

[Draft] Compatibility Determination

Title

Draft Compatibility Determination for Cooperative Farming, Cibola National Wildlife Refuge

Refuge Use Category

Agriculture

Refuge Use Type

Farming (cooperative)

Refuge

Cibola National Wildlife Refuge

Refuge Purpose(s) and Establishing and Acquisition Authority(ies)

The Cibola National Wildlife Refuge was established 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 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.

Most of the refuge's lands were withdrawn from the public domain for refuge purposes or for the Colorado River Storage Project, although some lands were acquired in fee title. There are presently no non-federal parcels (in-holdings), within the refuge boundary. In addition, the Refuge owns the bottom of the existing Colorado River where the river bypasses the "old river channel" as well as the Arizona side of the old river channel's bottom. The Fish and Wildlife Service has a 49-year lease agreement on the California side of the "old river channel" bottom.

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 in the Blythe, California area. Its establishment was encouraged and recommended by the Lower Colorado River Land Use Plan in 1964.

National Wildlife Refuge System Mission

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 (Pub. L. 105-57, 111 Stat. 1252).

Description of Use

Is this an existing use?

Yes

Farming has been conducted on the refuge since 1983. Cooperative agriculture is consistent with the 1994 Comprehensive Management Plan (CMP) For Lower Colorado River National Wildlife Refuges and was approved in the Environmental Assessment (USFWS, 2010) and Finding of No Significant Impact (USFWS, 2010). This compatibility determination (CD) reviews and replaces the Cooperative Farming CD published in 2010. This use is being reevaluated pursuant to the Service's Compatibility Policy (603 FW2, USFWS 2000). The use has not substantially changed since first evaluated and proposed changes are minor. There would be a total decrease in cropland by 350 acres and subsequent increase in riparian and riparian scrub land.

What is the use?

Farming is a habitat management tool used on NWRs to provide high-energy food sources for millions of wintering ducks, geese, cranes, swans, and other migratory bird species, to serve landscape-level goals and objectives (e.g., outlined in the North American Waterfowl Management Plan [NAWMP; USFWS and Canadian Wildlife Service 1986], U.S. Department of the Interior [US DOI], Environment Canada [EC], and Environment and Natural Resources Mexico [ENRM] 2018) and refuge management purposes, goals, and objectives (USFWS 1994).

Farming is the practice of agriculture, especially mechanically disturbing the soil and artificially introducing seeds or other plant parts periodically to produce stands of plants, for use primarily as food for wildlife, domestic animals, or humans. This includes water delivery, irrigation, drainage, and mechanical and chemical management to promote desired vegetation and planting of row crops to provide high levels of metabolizable energy.

Cooperative farming on NWRs is a tool whereby agricultural practices are employed with substantial involvement of the Service to supplement natural ecosystem processes to meet Service-desired biological outcomes. Cooperative farming is used on NWRs in situations where the Service cannot otherwise meet its resource management objectives (e.g., through the maintenance, management, or

mimicry of natural ecosystems processes or functions). More specifically, cooperative farming is a refuge management economic activity whereby a farmer, under a Cooperative Agriculture Agreement (CAA) with the Service, produces crops (e.g., corn, rice, winter wheat, and milo) on a refuge and, in lieu of a rental payment, leaves an unharvested share of the planted crop for wintering waterfowl and other wildlife species, thereby supporting refuge purposes, goals, and objectives. The cooperative farmer (Cooperator) is responsible for all equipment, fuel, seed, fertilizer, approved pesticides, and labor necessary to produce a crop on the NWR. The refuge is responsible for identifying the type(s) and location(s) of crops to be planted, providing the farmer with an approved list of pesticides for use, and identifying the refuge's crop share, which will contribute to refuge management goals and objectives. The amount of crop planted by cooperative farmers varies somewhat from year to year relative to the effects of rainfall and flooding, thus the NWR's share varies from year to year.

Is the use a priority public use?

No

Where would the use be conducted?

Cooperative farming is utilized to manage a portion of the Refuge's agricultural habitat. The Refuge administers a cooperatively managed farmland in order to provide food and habitat for wildlife. Approximately 938 acres of agricultural land on the Refuge are farmed under cooperative agreements in order to provide food and habitat for wildlife. The Refuge has the following primary agricultural management subunits:

Farm Subunit One: Located in the Arizona North Management Unit near the headquarters and is approximately 892 acres in size, 568 of which are cooperatively farmed (Figure 1). This subunit consists of approximately 438 acres of alfalfa, 115 acres of corn, and 15 acres of wheat. Small quantities of milo, rye, and other crops can also be planted in the subunit to complement or act as a substitute for corn for wildlife. The remaining acres, approximately 330, are cottonwood-willow riparian galleries or desert-scrub riparian units. Subunit One is closed to public entry except for the Goose Auto Tour Loop.

Farm Subunit Two: Located in the Hart Mine Management Unit near the center of the Refuge, 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. This subunit consists of approximately 250 acres of alfalfa fields and rotations of Bermuda grass to help restore salinity levels (Figure 2). Small grain crops (wheat, rye, and peas) 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.

Farm Subunit Three: This subunit sits within an area called the “Island Unit” and originally consisted of approximately 500 acres (Figure 3). Immediately following the floods of 1983, all farming ceased because of a high-water table resulting in high alkaline conditions. Farming only included refuge staff following the flood on around 160 acres and none of it was in a cooperative agreement. In recent years, a cooperative agreement has been established to cultivate approximately 70 acres of alfalfa on the north end of the unit. The remaining acreage that was once farmed in the subunit has been converted to moist soil managed wetlands or was allowed to return to native mesquite or riparian habitat. This subunit is open to the public for waterfowl, mule deer, and upland game hunting.

Approximately 938 acres of agricultural habitat on Cibola National Wildlife Refuge are cultivated to provide food for wildlife, and/or condition soils for future riparian habitat. The acreage will vary depending upon the year and rotation of crops from alfalfa to corn. Wheat, rye, or other small grains may also be included in the rotation depending on its benefit to wildlife. Currently, cooperative farmers manage 100% of the total agricultural acreage on the refuge.

The largest portion of the agricultural acreage is in the farm subunit one. Alfalfa is the largest crop grown and harvested by farmers but left as green browse throughout the winter season. Corn is planted in July and is the second largest crop grown. It is left un-harvested for waterfowl forage in the winter and remains standing until bumped or mown down for free feeding by all wintering waterfowl. The average crop rotation is 732 acres alfalfa, 130 acres corn and less than 30 acres of other small grain crops (wheat and ryegrass) that can be planted in the rotation to benefit other migratory birds including dove and songbirds.

Farm subunit two is also farmed entirely under cooperative agreement but done entirely to help maintain and/or remediate soil salt conditions. All of the area is planted in alfalfa or Bermuda grass 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 crops planted (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.

Farm subunit three is partially managed by Refuge staff as moist soil wetlands, reforested riparian habitat, and partially managed under a cooperative farming agreement. Only 70 acres of the unit are managed as a farm unit and planted with alfalfa. A crop of small grains (wheat, rye, and peas) may be planted in the rotation

and harvested in summer allowing a green browse throughout the winter. The remaining acres in the unit are designated as semi-perennial wetlands, moist-soil wetlands, or restoration areas.

When would the use be conducted?

Cooperative farming activities would occur from February to November of each year. Alfalfa seeding would occur February/March. Corn is planted in July and left un-harvested in order to provide waterfowl forage throughout the winter. Alfalfa and other small grain crops (wheat, rye, and peas) are harvested during the summer and left for green browse in the winter.

How would the use be conducted?

Areas identified for cooperative agriculture would be documented in the Special Use Permit (SUP) or Cooperative Agriculture Agreement (CAA). Preferred crops, planting times, rotation schedule, would be identified in the SUP, CAA or added by addendum to the CAA/SUP. This allows a person or entity to use agricultural practices on National Wildlife Refuge System lands in support of refuge management objectives.

A CAA would include a Commercial Special Use Permit and a Plan of Operations that details operation requirements. When substantial involvement between the Service and the agricultural cooperator is anticipated, the CAA would necessitate communication on a regular basis and annual reviews. If substantial involvement is not required, a Special Use Permit would be used instead.

Farming agreements would outline the crop(s), location and amount of acreage to be planted on specified years, up to a five-year agreement. The cooperator would be responsible for all equipment, fuel, seed, fertilizer, chemical and labor. Farming would require the use of tractors, combines, implements and grain trucks to plant, treat weeds, fertilize, and harvest crops. The Refuge owns the irrigation systems and would maintain irrigation systems; however, the cooperator could assist with the maintenance of those irrigation systems, would provide agricultural equipment, and would be responsible for all costs associated with the production of agricultural crops. Irrigation on the farmed areas is strictly flood-type irrigation. These would require occasional disturbance for ditch/canal cleaning, and maintenance activities.

Why is this use being proposed or reevaluated?

Reevaluation is due per policy 603 FW 2.11 H(2). "Except for uses specifically authorized for a period longer than 10 years (such as rights-of-way), we will reevaluate compatibility determinations for all existing uses other than wildlife

dependent recreational uses when conditions under which the use is permitted change significantly, or if there is significant new information regarding the effects of the use, or at least every 10 years, whichever is earlier. Again, a refuge manager may always reevaluate the compatibility of a use at any time”.

Cooperative agricultural practices for wildlife and restoration of habitat on Refuge lands include farming. When prescribed in a plan, these resource management activities are used to meet Refuge goals and objectives; typically benefiting grassland health and the restoration of high-quality habitat for migratory birds, pollinators, and other wildlife. Cooperative agriculture is an indispensable management tool utilized to restore the ecological diversity and habitat quality of Refuge lands

Availability of Resources

To comply with the Refuge Recreation Act (Public Law 87-714), the Project Leader must determine whether sufficient resources—financial, staffing, facilities, or other infrastructure—are available to support the proposed use without materially interfering with the refuge purpose(s) or the mission of the National Wildlife Refuge System. This determination should be informed by a review of current capacity and, where applicable, the refuge’s Comprehensive Conservation Plan (CCP).

Assessment of current resources and capacity

Funding and staff are at a minimal level but are currently available to oversee the cooperative agricultural program. Cultivating and planting of agricultural crops that benefit wildlife are completed solely through cooperative farming. The Refuge does not have adequate staffing and funding to conduct an agricultural program carried out solely by Refuge staff at this time. The cost of fuel, equipment, seed, fertilizers, herbicides, and electric pumping costs for irrigation would be far too great for the Refuge to handle through its current staffing and budget. Most of the needed work to prepare for this use would be done as part of routine habitat management duties. Habitat monitoring takes place periodically on the Refuge and no additional effort is proposed in relation to these uses. Existing Refuge staff would monitor the CAAs to ensure compatibility and compliance. The cooperator would be responsible for providing all equipment and labor associated with permitted activities. Facilities installed primarily for Refuge purposes are constructed or maintained at the Refuge’s expense.

Impacts of changes to resources and capacity

The availability of resources is subject to change and the level of use provided may vary based on current staffing, partner support, funding, or infrastructure

conditions. Costs may increase over time, in relation to changes in the costs for equipment, maintaining facilities, etc. A substantial increase to the number of requests may also create the need for additional resources to administer the use. The Project Leader will use sound professional judgment in evaluating whether the refuge or its partners can develop, operate, and maintain the use in a compatible manner.

For other refuge uses, if resource conditions shift such that the refuge can no longer sustain the use in a compatible manner, the Project Leader may modify or suspend the use pursuant to 50 CFR 25.21 (or 50 CFR 36.42 for Alaska). The public will be notified of any changes to refuge uses, including temporary modification or suspension, re-evaluation of compatibility and/or discontinuing of refuge uses.

Anticipated Impacts of the Use

The mission of the Refuge System provided in the Refuge Improvement Act of 1997 states that “The mission of the [National Wildlife 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.”

Conservation and management mean to sustain and, where appropriate, restore and enhance, healthy populations of fish, wildlife, and plants utilizing, in accordance with applicable Federal and State laws, methods and procedures associated with modern scientific resource programs. These definitions denote active management and are in keeping with the House report on the Act which states that the “Refuge System should stand as a monument to the science and practice of wildlife management.” It thus follows that if an economic use of a natural resource is shown to be conservation and management as defined in the Act, it does contribute to the mission by the very definition of terms used. If a use contributes to the mission, it thus meets the standard or threshold established in 50 CFR 29.1. In accordance with 50 CFR 29.2, cooperative farming as described in this compatibility determination, significantly contributes to the mission, purposes, goals, and objectives of the Refuge

Short-term Impacts

Agricultural and farming activities on the Refuge are directly related to and support the purposes for which the Refuge was established. The authority to undertake reclamation and restoration activities that enhance habitat conditions is supported by an agricultural program that provides feeding and resting areas for wildlife.

Farming will result in short-term disturbances and long-term benefits to both resident and migratory wildlife using the Refuge. Short-term impacts will include disturbances and displacement of wildlife that is typical of any heavy equipment operation.

In preparations for farming a unit all vegetation will be removed using a combination of mechanical and chemical methods. Wildlife will be disturbed and displaced initially when the area is prepared, and wildlife will lose the poor-quality cover previously present while the unit is planted.

Field prep, planting, weed control and harvesting will generally take a few days per month from February through November. During the remainder of the growing period disturbance will be minimal. Once crops are in the beginning growing stages and then again after harvest, wildlife observations and use by mammals and birds may increase if the crop is used for feed or cover during the growing season. Geese and ducks will use harvested crop fields for food during the fall and spring migration. Some shorebird species will also use the open temporary wetlands during migration. The crops grown on the Refuge provide food for an estimated wintering population of 4000 Canada Geese, 1,500 Lesser Snow Geese, 2,800 Greater Sandhill Cranes, and as many as 25,000 ducks.

After harvest, steps can be taken to improve winter habitat and soil health. Leaving residue standing instead of tilling it or using cover crops can provide food and cover for over-wintering wildlife including soil micro-organisms, which promotes soil health and ensures important nutrient cycling continues year-round. It is Service policy that the long-term productivity of the soil will not be jeopardized to meet wildlife objectives (601 FW3, 569 FW1).

The use of herbicides/pesticides is normal practice during farming. Herbicides can be used to remove undesired species from the area. Herbicides can also have negative impacts on non-targeted plants and wildlife species on the farmed area or in nearby lands. To decrease the likelihood of negative effects, only EPA registered pesticides that are approved through the Service's Pesticide Use Proposal (PUP) System will be applied when necessary. All pesticides must be used and applied according to the label, EPA guidelines, and following best management practices. Application of pesticides must follow the Department of Interior's Pesticide Use Policy (517 DM 1) and the Service's Integrated Pest Management Policy (569 FW 1).

Long-term Impacts

Depending on the condition of a unit and overall goals, cooperative farming practices could occur from one to five years. During this time, this area will not be ideal habitat for most wildlife, especially grassland nesting birds. However, it will

provide stopover and feeding areas for many resident and migrating ungulates and waterfowl as well as still providing habitat for insects and pollinators. Ungulates, sandhill cranes, geese and other migrating birds will take advantage of waste grain left in the field, so use by some of these species may increase during the post-harvest period while farming is ongoing.

Although pesticide use will be closely regulated, local wildlife may be negatively affected. Invertebrates that are a food source and important pollinators may be eliminated, and communities may shift. However, with the proper use of chemicals, most pest species can be eliminated thus allowing native species an increased chance of survival when planted. Pesticide use is limited to prevent or reduce acute or chronic adverse effects to wildlife.

Mechanical practices will break up the soil and negatively impact microorganisms in the soil and important nutrient cycling will slow or cease. Decomposition and subsequent building of organic material will be negatively affected. If the plan allows, leaving residue standing (no-till) over-winter or incorporating cover crops into the management plan will provide food and cover for migrating and wintering wildlife and soil micro-organisms. Maintaining agricultural areas also limits encroachment by undesirable woody species and helps remove standing vegetation in areas being prepared for native plant restoration. While some disturbance to ground nesting birds may result from the harvesting operations, the timing of harvests will be planned carefully and modified to minimize the impact to occupied nests.

Nearly all farming practices use either synthetic or natural fertilizers. The addition of these fertilizers can change the ratio of available soil nutrients to favor the growth of undesirable plants during native species planting. Fertilizer runoff and deposition in wetlands is another possibility on farmed units. Similar to ratios in soil, the effects of high nitrogen and phosphorus in wetlands can change plant communities, favoring non-native common reed or monoculture stands of native cattail over other diverse emergent plant communities. Buffers around wetland areas and appropriate application procedures can mitigate this outcome.

With cooperative agriculture for habitat restoration, there will be long-term benefits with the establishment of diverse or more desirable habitat for nesting, escape cover, perching, or non-crop feeding activities. The resulting habitat will generally improve conditions for most species negatively affected by the short-term agriculture activity. Cooperative farming is used on NWRs to ensure that waterfowl can satisfy their foraging needs, which enhances their body condition and supports reproductive output (Ringelman 1990, Dzus and Clark 1998). The use of agricultural crops as a waterfowl habitat management technique is well documented (Bellrose 1980; Baldassarre and Bolen 1984; Delnicki and Reinecke

1986; Ringelman 1990; Combs and Fredrickson 1996; Heitmeyer 2006). Positive long-term benefits result in providing food/habitat for migratory and resident wildlife and minimizing crop depredation on neighboring farms. Continuing the management of current agriculture activities will maintain and help increase the quality of the soils long term and provide quality habitat for migratory and resident wildlife on the Refuge.

Public Review and Comment

The draft compatibility determination will be available for public review and comment for 30 days from December 15, 2025 to January 15, 2026. The public will be made aware of this opportunity to comment through postings at the public library in Blythe, CA, letters to local tribes, and social media posts on the complex Facebook page. A hard copy of this document will be posted at the Refuge Visitor Center located at 66000 Cibola Lake Rd, Cibola, AZ 85328. It will be made available electronically on the refuge website <https://www.fws.gov/refuge/cibola>. All comments can be sent to the refuge address or emailed to swaz@fws.gov. Please let us know if you need the documents in an alternative format. Concerns expressed during the public comment period will be addressed in the final Compatibility Determination.

Determination

Is the use compatible?

Yes

Stipulations Necessary to Ensure Compatibility

1. All activities will be conducted in accordance with the CAAs.
2. The criteria for evaluating the need for habitat management, including all uses described in this CD, will be determined during annual planning activities.
3. Activities must meet specific and articulated habitat and related wildlife objectives and contribute to the achievement of the purposes for which the Refuge units were established. These objectives may be outlined in a Comprehensive Conservation Plan, a Habitat Management Plan, an Annual Work Plan, or in the Special Use Permit.
4. No genetically modified organism (GMO) seed used in farming operations.
5. No neonicotinoid treated seed or insecticide applied to Refuge lands.

6. All activities will adhere to general conditions for cooperative farming programs as listed in the Cooperative Agriculture Use Policy (620 FW 2).
7. All operations will be carried out in accordance with the BMPs and soil conservation practices.
8. Pesticide use will be restricted by type and economic threshold limitation. Annually, all proposed pesticides must be submitted to and approved by the refuge manager or the Regional or National Integrated Pest Management (IPM) coordinator. Pesticide use must be necessary and consistent with goals and objectives for habitat unit and needs to be approved by the refuge manager before application.
9. No new areas will be farmed, only acres that previously were farmed are eligible to be farmed.

Justification

The agricultural program supports the Refuge purposes by providing foraging areas for wildlife and by contributing to a diversity of habitat types. The acreage managed by farmers under a cooperative agreement greatly reduces the budgetary and manpower requirements that would be needed if the Refuge staff farmed all of the cropland. Cropland farming benefits wildlife by providing and maintaining alfalfa and small grain areas for feeding and resting, and corn crops for feeding and safe concealment areas. Maintaining agricultural areas also limits encroachment by undesirable woody species and helps remove standing vegetation in areas targeted for native plant restoration.

Refuge croplands supplement natural food sources on the Refuge and provide undisturbed areas where wintering waterfowl can forage. Mule deer and other resident wildlife indirectly benefit from refuge agriculture areas by using fields for safety and concealment, for fawning grounds or foraging areas. Additionally, wildlife viewing opportunities are enhanced through concentrating birds in agricultural areas, while providing an “edge effect” along farm fields, irrigation canals, and drains. Agricultural fields and adjacent irrigation canals continue to be important nesting and feeding areas for numerous burrowing owls found scattered throughout Farm Subunit One of the Refuge.

Signature of Determination

X

Acting Complex Manager
Southwest Arizona Refuge Complex

Signature of Concurrence

X

Regional Chief
National Wildlife Refuge System

Mandatory Reevaluation Date

2035

Literature Cited/References

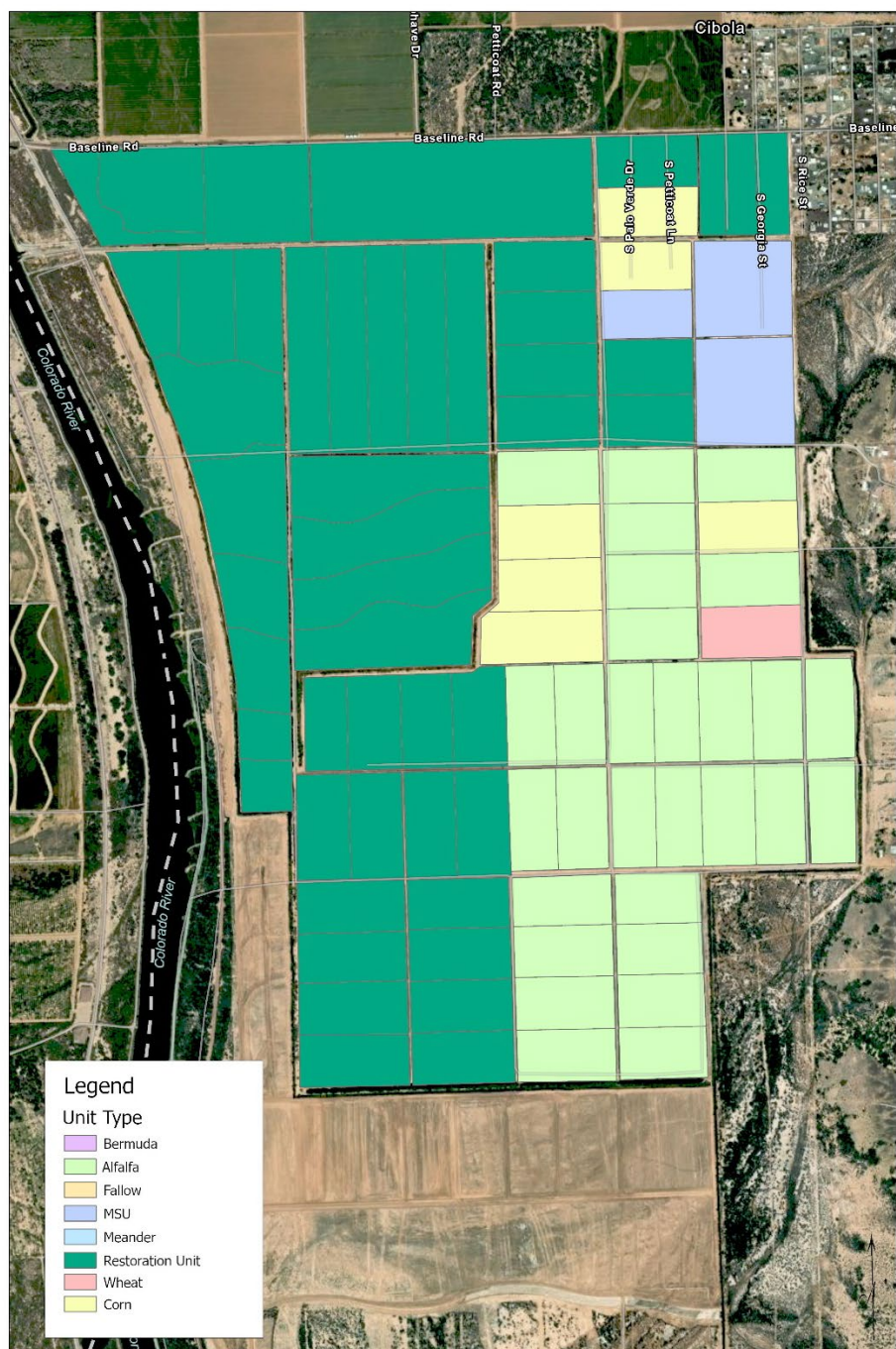
- Baldassarre, G. A., and E. G. Bolen. 1984. Field-feeding ecology of waterfowl wintering on the Southern High Plains of Texas. *The Journal of Wildlife Management*, 48:63-71.
- Bellrose, F. C. 1980. Ducks, geese, and swans of North America, Third ed. Stackpole Books, Harrisburg, PA. 540 pp.
- Combs, D. L., and L. H. Fredrickson. 1996. Foods used by male mallards wintering in southeastern Missouri. *The Journal of Wildlife Management*, 60(3):603-610.
- Delnicki, D., and K. J. Reinecke. 1986. Mid-winter food use and body weights of mallards and wood ducks in Mississippi. *The Journal of Wildlife Management*, 50(1):43-51.
- Dzus, E. H., and R. G. Clark. 1998. Brood survival and recruitment of mallards in relation to wetland density and hatching date. *Auk*, 115(2):311-318
- Heitmeyer, M. E. 2006. The importance of winter floods to mallards in the Mississippi Alluvial Valley. *The Journal of Wildlife Management*, 70:101-110

- Ringelman, J. K. 1990. Managing agricultural foods for waterfowl. Pp. 13-14 in Waterfowl Habitat Management Handbook for the Lower Mississippi River Valley. eds.
- U.S. Department of the Interior. 2007. Part 517 DM 1: Pesticides—Integrated Pest Management Policy. Departmental Manual. Office of Environmental Policy and Compliance.
<https://www.doi.gov/sites/doi.gov/files/elips/documents/517-dm-1.pdf>
- U.S. Department of the Interior, Environment Canada, and Environment and Natural Resources Mexico (USDOI EC ENRM). 2012. North American Waterfowl Management Plan 2012: People conserving waterfowl and wetlands. U.S. Department of the Interior, Washington, DC [The North American Waterfowl Management Plan | NAWMP.org](http://www.nawmp.org)
- U.S. Department of the Interior, Environment Canada, and Environment and Natural Resources Mexico (USDOI EC ENRM). 2018. North American Waterfowl Management Plan (NAWMP) Update: Connecting People, Waterfowl, and Wetlands. U.S. Department of the Interior, Washington, D.C., USA. [2018 Update | NAWMP.org](http://www.nawmp.org)
- U.S. House of Representatives. 1997. House Report No. 105-106. 26 pp.
- U.S. Fish and Wildlife Service. 2000. Part 603 FW 2: National Wildlife Refuge System Uses—Compatibility. Fish and Wildlife Service Manual. Division of Conservation Planning and Policy.
<https://www.fws.gov/policy/603fw2.html>
- U.S. Fish and Wildlife Service. 2006. Part 601 FW 3: National Wildlife Refuge System— Biological Integrity, Diversity, and Environmental Health. Fish and Wildlife Service Manual. Division of Natural Resources.
<https://www.fws.gov/policy/601fw3.html>
- U.S. Fish and Wildlife Service. 2010. Part 569 FW 1: Pest Management—Integrated Pest Management. Fish and Wildlife Service Manual. Division of Natural Resources and Conservation Planning.
<https://www.fws.gov/policy/569fw1.html>
- U.S. Fish and Wildlife Service. 2010. Cooperative Farming Compatibility Determination for Cibola National Wildlife Refuge. Southwest Region, U.S. Fish and Wildlife Service, U.S. Department of the Interior
- U.S. Fish and Wildlife Service. 2010. Environmental Assessment for Agricultural Program at Cibola National Wildlife Refuge. Southwest Region, U.S. Fish and Wildlife Service, U.S. Department of the Interior
<https://iris.fws.gov/APPS/ServCat/DownloadFile/275491>
- U.S. Fish and Wildlife Service and U.S. Bureau of Reclamation. 1994. Lower Colorado River National Wildlife Refuges Comprehensive Management Plan. 1994-2014 Final. Lower Colorado Region, U.S. Fish and Wildlife Service, U.S. Department of the Interior. <https://iris.fws.gov/APPS/ServCat/DownloadFile/19708>

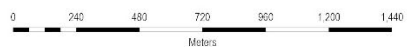
Figure(s)



U.S. Fish & Wildlife Service
Cibola NWR Farm Unit 1



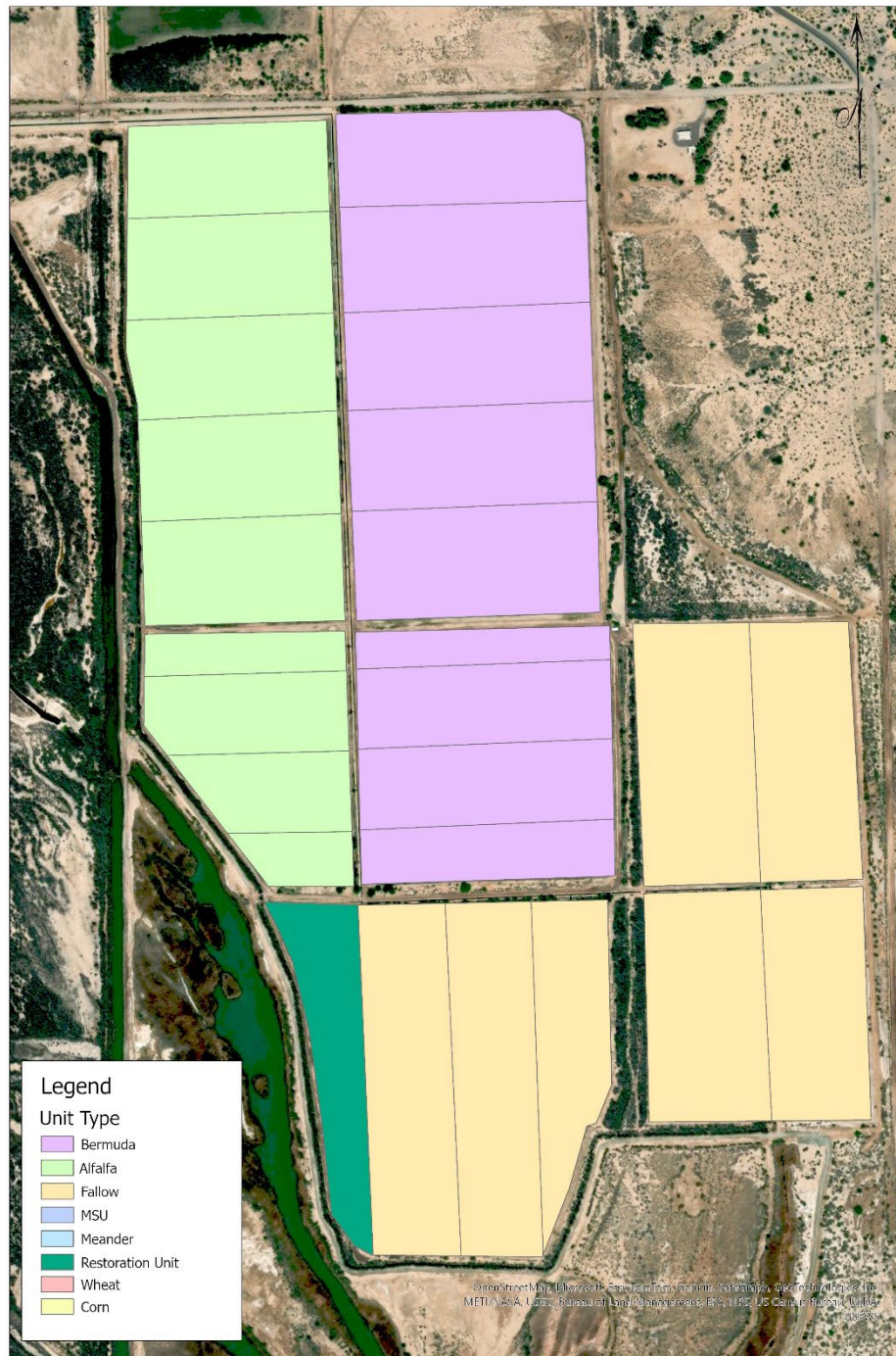
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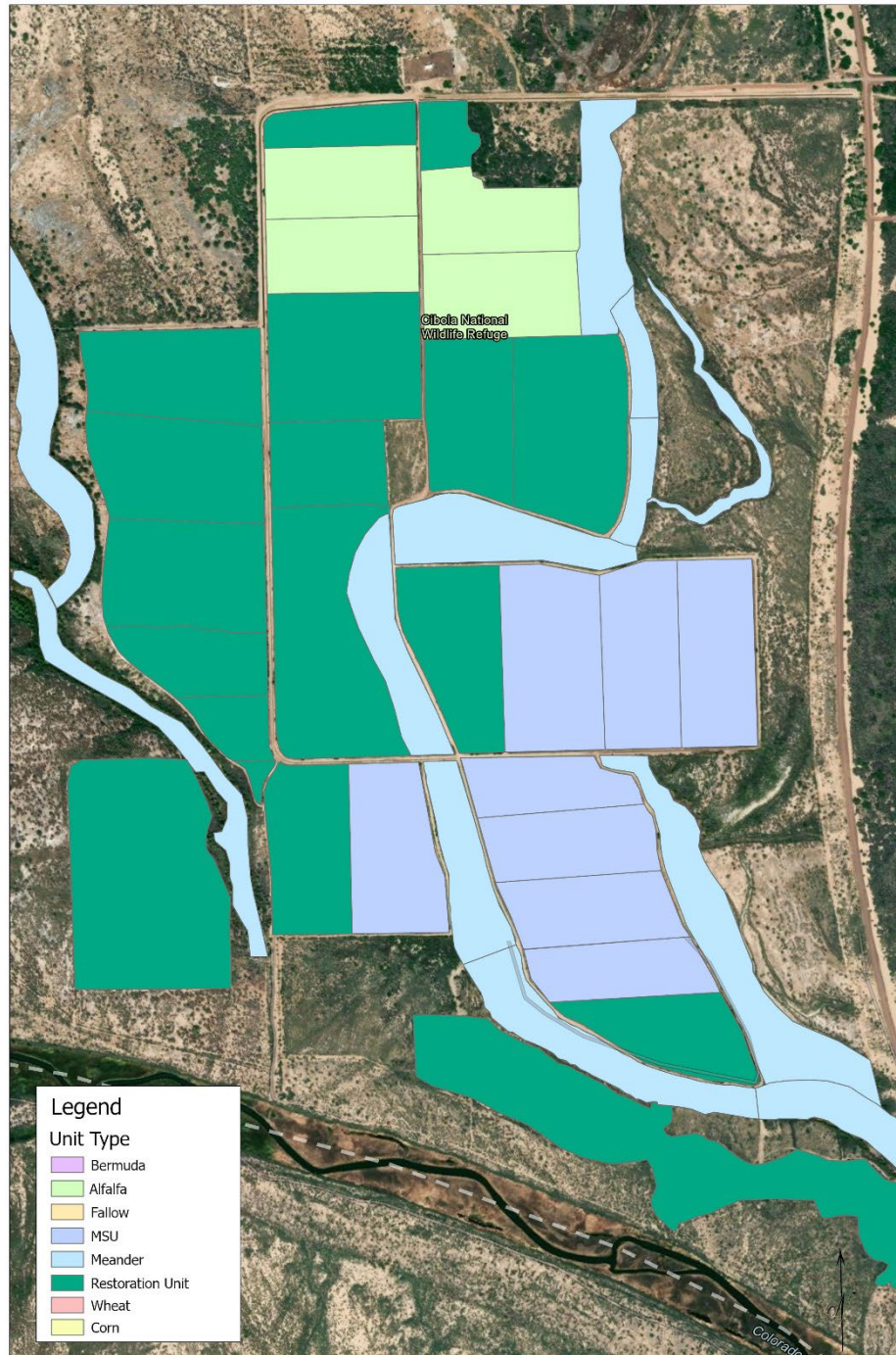
Figure 1. Map of Cibola NWR Farm Unit



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0 100 200 300 400
Meters

Figure 2. Map of Cibola NWR Farm Unit 2



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Figure 3. Map of Cibola NWR Farm Unit 3