in increased implementation of the 10 practices identified in each State.

The conservation practices most frequently used to address water quality issues and their effects are discussed in section 4.4.1.6 under Alternative 1. It is likely that Nutrient Management, and practices that reduce erosion and production of sediment that may transport nutrients to waterbodies (Cover Crop, No-Till or Strip-Till Residue Management) will be designated as high-priority practices eligible for increased payments. As a result, these practices are likely to continue to be among the most frequently used to reduce excessive nutrients in ground or surface water. The effects of those practices will be similar to those described under Alternative 1, but the extent is likely to increase due to the availability of higher payments and the overall increase in EQIP funding. Other erosion control practices, such as Conservation Cover and Conservation Crop Rotation, and buffer practices that intercept overland flow of water and remove sediment, suspended solids and associated contaminants (e.g., Filter Strip, Field Border, Riparian Herbaceous Cover) are also likely to see increased usage and would result in additional reductions of nutrients in ground and surface water.

Conservation practices most frequently used to address water quantity issues are described in section 4.4.1.5 under Alternative 1. Practices used to address the conservation of water to advance drought mitigation and declining aquifers are likely to be the same as those described under Alternative 1 and the effects of those practices would also be the same, but the extent of those practices is likely to increase due to the availability of incentive payments and more EQIP funding.

State Technical Committees will assist States to determine practices to be used to meet other environmental priorities and other priority resource concerns identified in habitat or other area

restoration plans. Such plans may include, but are not limited to, the North American Waterfowl Management Plan, State wildlife action plans, and recovery plans for ESA-listed species. The conservation practices most frequently used under Alternative 2 would likely be much the same as those described in section 4.4.1.2 under Alternative 1. As identified in habitat or other restoration plans, practices designed to restore specific habitat types may be added. For example, Brush Management and Prescribed Burning are often used to control woody vegetation in grassland habitats. Compared to Alternative 1, additional acres of wildlife habitat are likely to be improved due to the availability of incentive payments and increased EQIP funding.

State Technical Committees will also assist States to determine practices to be geographically targeted to address a natural resource concern in specific watersheds. It is impossible to predict what practices those will be, but NRCS uses three main mechanisms to evaluate the effects of all practices. Appendix A discusses three methodologies NRCS uses: Network Effects Diagrams, Conservation Practice Physical Effects (CPPE) documents, and the Conservation Effects Assessment Project (CEAP). As described under Alternative 1, some practices can have adverse impacts, especially during installation. Conservation practice standards and State-specific conservation practice specifications include considerations that, when combined with the considerations identified during the EE process, are designed to minimize potentially adverse impacts to affected resources. Further, NRCS regulations and policies require that plans minimize adverse effects before providing technical and financial assistance (7 CFR 650.3(b)(4)) and recommend alternatives that avoid or minimize adverse impacts. These procedures are described more fully in appendix B.

Overall, more frequent and more extensive use of conservation practices that receive increased payments is expected to achieve the conservation benefits for which these payments are authorized without resulting in major adverse impacts.

4.4.2.3 *Changes in Targeted Funding*

In the 2018 Farm Bill, Congress decreased the livestock production funding target from 60 to 50 percent of funds made available for EQIP payments and increased the wildlife habitat funding target from 5 to 10 percent. NRCS tracks EQIP funding targeted for livestock production on a contract basis. Funding targeted for wildlife habitat is tracked based on implementation of 16 conservation practices with wildlife habitat as a primary purpose and all other practices applied to achieve a specific wildlife habitat benefit, such as those under WLFW contracts.

Under Alternative 2, NRCS will continue these tracking methods. Table 4 below shows the percentage of EQIP funding obligated to livestock production-related contracts in each of fiscal years 2014 through 2018, based on data from NRCS' Program Contracts System (ProTracts), a web-enabled application used since 2004 to manage NRCS conservation program applications, financial assistance contracts, and conservation program fund management. NRCS conservation planners check a box in the ProTracts application to indicate a contract is related to livestock production. NRCS slightly exceeded the 60 percent funding target for livestock in each fiscal year under the 2014 Farm Bill. Therefore, NRCS expects to meet the 50 percent livestock 2014 production-related funding target under Alternative 2.

Table 4: 2014 Farm Bill EQIP Funds Obligated to Livestock Production Related Contracts

Fiscal Year	Total EQIP Funds Available for Payments	Total EQIP Funds Obligated to Livestock Production Related Contracts	Percentage of Available EQIP Funds Obligated to Livestock Production Related Contracts
2014	$928,866,591	$571,657,316	61.5%
2015	861,829,162	536,008,396	62.2%
2016	1,028,235,094	630,773,643	61.3%
2017	1,132,902,689	710,620,201	62.7%
2018	1,301,171,544	801,489,176	61.6%
TOTAL	**5,253,005,080**	**3,250,548,732**	**61.9%**

Because the same types of resource concerns generally exist on grazing lands now as under the 2014 Farm Bill, it is likely the same practices described in Section 4.4.1.4 under Alternative 1 will continue to be used on grazing lands under the 2018 Farm Bill. The reduction in the percentage of funding targeted to livestock operations should not reduce the environmental benefits achieved under the 2014 Farm Bill because the total amounts of funding available will be higher, as shown in table 5 below. It is important to note, however, that the 2018 Farm Bill requires the 50 percent to be calculated on the funds made available for payments. Because amounts obligated to program contracts will be less than the total authorized funding amounts, expenditures for livestock production practices will be less than the 50 percent shown in table 5 as well.

Table 5: 2018 Farm Bill EQIP Authorized Funding and Calculated Potential Livestock Production Funding

Fiscal Year	Authorized Funding	50% Minimum for Livestock Production Practices
2019	$1,750 million	$875 million
2020	1,750 million	875 million
2021	1,800 million	900 million
2022	1,850 million	925 million
2023	2,025 million	1,012,500,000
TOTAL	**9,175 million**	**4,587,500,000**

NRCS will also continue to track implementation of the 16 conservation practices with wildlife habitat as a primary purpose and all other practices applied to achieve a specific wildlife habitat benefit. Examples of conservation practices with a primary wildlife focus include—

- Early Successional Habitat Development/Management—used for early successional species such as the Golden Winged Warbler or New England Cottontail. This practice standard includes planting and vegetation management.
- Wetland Restoration—used to develop habitat for the variety of wetland-dependent species, from amphibians to migratory waterbirds. This practice standard includes structural, grading, planting, and water management.
- Stream Habitat Improvement and Management—used for many aquatic species, including

salmon. This practice standard includes in-stream work such as building redds, pools and riffles, establishing woody debris, and vegetation management.

- Upland Wildlife Habitat Management—used in a system of practices for a wide variety of terrestrial species. Often, NRCS adds this conservation practice to a conservation plan to ensure other practices (e.g., fence) are wildlife-friendly.

Out of more than 160 existing conservation practice standards, about 45 standards are often used to benefit wildlife in addition to the 16 practices that have wildlife habitat as a primary purpose. For example, reducing sedimentation with application of practices primarily implemented to reduce soil erosion often improves aquatic habitat. Similarly, range planting, fencing, and ponds can be used to provide upland wildlife habitat benefits. Under Alternative 2, NRCS would continue to address natural resource concerns using EQIP not only on an operation-by-operation basis but also through its initiatives. Landscape initiatives such as WLFW may require the use of conservation practices that are not included among the 16 NRCS practices with a primary wildlife benefit purpose. For example, use of the NRCS Conservation Practice Standard Prescribed Grazing (Code 528) is essential in facilitating the development and maintenance of habitat to benefit the lesser prairie-chicken, under review for listing as endangered under the ESA, and greater sage-grouse, a species determined in 2015 to not require listing due to the large commitment of conservation investments for this species across its western range, including EQIP conservation practices such as prescribed grazing and brush management. Every plan developed by NRCS under either the Lesser Prairie-Chicken Initiative or the Sage-Grouse Initiative, where grazing will occur, requires the use of Prescribed Grazing. To accommodate situations such as this, NRCS will include additional conservation practices, such as those related to NRCS landscape wildlife initiatives, in determining whether 10 percent of EQIP funding was used to benefit wildlife habitat.

Table 6 identifies the amount of EQIP funding required to be spent on fish and wildlife habitat improvement each year based on amounts authorized by the 2018 Farm Bill. As with the funding targeted to livestock production, the 2018 Farm Bill requires the 10 percent to be calculated on the funds made available for payments. Because amounts obligated to program contracts will be less than the total authorized funding amounts, expenditures for wildlife habitat will be less than the 10 percent shown in table 6, as well.

Table 6: 2018 Farm Bill EQIP Authorized Funding and Calculated Potential Wildlife Habitat Improvement Funding

Fiscal Year	Authorized Funding	10% Minimum for Wildlife Habitat
2019	$1,750 million	$175 million
2020	1,750 million	175 million
2021	1,800 million	180 million
2022	1,850 million	185 million
2023	2,025 million	202,500,000
TOTAL	**9,175 million**	**917,500,000**

Table 7 shows the percentage of EQIP contract funding obligated just to the 16 conservation practices with wildlife as the primary purpose as compared to the percentage obligated to the Working Lands for Wildlife and other initiatives benefiting wildlife excluding the 16 primary

wildlife practices under the 2014 Farm Bill. Total expenditures exceeded the minimum 5 percent of funding targeted to wildlife habitat as directed by Congress in the 2014 Farm Bill.

Table 7: 2014 Farm Bill EQIP Funding for 16 Primary Wildlife Habitat Improvement Practices and Working Land for Wildlife Initiatives Funding[32]

Contract Fiscal Year	Total EQIP Financial Assistance (FA) Obligated	EQIP FA Obligated to 16 Wildlife Practices[33]	Percentage EQIP FA Obligated to 16 Wildlife Practices	EQIP FA Obligated to All Practices in Wildlife Initiatives except the 16 Wildlife Practices[34]	Percentage EQIP FA Obligated to Improve Fish and Wildlife Habitat
2014	$900,343,819	$26,178,562	2.91%	$34,360,293	6.72%
2015	839,257,145	21,678,303	2.58%	39,633,438	7.31%
2016	1,028,058,020	18,204,543	1.77%	45,550,652	6.20%
2017	1,156,627,997	20,445,168	1.77%	49,699,469	6.06%
2018	1,318,374,096	22,636,987	1.72%	51,420,818	5.62%
TOTAL	**5,242,661,076**	**109,143,563**	**2.08%**	**220,664,671**	**6.29%**

As shown in the data above and the data on page 40 of the 2016 EQIP Programmatic EA, incorporated herein by reference, EQIP spending on the 16 conservation practices with wildlife as a primary purpose has decreased over time, while spending on WLFW Initiative contracts has simultaneously increased. NRCS began WLFW efforts under the 2008 Farm Bill and added new WLFW Initiatives over the course of the 2014 Farm Bill. WLFW increases the effectiveness of wildlife conservation efforts by targeting delivery of EQIP funding to implement practices to projects in locations where they can do the most good for at-risk species and ecosystems. WLFW efforts have contributed to removal of streams from the Federal impaired streams list and USFWS decisions not to list the greater sage-grouse and New England cottontail under the ESA.

The 2018 Farm Bill directs USDA to continue to carry out the WLFW model of conservation. Because EQIP spending targeted to wildlife habitat improvement under the 2014 Farm Bill did not approach 10 percent of program funds available for payments as required by the 2018 Farm Bill, new initiatives to benefit wildlife are very likely to be added under Alternative 2. Based on historical expenditures of wildlife-related practices in EQIP, the fact that demand has shifted from individual wildlife practices to WLFW contracts, and with emphasis to prioritize funding applications that address wildlife resource concerns, NRCS anticipates that the actual funding associated with developing wildlife habitat through EQIP will meet or exceed the 10 percent national target.

Though there is expected to be an increase in the amount of EQIP spending for wildlife habitat

[32] Source: NRCS ProTracts 10-01-2014 for 2014, NRCS ProTracts 10-01-2015 for 2015, NRCS ProTracts 10-03-2016 for 2016, NRCS ProTracts 10-03-2017 for 2017, NRCS ProTracts 09-29-2018 for 2018.
[33] Selected Wildlife Practices include Practice Codes 327, 390, 391, 395, 396, 422, 472, 580, 643, 644, 645, 646, 647, 657, 658, and 659.
[34] EQIP Wildlife Initiatives for Contract Fiscal Years (CFY) 2014-2018 include: Bog Turtle, Driftless Area, Golden-winged Warbler, Gopher Tortoise, Lesser Prairie-Chicken, New England Cottontail, Migratory Bird Habitat, Sage Grouse, and Southwestern Willow Flycatcher Initiatives and Regional Pollinator Efforts. See https://www.nrcs.usda.gov/wps/portal/nrcs/main/national/programs/initiatives/ for details.

improvement under the 2018 Farm Bill as compared to the 2014 Farm Bill, overall the effects of the Proposed Action, both alone and cumulatively, are likely to be similar to the effects of the No Action alternative with important environmental benefits resulting and no major adverse impacts anticipated.

4.4.2.4 *Water Conservation and Irrigation Efficiency Contracts with Entities*

Under Alternative 2, NRCS will be able to contract with a State, irrigation district, groundwater management district, acequia, land grant-mercedes, or similar entity on land controlled by the entity. This will allow NRCS to implement water conservation or irrigation practices under watershed-wide projects that will effectively conserve water, provide fish and wildlife habitat, or provide for drought-related environmental mitigation. Financial assistance through EQIP program contracts under previous Farm Bills was limited to water conservation or irrigation practices implemented on eligible land of a producer. This resulted in projects where NRCS worked with producers to implement more efficient irrigation systems under EQIP but had no control over the infrastructure on land controlled by entities that delivered irrigation water to these systems. NRCS also had no control over how entities made improvements to their water delivery systems without NRCS financial assistance.

The conservation practices applied under this new authority in Alternative 2 are expected to be largely the same as those described under Alternative 1, Section 4.4.1.5, "Water Quantity"; therefore, similar environmental benefits can be expected. As under Alternative 1, a conservation practice would only be funded through EQIP when it addresses an identified resource concern. Therefore, conservation practices supporting use of irrigation water would only be funded through EQIP to improve irrigation efficiency and save water; not to initiate new irrigation where none previously existed.

Irrigation water practices, as illustrated in the network effects diagrams associated with each practice and further supported by the results of CEAP studies, generally improve the efficient use of water and its availability for other uses and result in overall water savings. (See RCA EQIP Report for a list of NRCS irrigation efficiency practices implemented during the 2008 and 2014 Farm Bills and the network effects diagrams.) As discussed under Alternative 1, there may be some minor short-term adverse impacts to soil erosion during installation of some irrigation equipment, but those effects normally will be minimal. Other potential adverse impacts may occur depending on the site conditions, such as impacts to migratory birds when areas of moist foraging habitat are reduced. These types of impacts are dependent on things such as the type of new irrigation system installed, the type of system used previously, and whether the source of irrigation water will change. These site-specific effects are assessed during the NRCS EE process and adverse effects are avoided or minimized consistent with NRCS policy. (See 7 CFR 650.3(b)(4).)

Water conservation projects with entities have increased potential for unintended adverse impacts on wildlife and wetlands because many of these projects will remove earthen irrigation canals and ditches and replace them with pipelines. Earthen canals and ditches often support riparian vegetation on their banks due to lateral movement of water through the soil. Riparian vegetation provides food and cover for wildlife and scenic beauty to people who live or recreate nearby. Seepage of water from earthen canals and ditches is also often a source of hydrology supporting wetlands. In some cases, the riparian or wetland vegetation supported by irrigation water delivery

systems is entirely artificial and would not exist in that location without the irrigation water. In other cases, natural streams and creeks were channelized and converted to irrigation water delivery systems, or canals and ditches were excavated through existing wetlands. In either case, the more arid the environment, the more important water-loving vegetation is to wildlife. When pipelines are installed to eliminate water losses from earthen irrigation water delivery systems, riparian and wetland habitats are also eliminated.

NRCS policy specifically requires consideration of impacts to riparian areas and wetlands during conservation planning and the concurrent EE. Conservation plans that include riparian areas must maintain or improve the water quality and quantity and fish and wildlife benefits provided by the riparian area (NRCS General Manual (GM) (Title 190), Part 411, Section 411.3D.) If adverse impacts to wetlands may result from a proposed action, NRCS uses mitigation sequencing to avoid or minimize adverse impacts or compensate for lost wetland acres and functions. Compensation may include restoration of a wetland converted to upland, enhancement of a wetland that is not fully functional, creation of a wetland in upland habitat, or protection of an existing wetland. Compensation is not required under NRCS policy for irrigation or leakage-induced wetlands where no natural wetlands existed before the irrigation or waste management activity. However, important functions provided by these types of artificial wetlands must be assessed and evaluated in the EE (190-GM, Part 410, Subpart B, Section 410.26) and NRCS regulations and policies that require plans minimize adverse effects before providing technical and financial assistance (7 CFR 650.3(b)(4)) apply. NRCS policy (190-GM-410-B-410.24) also requires full consideration of alternatives that preserve scenic beauty or improve the landscape.

NRCS consults with USFWS, NMFS, and State and Tribal wildlife agency experts as necessary to avoid harm to any species that is protected under the ESA, State or Tribal law, or is proposed or a candidate for listing.

Some irrigation water delivery systems are eligible for listing on the National Register of Historic Places. NRCS follows the procedures outlined in the Advisory Council on Historic Preservation's (ACHP) regulations (36 CFR part 800) and consults with State Historic Preservation Officers and federally recognized Tribes (or their designated Tribal Historic Preservation Officers) as necessary. In addition, if other consulting parties are identified, they will be afforded, as appropriate, an opportunity to advise the NRCS State office during project-specific planning about their historic and cultural resource concerns so that they may be taken into account in accordance with the ACHP regulations.

Replacing open canals and ditches with pipelines tends to improve public health and safety, by reducing potential breeding habitat for mosquitoes and other vectors of disease and eliminating potential for drowning accidents. Authority to install practices on land controlled by entities as well as by individual producers will facilitate all needed practices, including any required mitigation, being implemented in a more coordinated and efficient manner. NRCS will be able to incorporate avoidance, minimization, and mitigation measures into the watershed-scale conservation plan and EQIP contracts. The new authority under Alternative 2 will ensure any potential adverse impacts are considered at the watershed scale and required mitigation is implemented.

4.4.2.5 *Conservation Incentive Contracts*

Conservation Incentive Contracts as authorized under the 2018 Farm Bill will require producers to implement, adopt, manage and maintain incentive practices that address at least one and up to three, priority resource concerns, for each of the relevant land uses, within State-identified watersheds or other areas of high priority. The term "priority resource concern" is defined in the 2018 Farm Bill as a natural resource concern or problem, as determined by the Secretary, that is identified at the national, State, or local level as a priority for a particular area of a State; and that represents a significant concern in a State or region.

NRCS in each State will work with its State Technical Committee to identify multiple high priority areas across each State to avoid limiting opportunities for producers to participate in Conservation Incentive Contracts based solely on the location of their operation. Priority resource concerns for each high priority area will also be selected in consultation with the State Technical Committee, using criteria established in EQIP regulations, and a process such as the State Resource Assessment described in appendices C and D.

Payments to producers will be made to adopt and install the incentive practices similar to traditional EQIP. In addition, producers will receive annual payments for managing, maintaining, and improving the incentive practices over the 5-to 10-year contract. The payments are expected to attain increased levels of conservation over traditional EQIP contracts that would be implemented under Alternative 1.

The types of practices most frequently implemented on each land use described under Alternative 1 are likely to be the same, and the effects of those practices are also likely to be very similar. Because Conservation Incentive Contracts are required to extend over a longer time period than traditional EQIP contracts, and because participants will receive annual payments to continue to manage, maintain, and improve the practices, NRCS expects that the practices will be used by participants for longer periods of time and conservation benefits will continue to be achieved, even after the contract ends.

4.4.2.6 *Cumulative Effects*

Cumulative effects under Alternative 2 would be much the same as they would be under Alternative 1. Under this Proposed Action alternative, the effects of EQIP would continue during the 2018 Farm Bill. Overall, the effects of EQIP would be similar to those under the 2014 Farm Bill described under Alternative 1, with important environmental benefits resulting and no major adverse impacts anticipated.

As under Alternative 1, conservation practices implemented under EQIP would continue to be implemented through other NRCS conservation programs, such as RCPP. NRCS landscape initiatives described under the cumulative effects of Alternative 1 would also likely continue under Alternative 2. NRCS is specifically required by the 2018 Farm Bill to continue to carryout WLFW, and the WLFW model may expand to new agreements between the Farm Service Agency and the USFWS for the purpose of carrying out conservation activities for species conservation. It is also likely NRCS will add new WLFW initiatives, to help meet the wildlife habitat funding target in the 2018 Farm Bill.

Under Alternative 2, NRCS' coordination with State technical committees on incentive payments

for high priority practices and identification of high priority areas and priority resource concerns for Conservation Incentive Contracts will result in additional focus of EQIP dollars to address resource problems in a coordinated fashion across larger geographic areas. This will help NRCS meet the need to more effectively target EQIP delivery to maximize the environmental benefits achieved as was identified by the 2017 GAO report (GAO 2017).

As described under Alternatives 1 and 2 will also have indirect effects associated with application of conservation activities and some negative impacts may also occur, since certain practices applied to benefit one resource concern may have adverse impacts on others. Applying suites of conservation practices that consider the impact on all resource concerns is key to resolving such incongruities and complying with NRCS regulations and policy for the protection of the environment as described in appendix B.

Based on the results identified on the network effects diagrams and CEAP studies, there is every reason to expect that in general under the Proposed Action, soil erosion will decrease; soil, air, and water quality will improve; water will be used more efficiently; plant conditions will improve; needs will be met for domestic animals and wildlife; and energy will be used more efficiently. These benefits should be slightly more pronounced and extensive under Alternative 2 than under Alternative 1, due to increased funding available and targeting of that funding to high priority geographic areas and resource concerns.

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APPENDICES

APPENDIX A

NRCS Methodologies to Estimate Conservation Effects

NRCS uses three main mechanisms to evaluate conservation effects of its recommended activities. They are: Network Effects Diagrams (NED), Conservation Practice Physical Effects (CPPE) documents, and the Conservation Effects Assessment Project (CEAP). Each is discussed below.

Conservation Network Effects Diagrams

To assist in the analysis of environmental impacts of its conservation practices, NRCS has developed NEDs depicting the chain of natural resource effects resulting from the application of each conservation practice. Each of the diagrams first identifies the typical setting to which the practice is applied. This includes identification of the predominating land use and the environmental resource concerns that trigger use of the conservation practice.

The diagrams then identify conservation practices typically used to mitigate or address the resource concerns. An NED for each of the NRCS conservation practice standards can be viewed on the National Handbook of Conservation Practices (NHCP) website in the far right column at: https://www.nrcs.usda.gov/wps/portal/nrcs/detailfull/national/technical/cp/ncps/?cid=nrcs143_026849.

Following identification of the conservation practice, the NEDs identify the physical activities that are carried out to implement the practice. From there, the NEDs depict the occurrence of the direct, indirect, and cumulative effects of the practice. Effects are qualified with a plus or a minus which qualitatively denotes an increase ("+") or decrease ("-") in the effect. Pluses and minuses do not equate to good and bad or positive and negative. Impacts are characterized in this manner because site-specific conditions can influence the degree or intensity of the potential environmental impact. Only the general effects that are considered the most important from a national perspective are illustrated.

Additional information on the process used to develop the NEDs is available in the NRCS Watershed Science Institute Report CED-WSSI-2002-2, "Analyzing Effects of Conservation Practices – A Prototypical Method for Complying with National Environmental Policy Act (NEPA) Requirements for Farm Bill Implementation."[1]

Conservation Practice Physical Effects

The CPPE documents, found in the Field Office Technical Guide – Section V and the NHCP, display in subjective terms the physical effects conservation practices have on natural resources. Technical specialists document in the CPPE the practice effects based on their experience and available technical information.

When creating the CPPE, the question is presented, "When this practice is installed according to NRCS practice standards and fully functional, what effect will it have on the various resource concerns?" The answer is in the form of a rating that represents the practice's effect on the resource concern and the magnitude of the effect.

[1] This document is included in the NRCS National Environmental Compliance Handbook and is available at https://directives.sc.egov.usda.gov/OpenNonWebContent.aspx?content=39475.wba

The following terms define "Effect" values:

- No effect.—The conservation practice being evaluated has no discernible effect on the resource concern identified;
- Worsening.—The conservation practice deteriorates the condition of the resource; and
- Improvement.—The conservation practice improves the condition of the resource.

The following terms express the magnitude of the effects:

- Slight.—Some effect (positive or negative) of the practice on the resource, but not enough to influence the decision to select the practice to solve the problem;
- Moderate.—A measurable effect (positive or negative) of the practice on the resource; and
- Substantial.—An extensive measurable effect (positive or negative) of the practice on the resource.

National technical specialists with responsibility for a given conservation practice establish CPPE values for each conservation practice. The effects listed in the national CPPE represent general conditions nationwide. For example, the national agronomist has determined that generally, the implementation of practice standard Residue and Tillage Management, No Till (Code 329) will extensively reduce the sheet and rill erosion problem because of increased surface cover and decreased soil disturbance. Therefore, a value is entered as "Substantial Improvement" to the Soil Erosion—Sheet and Rill Erosion resource concern. However, the implementation of Residue and Tillage Management, No Till (Code 329) may cause a slight increase in soluble nitrate nitrogen infiltration depending on the time and method of application, rainfall, nutrient form, organic matter, soil texture, and depth to water table, and therefore, a value is entered as "Moderate Worsening" to the Water Quality Degradation—Nutrients in Groundwater resource concern.

Since data on the CPPE are national in scope, State-level offices are encouraged to review and localize the information as necessary to reflect those effects expected to occur under local conditions. Each State will review and, if needed, edit the values in the national CPPE based on local knowledge and experience to reflect typical conditions in their State. States use an interdisciplinary group to refine existing entries to ensure proper consideration of all effects to all the resource concerns. If a State modifies the national CPPE, the State will provide a description of the local conditions and a depiction of the typical practice installation to justify the change. A well-written description of the typical practice installation will aid the planner when it comes time to conduct site-specific analysis. Expanding on the example discussed below, assume the national agronomist determined that, in general, the implementation of Residue and Tillage Management, Reduced Till (Code 345) results in a "Slight to Moderate Reduction" in the Soil Erosion – Wind problem. However, a State agronomist observes that with the implementation of Residue and Tillage Management, Reduced Till (Code 345) the reduction of wind erosion is extensive because the critical wind erosion period occurs when the soil is covered with residue or crop. The State agronomist will change the value to "Substantial Improvement" in the Soil Erosion – Wind resource concern, with a statement explaining the rationale for deeming the practice to have an Extensive rather than a Slight to Moderate reduction in the wind erosion resource concern.

The CPPE database and effects values are also incorporated into the ranking process NRCS uses to evaluate the relative environmental benefit associated with Environmental Quality Incentives Program (EQIP) applications. The Farm Bill requires that NRCS evaluate EQIP applications based in part on "how effectively and comprehensively the project addresses the designated resource

concern." (Section 1240C (16 USC 3839aa—3), Evaluation of Applications.) Generally, NRCS relies upon the CPPE database to identify environmental effects of practices proposed in EQIP applications and derives a cost-effectiveness score based upon the CPPE value, anticipated environmental benefits over the lifespan of the practice, and average cost of implementing the practice. This cost-effectiveness score is added to the overall environmental score resulting from the process of ranking each application.

Conservation Effects Assessment Project

In addition to developing the NEDs described above, following the 2002 Farm Bill, NRCS initiated an extensive effort to assess environmental impacts from implemented conservation practices. The resultant CEAP uses literature reviews, modeling, farmer surveys, watershed assessments, and regional studies in collaboration with partners in universities, agencies, and conservation organizations to conduct this assessment. It relies, in part, on the statistical framework developed for the National Resources Inventory (NRI). Since the early 1980s, the NRI has provided statistically reliable nationwide information on status and trends in soil erosion and land use. Besides estimates of acres in cropland, pastureland, rangeland, and forests, the survey also classifies land with prime farmland conditions and wetland characteristics. The CEAP cropland assessments use NRI points to collect additional information, through surveys with farmers, to evaluate how conservation practices may affect such trends and to connect other resource concerns into the modeling framework. The CEAP grazing lands, wetlands, and wildlife assessments are developing ways to use the NRI as a basis for modeling regional estimates as well.

Regional studies show that existing conservation practices on cultivated cropland have reduced sediment, nitrogen, phosphorus, and pesticide losses and increased soil carbon content at the basin scale. Smaller-scale analyses of watersheds across the country have helped refine CEAP models and incorporate additional elements into the framework. Other ongoing CEAP components are evaluating the environmental impacts of conservation practices on wildlife habitats, wetland ecosystem services and restoration, and grazing lands. Studies have so far shown positive benefits for those resources.[2]

CEAP cropland assessments show that voluntary, incentives-based conservation approaches are achieving measurable results. Further opportunities exist to reduce soil erosion and nutrient losses from cultivate cropland. Targeting enhances effectiveness and efficiency of conservation program funding and technical assistance. Plus, comprehensive conservation planning that includes a combination of erosion-control and nutrient management practices is essential.

Conservation planning should account for regional variation in pressing resource concerns. For example, in the Chesapeake Bay, Great Lakes regions, and Upper-Mississippi River Basin, the most important issue is the loss of nitrogen through leaching. In the Ohio-Tennessee Basin, loss of phosphorous causes the most damage. In the Missouri Basin, wind erosion is the largest culprit.

Estimating the direct and indirect impacts of such practices is a complicated task. CEAP is the latest and most complex development toward that goal and is a continuing effort. The CEAP

[2] For specific details see the NRCS Web site on CEAP: https://www.nrcs.usda.gov/wps/PA_NRCSConsumption/download?cid=nrcseprd1392242&ext=xlsx

modeling framework allows researchers to account for variable topographical and soil characteristics as well as for the effects of weather and climate. The impact of each practice at each site is modeled through mathematical formulas based on empirical observations. Since the underlying data points are statistically distributed, results can be extended beyond the sample. Still, CEAP cropland models currently do not have the capacity to assess the impacts on all different natural resource concerns. They focus on nutrients and pesticides in water, sediment losses, and changes in soil organic carbon, primarily on cropland. Projects within the other CEAP components—wildlife, wetlands, and grazing lands—are underway to extend the use of the models. In addition, CEAP modeling is the basis for development of decision tools that can be used in policy decisionmaking at the national or regional level, as well as in conservation planning at the farm or field level.

Additional information and resources on CEAP are available for all components –cropland, grazing lands, wetlands, wildlife, and watershed studies—are available on the CEAP website through a series of Story Maps and a compilation of all CEAP reports and products, at https://www.nrcs.usda.gov/wps/portal/nrcs/main/national/technical/nra/ceap/

APPENDIX B

Integration of Environmental Considerations into NRCS Planning and Program Delivery

From soil erosion prevention, to wetland restoration, to water quality improvements, to wildlife and energy conservation efforts, the intent of NRCS conservation activities has been to improve the quality of the environment for future generations by mitigating the effects of agricultural production on our Nation's natural resources using the best available science-based information and technologies.

State and local conservationists, as well as members of the public, play a pivotal role in accomplishing this mission. In each State there is a State Technical Committee comprised of representatives from Federal, State, local, and Tribal Governments, as well as representatives of organizations knowledgeable about conservation and agricultural production issues, and other interested individuals. This committee provides the NRCS State Conservationist with advice and recommendations on the implementation of NRCS-administered conservation programs.
Local, as well as State-wide priorities are considered so that when a local NRCS conservationist is developing a conservation plan, they are able to address natural resource concerns not only of national or State interest, but also those of most importance locally. Conservation plans can be designed to address environmental resource concerns on private, non-Federal, or Tribal government lands, or a combination. NRCS conservationists help individuals and communities take a comprehensive approach to planning the proper use and protection of natural resources on these lands through a nine-step planning process described in the NRCS National Planning Procedures Handbook. (See http://directives.sc.egov.usda.gov/RollupViewer.aspx?hid=32437.)

As part of this conservation planning effort, individual environmental reviews called environmental evaluations (EE) are completed which inform the conservation planning effort and assist the agency's compliance with NRCS regulations implementing National Environmental Policy Act (NEPA). The EEs are a concurrent part of the planning process in which the potential long- and short-term impacts of an action are briefly evaluated, and alternative actions explored. The EEs and conservation plans are developed to assist the landowner in making decisions and implementing the conservation practices identified in the conservation plan.

Conservation plans include practices that meet NRCS conservation practice standards and specifications as documented in the Field Office Technical Guide (FOTG) and the National Handbook of Conservation Practices (NHCP). These conservation practices are developed through a multidisciplinary science-based process, including the opportunity for public comment, in order to minimize and mitigate the risk of unintended consequences. NRCS practice standards are established at a national level and set the minimum level of acceptable quality for planning, designing, installing, operating, and maintaining conservation practices. At a minimum, each conservation practice standard includes the definition and purposes of the practice, conditions in which the conservation practice applies, and the criteria supporting each purpose. See NRCS conservation practices at:
https://www.nrcs.usda.gov/wps/portal/nrcs/detailfull/national/technical/cp/ncps/?cid=nrcs143_026849

When a conservation practice standard is developed or revised, NRCS publishes a notice in the

Federal Register of the availability of the standard for review and comment for a period of not less than 30 days from the date of publication. Standards from the NHCP and interim standards are used and implemented by States, as needed, and may be modified to include additional requirements to meet State or local needs. Because of wide variations in site conditions such as soils, climate, and topography, States can revise these national standards and develop specifications to add special provisions or provide additional details in the conservation practice standards. State laws and local ordinances or regulations may also dictate more stringent criteria; in no case, however, can States use standards that are lower than national standards.
Only practices that meet NRCS standards and specifications are eligible for funding through NRCS programs.

Standards for conservation practices are detailed in Section IV of the local FOTG.[1] Conservation practice standards, planning criteria, and local resource data are maintained in the FOTG to provide detailed information for planners to plan and design practices in a manner consistent with local conditions and resource concerns. Commonly, suites of conservation practices are planned and installed together as part of a conservation management system designed to enhance soil, water, and related natural resources for sustainable use. Conservation practice standards and State-specific conservation practice specifications include considerations that, when combined with the considerations identified during the EE process, are designed to minimize potentially adverse impacts to affected resources.

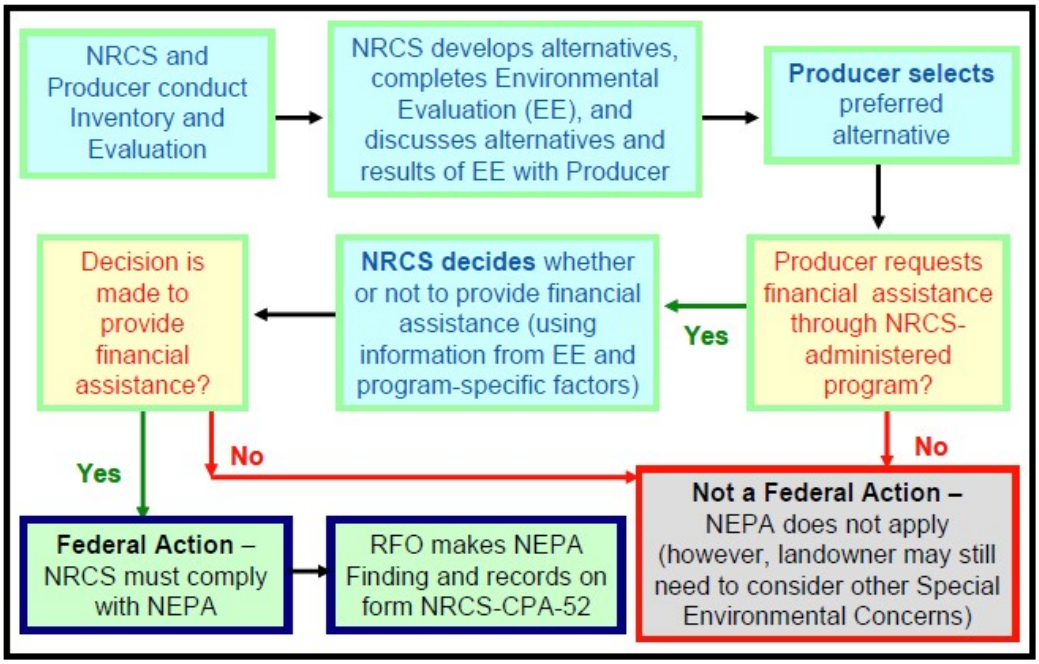
Typical effects of implementing conservation practices are summarized in each State's Conservation Practice Physical Effects, contained in Section V of the FOTG. This collection of resource-based planning, design, and implementation documents provides NRCS employees and other users with the necessary information, modified for local conditions, to develop alternative approaches to addressing natural resource problems.

When an action has been proposed, the conservation planner conducts the EE and documents the results on the EE worksheet. The proposed action is evaluated against a No Action alternative and other alternatives being considered to address identified resource concerns to determine and quantify, to the extent feasible, impacts upon soil, water, air, plant, animal, and certain human and energy resources. The planner also considers and evaluates the Proposed Action and alternatives with respect to special environmental concerns identified by related laws, regulations, Executive orders, and agency policies. Where adverse impacts or extraordinary circumstances are present, the planner identifies ways in which the alternative can be modified to avoid or minimize these effects.[2] Required permits or consultations with other agencies are also identified.

The results of the EE are shared with the landowner, who then identifies the alternative and conservation practices they are willing to implement, if any. NRCS may then provide financial assistance or offer to purchase an easement if there are no significant adverse effects, funds are available, program-specific requirements are met, and the landowner is willing to follow NRCS conservation practice standards and specifications and other program requirements. The NRCS Responsible Federal Official (RFO) reviews the results of the EE to ensure any necessary consultation has been carried out and to determine whether NRCS NEPA analysis is sufficient, before Federal funding is provided. (See fig. B1.)

[1] See https://efotg.sc.egov.usda.gov/#/ to access the FOTG for an NRCS office.
[2] See NRCS General Manual Title 190 Part 410.3B.

Figure B1: NEPA and the NRCS Process



This process is followed for all NRCS Farm Bill conservation programs. The effects of the practices may vary somewhat depending on the local ecosystems, methods of practice installation, and presence of special resource concerns in a particular State, such as the presence of a coastal zone, endangered or threatened species, historic or cultural resources, and the like. While effects on these resources may be described in general terms at the national level, they must be addressed at the State and local level. This is particularly true for endangered and threatened species, historic preservation, historic and cultural resources, essential fish habitat, and other resources that are protected by special authorities that require consultation. NRCS will consult on a State or site-specific level, as needed and appropriate, to ensure the Environmental Quality Incentives Program (EQIP) program actions do not adversely affect special resources of concern. NRCS will also implement practices in a manner that are consistent with the NRCS policy to avoid, minimize, or otherwise mitigate adverse effects to the extent feasible.

For example, to ensure compliance with the Endangered Species Act, State Conservationists will invite representatives of the U.S. Fish and Wildlife Service (USFWS) and the National Marine Fisheries Service (NMFS), as applicable, to all State Technical Committee meetings and encourage their involvement in the development of program criteria within the State. NRCS will also conduct additional programmatic consultations with USFWS and NFMS at the State level, as needed, to ensure that EQIP implementation is not likely to adversely affect species listed as endangered or threatened or species proposed for listing as endangered or threatened or designated or proposed critical habitat. Such consultation will also be used to identify ways the EQIP program might further the conservation of protected species and identify situations in which no site-specific

consultation would be needed.[3] Site-specific consultation will also be conducted as needed to avoid adversely affecting any protected species or habitat.

To ensure compliance with the National Historic Preservation Act and associated authorities, NRCS State offices will follow the procedures outlined in the Advisory Council on Historic Preservation's (ACHP) regulations (36 CFR part 800) or, in accordance with NRCS' alternate procedures (nationwide Programmatic Agreement), invite State Historic Preservation Officers (SHPOs) and federally recognized Tribes (or their designated Tribal Historic Preservation Officers) to enter into consultation agreements that highlight and focus review and consultation on those resources and locations that are of special concern to these parties. In addition, if no State-level agreements are developed with the SHPOs or Tribes, and if other consulting parties are identified, they will be afforded, as appropriate, an opportunity to advise the NRCS State office during project-specific planning about their historic and cultural resource concerns so that they may be taken into account in accordance with the ACHP regulations. Similar processes will be followed, as needed and appropriate, to address other special requirements for the protection of the environment.

[3] In addition to situations in which NRCS determines there is no effect on protected species or habitat, site-specific consultation should not be needed when NRCS and USFWS or National Oceanic and Atmospheric Administration Fisheries agree a category of Proposed Actions is not likely to adversely affect a protected species or habitat and NRCS obtains written concurrence based on that agreement.

APPENDIX C

NRCS State Resource Assessment Methodology for Determining Top Conservation Practices by Natural Resource Concern

States were asked to assign up to three resource concerns to each conservation practice that they expected to contract in fiscal year (FY) 2013. Many practices can be used to treat multiple resource concerns; States selected resource concerns based on their natural resource needs and priorities. States were also asked to estimate the percent of time that these practices would be used to treat each resource concern.

Cover Crop (340) → **RC1 – Soil Quality Degradation (40%)**
RC2 – Water Quality Degradation (35%)
RC3 – Soil Erosion (25%)

States then estimated the number of times they expected to contract each practice in FY 2013. Those estimates were prorated by resource concern.

Cover Crop – 100 instances → **Soil Quality Degradation: 40 instances**
Water Quality Degradation: 35 instances
Soil Erosion: 25 instances

Prorated practice counts were used to compute the "top 5" practices by resource concern across all programs, for individual programs, and for selected States. Prorated practice counts were also used to compute the "top 20" practices identified in the FY 2013 State Resource Assessment.

APPENDIX D

Top Five EQIP Practices by Resource Concern (FY 2013 NRCS State Resource Assessment)

Air Quality

372	Combustion System Improvement
340	Cover Crop
590	Nutrient Management
380	Windbreak/Shelterbelt Establishment
533	Pumping Plant

Degraded Plant Condition

314	Brush Management
382	Fence
666	Forest Stand Improvement
528	Prescribed Grazing
614	Watering Facility

Excess Water/Insufficient Water

430	Irrigation Pipeline
449	Irrigation Water Management
587	Structure for Water Control
516	Livestock Pipeline
442	Sprinkler System

Inadequate Habitat for Fish and Wildlife

314	Brush Management
646	Shallow Water Development and Management
666	Forest Stand Improvement
338	Prescribed Burning
645	Upland Wildlife Habitat

Inefficient Energy

374	Farmstead Energy Improvement
122	Agricultural Energy Mgmt - Component 2 - Headquarters Plan
798	Seasonal High Tunnel
372	Combustion System Improvement
533	Pumping Plant

Livestock Production Limitation

614	Watering Facility
382	Fence
516	Livestock Pipeline
528	Prescribed Grazing
512	Forage and Biomass Planting

Soil Erosion

340	Cover Crop
342	Critical Area Planting
329	Residue and Tillage Management, No-Till
561	Heavy Use Area Protection
410	Grade Stabilization Structure

Soil Quality Degradation

340	Cover Crop
590	Nutrient Management
329	Residue and Tillage Management, No-Till
328	Conservation Crop Rotation
512	Forage and Biomass Planting

Water Quality Degradation

590	Nutrient Management
561	Heavy Use Area Protection
382	Fence
340	Cover Crop
595	Integrated Pest Management