United States Fish and Wildlife Service
Environmental Action Statement

Within the spirit and intent of the Council on Environmental Quality's regulations for implementing the National Environmental Policy Act (NEPA), and other statutes, orders, and policies that protect fish and wildlife resources, I have established the following administrative record and determined that the action of maintaining the current agricultural management program on Cibola National Wildlife Refuge:

Check One:

_____ is a categorical exclusion as provided by 516 DM Chapter 8 [*specify CE category and include text of the citation*]. No further NEPA documentation will therefore be made.

__✓__ is found not to have significant environmental effects as determined by the attached environmental assessment and finding of no significant impact.

_____ is found to have significant effects and, therefore, further consideration of this action will require a notice of intent to be published in the Federal Register announcing the decision to prepare an EIS.

_____ is not approved because of unacceptable environmental damage, or violation of Fish and Wildlife Service mandates, policy, regulations, or procedures.

_____ is an emergency action within the context of 40 CFR 1506.11. Only those actions necessary to control the immediate impacts of the emergency will be taken. Other related actions remain subject to NEPA review.

Other supporting documents:

Finding of No Significant Impact, Compatibility Determination for the Agricultural Program on Cibola National Wildlife Refuge, and Intra-Service Section 7 Biological Evaluation

Signature Approval:

Mitch Lee 12-9-2010
(1) Originator — Date

Carol N. Jones 12/14/10
(2) Environmental Coordinator, R2 NWRS — Date

Donna Stinde 12/14/10
(3) Regional Chief, R2 NWRS — Date

ACTING Joy E. Nicholopoulos 12/15/10
(4) Regional Director — Date

FINDING OF NO SIGNIFICANT IMPACT

ENVIRONMENTAL ASSESSMENT
FOR AGRICULTURAL MANAGEMENT PROGRAM
AT
CIBOLA NATIONAL WILDLIFE REFUGE
IMPERIAL COUNTY, CALIFORNIA, AND LA PAZ COUNTY, ARIZONA

The U.S. Fish and Wildlife Service is proposing to continue to administer a cooperative farming program on 1,262 acres on the Cibola National Wildlife Refuge (NWR) near Blythe, California. An Environmental Assessment (EA) was prepared in compliance with the National Environmental Policy Act (NEPA) to provide decision-making framework that 1) explores a reasonable range of alternatives to meet project objectives, 2) evaluates potential issues and impacts to the refuge, resources and values, and 3) identifies mitigation measures to lessen the degree or extent of these impacts. The EA evaluated the effects associated with three alternatives.

Alternatives Considered and Analyzed

Alternative A – Current Management (Proposed Action)
Under this alternative, the Refuge would continue to administer cooperative farming on 1,262 acres on Farm Subunits 1, 2, and 3, in order to fulfill one of the primary purposes for which the Refuge was established as well to achieve the goals and objectives described in Refuge planning documents. On Farm Subunit 1, 892 acres would continue to be farmed in alfalfa, corn, and small grain crops (e.g., wheat, milo, or rye). The cooperative agreement for these acres identifies a quarter of the crop for the Refuge share in order to benefit waterfowl and migratory birds. Alfalfa provides a source of green browse during the fall and winter months for geese, cranes, deer, and other wildlife, while corn provides high carbohydrate forage used by similar species. Three hundred acres on Farm Subunit 2 are also managed under cooperative agreement in which the farmer rotates alfalfa and other small grain crops to keep soil salinities from increasing. Farming Subunit 3 will continue to include 70 acres that will be planted in alfalfa and administered through a cooperative agreement. The farmers managing both Farm Subunits 2 and 3 leave their crop unharvested over the winter to provide green browse for wintering waterfowl and other wildlife.

Alternative B – Conversion of 242 Cooperatively Farmed Acres to Moist-Soil Management and Native Vegetation
This alternative involves converting 242 acres of existing farmlands to a combination of 100 acres of moist-soil units and 142 acres of native riparian habitat. Approximately 142 acres would be removed from the alfalfa crop in Farm Subunit 1 and converted to cottonwood-willow woodlands to provide habitat for neoptropical migrants. Providing water to these newly restored areas would create a challenge for the Refuge, however, as the current cooperative farmers pay the high costs of pumping water and this benefit would be sacrificed under this action. On Farm Subunit 2, the Refuge would reduce the amount of alfalfa from 300 to 200 acres, converting 100 acres to a moist-soil unit managed solely by the Refuge. This moist-soil unit would force the Refuge to utilize a larger portion of their water entitlement because moist-soil management would require up to ten times as much water as the alfalfa field it would replace. The 70 acres farmed on Farm Subunit 3 would remain the same as Alternative A. Overall, the Refuge would continue cooperatively farming 1,020 acres under this alternative.

Alternative C – Conversion of 550 Cooperatively Farmed Acres to Moist-Soil Management and Native Vegetation
Under this alternative, the Refuge would reduce farmed habitat by 550 acres. On Farm Subunit 1, cooperative farming would be reduced from 892 acres to 492 acres. The 400 acres removed from farming would be split between conversion of 200 acres to moist-soil management and 200 acres to native

vegetation. The amount of alfalfa and small grains produced on Farm Subunit 2 would be reduced from 300 to 150 acres, and the former agriculture fields would be converted to moist-soil management. Farm Subunit 3 would remain cooperatively farmed on the entire 70 acres as described in both Alternatives A and B. This alternative would provide less browse and forage for migratory birds and resident wildlife. While moist-soil management would compensate for some of the supplemental food from reduced agricultural acreage, current staff, funding, and water limitations would not support this alternative.

Proposed Action

Alternative A, continuation of the existing farming program, was selected because it best satisfies the purpose and need for the project. Although Alternatives B and C provide food and restored habitat for wildlife, the proposed action will result in continued production of green browse and high carbohydrate forage for the migratory birds for which the Refuge was established. This action will continue to benefit geese, cranes, deer, and other wildlife, while simultaneously preventing soil salinities from increasing.

Detailed descriptions and range of effects for all alternatives can be found in Section 2.0 and 4.0 of the EA respectively.

Summary of Effects

Implementation of the Agency's decision would be expected to result in the following environmental, physical, and social and economic effects. Continuation of agricultural activities involving equipment use and chemical treatments may result in short-term minor negative effects due to production of dust, emissions, and spray drift. Agricultural operations will also result in continued ground disturbance on 1,262 acres as crops are planted and maintained. Integrated pest management strategies and best management practices, such as the use of buffer zones, will continue to be used to minimize potential minor negative effects to soils, water, and air quality.

The proposed action will require continued pumping of water diverted from the lower Colorado River for consumptive use on the Refuge. This use is within the designated beneficial use described by the Refuge's water rights; therefore, only short-term minor negative impacts to water quantity across the Refuge are expected.

Beneficial impacts will result from the proposed action, especially for soils, habitat, wildlife, and visitor use opportunities. Farming on Farm Subunit 2 will maintain and remediate soil salt conditions while providing public hunting opportunities. Benefits to soils on this subunit are expected to be major and long-term. Continuing farming on 1,262 acres will continue to provide food and habitat for migratory waterfowl in the winter and resident wildlife year-round. Over 85 percent of the Canada geese that visit the state of Arizona migrate to the Refuge and depend on alfalfa fields for browse. The proposed action will continue to provide major beneficial impacts to these geese as well as mule deer, songbirds, cranes, migratory a variety of other granivorous birds (such as Gambel's quail, white-winged doves, and mourning doves), and small mammals and their predators.

In addition, the proposed action will continue to provide economic benefits to two cooperative farmers while assisting the Refuge in utilizing their water entitlement at very little cost to meet the Refuge purpose. Existing opportunities for wildlife observation, photography, interpretation, and hunting will continue on and throughout Refuge farm fields.

The proposal is not expected to have any effects on wetlands and floodplains, pursuant to Executive Orders 11990 and 11988, because the project area does not contain jurisdictional wetlands or floodplains. No cultural resource concerns were identified because all farming occurs on lands that were previously farmed. In addition, the threatened and endangered species that occur on the Refuge do not occupy or utilize farm fields; therefore, these resources will not be impacted by the proposed action.

The proposal is not expected to have any significant effects on the human environment because: (1) this proposal is compatible with the general Service policy regarding invasive species management on National Wildlife Refuges; (2) this proposal is compatible with the purposes for which Cibola NWR was established; (3) this proposal does not initiate widespread controversy or litigation; and (4) there are no conflicts with local, regional, state, or federal plans or policies.

Public Review

The proposal has been thoroughly coordinated with all interested and/or affected parties, including the general public, Service staff biologists, and the immediate neighbors adjacent to the site. The FWS has encouraged public participation throughout the NEPA process during which the public had two opportunities to comment on this project: once during initial project scoping and again following the release of the Draft EA. On July 1, 2010, the Service released a News Release to 16 media outlets and posted a public notice soliciting comments on the Refuge's farming program. The Service also sent a letter soliciting feedback on all of the farming programs on refuges in the region to 263 interested parties. A two-month scoping period was established, which ceased on August 31, 2010. Two comments were received as a result of public scoping, and the Service incorporated those comments into the EA.

The Draft EA was released for a 35-day public review period, which ended December 5, 2010. Copies of the Draft EA were provided at Cibola National Wildlife Refuge Headquarters and online at the National Wildlife Refuge System Southwest Region Division of Planning website. The Refuge received one comment from the Arizona Department of Environmental Quality informing the Refuge of their intent to enforce a new permitting program regarding pesticide use. When this regulation is formalized, the Refuge will follow the new permitting process as appropriate. In addition, ADEQ suggested best management practices for mitigating nonpoint source pollution, which the Refuge already implements.

Determination

Based upon a review and evaluation of the information contained in the EA as well as other documents and actions of record affiliated with this proposal, the Service has determined that the proposal to continue the current agricultural management program on Cibola National Wildlife Refuge does not constitute a major Federal action significantly affecting the quality of the human environment under the meaning of section 102 (2) (c) of the National Environmental Policy Act of 1969 (as amended). As such, an environmental impact statement is not required. An environmental assessment has been prepared in support of this finding and is available upon request to the U.S. Fish and Wildlife Service facility identified above.

Joy E Nicholopoulos

ACTING Regional Director

12/15/10

Date

U.S. DEPARTMENT OF THE INTERIOR
FISH AND WILDLIFE SERVICE
CIBOLA NATIONAL WILDLIFE REFUGE
66600 CIBOLA LAKE ROAD
ROUTE 2 BOX 1
CIBOLA, AZ 85328
928/857-3253, FAX 928/857-3420

Note to file for Cooperative Management Agricultural Program Environmental Assessment (EA) and Compatibility Determination (CD)

The Draft Environmental Assessment and Compatibility Determination for the Cibola National Wildlife Refuge Agricultural Management Program were open to public comment between November 1st and December 5th of 2010. The Refuge distributed a news release to 19 local media outlets including Yuma Business Direct, Yuma Sun, Western Agri-Radio Networks Inc., 12 radio stations, and 4 television news networks. The Refuge simultaneously posted a public notice that established a 35-day comment period with a scheduled culmination date of December 5, 2010. The public notice was posted at the Cibola National Wildlife Refuge and at the public library in Blythe, CA.

The Draft EA and CD dated November 1, 2010 has a total acreage of 1,293 in the cooperative agricultural management program with 52 fields consisting of 923 acres in Farm Subunit 1. This is incorrect due to 2 agriculture fields consisting of 31 acres that belong to a private landowner being included in the total acreage. This acreage has been corrected in the final version of the EA and CD which now represents 1,262 acres total for the agricultural management program with a total of 50 fields consisting of 892 acres being in Subunit 1. These two private fields are alfalfa and bring the total acreage of alfalfa for Subunit 1 from 763 to 732. This acreage change is negligible when considering the total acreage in the agricultural management program area, and it will have no effect on the how the program is managed or its overall productivity.

Steven Rimer
Cibola NWR
Wildlife Biologist
Signed 12/08/2010

Environmental Assessment

Cibola National Wildlife Refuge
Agricultural Program

December 9, 2010

Prepared by

Refuge Staff
Cibola National Wildlife Refuge
Cibola, Arizona

&

National Wildlife Refuge System
Southwest Region
Division of Planning
Albuquerque, New Mexico

Table of Contents

1.0 PURPOSE OF AND NEED FOR PROPOSED ACTION ALTERNATIVE

1.1 Introduction

The United States Fish and Wildlife Service (Service) is proposing to continue the current agricultural program on the Cibola National Wildlife Refuge (Refuge) within the Southwest Arizona Refuge Complex. The agricultural practices on the Refuge are conducted to provide food and resting areas for migratory birds. Goals and objectives set forth in the Refuge's Comprehensive Management Plan call for the management and maintenance of such habitat to mitigate for landscape level alteration and loss of habitats along the lower Colorado River. The program at the Refuge is implemented primarily through the use of local cooperators with expertise in agriculture.

This Environmental Assessment (EA) is being prepared to evaluate the effects associated with this proposal and complies with the National Environmental Policy Act (NEPA) in accordance with Council on Environmental Quality regulations (40 CFR 1500-1509) and Department of the Interior (516 DM 8) and Service (550 FW 3) policies (see Section 1.7 for a list of additional regulations that this EA complies with). NEPA requires examination of the effects of proposed actions on the natural and human environment. In the following chapters, three alternatives are described and environmental consequences of each alternative are analyzed.

1.2 Location

Cibola National Wildlife Refuge consists of approximately 18,444 acres and is located along 12 miles of the lower Colorado River in Imperial County, California, and La Paz County, Arizona. The city of Blythe, California, is located approximately 20 miles north of the Refuge, and Yuma, Arizona, is nearly 42 miles to the south. Situated within the Sonoran Desert, the Refuge is located in the historic floodplain of the lower Colorado River. In this wide expanse of desert, the Refuge contains rare wetland and riparian habitats that provide a home for over 288 species of birds throughout the year. The Refuge contains the 600-acre Cibola Lake, approximately 10 miles of Colorado River backwaters, various moist-soil units, 1,262 acres of agriculturally managed habitats, and 785 acres of desert ridge and dry-wash land. A map of the Refuge is provided in Appendix A.

1.3 Background

As demonstrated throughout history, the lower Colorado River basin plays a defining and central role for desert and riparian ecosystems in western Arizona and eastern California. Modern technological development beginning in the early 1900s quickly began altering the River basin's natural flows, thereby changing the natural ecosystem and affecting many of the wildlife species that depended on this oasis in the immense desert. Dam building, specifically, has produced many issues for both wildlife and human ecology. Since the 1930s, natural resource values,

especially wetland and riparian habitat, have been consistently declining along the lower Colorado River.

Cibola National Wildlife Refuge is the only refuge on the lower Colorado River designated as having the fundamental purpose of mitigating the negative impacts of channelizing the Colorado River below Parker Dam near Blythe, California. Its establishment was encouraged and recommended by the Lower Colorado River Land Use Plan in 1964. Cibola National Wildlife Refuge was established later that year, on August 21, 1964, by Public Land Order 3442 pursuant to Executive Order 10355. It was "… reserved for use of the… United States Fish and Wildlife Service, as the Cibola National Wildlife Refuge" and "… subject to their use for reclamation purposes or wildlife refuge purposes." At the time of its establishment, the Refuge contained 17,000 acres dedicated to the management and protection of migratory birds, wintering waterfowl, and resident wildlife and bird species.

The Colorado River has undergone substantial modification to meet the water supply requirements of law, Interstate Compact, and International Treaty. These modifications have included dams, levees, and channelization. All of the Colorado River flowing through Cibola National Wildlife Refuge has been channelized and bounded by levees. The old or 'abandoned' channel (that defines the boundary between Arizona and California) exists now as a conveyance for irrigation return flow. Other 'abandoned' channel meanders exist as backwater areas deriving their water supply from Colorado River subflow, adjacent ephemeral drainageways, and rare overbank flooding. The old river channel and remnant meanders are now important habitat areas and serve a critical role in the mission of the Cibola National Wildlife Refuge. Habitat exists for migrant and resident birds and animals as well as fish species protected under the Endangered Species Act.

The Lower Colorado River Valley around Blythe, CA south to the Refuge contains an intensive aggregate of farmlands with some community development. The historical floodplain of the Colorado River consists of very productive soils in many areas. The river's deposition of sediment load contributes to a varied soil horizon of sand, silt and clay that took many years to develop. Soils surrounding the Refuge (Cibola and Palo Verde Valley) have been intensively farmed over the past several decades and are considered some of the area's most productive agricultural land. General crops for the area include alfalfa, wheat, cotton, melons, and broccoli. Farming areas that have remained fallow or been abandoned over the past years continue to degrade as salts accumulate at the surface through normal evaporation. The soils, if left unaltered, are eventually overtaken by native desert species or in many cases invasive plants like salt cedar (*Tamarix chinensis*).

Waterfowl and sandhill crane use of croplands outside Refuge boundaries in Cibola and Palo Verde Valley has not been problematic or contributed to large depredation claims. Most of the wintering ducks, geese, and cranes spend the majority of the season on the Refuge's wetlands and agricultural areas. The Refuge has an average wintering population of 2,500 sandhill cranes, nearly 1,000 snow geese, and around 7,000 Canada geese.

In 1994, the four national wildlife refuges along the lower Colorado River (Havasu, Bill Williams, Cibola, and Imperial) developed one 20-year Comprehensive Management Plan

(CMP) in accordance with Service policy. This document guides overall management of the refuges.

The Lower CMP identified the following goals for these four refuges:

1. In cooperation with other resource management agencies, to restore and maintain the natural diversity of the Colorado River Area of Ecological Concern, especially on refuge lands.
2. To achieve threatened and endangered species recovery and to strengthen the role of the lower Colorado River national wildlife refuges in the recovery of all applicable endangered species, threatened species, all candidate species, and all species of concern to the States of California and Arizona.
3. In cooperation with the Service Fisheries Resource Office, and other state and federal agencies with joint jurisdiction to restore, enhance, and protect fish ecosystems on the lower Colorado River refuges.
4. To improve ongoing refuge management programs that enhance migratory waterfowl populations and health on each of the four River refuges and other jurisdictions within the Area of Ecological Concern.
5. To achieve protection and enhancement of existing wetland areas on the four river refuges and rehabilitation of former wetlands where possible.
6. In cooperation with the Bureau of Reclamation (BR) and the lower basin states, to enhance use of Colorado River water by the refuges, protect existing Refuge water rights holding in the Area of Ecological Concern, and obtain additional rights when possible without adversely affecting other entitlement holders in the lower basin states.
7. In cooperation with the BR and the Army Corps of Engineers, improve the efficiency of water delivery systems and more effectively gauge water use for the ultimate benefit and enhancements to habitat and wildlife.
8. In cooperation with the BR, revegetate substantial amounts of habitat with native mixes of vegetation leading to biological diversity.
9. To improve overall refuge water quality and protect refuge waters from all contamination.
10. To ensure that only compatible and appropriate activities occur on the lower Colorado River national wildlife refuges, and to regulate, as provided by law, all activities, uses, and practices on and off the refuges that are potentially harmful to refuge resources.
11. To clarify each of the Colorado River refuges' jurisdictional authorities as they relate to any concurrent or related authorities vested in other Federal, state, local, and Native American governments with natural resource interests within the Area of Ecological Concern; to ensure refuge boundary integrity relative to adjacent lands; and when the opportunities, funding, and rationale are present, to acquire additional lands to further protect fish and wildlife resources.
12. To reduce levels of non-wildlife-oriented recreation on the River channel that runs through the lower Colorado River refuges, eliminate all non-wildlife-oriented recreation that is not compatible, increase the quality experience related to natural values by all River visitors, and raise public awareness of the lower Colorado River ecosystem values.
13. To establish a formal program for public outreach, identify important public resources, and improve educational and interpretive programs for refuge habitat, wildlife, and cultural resources.

14. To achieve optimum levels of wildlife observation, fishing, and hunting recreation opportunities where such use is legally compatible with the purposes of the refuges and the goals of the National Wildlife Refuge System.
15. To strengthen interagency and jurisdictional coordination of lower Colorado River issues, resulting in decisions benefiting fish and wildlife resources, while avoiding duplication of effort.
16. To strengthen Service working relationships with the various Native American governments situated along the lower Colorado River, resulting in decisions that benefit fish and wildlife resources.
17. To effect improvements to funding and staffing that will result in long lasting enhancements to habitat and wildlife resources in the Area of Ecological Concern and the lower Colorado River national wildlife refuges, leading to the achievement of the goals of this plan and the goals of the National Wildlife Refuge System.

Cibola National Wildlife Refuge uses agriculture as a tool to assist in meeting their purpose and achieving their goals, objectives, and strategies outlined in the CMP, Habitat Management Plan, Water Management Plan, and other planning documents. The Refuge now administers a cooperative farming program on a total of 1,262 acres of the Refuge, where alfalfa and mixed grain forage is produced annually. The cropland areas are made up of Units 1, 2, and 3, and these lands provide a substantial amount of food for migratory birds reliant on the area for over wintering. This is crucial to maintaining and enhancing migratory bird use in the Lower Colorado River Valley.

Approximately 900 acres surrounding Farm Subunit 1 is currently being restored to native vegetation through the Lower Colorado River Multi Species Conservation Plan (LCR MSCP) through a long-term program. The LCR MSCP is a multi-stakeholder Federal and non-Federal partnership responding to the need to balance the use of the LCR water resources and the conservation of native species and their habitats in compliance with the Endangered Species Act. The Bureau of Reclamation (BR) is the entity responsible for implementing the LCR MSCP over the 50-year term of the program which extends from Lake Mead to the Southerly International Boundary with Mexico. Since 1999, the BR and the Service have collaborated on several riparian habitat restoration and demonstration projects at the Refuge. While this program utilizes farming techniques in preparation for restoration activities, the areas being treated under the MSCP are not part of the Refuge's agricultural program. For additional information on the MSCP, please visit their website at http://www.lcrmscp.gov. Activities defined under the MSCP program are evaluated under … (will cite this NEPA document later)

Tied to agricultural practices and other Refuge management priorities, the limited water supply flowing within the once-swift lower Colorado River has been a subject of controversy throughout recent history. Cibola National Wildlife Refuge does not have a federal reserved right, but rather the Secretary established an entitlement to Colorado River water for the Refuge through a Secretarial reservation published in the Federal Register. The water entitlement was established on December 8, 1982, and states, "Consistent with the February 9, 1944, contract between the U.S. and the State of Arizona, notice is given that the following amount of lower Colorado River water is reserved for the United States for use on the Cibola National Wildlife Refuge in Arizona: (1) the diversion of 7,500 acre-feet annually from the mainstream for

circulation water, and (2) the diversion of 27,000 acre-feet annually from the mainstream or the consumptive use of 16,793 acre-feet annually from the mainstream, whichever is less, with a priority date of August 21, 1964."

1.4 Purpose of Action

The purpose of the proposed action is to produce habitat and food, in adequate amounts and concentrations to fulfill the needs of migratory birds and resident wildlife for which the Refuge was established. Providing this habitat contributes to the accomplishment of the Refuge purpose and the mission of the National Wildlife Refuge System. The purpose of the Environmental Assessment (EA) is to determine the adequacy and appropriateness of the current agricultural practices in meeting the purpose of Cibola National Wildlife Refuge and fulfilling the needs of migratory birds and resident wildlife. Additionally, the purpose of the EA is to remain consistent with current law, regulation, and policy (National Environmental Policy Act of 1969 and National Wildlife Refuge System Improvement Act of 1997).

1.5 Need for Action

There is a need to evaluate the Refuge's agricultural program to determine its effectiveness and consistency with laws, policies and other guidance and to determine the most biologically efficient means of meeting the Refuge's wildlife management objectives. The Service's Biological Integrity policy has direct application and states that refuges must ensure that the biological integrity, diversity, and environmental health of each refuge are maintained, and where appropriate, restored.

The Cibola National Wildlife Refuge has a need to conduct agriculture to mitigate for habitat losses in surrounding areas. These needs are outlined within the goals, objectives, and strategies found in the CMP and subsequent step-down plans. As stated in Goal #4 of the CMP (page 51), the Refuge needs "to improve ongoing refuge management programs that enhance migratory waterfowl populations and health on each of the four River refuges and other jurisdictions within the Area of Ecological Concern." Strategies to accomplish this on the Refuge include holding farm management acreage stable at 1993 levels, continuing moist-soil management activities, and monitoring adjacent farm depredation. In addition, there is a need to maintain low soil salinities on the Refuge through agricultural practices.

Tied to findings in the Habitat Management Plan and corresponding Annual Habitat Work Plans, there is a need to maintain croplands and moist-soil units to provide habitat for migratory birds including cranes and waterfowl.

1.6 Decision to be Made

This EA is an evaluation of the environmental impacts of the alternatives and provides information to help the Service fully consider these impacts and any proposed mitigation. Using the analysis in this EA, the Regional Director of the Southwest Region (Region 2 of the U.S. Fish and Wildlife Service) will decide which alternatives to implement and whether there would

be any significant effects associated with the selected alternative that would require the preparation of an environmental impact statement. If no significant impacts are identified, a Finding of No Significant Impact (FONSI) will be prepared.

1.7 Regulatory Compliance

National Wildlife Refuges are managed to help fulfill the mission of the National Wildlife Refuge System (NWRS) and the purposes of the individual refuge. Relevant guidance includes the National Wildlife Refuge System Administration Act of 1966, as amended by the National Wildlife Refuge System Improvement Act of 1997, Refuge Recreation Act of 1962, and selected portions of the Code of Federal Regulations and Fish and Wildlife Service Manual.

The mission of the Refuge System is:

"... to administer a national network of lands and waters for the conservation, management and, where appropriate, restoration of the fish, wildlife, and plant resources and their habitats within the United States for the benefit of present and future generations of Americans" (National Wildlife Refuge System Improvement Act of 1997, Public Law 105-57).

The goals of the Refuge System are to:

- *Conserve a diversity of fish, wildlife, and plants and their habitats, including species that are endangered or threatened with becoming endangered;*
- *develop and maintain a network of habitats for migratory birds, anadromous and interjurisdictional fish, and marine mammal populations that is strategically distributed and carefully managed to meet important life history needs of these species across their ranges;*
- *conserve those ecosystems, plant communities, wetlands of national or international significance, and landscapes and seascapes that are unique, rare, declining, or underrepresented in existing protection efforts;*
- *provide and enhance opportunities to participate in compatible wildlife-dependent recreation (hunting, fishing, wildlife observation and photography, and environmental education and interpretation);* and
- *foster understanding and instill appreciation of the diversity and interconnectedness of fish, wildlife, and plants and their habitats.*

The NWRS Improvement Act of 1997 provides guidelines and directives for the administration and management of all areas in the NWRS. It states that national wildlife refuges must be protected from incompatible or harmful human activities to ensure that Americans can enjoy Refuge System lands and waters. Before activities or uses are allowed on a national wildlife refuge, the uses must be found to be compatible. A compatible use "… will not materially interfere with or detract from the fulfillment of the mission of the Refuge System or the purposes of the refuges." A compatibility determination for cooperative farming has been completed and is also available for review.

This EA was prepared by the Service and represents compliance with applicable Federal statutes, regulations, Executive Orders, and other compliance documents, including the following:

- Administrative Procedures Act (5 U.S.C. 551-559, 701-706, and 801-808) as Amended
- American Indian Religious Freedom Act of 1978 (42 U.S.C. 1996)
- Antiquities Act of 1906 (16 U.S.C. 431-433
- Archaeological Resources Protection Act of 1979 (16 U.S.C. 470)
- Bald Eagle Protection Act (16 U.S.C. 668-668d) as amended
- Clean Air Act of 1972, as amended (42 U.S.C. 7401 *et seq.*)
- Clean Water Act of 1972, as amended (33 U.S.C. 1251 *et seq.*)
- Endangered Species Act of 1973, (ESA) as amended (16 U.S.C. 1531 *et seq.*)
- Executive Order 12898, Federal Action Alternatives to Address Environmental Justice in Minority Populations and Low Income Populations, 1994.
- Executive Order 13112, Invasive Species (issued in February 1999)
- Fish and Wildlife Coordination Act of 1958, as amended (16 U.S.C. 661 *et seq.*)
- Fish and Wildlife Improvement Act of 1978 (16 U.S.C. 7421)
- Floodplain Management (Executive Order 11988)
- National Refuge System Administration Act of 1966 (16 U.S.C. 668dd-668ee) as amended
- National Environmental Policy Act (NEPA) of 1969, as amended (42 U.S.C. 4321 *et seq.*)
- Regulations for Implementing the Procedural Provisions of NEPA (40 CFR 1500 *et seq*.)
- National Historic Preservation Act of 1966, as amended (16 U.S.C. 470 *et seq*.)
- National Pollutant Discharge Elimination System, as amended (33 U.S.C. 1251 *et seq.*)
- Native American Graves Protection and Repatriation Act of 1990 (25 U.S.C. 3001 *et seq.*)
- Protection and Enhancement of the Cultural Environment (Executive Order 11593)
- Protection of Wetlands (Executive Order 11990)
- U.S. Fish and Wildlife Service Manual 601 FW 3, Biological Integrity, Diversity, and Environmental Health
- The Final Comprehensive Management Plan and Environmental Assessment for Lower Colorado River National Wildlife Refuges (1994).

Further, this EA reflects compliance with applicable State of Arizona and local regulations, statutes, policies, and standards for conserving the environment and environmental resources such as water and air quality, endangered plants and animals, and cultural resources.

1.8 Scoping/Public Involvement and Issues Identified

Scoping was initiated on July 1, 2010. The Refuge distributed a news release to 19 local media outlets including Yuma Business Direct, Yuma Sun, Western Agri-Radio Networks Inc., 12 radio stations, and 4 television news networks. The Refuge simultaneously posted a public notice that established a 30-day scoping period with a scheduled culmination date of August 1, 2010. The public notice was posted at the Cibola National Wildlife Refuge and at the public library in Blythe, CA. The Service determined that additional time was necessary to involve the

many interested parties in the EA process, and the public scoping period was extended through August 31, 2010. Public notices were reposted to reflect this change.

The Service also developed a scoping letter explaining all of the agricultural programs on the national wildlife refuges in the Southwest Region. On July 29, 2010, this letter was distributed to 263 potentially interested parties including federal, state, and local agencies; nearby irrigation districts; soil and water conservation districts; cooperative extensions; volunteer groups; private landowners; local chambers of commerce; county commissioners; members of Congress; and U.S. Representatives. The letter solicited comments and included a brief description of all of the agricultural programs throughout the region, including the program on Cibola National Wildlife Refuge.

During the scoping period, which lasted until August 31, 2010, the Service received no response letters and emails with comments from the local community. Two letters were received in response to the regional scoping letter and were considered in development of the Cibola National Wildlife Refuge Agricultural Program EA. One commenter recommended that all agriculture on national wildlife refuges should be conducted organically; no genetically modified crops should be used; focus should be on removal of invasive species such as Johnson grass, buffelgrass, salt cedar, etc.; and our first concern should be the health of wildlife. Another commenter, the Center for Food Safety, requested that the Southwest Arizona Refuge Complex continue its current ban on genetically engineered crops, issue a moratorium on the planting of such crops on the Refuge, and comply with federal laws by requiring completion of compatibility determinations, NEPA review, and an "essentiality" determination before planting of any said crops. This response both discussed the commenter's view that genetically engineered crops harm wildlife and the ecosystem and expressed concern over the potential for herbicide-resistant crops to foster evolution of resistant weeds and increase use of pesticides.

A public comment period was held for the Cibola National Wildlife Refuge draft EA and Compatibility Determination between November 1st and December 5th of 2010. The Refuge distributed a news release to 19 local media outlets including Yuma Business Direct, Yuma Sun, Western Agri-Radio Networks Inc., 12 radio stations, and 4 television news networks. The Refuge simultaneously posted a public notice that established a 35-day comment period with a scheduled culmination date of December 5, 2010. The public notice was posted at the Cibola National Wildlife Refuge and at the public library in Blythe, CA.

Internal scoping of refuge and regional office staff was also conducted to identify issues, concerns, and management opportunities. Based on internal and external scoping, the following issues were identified and considered in the development of the alternatives in Chapter 2 of this EA:

Use of Genetically Modified Crops

In accordance with the FWS Biological Integrity Policy, the use of genetically modified crops (GMCs) is allowed on national wildlife refuges if their use is deemed essential to meet the purpose of the refuge. The Cibola National Wildlife Refuge has not allowed the use of GMCs in the past and has no intention to propose their use in the future. One member of the public has stated that no GMCs should be used on any refuge, and the Center for Food Safety has requested

that the Southwest Arizona Refuge Complex issue a moratorium on all genetically engineered crop cultivation on the Refuge. Since the Refuge has made it explicitly clear that no genetically modified crops will be used under any of the alternatives evaluated in this EA, no further discussion of this issue regarding Cibola National Wildlife Refuge is necessary.

Use of Pesticides

Pesticides are routinely used on refuges to assist with the management of invasive species as part of Integrated Pest Management. There is concern that pesticides used as part of agricultural programs could adversely impact the physical, biological, or human environment. One commenter recommends that all farming on refuges should be done organically. Refuges only use pesticides that have been approved through the Pesticide Use Proposal (PUP) process. Pursuit, Raptor, Rodeo, Fusilade DX, and Select 2EC are the pesticides that have been approved through the PUP process for Cibola National Wildlife Refuge and are currently used on Refuge croplands to treat invasive species and maintain crop yields. This EA will evaluate the impacts of these pesticides on Cibola National Wildlife Refuge.

Management Consideration/Alternatives

It is important to determine the management scheme that will best meet the biological needs of wildlife on a particular refuge. Therefore, the Refuge will evaluate whether the current management is the most biologically efficient way to meet the Refuge's management goals and objectives as well as the Refuge purpose and consider an appropriate range of alternatives including reducing and/or eliminating the farming program if other management tools will more effectively meet the purpose of the Refuge.

Water Rights

Water is often described as the "lifeblood" of the Refuge System, but it is also the lifeblood of agriculture, industry, energy production, and municipalities. This resource is vital to supporting management actions occurring on Refuge lands, especially those along the lower Colorado River where water supply is limited. Cibola National Wildlife Refuge has water rights through a Secretarial reservation that authorizes the diversion of 7,500 acre-feet per year for circulation and the diversion of 27,000 acre-feet per year for consumptive use of 16,793 acre-feet annually (whichever comes first). As water resources are limited in this area, the Refuge currently utilizes nearly 90% of their allocated water supply for their broad array of current management activities. If a management action that requires consumption of water resources is changed, the Refuge's ability to supply sufficient amounts of water for all other management activities may be impaired. Therefore, the Refuge will consider the impacts that any change in proposed management could have on water rights.

2.0 ALTERNATIVES

Alternatives are different approaches designed to meet the purpose and need for the proposed action. NEPA requires federal agencies to consider a reasonable range of alternatives that meet the purpose and need for the proposed action. Based on the issues, concerns, and opportunities heard during the scoping process, the following alternatives were identified. Three management scenarios that could meet the purpose and need of the proposed action were identified and analyzed in detail in the EA. These alternatives represent feasible approaches to accomplishing habitat restoration goals on the Refuge. Three other scenarios/alternatives were also considered but were found to be infeasible (do not meet the stated purpose and need); therefore, they were eliminated from detailed analysis for the reasons listed in Section 2.5.

2.1 Alternative A – Current Management (Proposed Action):

Under the No Action Alternative, current management direction would continue. The Refuge would continue to administer cooperative farming on 1,262 acres. All crops grown on the Refuge would continue to be non-genetically modified organisms. Agricultural practices would continue to fulfill one of the primary purposes for which the Refuge was established as well as achieve the goals and objectives described in Refuge planning documents. All farming would continue to occur on Farm Subunits 1, 2, or 3.

Farm Subunit 1

The largest portion of farmed Refuge croplands is in Farm Subunit 1, which is located in the Arizona North Management Unit near the headquarters and is approximately 892 acres in size (See Figure 1). This subunit consists of approximately 732 acres of alfalfa, 130 acres of corn, and 30 acres of small grain crops, typically wheat. Small quantities of milo and rye have also been planted in the subunit to complement or substitute for corn. Farm Subunit 1 is closed to public entry with the exception of Canada Goose Drive.

In this subunit, alfalfa is the largest crop grown and harvested by farmers but left as green browse for wildlife throughout the winter season. Corn is the secondary crop planted in July, grown at smaller quantities, and left unharvested for waterfowl forage in the winter. The corn remains standing until bumped or mowed down which allows free feeding by all wintering waterfowl**.** The cooperative agreement for Farm Subunit 1 identifies a 75/25 crop share agreement. Under this agreement, an average crop rotation is 732 acres alfalfa and 130 acres corn. Around 30 acres of other small grain crops (wheat and ryegrass) can be planted in the rotation that will benefit other migratory birds, which include doves and songbirds.

Farm Subunit 2

Farm Subunit 2 is located closer to the center of the Refuge in the Hart Mine Management Unit (See Figure 2). This subunit suffers from severe alkalinity problems due to a high ground water table. The area once contained non-native vegetation until high water tables inundated and destroyed these trees. Most of the salt cedar trees remaining after 1988 were cleared by the cooperative farmer. Prior to the farmer taking over, the fields were in Bermuda grass. Soil salinities caused the cooperative farmer to plant small grain crops (wheat, rye, and peas) during

the last growing season. These small grain crops have been rotated in as experimental crop practices for wildlife forage. High salinity levels continue to degrade planted crops and force the return of Bermuda grass.

This subunit is open to the public and is primarily used for goose hunting. This subunit is also agriculturally managed exclusively under cooperative agreement, but cultivation is completed entirely to help maintain and/or remediate soil salt conditions. All of the area is planted in alfalfa or other small grain crops in a rotation to keep soil salinities from increasing. The entire unit is designated as a public goose hunting area from November through January. All planted crops (alfalfa, wheat, peas, and ryegrass) are beneficial to mule deer, songbirds, and other wildlife. The crops are harvested in summer but left as a green browse in the winter for geese, cranes, deer, and other wildlife. The future management of this farm unit has potential to change due to its hydrological connection with ground water levels in the Hart Mine Marsh and Colorado River.

Farm Subunit 3

Lastly, the Refuge would continue to administer cooperative farming on Farm Subunit 3 which sits within an area called the Island Unit and originally consisted of approximately 500 acres (See Figure 3). Following the floods of 1983, all farming ceased because of high ground water table resulting in high alkaline conditions. Farming by only Refuge staff continued after the flooding on approximately 160 acres, and the Refuge temporarily ceased their cooperative farming program. More recently, a smaller amount of crop farming of alfalfa only has occurred on approximately 70 acres on the north end of the subunit under a cooperative agreement. The remaining acres that were once farmed in the subunit have been converted to moist soil managed wetlands or have been reforested in a mesquite or riparian habitat. This subunit would continue to be open to the public for waterfowl, mule deer, and upland game hunting.

Farming Subunit 3 would continue to be partially managed by Refuge staff as a moist soil or reforested unit and also partially managed under a cooperative farming agreement. Only 70 acres of the unit would be managed as a farm unit planted in alfalfa. All alfalfa planted is harvested between February and November, but left as green browse in the winter for geese, cranes, deer, and other wildlife. The cooperator would continue to be allowed to plant a crop of small grains (wheat, rye, or peas) in the rotation and harvest in summer allowing a green browse throughout the winter. The remaining acres in the unit would continue to be designated as semi-perennial wetlands, moist-soil wetland, or restoration areas.

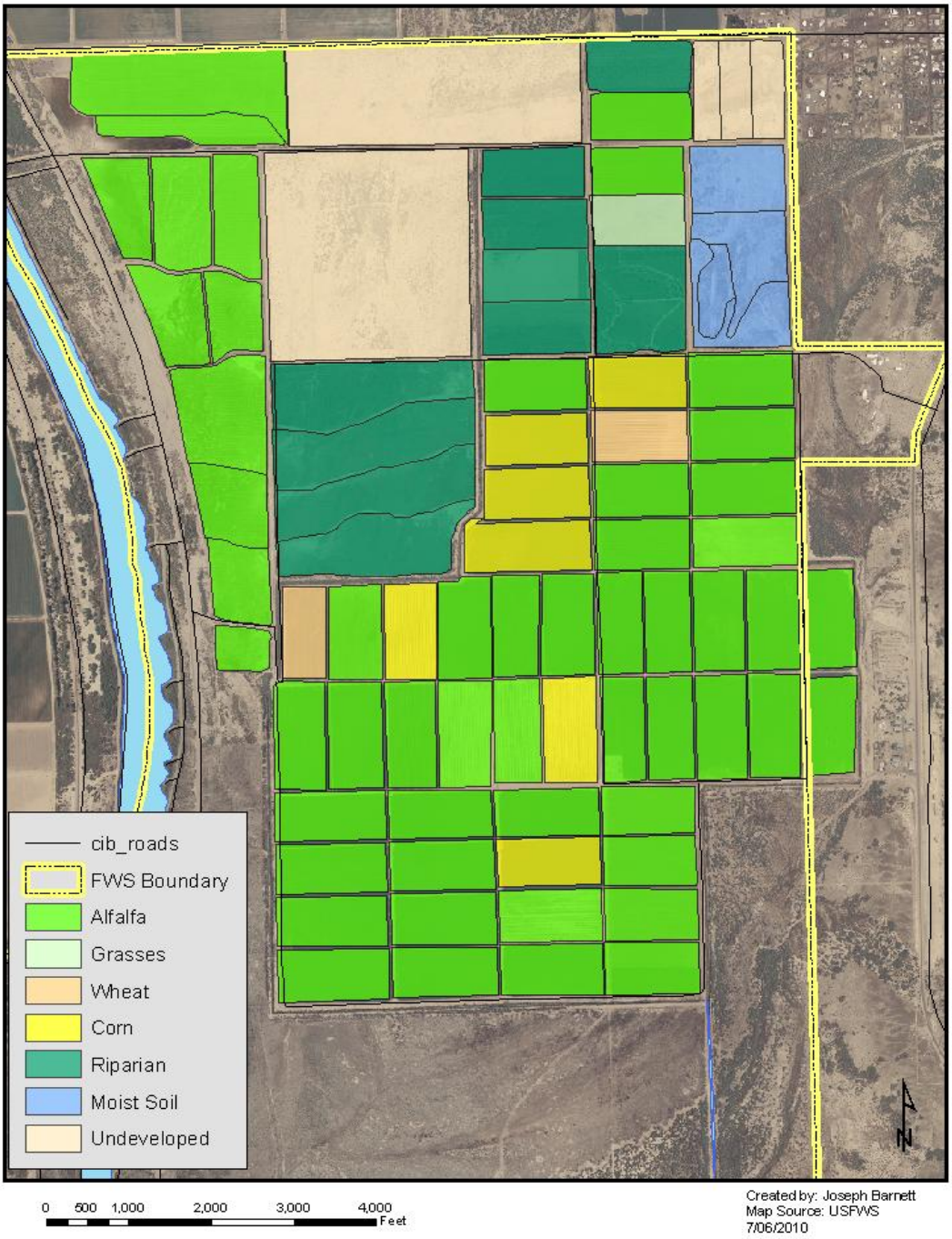

Figure 1. Farm Subunit 1 of the Cibola National Wildlife Refuge in the Arizona North Management Unit, estimated 892 acres.

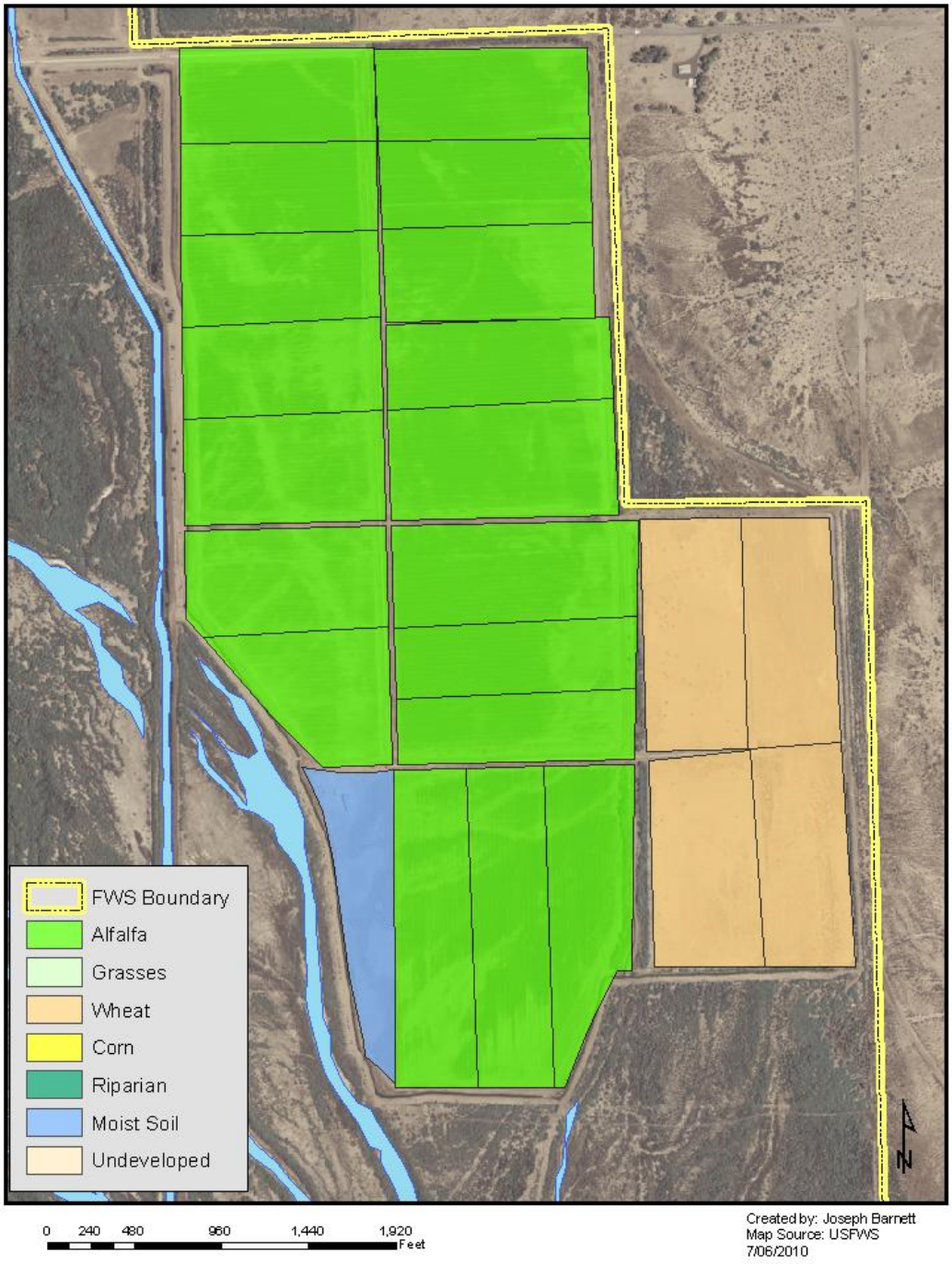

Figure 2. Farm Subunit 2 of the Cibola National Wildlife Refuge, within the Hart Mine Management Unit, estimated 300 acres.

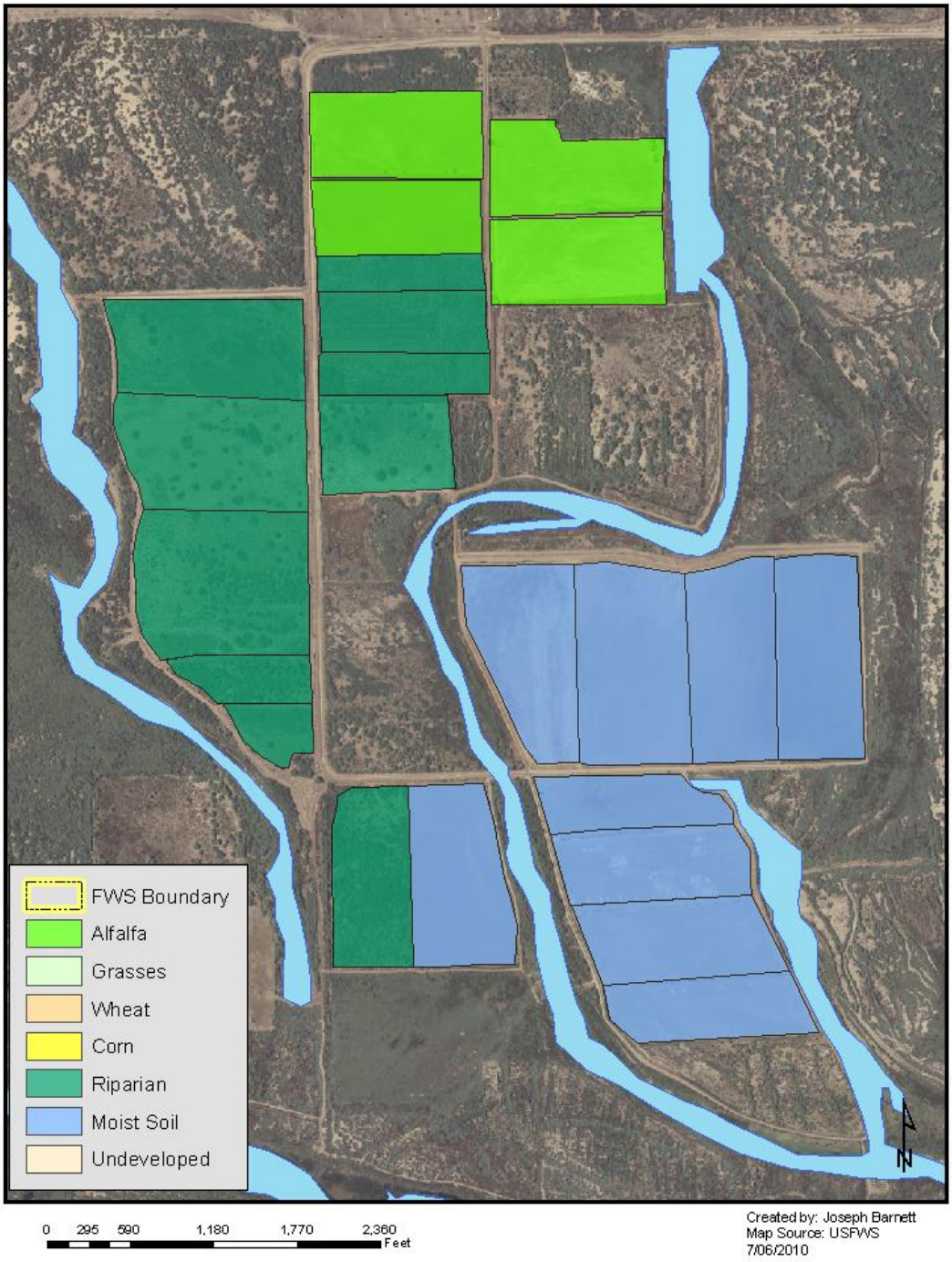

Figure 3. Farm Subunit 3 of the Cibola National Wildlife Refuge, within the Island Unit, estimated 70 acres.

Under the No Action alternative, the Refuge would continue to utilize cooperative farmers through Cooperative Farming Agreements. The current agreement requires the Refuge fields to be managed on a 4- or 5-year crop rotation, with 3 or 4 growing seasons of alfalfa followed by 1 season of forage/weed control crop. For example, Farming Subunit 1 has a total of 50 fields in the rotation that allow 4 years of alfalfa, followed by 1 year of corn and some introduction of small grains crops including barley, millet, wheat, or oats. The last alfalfa crop would continue to be left in the field for consumption by waterfowl and cranes. Grain crops would continue to be approved by the Manager, and shall be planted, irrigated, cultivated, and fertilized using normal farming practices. Small grain crops may be allowed to mature into grain for wildlife, plowed under as green manure, or harvested and used as a nurse crop when planting the following year. The same rotations may apply to Subunits 2 and 3 depending on the soil conditions and the need for other forage crops for wildlife.

Approximately 60 percent of the Refuge's water entitlement is utilized in support of the agriculture program. As part of the Cooperative Farming Agreement, the cooperator is allowed to use the Refuge's allocated water supply but is completely responsible for paying the cost of pumping water to the farm fields. This is a substantial benefit to the Refuge as topographical features on the Refuge prevent the possibility for water to be distributed by gravity-flow. Therefore, the Refuge is required to constantly pump water to reach the desired locations including the agriculture fields. This has resulted in electric bills topping $65,000 a year with approximately two-thirds of the cost associated with electrical pumping of water. Under the current management, the cooperator would continue to be responsible for paying the portion of the bill associated with farming practices.

Collectively on all 3 farm units, the farmers would continue to produce corn on approximately 130 acres, and discretionary crops on the remaining 1,132 acres. Corn is planted in July each year and left unharvested in order to provide waterfowl forage throughout the winter. The discretionary crops will consist mostly of alfalfa (1,036 acres), as well as oats, wheat, rye, or milo (96 acres). Crop types would continue to vary from year to year, depending on market conditions and needs. The alfalfa planting, growing, and harvesting season is from February to November of each year. Alfalfa and other small grains (wheat, rye, and peas) would continue to be harvested during the summer and left for green browse in the winter. All alfalfa crops would continue to be heavily used by mule deer throughout the entire year. The small grains would continue to be used heavily by dove, quail, and migratory birds.

Integrated Pest Management practices are employed on the Refuge to control plant pests. The cooperators use some pesticides to control weeds, but application is limited to prevent harm to non-target plants, water quality, or wildlife using Refuge agriculture habitat. The Refuge and cooperative farmers apply only pesticides that are approved through the Pesticide Use Proposal (PUP) process. Service policy requires that only minimal amounts of pesticides are used on refuge lands. Some mechanical cultivation practices are used to control plant or weed growth instead of pesticide application. Mowing and disking methods are primarily used to control plants without the use of pesticides.

Those pesticides related to agriculture practices and approved through the PUP process for use on Cibola National Wildlife Refuge include Pursuit, Raptor, Select 2EC, Rodeo, and Fusilade DX. Pursuit is utilized on alfalfa fields to maintain new alfalfa stand populations, adequate

yields, and stand longevity. Similarly, Raptor is also utilized on alfalfa fields to maintain new stand populations from weed competition. Select 2EC is used on alfalfa fields as well, in an effort to maintain crop yields and stand longevity by controlling Barnyard grass and Johnson grass, which affect the viability of crops. Rodeo is used on wheat and alfalfa stands to target pest species that interfere with moist soil and wetland management unit production; these pests include Bermuda grass, cattail, cocklebur, five hook bassia, giant salvinia, hemp sesbania, Johnson grass, phragmites, and salt cedar. Fusilade DX has been approved through the PUP process in order to control invasive, competitive plants (e.g., Johnson grass) on fallow agricultural fields.

Under this alternative, alfalfa and other small grains (wheat, peas, and ryegrass) would continue to provide a source of green browse during the fall and winter months for geese, cranes, deer, and other wildlife. Corn would also continue to provide high carbohydrate forage used by waterfowl, deer, and other wildlife during the colder months of winter. All crops planted in Farm Subunit 2 (alfalfa, wheat, peas, and ryegrass) are beneficial to mule deer, songbirds, and other wildlife, in addition to keeping soil salinities from increasing. Therefore, this alternative fully meets the purpose and need of the action.

2.2 Alternative B— Conversion of 242 Cooperatively Farmed Acres to Moist-Soil Management and Native Vegetation:

Under this Alternative, the Refuge would reduce farmed habitat by 242 acres and increase moist-soil management by 100 acres and restore 142 acres of native riparian habitat. Management would continue as described in Alternative A with the changes described below. All crops grown on the Refuge would continue to be non-genetically modified crops (non-GMCs).

Farm Subunit 1

Under Alternative B, the Refuge would reduce the farmed acreage in Farming Subunit 1 from 892 to 750 acres. A total of 142 acres would be removed from alfalfa/small grain crop, and converted to native riparian vegetation. The crop rotation on the remaining farming acreage would be split into an average of 620 acres of alfalfa and 130 acres of corn. The 142 acres converted to native vegetation would be planted in cottonwood-willow woodlands. Restoration activities would involve disking for site preparation. No soil amendments or additional chemical treatments are anticipated. Additionally, the Refuge would contour the fields to aid in water delivery. Through a contract with a local nursery, tree stock may be planted from genetics found on the Refuge. Trees would be planted mechanically or by hand over time. Initially, it is anticipated that the Refuge would apply fertilizer to enhance growth and survival. More dense stands of trees are likely to provide high quality habitat for neotropical migrants. Limited pesticide use would continue to be used around edges of newly restored areas to control invasive species. Overall, only pesticides approved through the PUP process would be used and the pesticide use would be relatively the same as Alternative A.

Due to the dry climate of the Refuge, planting of native vegetation would require the application of ample amounts of water to aid in establishment of the trees. For the first 1-2 years, this application would require approximately the same amount of water as keeping that acreage in

alfalfa (one irrigation per month or as needed in summer months). After 4-5 years, it is expected that the newly planted vegetation would have roots reaching the water table, and the Refuge could minimize watering of the stands to only a few occasions throughout the year when conditions are driest. Water requirements will vary depending on the desired habitat type; for example, creation of habitat for the Southwestern willow flycatcher would require higher amounts of water per unit area because a wet understory is needed. The Refuge would take on the responsibility of paying for the pumping of water on the 142 acres restored to native vegetation.

Farm Subunit 2

Under this alternative, the Refuge would reduce the amount of alfalfa and small grains produced on Farm Subunit 2 from 300 to 200 acres (a reduction of 100 acres or 33 percent of the current farm acreage on this subunit). The 100 acres removed from production would be converted to a moist-soil unit managed solely by the Refuge. Initially, pesticide application would be used to control Bermuda grass. This may require periodic application of pesticides due to the persistence of the Bermuda grass. Overall, pesticides use on this subunit would be similar to Alternative A. Site preparation would involve disking and planting of moist-soil managed seed (such as millet).

Flooding of moist-soil units typically is conducted from spring to summer as seeds germinate. The moist-soil units require once a week irrigation until a full crop is grown with subsequent drawdown. The moist-soil unit would also be flooded during the winter to support various wildlife species including shorebirds, waterfowl, upland game, and migratory birds. To receive full benefit of moist-soil units require continued inundation throughout the winter for up to four months which requires a very large amount of water. Under this alternative, the Refuge would have the added expense of pumping water to the newly established 100-acre moist-soil unit. Additionally, the moist-soil unit would require up to ten times as much water as the alfalfa field it would replace; therefore, the Refuge would be forced to utilize a larger portion of their water entitlement to support the management under this alternative.

Farm Subunit 3

Farm Unit 3 would remain cooperatively farmed on the entire 70 acres, with the crops rotated from alfalfa to small grain crops.

Implementation of this alternative would result in an overall decrease of farming acreage on Cibola National Wildlife Refuge from 1,262 acres to 1,020 acres. On the remainder of the farming acreage, all crops grown would continue to be non-genetically modified crops and the Refuge would continue to utilize cooperative farmers working under a Cooperative Farming Agreement. Additionally, the Refuge would continue to utilize the pesticides listed under Alternative A in the same manner as described previously.

This alternative would continue to meet the purpose and need of the action as described in Chapter 1 of this document, but this management would provide less browse and forage for migratory birds and resident wildlife. While moist-soil management would compensate for some of the supplemental food from reduced agricultural acreage, current staff and funding levels would not support this alternative. In addition, Refuge management is limited by their water

rights. Also, under this alternative, the Refuge would incur the added cost of pumping water to restore the native vegetation and create additional moist-soil units.

2.3 Alternative C— Conversion of 550 Cooperatively Farmed Acres to Moist-Soil Management and Native Vegetation:

Under this Alternative, the Refuge would reduce farmed habitat by 550 acres and increase moist-soil management by 350 acres and restore 200 acres of native riparian habitat. Management would continue as described in Alternative A with the changes described below. All crops grown on the Refuge would continue to be non-genetically modified crops (non-GMCs).

Farm Subunit 1
Under Alternative B, the Refuge would reduce the farmed acreage in Farming Subunit 1 from 892 to 492 acres. A total of 362 acres of alfalfa and 130 acres of corn would remain in production. The 400 acres removed from farming would be split between conversion of 200 acres to moist-soil management and 200 acres to native vegetation. Implementation of these activities would be the same as described in Alternative B.

Farm Subunit 2
Under this alternative, the Refuge would reduce the amount of alfalfa and small grains produced on Farm Subunit 2 from 300 to 150 acres (a reduction of 150 acres or 50 percent of the current farm acreage on this subunit). The 150 acres removed from production would be converted to a moist-soil unit managed solely by the Refuge. Conversion and management of the newly established moist-soil units would be the same as described under Alternative B.

Farm Subunit 3
Farm Unit 3 would remain cooperatively farmed on the entire 70 acres, with the crops rotated from alfalfa to small grain crops.

Implementation of this alternative would result in an overall decrease of farming acreage on Cibola National Wildlife Refuge from 1,262 acres to 712 acres. On the remainder of the farming acreage, all crops grown would continue to be non-genetically modified crops and the Refuge would continue to utilize cooperative farmers working under a Cooperative Farming Agreement. Additionally, the Refuge would continue to utilize the pesticides listed under Alternative A in the same manner as described previously.

This alternative would continue to meet the purpose and need of the action as described in Chapter 1 of this document, but it would not do so as well as Alternatives A and B. This management would provide less browse and forage for migratory birds and resident wildlife. While moist-soil management would compensate for some of the supplemental food from reduced agricultural acreage, current staff and funding levels would not support this alternative. In addition, Refuge management is limited by their water rights.

2.4 Comparison of Alternatives

Issue		**Alternative A** Current Management (Proposed Action)	**Alternative B** Conversion of 242 Cooperatively Farmed Acres to Moist-Soil Management and Native Vegetation	**Alternative C** Conversion of 550 Cooperatively Farmed Acres to Moist-Soil Management and Native Vegetation
Use of Genetically Modified Crops		No GMCs would be used.	Same as Alternative A.	Same as Alternative A.
Use of Pesticides to Control Pests and/or Invasive Species		Only pesticides approved through the Pesticide Use Proposal process would be utilized.	Same as Alternative A.	Same as Alternative A.
Management Considerations	**Subunit 1**	892 acres in agriculture (732 acres alfalfa, 130 acres corn, 30 acres small grain)	750 acres in agriculture (620 acres alfalfa and 130 acres corn); 142 acres converted to native vegetation	492 acres in agriculture (362 acres alfalfa and 130 acres corn); 200 acres converted to native vegetation; 200 acres converted to moist-soil management
	Subunit 2	300 acres in agriculture (alfalfa and small grain rotation)	200 acres in agriculture (alfalfa and small grain rotation); 100 acres converted to moist-soil management	150 acres in agriculture (alfalfa and small grain rotation); 150 acres converted to moist-soil management
	Subunit 3	70 acres in agriculture (alfalfa and small grain rotation)	Same as Alternative A.	Same as Alternative A.

Water Rights	Use of allocated water rights would not change.	100 acres of previously cultivated land would be converted to moist-soil management, requiring increased use of allocated water rights. Additionally, 142 acres would be restored to native vegetation, which would likely require roughly the same amount of water input as agricultural habitat.	350 acres of previously cultivated land would be converted to moist-soil management, requiring increased use of allocated water rights. Additionally, 200 acres would be restored to native vegetation, which would likely require roughly the same amount of water input as agricultural habitat.

2.5 Alternatives Considered But Dismissed From Detailed Analysis:

Elimination of the farming program on Cibola National Wildlife Refuge was considered, but staff determined that this alternative would not meet the purpose and need described in the EA or the overall purpose of the Refuge. The Refuge was established to provide habitat for migratory waterfowl on the lower Colorado River, where human development and river channelization has caused habitat decline. If the Refuge ceased management of the agricultural fields, they would not produce adequate amounts of food to support the migratory waterfowl and other wildlife species dependent on the Refuge. For example, the Refuge provides a winter home for over 85 percent of the Canada geese that visit the state of Arizona. Eliminating farming would likely eliminate or reduce this trend. Likewise, it is likely that crop depredation on nearby privately owned farmlands would dramatically increase. Therefore, elimination of the agriculture program on the Refuge was determined to be unfeasible and was dismissed from further evaluation.

Refuge staff also considered converting the entire 1,262 acres of agricultural habitat to moist-soil management. By removing the cooperative farming program, the Refuge would take on the added financial responsibility of paying for all pumping of water. This large expense would be added to the Refuge budget. In addition, the Refuge would be limited as to how many acres could actually be converted to moist-soil due to the Refuge's water entitlement. Moist-soil units on the Refuge typically require up to 10 times as much water as alfalfa croplands. Simultaneously, the Refuge is currently utilizing close to 90 percent of their yearly water allotment. To remain within their entitlement, the Refuge would likely be restricted to converting only between 84 and 125 acres to most-soil management. The remainder of the retired agriculture fields would remain fallow, increasing the potential for widespread overtaking by invasive species. Additionally, the up to 125 acres of moist-soil units would not be able to support the same populations of migratory waterfowl as the 1,262 acres of agricultural habitat,

and the Refuge would be unable to meet both the purpose and need described in this EA and that of the Refuge itself. Therefore, this alternative was considered but eliminated from detailed analysis.

The Refuge considered converting their farm program to organic farming but determined this action to not be feasible. This action would be labor intensive and expensive as mechanical treatments to control invasive and nuisance species would have to be increased. It is unlikely that the Refuge would be able to find local farmers to participate in the program. The quality of the farming program would likely decrease as yields decrease; therefore, less food would be produced for wildlife. In addition, the Refuge does not currently have adequate staffing and funding to implement organic farming through force account.

3.0 AFFECTED ENVIRONMENT

This section provides a description of the affected resources determined to be applicable to the range of alternatives. Located along approximately 12 miles of the lower Colorado River in Imperial County, California and La Paz County, Arizona, the roughly 18,444 acre Cibola National Wildlife Refuge is situated in the floodplain of the lower Colorado River and surrounded by a fringe of desert ridges and washes. The Refuge encompasses both the historic Colorado River channel as well as a channelized portion constructed in the late 1960s. Along with these main water bodies, several important backwaters are home to many wildlife species that reside in this portion of the Sonoran Desert. Because of the river's life-sustaining water, wildlife here survive in an environment that reaches 120 degrees Fahrenheit in the summer and receives an average of only 2 inches of rain per year.

3.1 Physical Environment

The Refuge, mostly on the Colorado River's floodplain, contains habitat that is rare in the arid environment of dry washes and desert bench lands found in southern Arizona and southeastern California. The Refuge is composed of the 600-acre Cibola Lake, approximately 10 miles of Colorado River backwaters, fields of moist-soil management areas, 1,262 acres of operational agricultural habitat, 2 historic river meanders, Three Finger Lake, Hart Mine Marsh, and about 785 acres of desert ridge and dry-wash land. Within the project area, the topography is generally flat, with slight slopes toward the south and east.

3.1.1 Air Quality:

The project area has excellent air quality, due to the rural land uses in most of the surrounding area.

3.1.2 Soils / Geology:

Soils in the project area consist of sandy loam intermixed with some heavier clays that extend past the riparian area into the uplands. Soils near the riparian area are generally compacted due to road development and levee maintenance.

The historical floodplain of the Colorado River consists of very productive soils in many areas. The river's deposition of sediment load contributes to a varied soil horizon of sand, silt and clay that took many years to develop. Farming areas that have remained fallow or been abandoned over the past years continue to degrade as salts accumulate at the surface through normal evaporation. The soils, if left unaltered, are eventually overtaken by native desert species or in many cases invasive plants like salt cedar (*Tamarix chinensis*).

3.1.3 Water Resources and Quality:

The entirety of the project area is located within the 100-year floodplain of the Colorado River Valley. The Colorado River is the primary source of water for the Refuge, both in terms of surface water and groundwater resources.

When farm fields in an arid environment are irrigated, they have the potential to become 'salt loaded' on or near the surface if the underlying soil has abundant soluble salts. High rates of evaporation induce the upward translocation through the soil profile of salt in solution until it accumulates at the soil surface. If these salts are not periodically 'flushed' back down into the soil profile, fields become salty as does field drainage water. When field effluent is delivered to a water body like Hart-Mine Marsh or Cibola Lake, the chemistry of the receiving water body can change in a negative fashion. Water quality data collected from Refuge water bodies that are no longer in direct contact with the Colorado River reveal that this process is currently operative. A trend toward increased selenium concentrations has been measured in Cibola Lake, Hart-Mine Marsh, and Three Fingers Lake.

The Service faces a difficult conundrum with respect to water quality. Specifically, Refuge water bodies that are no longer in free-flow connection with the Colorado River display degraded water quality over time (i.e., higher salinity, lower dissolved Oxygen, etc.). A free-flowing connection to the river would carry water quality benefits to most of the areas. However, the conundrum arises with respect to Selenium. The water of the Colorado River is thought to be the only source of Selenium in the lower Colorado River area. Consequently, if Colorado River water is introduced into backwater areas, Selenium will be introduced as well.

The water entitlement for the Refuge was established on December 8, 1982, and states, "Consistent with the February 9, 1944, contract between the U.S. and the State of Arizona, notice is given that the following amount of lower Colorado River water is reserved for the United States for use on the Cibola National Wildlife Refuge in Arizona: (1) the diversion of 7,500 acre-feet annually from the mainstream for circulation water, and (2) the diversion of 27,000 acre-feet annually from the mainstream or the consumptive use of 16,793 acre-feet annually from the mainstream, whichever is less, with a priority date of August 21, 1964."

3.2 Biological Environment

3.2.1 Vegetative Communities:

The project area includes associated riparian habitats, floodplains, backwaters, and adjacent uplands. The diverse topography is dissected and ranges in elevation from 200 to 250 feet. The width of the river channel and floodplain varies from less than 0.1 to greater than 0.5 miles. Prominent cliffs rise 100 to 300 feet above the River.

Habitat types in the North Management Unit where Farm Subunit 1 is located include agricultural habitat, moist-soil units, cottonwood, willow, atriplex, salt cedar, mesquite, and seasonally flooded ponds. Wildlife known to use this area includes sandhill cranes, Canada geese, shorebirds, invertebrates, and other waterfowl. Habitat types near Farm Subunit 2 in the Hart Mine Management Unit include high alkalinity cropland, cattail marsh, salt cedar, mesquite,

old river bottomland, and open water. Wildlife that utilize this area include cranes, geese, ibis, waterfowl, Yuma clapper rail, and other marsh and waterbirds. Lastly, habitat types in and around the Island Management Unit where Farm Subunit 3 is situated include cottonwood, willow, salt cedar, agricultural habitat, moist-soil management units, screwbean and honey mesquite, and limited marsh. Wildlife using this area include small and large mammals, raptors, quail, dove, cottontail, seed-eating passerines, waterfowl, reptiles, shorebirds, swans, and migratory birds.

3.2.2 Wildlife:

Over 288 species of birds have been observed on Cibola National Wildlife Refuge, including many species of migratory songbirds, Gambel's quail, roadrunners, mourning and white-winged doves, phainopepla, greater sandhill cranes, Canada and snow geese, Vermilion flycatchers, grosbeaks, and many more. A host of species reside on the Refuge year-round including many aquatic birds that nest in the backwaters of the river. It is a common sight to see western and Clark's grebes young riding on their parents' back, a heron and egret rookery, nesting mourning and white-winged doves, barn owls, burrowing owls, kestrels, white-faced ibis, and more. It is also not uncommon to see desert mule deer, bobcat, and coyotes on the Refuge. Management of farm fields along with restoration of wetlands and moist-soil units provide habitat for thousands of Canada geese that migrate to the Refuge in the winter. About 85% of Arizona's wintering Canada goose population resides on the Refuge.

3.2.3 Threatened and Endangered Species and Other Special Status Species

The Southwestern willow flycatcher, Yuma clapper rail, bonytail chub, and razorback sucker are among the endangered species that utilize Cibola National Wildlife Refuge. Other candidate or recovered species include the desert tortoise (Arizona-Sonoran subspecies), Yellow-billed cuckoo, bald eagle, and Peregrine falcon. None of these species, however, utilize agricultural habitat on the Refuge.

3.3 Human Environment

3.3.1 Cultural Resources:

For centuries, Cibola National Wildlife Refuge was part of the ancestral and traditional home of the Yuma Tribes of the Colorado River, principally the Mohave and Quechan. Archaeologists refer to the prehistoric Yumans as the "Patayan." The people farmed the river floodplain, which flooded annually depositing rich soils for crops. Following each harvest, the people left the river to hunt and gather wild plants in the neighboring desert uplands, returning to the river once again to plant crops, after the spring floods had subsided. Because of the annual flooding, however, little physical evidence of their dispersed villages has survived.

Given that the project area is within the flood plain of the Colorado River, most of the ground surface at Cibola National Wildlife Refuge has historically been flooded and reworked, making the location of archeological sites an infrequent occurrence. Indeed, perhaps more than any other

region of the Southwest, the native tradition of the lower Colorado River is defined almost entirely through modern ethnography and historic accounts rather than by evidence of prehistoric archeology.

All of the alternatives involve cultivating crops on previously farmed lands or reducing the amount of lands already in production. Therefore, it is not expected that cultural resources, including Indian trust assets, will be affected by the actions outlined in this EA.

3.3.2 Socioeconomic Resources:

The Refuge is located near the small town of Cibola, Arizona, which had a population of approximately 170 people at the time of the 2000 Census. Several other small towns are also within thirty to ninety miles away, but the area is primarily rural. The predominate land uses in Refuge vicinity is irrigated farming and recreation on other public lands. The Refuge is tied to the local economy largely through the public's use of the Refuge for recreational opportunities. These opportunities typically come in the form of fishing, hunting, wildlife viewing, and sightseeing. The Refuge plays a role in the local economy as relates to the fact that Refuge employees typically live in the community, own property, and support local businesses through their routine purchases.

3.3.3 Visitor Services/Public Use Opportunities

The Refuge provides the public with opportunities for hunting, fishing, wildlife observation, photography, environmental education, and interpretation. The entire project area (agricultural lands) is open to wildlife observation and photography. Interpretation may occur but is limited to the Auto Tour Loop, which goes through Farm Subunit 1.

The Refuge provides goose hunting opportunities in Farm Subunit 2 and goose, waterfowl, small game, and deer hunting opportunities on Farm Subunit 3. In Farm Subunit 2, there are 14 blinds specifically used for goose hunting. The hunting program is operated under a lottery system, and these opportunities are in high demand. Although there are surrounding public lands, none of these areas provide waterfowl habitat.

3.3.4 Visual Resources:

While the Colorado River and river valley are the most notable natural features and by themselves provide a visual resource, natural views are limited within the previously disturbed project area. Water management devices are scattered throughout the landscape, diverting water to irrigation systems and subsequent farming operations. None of the alternatives analyzed in this EA require a change in the mechanical irrigation systems already existing on the Refuge, and each only proposes to continue agriculture operations on lands already designated to this use. With no new construction activities, it is not expected that any of the alternatives will have an effect on visual resources of the Refuge.

4.0 ENVIRONMENTAL CONSEQUENCES

This chapter analyzes and discusses the potential environmental effects or consequences that can be reasonably expected by the implementation of the alternatives described in Chapter 2.0 of this EA. An analysis of the effects of management actions has been conducted on the physical environment (air quality, water quality, and soils); biological environment (vegetation, wildlife, and threatened and endangered species); human environment (socioeconomic resources and visitor services). It has been determined that the current management and its alternatives will not have impacts on climate, hydrology, geology, mineral resources, cultural resources, and visual resources; therefore, there will be no further discussion of these resources in the analysis. Potential impacts to all other resources are addressed below.

The direct, indirect, and cumulative impacts of each alternative are considered in the Environmental Assessment.

- **Direct effects** are the impacts that would be caused by the alternative at the same time and place as the action.
- **Indirect effects** are impacts that occur later in time or distance from the triggering action.
- **Cumulative effects** are incremental impacts resulting from other past, present, and reasonably foreseeable future actions, including those taken by federal and non-federal agencies, as well as undertaken by private individuals. Cumulative impacts may result from singularly minor but collectively significant actions taking place over a period of time.

The Refuge also considered various types of impacts during the Environmental Assessment. These include beneficial and adverse impacts.

- **Beneficial impacts** are those resulting from management actions that maintain or enhance the quality and/or quantity of identified refuge resources or recreational opportunities.
- **Adverse impacts** are those resulting from management actions that degrade the quality and/or quantity of identified refuge resources and recreational opportunities.

The Environmental Assessment also evaluates the reasonably expected duration of each impacts, whether short-term or long-term.

- **Short-term impacts** affect identified refuge resources or recreational opportunities and occur during implementation of the project but last no longer.
- **Long-term impacts** affect identified refuge resources or recreation opportunities and occur during implementation of the management action and are expected to persist in the 1-5 years following implementation.

The Refuge considered the intensity of impact when evaluating the alternatives presented in the Environmental Assessment.

- **Negligible impacts** result from management actions that cannot be reasonably expected to affect identified refuge resources or recreational opportunities at the identified scale.

- **Minor impacts** result from a specified management action that can be reasonably expected to have detectable though limited effect on identified refuge resources or recreation opportunities at the identified scale.
- **Moderate impacts** result from a specified management action that can be reasonably expected to have apparent and detectable effects on identified refuge resources or recreation opportunities at the identified scale.
- **Major impacts** result from a specified management action that can be reasonably expected to have readily apparent and substantial effects on identified refuge resources and recreation opportunities at the identified scale.

Scale of impact is an additional consideration evaluated in this EA. Geographic scale can refer to effects at the site-specific level, local level, or Refuge-wide.

- **Site-specific** effects are those impacts that occur solely within the project area's agricultural habitat.
- **Local** effects are those impacts that can be reasonably expected to have detectable effects within and immediately surrounding the project area's agricultural habitat.
- **Refuge-wide** effects are those impacts that can be reasonably expected to have noticeable effects across the entire Refuge landscape.

4.1 Physical Environment

4.1.1 Impacts on Air Quality:

Alternative A –Current Management (Proposed Action)
Continuation of the current agriculture activities would cause minor short-term negative effects to air quality. These direct impacts would be the result of increased dust and emissions produced by agriculture equipment such as tractors and ploughs. Pesticide treatment of invasive weed species also has the potential to result in spray drift that could degrade air quality at the local scale in the short-term. The Refuge, however, implements best management practices to minimize the potential for spray drift by only applying pesticides when wind speed is below 10 miles per hour. Experience has shown that any impacts to air quality resulting from the current agriculture program would remain minor, short-term, and local and would not cause any significant impacts to air quality.

Alternative B - Conversion of 242 Cooperatively Farmed Acres to Moist-Soil Management and Native Vegetation
Implementation of Alternative B would likely result in the same minor, short-term, localized negative effects to air quality as Alternative A resulting from equipment emissions, fugitive dust, and spray drift. In addition, areas that are restored to native riparian habitat would likely provide beneficial impacts to site-specific areas in the long-term.

Alternative C - Conversion of 550 Cooperatively Farmed Acres to Moist-Soil Management and Native Vegetation
Same as Alternative B.

4.1.2 Impacts on Water Quality and Quantity

Alternative A—Current Management (Proposed Action)
Crop production on all three farm subunits would result in disturbance to soils as crops are planted and maintained; this disturbance has the potential to indirectly result in an increased amount of soil particles reaching local water bodies and causing sedimentation. Pesticides applied to agriculture fields could reach nearby water bodies through runoff events or wind erosion resulting in degraded water quality. Buffer zones are utilized to prevent any potential negative effects. Cooperative farmers are required to follow the integrated pest management strategies outlined in approved PUPs to supplement and minimize the use of pesticides; such activities include tillage, cover crops, mowing, and mechanical removal. These activities minimize the need to utilize pesticide treatments and, thus, reduce the potential for negative impacts associated with pesticide use. Experience shows that these activities would likewise minimize the intensity, duration, and scale of the potential effects; thus, none of these potential direct or indirect effects to water quality would be significant in nature. Therefore, it is expected that the current management would result in short-term minor negative effects to water quality at the local scale.

Additionally, continuing the current agricultural management would result in the continued need for pumping of water diverted from the lower Colorado River for consumptive use on the Refuge. The water for irrigation is pumped from the river at three locations by electric pumps and delivered into feeder canals which distribute water to headgate-equipped field ditches to flood irrigate the receiving fields. As fields fill, they may deliver excess irrigation water into drains. Fields are often kept in flooded condition for extended periods and much of the irrigation water will remain on the fields to which it was applied until the water (and accumulated salts) is translocated downward into the soil profile. Return flow from irrigated fields is delivered either to drains, marshes, or the river itself. Each of these uses is within the designated beneficial use described by the Refuge's water rights. Therefore, this would result in short-term minor negative impacts to water quantity across the Refuge as water is supplied to farming operations.

Alternative B - Conversion of 242 Cooperatively Farmed Acres to Moist-Soil Management and Native Vegetation
Alternative B would result in the same short-term minor effects to water quality at the local scale with decreased intensity due to the removal of 242 acres out of crop production. In the short-term, this alternative may require increased pesticide application to ensure that invasive species do not encroach upon the area. In the long-term, this shift in management would result in the decreased need for ground-disturbing activities and pesticide application as native vegetation is fully established. This would lessen the potential for chemicals and sediment to reach nearby waterbodies. However, 1,020 acres would remain in production, and short-term minor negative effects to water quality would still occur on those lands as described in Alternative A.

Alternative B would also result in a continuation of minor short-term Refuge-wide negative impacts to water quantity as Alternative A as water is diverted from the lower Colorado River and supplied to agriculture operations, moist-soil management, and native habitat restoration.

Moist-soil management would demand increased water use; however, the Refuge would continue to operate within its current water entitlement.

Alternative C - Conversion of 550 Cooperatively Farmed Acres to Moist-Soil Management and Native Vegetation
Impacts on water quality would be similar to Alternative B with decreased intensity due to added restoration activities, but impacts to water quantity would be greater because this alternative would require more water than Alternative A or Alternative B.

4.1.2 Impacts on Soils:

Alternative A – Current Management (Proposed Action)
Alternative A would involve continual planting and harvesting on 1,262 acres of Refuge agricultural habitat. Agriculture activities would continue to require ground-disturbing activities, such as plowing or mowing, and pesticide use that, in combination, could produce negative effects to soil texture, structure, and chemistry. As the cooperators prepare the ground for planting and maintain their crops, there is an increased risk of soil erosion and leaching of nutrients. The use of pesticides to treat invasive species may result in changes to soil chemistry, such as pH. The need for pesticide treatment is, however, minimized through the implementation of Integrated Pest Management. Experience shows that each of these adverse impacts to soils would remain minor, short-term, and site-specific.

In addition, Farm Subunit 2 suffers from alkalinity problems that have continued to degrade planted crops and force the return of Bermuda grass. On this subunit, agriculture is performed to maintain and remediate soil salt conditions and provide public hunting opportunities. Planting of alfalfa and small grain crops under the current management would continue to provide a long-term, major, site-specific beneficial impact to soils within this subunit.

Alternative B - Conversion of 242 Cooperatively Farmed Acres to Moist-Soil Management and Native Vegetation
Alternative B would result in the same impacts to soils as Alternative A, with slightly decreased intensity as 242 acres would be removed from production. Moist-soil management would likely require similar level of management and subsequent impacts to soils as Alternative A. On restored areas, this alternative would allow for a decrease in the ground-disturbing activities that have the potential to negatively affect soils. Ultimately, restoring 142 acres to native vegetation would provide minor, long-term, beneficial impacts to soils at the site-specific scale, as agriculture activities cease and native riparian vegetation is established. Utilizing the remainder of the agriculture acreage would continue to result in the same impacts to soils as Alternative A.

Alternative C - Conversion of 550 Cooperatively Farmed Acres to Moist-Soil Management and Native Vegetation
Alternative C would cause the same impacts to soils as Alternative B. Restoration of 200 acres would provide increased long-term beneficial impacts.

4.2 Biological Environment

4.2.1 Impacts on Habitat:

Alternative A - Current Management (Proposed Action)
Continuation of the current agricultural management would maintain the current habitat conditions on the Refuge, thus continuing to provide major, long-term, beneficial impacts to habitat at the local scale. On an annual basis, these 1,262 acres provide habitat and food for migratory waterfowl in the winter and resident wildlife year-round. The Refuge is a rare oasis in the desert and provides vital habitat for wildlife during all seasons.

Alternative B - Conversion of 242 Cooperatively Farmed Acres to Moist-Soil Management and Native Vegetation
Alternative B would involve the removal of 242 acres from production, which would change the mosaic of habitat types distributed across the Refuge landscape. The 100 acres of agricultural habitat removed from Farm Subunit 2 would reduce the habitat utilized by geese and cranes. In replacement of those acres, the new moist-soil management unit would instead provide habitat for shorebirds, waterfowl, upland game, and migratory birds. The 142 acres removed from Farm Subunit 1 under this alternative historically served as habitat for sandhill cranes, Canada geese, shorebirds, waterfowl, and other wildlife. Under this alternative, the land would be restored to native vegetation that has the potential to provide habitat for passerine, quail, neoptropical songbirds, small and large mammals, raptors, and amphibians.

Overall, this shift in habitat would result in a similar continuation of major, long-term, beneficial impacts to habitat at the local scale as Alternative A, but it would involve a slightly different mosaic of habitat types.

Alternative C - Conversion of 550 Cooperatively Farmed Acres to Moist-Soil Management and Native Vegetation
Alternative C would result in the same types of impacts as Alternative B also shifting the mosaic of habitat types across the Refuge with increased native and moist-soil habitat.

4.2.2 Impacts on Wildlife:

Alternative A – Current Management (Proposed Action)
Continuation of the current agriculture activities would continue to result in both short-term and long-term direct impacts to resident and migratory wildlife at the Refuge-wide scale. Minor short-term negligible effects to wildlife include the disturbance and displacement of wildlife that is typical of any heavy equipment operation. In additional, pesticide use occurring on the Refuge has the potential to result in minor short-term negative effects to wildlife at the site-specific scale, but such use is limited to prevent or reduce acute or chronic adverse effects. Alternatively, short-term major beneficial impacts include the production of food and habitat for an estimated peak population of 7,000 Canada geese, 1,000 snow geese, 2,800 sandhill cranes, and as many as 25,000 ducks. Alfalfa and other small grains (wheat, peas, and ryegrass) provide a source of green browse during the fall and winter months for geese, cranes, deer, and other wildlife. Over 85 percent of the Canada geese that visit the state of Arizona migrate to the Refuge and depend

on alfalfa fields for browse. Corn provides high carbohydrate forage used by waterfowl, deer, and other wildlife during the colder months of winter. All crops planted in Farming Subunit 2 (alfalfa, wheat, peas, and ryegrass) are beneficial to mule deer, songbirds, and other wildlife. Other species that indirectly benefit from the croplands on the Refuge include a variety of other granivorous birds that use the crops after they have cured (most notably Gambel's quail, white-winged doves, and mourning doves) and small mammals and their predators, including owls, hawks, falcons, and coyotes. Larger scale long-term beneficial impacts resulting from the current management include the potential to sustain or even increase populations of migratory waterfowl, cranes, and resident wildlife.

Alternative B - Conversion of 242 Cooperatively Farmed Acres to Moist-Soil Management and Native Vegetation

Alternative B would result in similar impacts to wildlife as Alternative A although with slight variations. The addition of 100 acres of moist-soil units would result in an increase of habitat available to shorebirds, waterfowl, upland game, cranes, and migratory birds. This change in management would therefore provide short-term minor beneficial impacts to these species at the site-specific scale. Simultaneously, the removal of 100 acres from cultivation would reduce crops utilized by cranes, geese, ibis, marshbirds, waterbirds, and resident wildlife. Similarly, the conversion of 142 acres from alfalfa production on Farm Subunit 1 to native vegetation would also decrease benefits to these species. It is likely that the local deer population would be negatively impacted by this alternative; while deer would utilize native habitat for cover, their food supply would be negatively impacted by reducing alfalfa and corn fields. After the 142 acres are restored to native vegetation, this shift in management could produce similar short-term beneficial impacts at the site-specific scale by increasing habitat for passerine, quail, neoptropical songbirds, invertebrates, small and large mammals, raptors, and amphibians that reside in and migrate to the native habitat that would be provided in Farm Subunit 1. This shift in management would produce short-term minor adverse effects for these species at the site-specific scale.

Under Alternative B, large-scale long-term beneficial impacts could result from the potential to sustain or even increase populations of migratory waterfowl and resident wildlife.

Alternative C - Conversion of 550 Cooperatively Farmed Acres to Moist-Soil Management and Native Vegetation

Alternative C would result in similar impacts to those described under Alternative B with more native habitat and moist-soil units and less agricultural areas. There would be greater negative impacts to species that rely on croplands and greater beneficial impacts to species that depend on native habitat and moist-soil habitat. A greater shift in habitats across the Refuge would occur, providing more value for neotropical migrants while detracting from that for geese.

4.2.3 Impacts on Threatened and Endangered Species and Special Status Species:

Alternative A – Current Management (Proposed Action)
Under the current agricultural management, the existing habitat conditions for threatened and endangered species would be maintained. None of the listed species that occur on the Refuge are known to occupy or utilize farm fields. Current management would not produce beneficial or negative effects for any of the listed or candidate species occurring in the project area. Additionally, each of the five pesticides currently used on the Refuge is expected to have no effect on any of the federally-listed species and critical habitat described in their Pesticide Use Proposals. There would be no direct, indirect, or cumulative impact to Threatened and Endangered Species from continuation of current management.

Alternative B - Conversion of 242 Cooperatively Farmed Acres to Moist-Soil Management and Native Vegetation
Areas converted to native habitat would potentially produce long-term beneficial effects at the site-specific scale to the southwestern willow flycatcher and yellow-billed cuckoo.

Alternative C - Conversion of 550 Cooperatively Farmed Acres to Moist-Soil Management and Native Vegetation
The effects of Alternative C would be similar to but greater than Alternative B due to increased restored acreage.

4.3 Human Environment

4.3.1 Impacts on Socioeconomics

Alternative A – Current Management (Proposed Action)
Under the No Action Alternative, the economic and social condition of the area would remain the same. The Refuge would continue to provide economic benefits to two cooperative farmers in exchange for the service they provide.

Under the current agriculture program, the cooperators would continue to pay the Refuge expenses associated with pumping water to the agriculture fields. Nearly 60 percent of the Refuge's water supply is associated with agriculture management and all of that water must be pumped to reach desired destinations. Therefore, the Refuge receives substantial electrical bills reflecting the cost of pumping the water to agriculture fields. Under Alternative A, the cooperative farmer would continue to pay this cost, thereby assisting the Refuge in utilizing their water entitlement to meet the Refuge purpose.

In addition, the Refuge agriculture program minimizes crop depredation on surrounding area lands, thus preventing economic loss to private landowners. The agriculture program provides two cooperative farmers with the land required to practice their agriculture operations. The cultivation and planting of agricultural crops that benefit wildlife would continue to be done solely through the cooperative farmers who oversee the cost of fuel, equipment, seed, fertilizers,

pesticides, and electric pumping costs for irrigation. These farming inputs are typically purchased from stores and individuals located in the local community, thereby stimulating the local economy. Overall, the current management would continue to provide long-term minor beneficial impacts to the socioeconomic resources of the Refuge's nearby communities.

Alternative B - Conversion of 242 Cooperatively Farmed Acres to Moist-Soil Management and Native Vegetation
Generally, Alternative B would reduce the long-term minor beneficial impacts to the socioeconomic resources of the Refuge's nearby communities as Alternative A.

The two existing cooperative farmers employ a labor force of up to 15 individuals. Reducing this program would negatively impact these individuals. Also, nearly 100 individuals visit the Refuge each year to participate in hunts that occur within the project area. Under this alternative, minimizing the hunting program would bring fewer individuals to the area where they currently invest money on lodging, equipment, etc. in the local communities.

Converting agricultural lands to native and moist-soil habitat would require additional funding, staff, and potentially equipment. In addition, the Refuge would be forced to pay the electrical costs of pumping water to the converted acres, which is a substantial expense to the base budget. This cost could be up to $45,000 per year. Although this alternative would impact the Refuge, this change would not impact the local economy.

Alternative C - Conversion of 550 Cooperatively Farmed Acres to Moist-Soil Management and Native Vegetation
Alternative C would have similar impacts as Alternative B; however, there would be greater negative impacts to local farmers and individuals they employ, thereby causing minor, long-term, negative impacts on the local economy. The expense to the Refuge would also be greater than described under Alternative B due to the greater number of acres being converted.

4.3.2 Impacts on Visitor Services/Public Use Opportunities

Alternative A – Current Management (No Action)
Under the current management, public use opportunities would be maintained.

Alternative B - Conversion of 242 Cooperatively Farmed Acres to Moist-Soil Management and Native Vegetation
Alternative B would reduce the opportunities for goose hunting in Farm Subunit 2. The deer hunting opportunities would not decrease, but the quality of the deer hunt may be reduced. Indirectly, increased moist-soil habitat would benefit waterfowl populations and potentially increase the quality of waterfowl hunting opportunities in the area. All other public use opportunities would remain the same as the current management.

Alternative C - Conversion of 550 Cooperatively Farmed Acres to Moist-Soil Management and Native Vegetation
Alternative C would result in the same effect as Alternative B.

4.4 Assessment of Cumulative Impacts:

A cumulative impact is defined as an impact on the environment that results from the incremental impact of the proposed action when added to other past, present, and reasonably foreseeable future actions regardless of what agency (federal or nonfederal) or person undertakes such other actions. Cumulative impacts can result from individually minor but collectively significant actions taking place over a period of time (40 CFR 1508.7).

Cumulative impacts are the overall, net effects on a resource that arise from multiple actions. Impacts can "accumulate" spatially, when different actions affect different areas of the same resource. They can also accumulate over the course of time, from actions in the past, the present, and the future. Occasionally, different actions counterbalance one another, partially cancelling out each other's effects on a resource. However, more typically, multiple effects add up, with each additional action contributing an incremental impact on the resource.

This analysis considered an area larger than the Refuge, within the Lower Colorado River Valley, as well as considering cumulative impacts resulting from the variety of projects (past, present, and reasonably foreseeable) occurring on private, state, and other federal lands in the area. Generally, lands surrounding the Refuge are owned by either Indian tribes or other Federal and state agencies (specifically the Bureau of Land Management and Department of Defense). Land uses in the nearby area include agriculture on privately owned lands and recreation occurring on these public lands.

Cumulative Impacts to the Physical Environment

As illustrated in the Refuge map in Appendix A, the northwest boundary of the Refuge neighbors privately owned agricultural land. Farming operations occurring on those adjacent lands likely includes increased utilization of farming equipment and pesticides. These practices may adversely affect air quality, water quality, and soils, primarily through emissions, dust, pesticide drift, and ground disturbance. It is expected that dust and pesticide drift produced by nearby farming operations would be greater than that produced by the Refuge's agriculture program. Degradation to air quality and water quality may be associated with these actions. When these external factors are added to similar environmental effects produced by each of the Refuge's management alternatives, the overall impact to the physical environment is still expected to be minor due to the small proportion of land in the surrounding area that is farmed.

Cumulative Impacts to the Biological Environment

As discussed in Section 1.3, the Lower Colorado River Multi Species Conservation Program (LCR MSCP) is a multi-stakeholder Federal and non-Federal partnership responding to the need to balance the use of the lower Colorado River water resources and the conservation of native species and their habitats in compliance with the Endangered Species Act. The LCR MSCP is currently restoring approximately 900 acres of Refuge land. As stated in the LCR MSCP Conservation Areas Fiscal Year 2010 Work Task for the Cibola NWR Unit #1, these 900 acres are targeted primarily for cottonwood and willow cover types in development for the Southwestern willow flycatcher, but will also likely include a mosaic of native habitats including riparian, wetland, and riparian-upland interface areas. The purpose of the MSCP actions

occurring on Cibola National Wildlife Refuge is to create and manage a mosaic of native land cover types for LCR MSCP covered species.

The alternatives analyzed in Section 4.2 (Biological Environment) are expected to result in primarily beneficial impacts to the biological environment. In addition to the activities of the LCR MSCP, the activities outlined in this EA are providing beneficial cumulative impacts to wildlife and habitat along the lower Colorado River.

Cumulative Impacts to the Human Environment

Recreation is one of the primary uses of public lands surrounding the Refuge. The project area on the Refuge itself, however, provides opportunities for wildlife observation, photography, interpretation, and hunting. The Refuge provides important opportunities to hunt waterfowl in Farm Subunit 3 because waterfowl habitat (and hunting) is rare in the surrounding public lands. The proposed action, described under the current management, in combination with nearby public use opportunities will continue to provide such opportunities that attract local visitors and provide revenue for local communities through tourism.

4.5 Environmental Justice:

Executive Order 12898 (Federal Actions to Address Environmental Justice in Minority and Low-Income Populations; February 11, 1994) was designed to focus the attention of Federal Agencies on the environmental and human health conditions of minority and low-income populations, with the goal of achieving environmental protection for all communities. The order directed federal agencies to develop environmental justice strategies to aid in identifying and addressing disproportionately high and adverse human health and environmental effects of their programs, policies, and activities on minority and low-income populations. The order is intended to promote nondiscrimination in federal programs substantially affecting human health and the environment, and to provide minority and low income communities with access to public information and opportunities for participation in matters related to human health and the environment.

None of the alternatives described in this EA will disproportionately place any adverse environmental, economic, social, or health impacts on minority and low income populations. Implementation of the proposed action is anticipated to benefit the environment and people in the surrounding communities.

4.6 Indian Trust Assets:

Although Indian Trust Assets have been identified in the Lower Colorado River Valley and the Colorado River Indian Reservation is located in close proximity to the Refuge, it is expected that no Indian Trust Assets will be affected by any of the alternatives outlined in this EA. All proposed agriculture activities or reduction in such would occur on previously disturbed lands, and none of these alternatives involve the breaking of new ground. Therefore, no impacts are anticipated to result from implementation of any of the alternatives described in the EA.

4.7 Unavoidable Adverse Effects

None of the alternatives would result in any unavoidable adverse impacts to Refuge resources. Agriculture operations may result in some short-term disturbance to migratory and resident wildlife, but these impacts are expected to be negligible.

4.8 Irreversible and Irretrievable Commitment of Resources:

Irreversible and irretrievable resource commitments are related to the use of nonrenewable resources and the effects that this use could have on future generations. Irreversible effects primarily result from the use or destruction of specific resources that cannot be replaced within a reasonable time frame, such as energy or minerals. Irretrievable resource commitments involve the loss in value of an affected resource that cannot be restored as a result of the action, such as extinction of a threatened or endangered species or the disturbance of a cultural resource.

None of the alternatives would result in a large commitment of nonrenewable resources. Project implementation would require the irretrievable commitment of fossil fuels (diesel and gasoline), oils, and lubricants used by heavy equipment and vehicles. Since the Proposed Action is a continuation of an ongoing activity, no unavoidable harm or harassment to wildlife is expected. The Service would implement best management practices to minimize potential negative impacts.

4.9 Table 1 - Summary of Environmental Effects by Alternative

Environmental Resource	**Alternative A** **No Action Alternative**	**Alternative B** **Conversion of 242 Cooperatively Farmed Acres to Moist-Soil Management and Native Vegetation**	**Alternative C** **Conversion of 550 Cooperatively Farmed Acres to Moist-Soil Management and Native Vegetation**
Impacts to Air Quality	Minor, short-term, local negative effects	Same as Alternative A, plus minor beneficial long-term site-specific impacts	Same as Alternative B.
Impacts to Water Quality and Quantity	Short-term minor negative effects at the local scale	Same as Alternative A with decreased intensity	Similar impacts to water quality as Alternative B plus greater impacts to water quantity
Impacts to Soils	Minor short-term site-specific negative impacts in general with long-term major site-specific beneficial impacts occurring on Farm Subunit 2	Same as Alternative B with decreased intensity	Same as Alternative B
Impacts on Habitat	Major, long-term beneficial impacts at the local scale	Similar to Alternative A with a different mosaic of habitat types	Same as Alternative B
Impacts of Wildlife	Minor short-term negligible effects in addition to short-term local major beneficial impacts; long-term beneficial impacts	Similar to Alternative A with variations in species that would benefit and those that would lose current benefits	Similar to Alternative B with greater intensity
Impacts on Threatened and Endangered Species	No effect	Long-term minor beneficial effects	Similar to but greater than Alternative B

Impacts on Socioeconomic Resources	Long-term minor beneficial impacts to nearby communities	Reduction of the long-term minor beneficial impacts described under Alternative A	Similar impacts to Alternative B with minor, long-term negative impacts on the local economy
Impacts on Visitor Services/Public Use Opportunities	Current opportunities maintained	Reduced opportunities	Same as Alternative B.

5.0 CONSULTATION, COORDINATION AND DOCUMENT PREPARATION

5.1 Agencies and individuals consulted in the preparation of this document include:

Document prepared by Division of Planning Staff, National Wildlife Refuge System, Southwest Region, Albuquerque, New Mexico, and Refuge Staff, Cibola National Wildlife Refuge, U.S. Fish and Wildlife Service, Needles, California.

Table 1. List of Individuals Involved in Preparation of the Draft EA.

Team Member	Title
Mitch Ellis	**Complex Manager**
Bill Seese	**Deputy Complex Manager**
Mike Oldham	**Refuge Manager**
Brenda Zaun	**Zone Biologist**
Steven Rimer	**Wildlife Biologist**
Andrew Hautzinger	**Hydrologist**
Carol Torrez	**NEPA Coordinator**
Katie Boyer	**Assistant Natural Resource Planner (STEP)**

5.2 References

U.S. Fish and Wildlife Service. 1994. Lower Colorado River National Wildlife Refuges Comprehensive Management Plan and Environmental Assessment. U.S. Fish and Wildlife Service, Region 2. September 19, 1994.

U.S. Fish and Wildlife Service. 2004. Cibola National Wildlife Refuge Final Water Management

Plan. Williams and Associates, LLC, prepared for the U.S. Fish and Wildlife Service, Region 2. March 2004.

Appendix A
Refuge Map

Figure 1: Cibola National Wildlife Refuge Farm Subunits