

DRAFT ENVIRONMENTAL ASSESSMENT

For

**White-winged and Mourning Dove, Quail & Desert
Cottontail Rabbit Hunt Plan**

SAN BERNARDINO NATIONAL WILDLIFE REFUGE
Douglas, AZ

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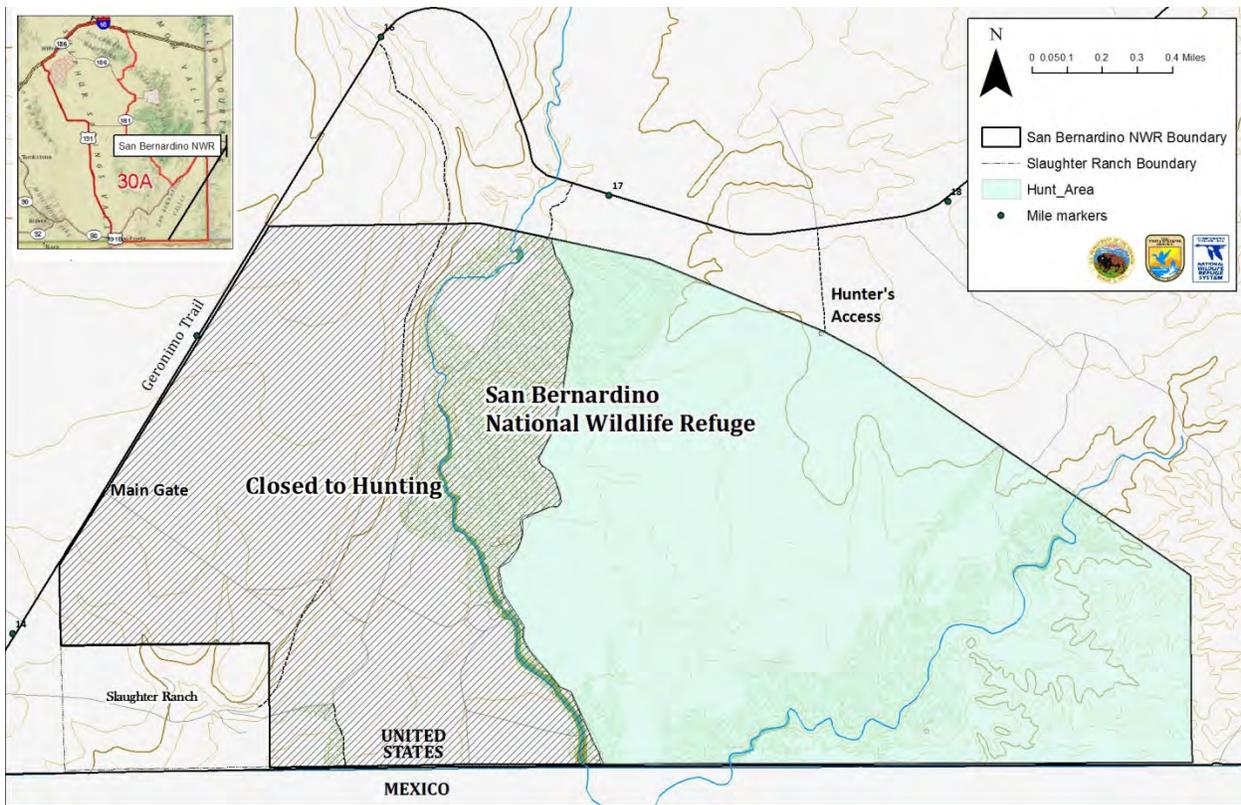
1.0 PURPOSE AND NEED FOR ACTION

1.1 Introduction

The U.S. Fish and Wildlife Service (Service) is reevaluating the existing hunting program on San Bernardino National Wildlife Refuge (San Bernardino NWR). This Environmental Assessment (EA) is being prepared to evaluate the impacts of the of existing hunting program and other reasonable alternatives and complies with the National Environmental Policy Act (NEPA) in accordance with Council on Environmental Quality regulations (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 with which this EA complies). 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. The No Action Alternative, which is the Service's Proposed Action, would continue the existing hunting program (with limited hunting), a second alternative considers expanding hunting opportunities (to include deer and javelina hunting) and a third alternative considers closing hunting altogether on the refuge.

1.2 Location

San Bernardino NWR is located in a north-south valley with flat-to-rolling uplands that drop into the flat bottomlands that bisect the refuge. The uplands are dominated by Chihuahuan desert grassland and desert scrub while the bottomlands are covered with fallow fields, a mesquite bosque, and giant sacaton grasslands. A series of natural seeps and man-made artesian wells have been used in this landscape to create cattail marshlands and other aquatic habitats. Refuge headquarters is located about 13 miles northwest of Douglas while the refuge itself is about 15 miles east of Douglas (Figure 1).



1.3 Background

San Bernardino National Wildlife Refuge was established in 1982 under the authority of the Fish and Wildlife Act of 1956 and the Endangered Species Act of 1973 in order ". . . to conserve fish or wildlife which are listed as endangered species or threatened species. . . or plants." More precisely, in 1982, 2,309 acres of land in southeastern Arizona (later an additional 60 acres were added to bring the total area to 2,369 acres), along the International border with Mexico, were purchased from The Nature Conservancy and designated as the San Bernardino National Wildlife Refuge. The underlying reason for establishing SBNWR was to protect Yaqui Catfish, Yaqui Topminnow, Yaqui Chub, and Beautiful Shiner habitat.

Existing hunts for scaled and Gambel's quail, mourning dove and white-winged dove, and desert cottontail rabbit were established in 1985. Refuge lands east of Black Draw are open to hunting during the State season for upland game and migratory birds. Small closures around sensitive springs and water developments are maintained. Separate refuge access from the north is maintained through an annual right of way agreement with the Glenn Ranch Corporation.

1.4 Purpose and Need for the Proposed Action

The purpose of the EA is to revisit and reevaluate the hunting program on San Bernardino NWR. There is a need to evaluate the changes to habitat and the population of species being hunted. The proposed action is to maintain the existing hunting opportunities. This action is needed to

provide compatible wildlife-oriented recreation on the refuge. Providing hunting opportunities is consistent with the Refuge Comprehensive Management Plan (CMP, 1995) and U.S. Fish and Wildlife Service policies on wildlife dependent recreation and hunting as mandated by the National Wildlife Refuge System Improvement Act of 1997. The Hunt Plan will replace the hunting section of the CMP.

1.5 Decision to be Made

The Service's Regional Director will review the recommendations assessed in this EA and select one of the three Alternatives presented. The Regional Director will also determine whether this EA is adequate to support a Finding of No Significant Impact (FONSI) or whether an Environmental Impact Statement will need to be prepared.

To expand hunting programs, the Service must publish in the Federal Register any proposed and final refuge-specific regulations pertaining to that use prior to implementing them. The regulations are only one element of a complete opening package, which is comprised of the following documents: hunting plan; compatibility determination; documentation pursuant to compliance with the National Environmental Policy Act of 1969, as amended (NEPA) and appropriate NEPA decision document; Endangered Species Act section 7 evaluation; copies of letters requesting State involvement and the results of the request; draft news release; outreach plan; and the draft refuge-specific regulations.

This EA serves as the NEPA document which analyzes the impacts on environmental, cultural, and historical resources of continuing to provide hunting opportunities on the San Bernardino NWR. The Hunting Plan is presented in this document as the preferred alternative. Proposed uses within this plan have been determined to be appropriate and compatible with the mission of the Refuge System and purposes for which the refuge was established.

If the existing hunting program is deemed to stay the same, then there is no need to publish in the Federal Register.

1.6 Regulatory Compliance

National wildlife refuges are guided by the mission and goals of the National Wildlife Refuge System (NWRS), the purposes of an individual refuge, Service policy, and laws and international treaties. 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 inter-jurisdictional 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.” In addition, “wildlife-dependent recreational uses may be authorized on a refuge when they are compatible and not inconsistent with public safety.” The act also recognized that wildlife-dependent recreational uses involving hunting, fishing, wildlife observation, photography, environmental education and interpretation, when determined to be compatible with the mission of the System and purposes of the refuges, are legitimate and appropriate public uses of the NWRS and they shall receive priority consideration in planning and management.

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

- American Indian Religious Freedom Act of 1978 (42 U.S.C. 1996)
- Archaeological Resources Protection Act of 1979 (16 U.S.C. 470)
- 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.
- Fish and Wildlife Coordination Act of 1958, as amended (16 U.S.C. 661 et seq.)
- Floodplain Management (Executive Order 11988)
- 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.)
- 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)
- National Pollutant Discharge Elimination System, as amended (33 U.S.C. 1251 et seq.)
- Executive Order 13112, Invasive Species (issued in February 1999)
- Administrative Procedures Act (5 U.S.C. 551-559, 701-706, and 801-808) as amended
- Antiquities Act of 1906 (16 U.S.C. 431-433)
- Bald Eagle Protection Act (16 U.S.C. 668-668d) as amended
- Federal Land Recreation Enhancement Act (REA), 16 U.S.C.6803(c), Consolidated Appropriations Act (PL 108-447)
- Fish and Wildlife Act of 1956 (16 U.S.C. 742a-754j-2)
- Fish and Wildlife Conservation Act (16 U.S.C. 2901-2911) as amended
- Fish and Wildlife Improvement Act of 1978 (16 U.S.C. 7421)
- Migratory Bird Treaty Act (16 U.S.C. 703-712 as amended)
- National Refuge System Administration Act of 1966 (16 U.S.C. 668dd-668ee) as amended
- Recreation Hunting Safety and Preservation Act of 1994 (16 U.S.C. 5201-5201)
- Refuge Recreation Act (16 U.S.C. 460K-460K-4) as amended
- Sikes Act (16 U.S.C. 670a-680o) as amended
- Soil and Water Conservation Act of 1977 (16 U.S.C. 2001-2009) as amended

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.

1.7 Public Involvement and Issues Identified

Conversations concerning hunting on the refuge have been ongoing with Arizona Game and Fish Department (AZGFD) personnel since 2012. The Arizona Game and Fish Department responded in February 2012 in support of new hunting opportunities at the refuge. AZGFD stated that they recommended additional hunting opportunities for archery for deer and javelina hunting on the San Bernardino Unit and possibly also on the Leslie Canyon Unit. AZGFD also suggested the possibility of predator hunting with shotguns, if not centerfire rifles.

Formal scoping for the refuge's hunting program was initiated on April 29, 2015. The Service announced its intent to prepare an Environmental Assessment of alternatives for updating the San Bernardino National Wildlife Refuge to continued dove, quail and rabbit hunting. A 14-day

scoping period (April 29-May 11) was established under that notice and posted on the Refuge website.

During the scoping period the Service received no public comments. The following issues were identified by refuge staff considering input from AZGFD and are considered as part of this analysis.

Issues

Desire (by AZGFD) for additional hunting opportunities

AZGFD stated that they recommended additional hunting opportunities for archery for deer and javelina hunting on the San Bernardino Unit and possibly also on the Leslie Canyon Unit. AZGFD also suggested the possibility of predator hunting with shotguns, if not centerfire rifles. In reviewing this request, the refuge identified concerns about the feasibility and practicality of these hunts.

There are many opportunities for hunting outside of the refuge boundaries in this hunting unit. Based on limited refuge resources and the limited use of the refuge, the staff feels that closing hunting on the refuge would not limit public hunting opportunities in the area.

Public safety concerns

Visibility is very limited in the habitats being hunted and the likelihood of encountering border-related illegal activities of great concern. Hunting with high powered rifles would pose a significant safety issue.

Future funding/staffing concerns

With current staffing/funding levels, it is not feasible to expand hunting opportunities. This is not likely to change in the foreseeable future.

2.0 ALTERNATIVES; INCLUDING PROPOSED ACTION ALTERNATIVE

This chapter discusses the alternatives considered for continuing/providing hunting opportunities on the refuge.

2.1 Alternative A – No Action/ Proposed Action: (Current Management):

No additional refuge tracts would be open to hunting - Current Management includes hunting of mourning and white-winged dove, Gambel's and scaled quail, and desert cottontail rabbits within a designated portion of the refuge (see Figure 1).

San Bernardino NWR is located in Hunt Unit 30A – in the Southeast corner of the unit; that portion of the San Bernardino National Wildlife Refuge north of the United States / Mexico International Border which includes approximately 1,300 acres. These lands include all lands east of Black Draw except for small posted closures around sensitive springs and water

developments. This area is open to hunting of all the above listed species in accordance with State regulations.

2.2 Alternative B –Expand Hunting:

This alternative would allow new hunting/ public use opportunities for mule deer archery hunting on the San Bernardino Unit to address Arizona Department of Game and Fish concerns to allow public access for large game hunts that currently exist on the State Unit 30A outside the refuge.

Under this alternative hunting would continue as described under Alternative A; however, we would add archery hunting of mule deer to the same refuge hunt unit.

2.3 Alternative C – Closed to Hunting.

Under Alternative C, hunting opportunities for upland game and migratory bird hunting on San Bernardino NWR would be closed. This would address public safety concerns close to the Mexican border and foreseeable decrease in future staffing. Upland game and migratory bird hunting would continue on the rest of the State’s Unit 30A outside of the refuge.

2.4 Alternative Considered But Dismissed From Detailed Analysis

All comments and suggestions received during scoping were considered during alternative development. Alternatives that were determined to be infeasible are discussed below.

Hunting on Leslie Canyon: An Alternative for hunting on Leslie Canyon - Leslie Canyon’s possible difficulties and hindrance’s are access, there are no roads through the refuge except for the county road; rugged terrain, steep, rocky mountainous terrain; and size of refuge, roughly 1.5 miles wide, at widest, and 4 miles top to bottom. Again its size restricts use of rifle hunting. This would require more staff to operate the hunts which at this time are not feasible. For this refuge’s population size for big game species is another limiting factor. Because of the sizes of the refuge/established hunt areas; population numbers are very low, <50 individuals for deer; with javelina numbers just slightly higher and both populations are very transitory.

Rifle Hunting for mule deer and javelina: An alternative for rifle hunting for mule deer and javelina hunting with centerfire rifles has been considered but dismissed because of the size of San Bernardino NWR hunt area, <1,400 acres, big game hunting with rifles is not practical. Also, the proximity to the border presents its own issues (i.e. animals not brought down with first shot, can escape into Mexico). Public safety is another concern with potential for conflict between hunters and undocumented aliens along the border. For both refuges population size for big game species is another limiting factor. Because of the sizes of the refuge/established hunt areas; population numbers are very low, <50 individuals for deer; with javelina numbers just slightly higher. Extra staffing would be required for these hunts and that is not feasible at this time.

Archery Hunting for Javelina: There is no season available for Archery hunting in Unit 30A for javelina.

Predator Hunting on San Bernardino: Because of the size of San Bernardino NWR hunt area, <1,400 acres, predator hunting is not practical. Also, the proximity to the border presents its own issues (i.e. animals not brought down with first shot, can escape into Mexico). Predator hunting would have the above mentioned issues, but with even lower population numbers. Extra staffing would be required for these hunts and that is not feasible at this time.

3.0 AFFECTED ENVIRONMENT

The San Bernardino Valley lies within the Chihuahuan Desert interface with the Sonoran Desert at an elevation averaging about 3,500-feet, located between mountain ranges reaching up to 8,000-feet. The SBNWR is at the northern margin of the Rio Yaqui Basin in Arizona, creating headwaters, which eventually flow south into the Sea of Cortez. The vast majority of this watershed is in Mexico, with only about 2% draining from the United States. The following resources are not discussed in this EA because the proposed hunting activities are not expected to have any impacts on them: physiography, hydrology, minerals, visual resource, land used and wilderness.

The refuge portion of Hunt Unit 30A is composed of Chihuahuan desert scrub; mesquite, creosote, and grasses, on the upland portions of the hunt area; and a mix of mesquite bosque and sacaton grasslands on the lower flood plain portion of the hunt area. Target species can be found in all the different habitat types mentioned. The resources described below are those that could be impacted (directly or indirectly) by the alternatives discussed in this document.

3.1 Physical Environment

3.1.1 Air Quality

Currently air quality in this region is good, and is much improved from previous decades when copper production was a major part of the economies in both Arizona and Sonora. Some pollution from metropolitan areas comes primarily from Agua Prieta, Sonora in the form of dust and some carbon emissions from vehicles. Smoke resulting from heating with wood during winter months, and periodically from wildfires and/or prescribed fires can occur for short periods of time. Dust in the San Bernardino Valley comes largely from vehicular traffic on Geronimo Trail Road, Guadalupe Canyon Road, and from the DHS Border Road, with prevailing winds coming out of the SW.

3.1.2 Water Quality and Quantity

The Río Yaqui Basin is a large riverine system, which drains portions of southeastern Arizona and southwestern New Mexico in the United States, and eastern Sonora and western Chihuahua in Mexico. These rivers flow southwesterly where they eventually join to empty into the Sea of Cortez near Ciudad Obregon, Sonora. The entire basin is approximately 73,000 square

kilometers. Less than 2% of the entire basin is in the United States, with drainages receiving runoff from the Swisshelm, Chiricahua, Mule, Pedregosa, Perilla, and Peloncillo Mountains.

Other than mostly ephemeral stream channels, the San Bernardino Ciénega is the most extensive wetland in the region, and forms an important migratory link between mesic environments of the Sierra Madre Occidental with those further to the north. It supports a unique and endemic biota, varying from special vertebrates to invertebrates and plants; rare species listed as endangered or threatened both by Mexico and the United States are present. Its natural history is well known so baselines for restoration are available. The ciénega was well watered in the past, beginning on what is now the SBNWR in the United States and extending into Sonora for >2.5 km (1.6 mi) along Río San Bernardino (Black Draw). It is now reduced to remnants associated with artesian wells, springs, and artificial ponds. Even in its degraded state it remains an oasis within these otherwise arid lands, providing stopover, breeding, and year around habitat for a significant number and diversity of organisms.

The western portion of the hunt unit is in what was the eastern half of the San Bernardino Ciénega that was found in the United States. Only man made wetlands and marshes exist in this area now.

3.1.3 Soils

Soils found within the hunt unit are comprised of four types: Bonita Clay, Karro Loam, Riggs, and Stronghold.

Bonita Clay are deep, well drained, level to hilly soils. They are found on alluvial fans, terraces, flood plains, and basin floors. In a representative profile, the surface layer is brown to dark reddish brown, cobbly clay loam about nine inches thick. The subsurface layer is brown clay to dark reddish brown silty clay about nine to twenty-five inches thick. Typical elevations for this soil type are 4,100 to 4,500 feet. However, it is found at elevations between 3,700 to 3,800 feet in the extreme southwestern corner of the hunt unit.

Karro Loam consists of well drained soils that formed in old alluvium from mixed igneous and sedimentary rocks on alluvial fans on uplands. In a representative profile, the surface layer is light brownish-gray and pale-brown heavy loam and silt loam about eleven inches thick. The subsoil is light brownish-gray silty clay loam about twelve inches thick. Karro soils are typically found between 4,000 and 5,000 feet. Karro loam is found below 4,000 feet in the eastern half of the hunt unit.

The Riggs series consists of very deep, moderately well-drained soils formed in stream or fan alluvium from volcanic, granitic, sedimentary rock. The soils are on level to nearly level alluvial fans and flood plains at elevations of 2,400 to 5,000. Riggs soils occupy the largest area within the hunt unit and are found from the western edge to the northeast-east boundary of the refuge in flood plains adjacent to the riparian areas.

Stronghold soils are deep, well-drained soils that formed in fan alluvium from mixed sources and wind transmitted (eolian) sediment. These soils formed in fan alluvium from limestone, schist, granite, andesite, rhyolite, and eolian sediments. In the hunt unit Stronghold soils are found below 4,000 feet on the eastern edge of the unit.

3.2 Biological Environment

3.2.1 Vegetation

Over 493 varieties of plants have been recorded from the area. The vast majority of these are native species, leaving the ecosystem relatively free from exotic invader species. Some Russian thistle (*Salsola iberica*), Johnsongrass (*Sorghum halapense*), and Lehmann's lovegrass (*Eragrostis lehmanniana*) exists and deserves control. At least 77 varieties of grasses have been recorded on the refuge, indicative of the regional diversity and species richness. Wetland species include Huachuca water umbel, five species of sedge, spikerush, bulrush, three species of rush, four species of duckweed, sago pondweed, cattail, and others. These species and probably others were at one time abundant and widespread in the area, but are currently limited in distribution and abundance due to human caused changes to the habitat, namely ranching and other agricultural uses. Dominant shrub species in the upland portions of the project area are mesquite, various forms of acacia, creosote, and tarbush.

The vegetation communities that comprise the hunt units are as follows:

1. Desert Grasslands component dominated by tobosa, six weeks grama, side-oats grama, black grama, alkali scaton, burrow grass, white-thorn acacia, honey mesquite, prickly pear cactus, and Christmas cactus;
2. Desert Scrub comprised of creosote bush, tarbush, white thorn, ocotillo, snakeweed, honey mesquite, soap tree yucca, agave, alkali sacaton, bush muhly, fluffgrass, tobosa, sideoats grama and sand dropseed; and
3. Mesquite Bosque with the dominate component of honey mesquite, netleaf hackberry and creosote bush.

3.2.2 Wildlife

The upper Río Yaqui watershed including SBRNWR has long been famous for its biodiversity, beginning with E. A. Mearns who sampled there in 1892 and clearly anticipated far greater scientific discoveries in expressing regret he could not explore further. This early recognition carries to the present. At least 330 bird species have been documented on the refuge, including many nesting species. In addition, at least 58 mammal, 30 reptile, 10 amphibian, 8 native fish, and hundreds of invertebrate species have been recorded. Due to reduced populations, habitat loss, or a combination of causes, a number of species and species groups receive special protection or management designation. Twenty two birds that use the refuge are on Mexico's list of species of concern, 36 are on a "Priority Species Pool" developed by Partners in Flight for adoption by the Service as part of their "List of Species of Management Concern;" 6 are listed by the state of Arizona. Excluding bats, at least 11 mammals that frequent the area receive listing by

the Mexican government, 6 as endangered. The noteworthy amphibians and reptiles are all restricted geographically and suffering population declines due to habitat loss or negative interactions with exotic species, and also are listed by Mexico. Eight of the nine fishes in the area are listed as threatened, endangered, or of special concern either by the Mexican government or by the Service. Six fish species also are "of concern" to the State of Arizona, and federally designated critical habitat exists for a shiner, chub, and catfish in the United States. Viable populations of all nine fishes persist in or adjacent to the area in Mexico. While the diversity of fish has been well documented, baseline inventories of aquatic invertebrates are almost unknown. The potential for discovery of numerous new endemic species is great due to the unique geology, isolation, and diversity of habitats.

Mammals

Fifty-six mammals have been identified on SBRNWR. Those include mule deer, white-tailed deer, javelina, mountain lion, bobcat, coyote, raccoon, white-nosed coati, ringtail, badger, four species of skunk, porcupine, Mexican opossum, black-tailed jackrabbit, desert cottontail, rock squirrel, fifteen species of bats, Botta's pocket gopher, Harris' antelope squirrel, and a wide variety of mice and rats. A complete list can be found at

http://www.fws.gov/refuge/San_Bernardino/Wildlife/Species_List.html

Reptiles and Amphibians

Thirty different species of reptiles and nine species of amphibians are found on SBRNWR. Some of these reptiles are; lesser earless lizard, tree lizard, Texas horned lizard, regal horned lizard, grassland whiptail, Gila monster, coachwhip, gopher snake, desert Kingsnake, checkered gartersnake, and western diamondback. Some of the more common amphibians are; Couch's spadefoot, Mexican spadefoot, red-spotted toad, Great Plains toad, lowland leopard frog, and American bullfrog (introduced). A complete list can be found at

http://www.fws.gov/refuge/San_Bernardino/Wildlife/Species_List.html

Fish

Historically there were 8 species of native fish found on SBRNWR. These included the Yaqui chub, Yaqui topminnow, Yaqui catfish, beautiful shiner, Yaqui sucker, Mexican stoneroller, roundtail chub, and longfin dace. Today only four of the eight are regularly found on the refuge (Yaqui chub, Yaqui topminnow, Yaqui catfish, and beautiful shiner). No non-native fish species are currently known to occur on the refuge. Within the hunt area, there is a perennial section of Hay Hollow Wash and a wetland impoundment that holds populations of Yaqui chub and topminnow.

Avifauna

Over 330 species of birds have been identified on the refuge. A complete list can be found at http://www.fws.gov/refuge/San_Bernardino/Wildlife/Species_List.html. Below are some of the more common species.

Marsh and waterbirds: great blue heron, green heron, great egret, sora, pied-billed grebe, belted kingfisher, and American bittern.

Shorebirds, gulls, terns, and allied species: American avocet, killdeer, and solitary sandpiper.

Raptors: gray hawk, red-tailed hawk, Swainson’s hawk, Cooper’s hawk, northern harrier, American kestrel, prairie falcon, black vulture, turkey vulture, Chihuahuan raven, great-horned owl, western screech owl, and barn owl.

Neotropical Birds: yellow warbler, blue grosbeak, Vermillion flycatcher, ash-throated flycatcher, summer tanager, loggerhead shrike, phainopepla, mockingbird, northern cardinal, Lucy’s warbler, western kingbird, Cassin’s kingbird, Say’s phoebe, Botteri’s sparrow, Cassin’s sparrow, and lesser goldfinch.

Game birds: Gambel’s quail, scaled quail, mourning dove, white-winged dove, and common ground dove.

3.3.3 Threatened and Endangered Species and Species of Concern

Various human activities have altered the landscape and ground water levels and have drastically changed the ecosystem since the turn of the century. The refuge provides a critical role in maintaining a sanctuary for multiple plant and wildlife species of special concern (federal and/or state listed) which are identified in the following table.

Table 3.6 Known Federal and State Listed Species that Occur on and Immediately Adjacent to San Bernardino NWR. Status: WC1 = Arizona Wildlife Species of Special Concern, FE = Federally Listed Endangered, FT = Federally Listed Threatened.

Status	Common Name	Scientific Name	Occurrence
FE	Huachuca Water Umbel	<i>Lilaeopsis schaffneriana</i>	resident
WC1	San Bernardino Springsnail	<i>Pyrgulopsis bernardina</i>	resident
FE/WC1	Yaqui Chub	<i>Gila purpurea</i>	resident
FT/WC1	Yaqui Beautiful Shiner	<i>Cyprinella formosa</i>	resident
FT/WC1	Yaqui Catfish	<i>Ictalurus pricei</i>	resident
FE/WC1	Yaqui Topminnow	<i>Poeciliopsis o. sonoriensis</i>	resident
FT	Chiricahua Leopard Frog	<i>Rana chiricahuensis</i>	resident
FT/WC1	Mexican Gartersnake	<i>Thamnophis eques</i>	resident

FT/WC1	Yellow-Billed Cuckoo	Coccyzus americanus	nesting
FE	Lesser Long-nosed Bat	Leptonycteris curasoae	migrant

3.3 Human Environment

3.3.1 Cultural Resources

The San Bernardino Valley, including the refuge, lies within a rich cultural heritage area, with documented human inhabitation going back for at least 10,000 years. The area encompassing what is now the refuge has been actively occupied during both the prehistoric and historic periods, and prehistoric sites appear to reflect both Mogollon (San Simon Branch) and a later Salado occupation of the area. Numerous archeological sites exist on this refuge, and a large Salado habitation site at the north end of the refuge, named the “Slaughter Ranch Site,” was partially excavated and recorded by Mills and Mills in 1966. A number of additional sites were recorded and reported by V. K. Pheriba Stacy in 1974. The refuge includes a portion of the San Bernardino Ranch National Historic Landmark (designated in 1963), though most of this landmark lies on the adjacent 131-acre Slaughter Ranch property. During 1982, an archaeological inventory was completed on this area and 24 archaeological sites were identified. These included the fortified military encampment used for troop training and border security, a number of historic house sites and associated trash dumps, and three prehistoric Mogollon sites. In addition, 33 sites and 99 isolated cultural features and artifacts existing on 2,000 acres of San Bernardino NWR west of Hay Hollow Wash have been documented by University of Arizona archeologists as part of a cultural resource inventory conducted under FWS contract from August 1984 - March 1985. These include archaic sites dating from 1500- 500 BC and also late prehistoric Animas phase (Mogollon and Salado) sites, including extensive settlements and pueblos, dating from about 1200 – 1400 AD. Although most sites are relatively secure from vandalism and “pot hunting,” some of the sites are in the immediate proximity of high public use areas.

3.3.2 Socioeconomic Resources

Over the last 35 years population growth in Cochise County, Arizona has been slower than the state and faster than the nation. Population growth is not generally impacted by national recessions. From 1980 to 2014 population grew by 41,762 people, a 48.74% increase in population.

The population has gotten older since 2000. The median age in 2010 was 39.7 years, up from 36.9 years in 2000. The largest age category is 15 to 19 years old (9,245 people or 7.04% of the total).

Total population in 2010 was 131,346 people, up 11.5% from 117,755 in 2000. The age group that has grown the fastest, as a share of total, is 55 to 59 years, up 2,589 people. Their share of total rose by 0.7%.

In 2013, for every household that made over \$100K, there were 2.39 households that made under \$35K (estimated). 13 years earlier, for every household that made over \$100K, there were 8.6 households that made under \$30K.

The housing affordability index is 152, which suggests that the median family can afford the median house. Housing affordability has become more affordable in the last decade, from 130 in 1990 to 152 in 2000.

Source: Census 2010, Census 2000, Census 1990, and Census 1980

From 1970 to 2004, average wage and salary disbursements grew at an annualized rate of 0.0% (adjusted for inflation), faster than from average nonfarm proprietors' income, which fell by 2.8%. In 2004, average wage and salary disbursements were \$33,373 (adjusted for inflation), more than average nonfarm proprietors' income (\$13,413). In 1970, it was the other way around. Average nonfarm proprietors' income was \$35,696 (adjusted for inflation), more than average wage and salary disbursements (\$33,140).

Source: BEA REIS 2004 Table CA30

<http://www.rosemonteis.us/documents/economic-profile-system-2007a>

3.3.3 Public Use/Recreation

The refuge receives over 6,000 visitors annually and provides opportunities for the public to hunt upland game birds (scaled and Gambel's quail and white-winged and mourning dove) and desert cottontail rabbit and the ability to observe, photograph and learn about the unique and highly diverse region created by the combining of four ecosystems; Southern Rocky Mountains, Chihuahuan Desert, Sierra Madres, and the Sonoran Desert.

The refuge actively participates in five of the Big 6 use outlined by the NWRS Improvement Act of 1997. They include: hunting, wildlife observation, wildlife photography, environmental education, and interpretation. Visitors can bird, hike, and hunt appropriate areas of the refuge during daylight hours.

4.0 ENVIRONMENTAL CONSEQUENCES

This chapter analyzes and discusses the potential environmental effects or consequences that can reasonably be expected by the implementation of the proposed action. An analysis of the effects of management action has been conducted on the physical environment (climate, air quality, hydrology, geology, mineral resources, and soils); biological environment (habitat, resident wildlife, migratory species, and threatened and endangered species); and socioeconomic

environment (cultural resources, socioeconomic, visitor service/recreational opportunities, public health and safety, facilities, and visual and aesthetic resources). The direct, indirect, and cumulative impacts of each alternative are considered. Direct effects are the impacts that would be caused by the proposed action at the same time and place as the triggering 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.

It has been determined that Alternative A (Current Management) and Alternative B (Expanded Hunting) will not have impacts on hydrology, water quality, geology, mineral resources and visual/aesthetic resources; therefore there will be no further discussion of these resources in the analysis. Potential impacts on other physical, biological, and socioeconomic resources are addressed in the sections below. Potential impacts are described in terms of type, duration, intensity and context (scale). General definitions are defined in Appendix A.

4.1 Effects Common to All Alternatives:

4.1.1. Environmental Justice:

Executive Order 12898 “Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations” was signed by President Bill Clinton on February 11, 1994, to focus federal attention 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 or environmental effects of their programs, policies, and activities on minority and low-income populations. The Order is also intended to promote nondiscrimination in federal programs substantially affecting human health and the environment, and to provide minority- and low-income residents access to public information and participation in matters relating to human health or the environment. This EA has not identified any adverse or beneficial effects for any alternative unique to minority or low-income populations in the affected area. Additionally, none of the alternatives will disproportionately place any adverse environmental, economic, social, or health impacts on minority or low-income populations.

4.1.2. Climate Change:

Climate change is already affecting fish, wildlife, plants and their habitats around the globe. The Service's Southwest Region has been working with the U.S. Geological Survey, the academic community, and other natural resource management agencies and interest groups to translate available and emerging science into concrete actions that reduce the impacts of a changing climate on the broadly diverse ecosystems in Arizona, New Mexico, Oklahoma and Texas. The Refuge believes that its hunt program will have negligible impacts on Climate Change; however, much is unknown about this subject. The Service has recently addressed the subject of Climate Change with the issuance of the publication “Rising to the Urgent Challenge: Strategic Plan for Responding to Accelerating Climate Change.” This five year plan calls for developing

long-term processes and protocols for biological planning and conservation at broad, landscape scales. This five year action plan calls for baseline data to be established. Refuges to date have no information or data regarding their carbon footprint. This subject will be further addressed as future direction is developed and provided on how to step this Strategic Plan down to the field level.

4.1.3. Impacts on Cultural Resources

Hunting, regardless of method or species targeted, is a consumptive activity that does not pose any threat to historic properties on and/or near the Refuge. In fact, hunting meets only one of the two criteria used to identify an “undertaking” that triggers a federal agency’s need to comply with Section 106 of the National Historic Preservation Act. These criteria, which are delineated in 36 CFR Part 800, state:

1. An undertaking is any project, activity, or program that can alter the character or use of an archaeological or historic site located within the “area of potential effect;” and
2. The project, activity, or program must also be either funded, sponsored, performed, licenses, or have received assistance from the agency.

Consultation with the pertinent State Historic Preservation Office and federally recognized Tribes is, therefore, not required.

4.2. Physical Environment

4.2.1 Impacts on Air Quality

Alternative A – Current Management and Proposed Action

Under Alternative A, no additional impacts to air quality are expected from continuation of current hunting programs. The refuge has between 10-20 hunters per year for dove, rabbit and quail hunting. Use is low on the refuge. Hunter traffic on roads to the refuge may cause a very slight increase in air quality due to vehicle emissions and the stirring of road dust. These impacts are expected to be negligible, short-term, and local because the small number of vehicles (at an average of 2 hunters per vehicle) therefore, there would not be a noticeable improvement in air quality if hunting opportunities were ceased.

Alternative B – Expanded Hunting:

Impacts would be similar to Alternative A, with additional mule deer hunting on the refuge unit. Levels of hunter traffic may cause a negligible decrease in air quality due to vehicle emissions and the stirring of road dust additional 1-3 vehicles for a period of 14 days per year. These impacts are expected to be short-term and local and would have no noticeable effects on air quality.

Alternative C – Closed to Hunting

Impacts would be less than Alternative A. However, hunting would be eliminated in refuge unit of State Unit 30A, which would reduce vehicle emissions and the stirring of road dust. These impacts are expected to be negligible, short-term, and local because of the small number of vehicles. The State would still be opened to hunting and the air quality there would remain the same.

4.2.2 Impacts on Water Quality and Quantity:

Alternative A – Current Management/ Proposed Action:

Vehicles would be confined to public access roads and parking facilities on the refuge, and foot traffic is minimal along the 100 feet of perennial stream. The current hunting program has no direct impacts on water quality or quantity.

Alternative B – Expanded Hunting:

Under this alternative, impacts would be similar to Alternative A. Only 5-10 additional hunters on the refuge unit would not be expected to change the overall water quality. Any change that results in the increase would be negligible to water quality. No impacts to water quantity are anticipated with both mule deer or upland game and migratory birds because we are using non-toxic projectiles. .

Alternative C – Closed to Hunting:

Under this alternative, impacts would be a slight improvement from Alternatives A and B. Hunter activity would not be allowed in the Refuge Unit.

4.2.3 Impacts on Soils:

Alternative A – Current Management:

Under Alternative A would result in some disturbance to surface soils (compaction by foot traffic). Impacts are expected to be short-term, negligible and local because hunter density will be low across the refuge throughout the hunting season (approximately one hunter per 100 acres). Vehicles would be confined to public access roads and parking facilities on the Refuge. Refuge regulations will not permit the use of ATVs.

Alternative B – Expand Hunting:

Under this alternative impacts would be similar to Alternative A. The additional hunting on the refuge unit, up to 1-3 more vehicles, is not expected to noticeably impact soils since vehicles will be confined to the access roads and designated parking areas on the unit.

The projectiles used for archery hunting are constructed of carbon fiber, aluminum or steel components and are typically recovered after use but are inert if lost while afield. Because archery consists of single projectiles, fewer of them are used per hunter and they are distributed across a larger area, their impact to soil quality is likely negligible.

Alternative C – Closed to Hunting:

Under this alternative, impacts to soils would be less than to those discussed under Alternative A and Alternative B since there will no longer be hunting on the refuge hunt unit.

4.3 Biological Environment

4.3.1 Impacts on Habitat

Alternative A – Current Management:

Under Alternative A, there would be minimal impacts to habitat. Hunters are not permitted to manipulate vegetation. Prohibited activities include: cutting limbs, screwing or nailing into trees, clearing trails, paths or lanes. Foot travel associated with hunting activities could result in disturbance to vegetation (trampling); however, these impacts are expected to be short-term, minor and local because hunter density will be low across the refuge throughout the hunting season (i.e., approximately one hunter per 100 acres). To reduce to risk of spreading seed of exotic or invasive plant species or damaging native habitat by other means, vehicles would be confined to public access roads and parking facilities on the refuge. Refuge regulations would not permit the use of ATVs.

Alternative B – Expand Hunting:

Under this alternative impacts would be the same as Alternative A. Adding mule deer hunting is expected to have negligible impacts on the habitat community since hunter density would be low (2 hunters per 1,300 acres).

Alternative C – Closed to Hunting:

Under this alternative, with hunting removed, impacts to habitat would be less than those discussed under Alternative A and Alternative B.

4.3.2 Impacts on Resident Wildlife

Alternative A— Current Management (Proposed Action):

Alternative A is not expected to adversely impact upland game or migratory bird populations, which are expected to remain stable and below carrying capacity. Non-game species will be temporarily disturbed by human presence in the field.

Alternative B— Expand Hunting:

Under this alternative impacts would be the same as Alternative A because of the small number of additional hunters that would participate in the mule deer hunt. These hunts would happen during different times of the year according to State seasons so there would be some overlap between species hunts.

Alternative C— Closed to Hunting:

Under this alternative, impacts to resident wildlife would be reduced from those of Alternative A.

4.3.3 Impacts to Migratory Species

Alternative A— Current Management:

Migratory species present on the refuge include waterfowl, other water birds, neo-tropical migrant birds, and raptors. This alternative would result in some short-term disturbance

(increased human presence and noise associated with hunting) to migratory birds that occur on the refuge. However, the level of disturbance perceived likely varies by species and individual. The low hunter densities result in low and patchily distributed disturbance across the refuge. The impacts of this disturbance are expected to be direct and negligible.

Alternative B— Expand Hunting:

Under this alternative impacts would be the same as Alternative A because of the small number of additional hunters that would participate in the mule deer hunt. These hunts would happen during different times of the year according to State seasons so there would be some overlap between species hunts.

Alternative C— Closed to hunting:

Under this alternative, impacts to resident wildlife would be reduced from those of Alternative A.

4.3.4 Impacts on Threatened, Endangered and Special Status Species

Alternative A— Current Management

The current management is not likely to impact any of the listed species found in the areas adjacent to the hunt unit. The number of hunters that utilize the refuge is of such a small number that impacts to any of the listed species would be negligible.

Yaqui chub, Yaqui catfish, Yaqui topminnow, and beautiful shiner can be found in wetland impoundments that are within the hunt area or immediately adjacent to it, but with the use of non-toxic shot and there being no need for hunters to enter the water, there should be no significant impacts to any of these species. Yaqui topminnow are also found in a reach of Hay Hollow wash, but the reach is of such a short length, that it is expected that hunters would have no impact to this small population.

The San Bernardino springsnail, Chiricahua leopard frog, and Mexican gartersnake are not found within the hunt unit and the closest populations are far enough from the hunt unit that there is no chance for hunters to impact them.

Huachuca water umbel is a wetland/riparian obligate plant, and is found in the riparian corridor of Hay Hollow Wash, along the same reach that holds the above mentioned population of Yaqui topminnow. Huachuca water umbel can be impacted if it is trampled down and killed if it is continuously walked over. It is not believed that hunters will impact this population of water umbel due to the small area it is found in and the expected number of hunters that would use the refuge for hunting.

Alternative B— Expand Hunting:

Under this alternative impacts would be the same as Alternative A. The addition of mule deer hunting would not significantly increase the likelihood of impact to any of the refuge's listed species.

Alternative C— Closed to Hunting:

Under Alternative C there would be no impacts. With the closing of the refuge to hunting, any impacts to listed species would be removed due to the removal of hunters from the refuge.

4.4 Socioeconomic Environment

4.4.1 Impacts on Socioeconomic Resources

Alternative A— Current Management:

Under Alternative A, the economic and social condition of the area would remain the same and the public is allowed a limited harvest of a renewable resource. Additionally, the refuge is promoting a wildlife-oriented recreational opportunity that is compatible with the purpose for which the refuge was established. The public would have an increased awareness of San Bernardino NWR and the National Wildlife Refuge System and public demand for some hunting would be met.

Alternative B— Expanded Hunting:

Under this alternative, impacts would be the same as Alternative A with a slight increase.

Alternative C— Closed to Hunting:

Under this alternative, impacts would be less than Alternative A with a closure of hunting opportunities for the public on the refuge unit of Unit 30A. This reduction is not expected to impact socioeconomics of the area since the affected hunters are likely to continue to use the rest of Unit 30A.

4.4.2 Impacts to Visitor Services/Recreation Opportunities

Alternative A— Current Management:

Under Alternative A, there would be no change in the existing visitor services and recreation opportunities on the refuge. The average breakdown of the approximately 6000 annual visitor use days over the past 3 years is as follows: hunting ~1% and other wildlife-dependent uses (photography, wildlife observation, and interpretation) ~99%. Currently, white-winged and mourning dove, quail, and desert cottontail rabbit hunters average about 10 visits per year. Most wildlife observation and hiking visits occur west of the refuge hunt unit boundary. They are not affected by the hunting since the two activities do not overlap.

Alternative B— Expand Hunting:

Under this alternative, both beneficial and adverse impacts to visitor services/recreational opportunities would occur. There would be an additional hunting opportunity which would be a positive impact because the state has limited hunting opportunities for the public. The refuge hunt unit is to the west of the trails that are used by other uses on the refuge. Hunters would benefit from additional opportunities to hunting, however given the low population of deer and their transitory nature through the refuge, the quality of the hunt would not be as good as other public hunting areas nearby. Overall, impacts to visitor services/recreation opportunities are

considered short-term, minor and local since other parts of the Refuge are available for use by non-hunters (other wildlife-dependent recreation users).

Alternative C— Closed to Hunting:

Under this alternative there would be a negligible impact on visitor services. Not allowing hunting on refuge hunt unit will impact 10-20 hunters per year, but Unit 30A will still be available for hunting, thus the impact is minimal. The hunting occurring on San Bernardino NWR will have no effect on the other public use activities due to the limiting factor of low hunter visitors using the refuge.

4.4.3 Impacts on Public Health and Safety

Alternative A— Current Management:

Under current management public health and safety risks are minimal because the refuge employs multiple safety rules and regulations (CFR Reference). All other public use conflicts are taking place on other areas of the refuge while hunts are open. There is only a very slight chance of a hunting accident as refuge hunter densities are strictly limited. There would be few hunters spread out over the refuge hunt unit. There is a slight chance of a firearms accident to another hunter or themselves. The risk of accident on the Refuge would continue to be minimal.

Alternative B— Expanded Hunting:

Under this alternative impacts to public health and safety would be similar to Alternative A.

Alternative C— Closed to Hunting:

Under this alternative impacts to public health and safety would be less than in Alternative A.

4.4.4 Impacts on Refuge Facilities

Alternative A— Current Management:

Damages to roads and parking facilities from hunter use would continue at the current level, which requires some road grading a couple of times per year. Other non-consumptive users would also continue to use Refuge facilities, thereby necessitating periodic maintenance throughout the year. Other facilities and fences would not be affected.

Alternative B— Expanded Hunting:

Under this alternative impacts would be similar to Alternative A. With the addition of the new hunt there would be no measurable impact from the road traffic of 1-3 vehicles for an additional fourteen days per year.

Alternative C— Closed to Hunting:

Under this alternative, impacts to refuge facilities would be less than Alternatives A and Alternative B. Other non-hunting visitors would still be using the refuge.

4.4.5 Humaneness and Animal Welfare Concerns:

Alternative A— Current Management:

Under this alternative, mortality of white-winged and mourning dove, scaled and Gambel's quail and desert cottontail rabbits would occur. Accurate, clean shots are expected. The target should be within the effective range of the firearm, ammunition, or bow and arrow and the skills of the hunter; and a humane kill is likely.

Alternative B— Expand Hunting:

Under Alternative B, impacts would be the same as Alternative A with the addition of the possibility of wounded mule deer crossing the border into Mexico and a clean kill would not be likely.

Alternative C— Closed to Hunting:

Under Alternative C, there would be no hunter caused mortalities. Poaching on the refuge is very rare. There has only been one incident documented that occurred adjacent to the refuge, that was in October of 2008, and has only been reported twice in 6 years. However, there has been other evidence that points to poaching taking place on the refuge in the form of spent ammunition shells found outside of the designated hunt unit .

4.5 Cumulative Impacts Analysis

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 action 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. Sometimes different actions counterbalance one another, partially canceling out each other's effects on a resource. But more typically, multiple effects add up, with each additional action contributing an incremental impact on the resource.

4.5 .1 Anticipated Direct and Indirect Impacts of Proposed Action Alternative on Wildlife Species.

4.5.1.1 Resident Wildlife

Gambel's and Scaled Quail:

Regional Analysis:

There is no available population data available for Gambel's or scaled quail in Arizona, only harvest numbers for 2006-2010 and the Small Game Outlook, provided by the Arizona Game

and Fish Department on their website (http://www.azgfd.gov/h_f/small_game.shtml) are available. The small game outlook only provides information for the current hunt year based on that year's spring surveys.

Local Analysis:

Using call counts from 2006-2013 on the refuge, numbers of Gambel's quail encountered have decreased on the refuge similarly to the mourning dove population. Gambel's quail encountered during 2006-2007 call counts generally numbered in the 40-50 bird range, while encounters during 2012 and 2013 averaged 20-30 individuals. Scaled quail are rarely observed at any location on the refuge or in the immediate vicinity of the refuge. However, using anecdotal data (contact with hunters by refuge staff) and the sign-in sheet located at the Hunter's Access point, there is minimal use of the refuge for hunting either species of quail, and there is no recent known success of quail taken during the hunt season. Based on this information Gambel's quail populations should remain at sustainable levels and scaled quail population, because of lack of opportunity, is likely sustainable as well.

Cottontail Rabbit:

Regional Analysis:

There are no population numbers for desert cottontail available for the state of Arizona. The only information available is harvest numbers for the years 2006-2010 and the small game outlook provided by AZGFD each year.

Local Analysis:

Rabbit populations will not be impacted on the refuge due to their prolific breeding capabilities and the more than adequate refuge habitat. Desert cottontails have litter sizes ranging from 2.6-3.6 young per litter (Sowls, 1957; Chapman and Ceballos, 1990) and because of the length of the breeding season, seven to eight months, four litters per year are likely (Sowls, 1957). There are no recent known instances of desert cottontail rabbits being taken on the refuge and if the number of hunters that utilize the refuge for dove and quail are any indication, the refuge receives very little use by rabbit hunters. In addition, the limited five month hunting season on the refuge is less than half the length of the statewide season of a year.

Other Resident Wildlife:

There should be minimal direct disturbance to resident wildlife by hunters. Indirect effects are minimized due to the use of non-toxic shot by hunters, preventing accidental ingestion by scavengers of lost downed birds or rabbits (Haig, et al, 2014).

4.5.1.2 Migratory Species

Migratory species present on the Refuge (over 200 species) include waterfowl, other waterbirds, neotropical migrant birds, and raptors.

White-winged and Mourning Dove:

Regional Analysis:

White-winged dove populations in Arizona have been stable since 2001, but remain at their lowest relative abundance estimates since surveys were initiated in the 1960's. The survey method provides an annual index to relative abundance and is calculated as a simple mean of the counts conducted during the year (Rabe and Sanders, 2010). Using call count surveys conducted throughout the state in 2010 (the most recent data available), there was a mean of 23.6 birds per survey route. The average for the years 2001-2010 is 24.7. The breakdown of survey routes by habitat type was seventeen in Sonoran Desert, three in chaparral, and four in Chihuahuan Desert (Rabe and Sanders, 2010). The San Bernardino NWR is predominantly Chihuahuan Desert Habitat. Harvest numbers are in correlation to these estimates with an average of 4.8 birds harvested per hunter in 2010 with an average of 5.2 between the years 2001 through 2010 (Rabe and Sanders, 2010; Arizona Game and Fish Department, 2013).

Mourning dove populations have declined similar to the white-winged dove population over the last 40-plus years. Using Seamans' (2013) annual abundance indices of mourning doves based on call-count survey data from heard observances, Arizona had an index of 14 for 2012 and an average of 17.41 for 2004-2012 (data for 2013 is available; but to insure indices are relatable to harvest numbers, the years of 2004-2012 were used). As with white-winged dove, harvest numbers are in correlation with the population indices. 2012 had a harvest rate (birds/hunter) of 18.72, while the average rate during the years 2004-2012 was 23.34.

Local Analysis:

Using call count surveys done on the refuge from 2006-2013, the same declining trend is seen in white-winged and mourning dove as with the rest of the state. In addition to this downward trend seen in white-winged dove, white-winged doves have never been numerous and are difficult to locate on the refuge even by the best observer. The most likely time to find white-winged doves is during the spring migration period, March to May. Because of the low numbers of white-winged doves and the perceived number of hunters that utilize the refuge for hunting during the September 1-15 dove season, which is approximately five hunters (derived from staff observation and sign-in sheet at refuge hunter access point), white-winged dove populations on the refuge are not likely to be impacted due to lack of opportunity.

Mourning doves, much like white-winged doves, are showing a downward trend on the refuge as well. However, mourning dove numbers, based on refuge call counts, are still high, especially during the hunt periods, with typically 200 birds observed during each survey period. Based on the observed numbers of mourning doves and the limited use of the refuge by hunters, an average of ten per year for both the early and late seasons, hunting should not pose a threat to the sustainability of the mourning dove population.

Other Migratory Species:

There may be incidental disturbance to other migratory species found within the designated hunt unit from hunters coming into an area occupied by them or from noise from firearm discharge

(Pease, M.L. et al, 2005). However, this effect should be negligible, given the amount of habitat that is available on the refuge outside of the hunt unit. With the use of non-toxic shot there is no risk of lead poisoning through incidental direct ingestion (Haig, et al, 2014) or secondary ingestion by raptors (McBride, et al, 2004).

4.5.1.3 Endangered Species

It is the policy of the Service to protect and preserve all native species of fish, wildlife, and plants, including their habitats, which are designated as threatened or endangered with extinction.

Regional Analysis

It was determined by the refuge that none of the alternatives would adversely affect threatened or endangered species on the refuge.

Local Analysis

Current management is not likely to have adverse impacts to any of the refuges threatened or endangered species. The number of hunters per acre (1 hunter per 800 acres) at an average of 21 days per year should not adversely affect threatened or endangered species.

4.5.2 Anticipated Direct and Indirect Impacts of Proposed Action on Refuge Programs, Facilities, and Cultural Resources.

4.5.2.1 Other Wildlife-Dependent Recreation

The Refuge has other public use wildlife-dependent opportunities that can be affected by the hunt program. During the various hunting seasons, there is the potential for non-hunting activities to be impacted by hunting. These impacts are believed to be small since the public use trail is west of the hunt unit and many of the areas frequented by visitors are well away from the hunt area. The most likely disturbance to non-hunt visitors would be from firearm discharge. Generally, many of these non-hunting activities do not occur frequently by the public during the colder months. These conflicts are temporary and short-term.

By continuing with Current Management or implementing Alternative B, the refuge would meet the demands of the public, by providing the public with a hunt opportunity.

By implementing Alternative C there would be no impact to other wildlife dependent recreation opportunities.

4.5.2.2 Refuge Facilities

The Service defines facilities as: “Real property that serves a particular function(s) such as buildings, roads, utilities, water control structures, raceways, etc.”

Because the hunt unit, and the refuge in general, is closed to vehicular traffic; the only infrastructure at risk of impact due to Current Management or Alternative B, would be to the access road, the parking area, and the hunter sign-in station. These impacts are expected to be minimal due to the small amount of hunters that utilize the refuge.

4.5.2.3 Cultural Resources

Hunting, regardless of method or species targeted, is a consumptive activity that does not pose any threat to historic properties on and/or near the Refuge. In fact, hunting meets only one of the two criteria used to identify an “undertaking” that triggers a federal agency’s need to comply with Section 106 of the National Historic Preservation Act. These criteria, which are delineated in 36 CFR Part 800, state:

1. An undertaking is any project, activity, or program that can alter the character or use of an archaeological or historic site located within the “area of potential effect;” and
2. The project, activity, or program must also be either funded, sponsored, performed, licenses, or have received assistance from the agency.

Consultation with the pertinent State Historic Preservation Office and federally recognized Tribes is, therefore, not required.

4.5.3 Anticipated Impacts of Proposed Hunt on Refuge Environment and Community

4.5.3.1 Refuge Environment

Negative impacts to the Refuge environment associated with the proposed hunting activities will be minor. It is expected that some minor disturbance to soils and vegetation will occur as a result of people engaging in the proposed hunting activities. Air quality will experience minor impacts due to increased fossil fuel emissions as people travel to and from the hunt unit. The refuge is not known for its ability to provide solitude due to the proximity of highway traffic in Mexico, heavy traffic by Border Patrol on roads adjacent to the refuge, and other such disturbance so the temporary increase in use during the proposed hunts would not affect this character of the refuge.

Lands adjacent to the refuge are predominantly agricultural and sparsely populated, and hunting is a common past time in the area, so the brief increase in activity on the refuge would have little effect on the public, visitors, and nearby residents.

Any negative cumulative impacts realized in the future action to the refuge environment would be further reduced by appropriate regulation(s). Collectively, these actions are anticipated to result in minor cumulative effects to the refuge environment.

4.5.3.2 Refuge Community

The economic impact of the proposed hunt program would remain the same, with no change in sales of licenses or ammunition.

4.5.4 Other Past, Present, Proposed and Reasonably Foreseeable Hunts (and Other Activities) and Anticipated Impacts

Past

Virtually all the lands acquired by the Service for inclusion into San Bernardino NWR were hunted as private before being added to the refuge system. Prior to becoming part of the Refuge System, the land had been in private ownership since the late 1800's and its history is fairly well documented. The past land use practices also included ranching, farming, and a water bottling facility.

Being that this region is on the International Border with Mexico, there has undoubtedly been a military or border patrol presence since the United States took possession of the area after the Gadsden Purchase in 1853. With numbers of soldiers or border patrol agents increasing or decreasing as needs mandated.

Present

The refuge has and continues to work in cooperation with the Malpai Borderlands Group within the San Bernardino Valley in an effort to monitor habitat and wildlife populations and work to restore habitats that were common to the area prior to European settlement. The Refuge is in a large area with many tracts of State Trust Land that are available for the public to use for hunting dove, quail and desert cottontail rabbit. All other hunting is by private lease, rare, or on personal property, that is not posted no hunting or no trespass, and continues at various levels from being poorly run to well managed around and adjacent to the refuge. The past land use practices of ranching and farming no longer continued once the land was added to the refuge. These areas are being restored to giant sacaton grasslands, ciénegas, and cottonwood-willow riparian galleries (e.g. prescribed burning, root grubbing, gabion construction, etc.) or passive management practices.

Since the mid-1990's, the U.S. Border Patrol has increased its number of agents in the region in response to increase immigration and terrorist activities. This number is currently 4,200 agents in Tucson Sector which is comprised of eight stations. Border Patrol is the heaviest user of infrastructure within the San Bernardino Valley. However, through an agreement between the refuge and the Douglas Station, agents are not permitted vehicular access to the refuge unless it is considered a critical situation that warrants immediate vehicular access, they can access the refuge on foot or horseback, and regularly do in the course of carrying out their duties.

Future

The proposed alternative of continuing with the Current Management of migratory bird, quail, and desert cottontail rabbit hunting on the refuge is expected to be an effective management tool ensuring healthy and sustainable game animal populations, while also providing the public with additional outdoor recreational opportunities. Refuge staff will continue to promote native flora

and fauna diversity through active habitat management that achieve refuge wildlife habitat priorities and objectives.

As public use levels expand across time, the potential for unanticipated conflicts among and with user groups could arise. In the event such unanticipated conflicts may occur as a result of retaining this hunt program, the refuge's visitor use programs would be adjusted as needed to eliminate or minimize each problem, so that it could continue to provide quality wildlife-dependent recreational opportunities. Hunting season dates and regulations would be set and regulated to allow most user groups to experience a quality visit while on the refuge. The refuge would have the flexibility to modify the hunt program in order to meet the needs of all wildlife-dependent recreational user groups.

With the prediction of continued instability of financial markets in Mexico and other developing countries to the south, it is likely that immigration will maintain at current levels or increase, possibly necessitating an increase of Border Patrol agents in the region and possibly voiding the current agreement between the Refuge and the Douglas Border Patrol Station.

As the refuge continues to become more widely known, visitation is expected to increase, especially in non-hunting wildlife-dependent recreational activities. It is assumed that more visitors to this area will create the potential for beneficial economic effects and a positive image for the county and surrounding area.

4.5.5 Anticipated Impacts if Individual Hunts are Allowed to Accumulate

The Service has concluded that there will be minor cumulative impacts on the refuge's wildlife populations, either hunted or non-hunted species. The Service has also concluded that the proposed action will not cumulatively impact the refuge environment or refuge programs. This determination was based upon a careful analysis of potential environmental impacts of hunting on the refuge together with other projects and/or actions. Hunting is an appropriate wildlife management tool that can be used to manage wildlife populations. Some wildlife disturbance will occur during the limited hunting seasons. Proper zoning, regulations, and refuge seasons will be designated to minimize any negative impacts to wildlife populations using the refuge.

Field checks by refuge law enforcement officers will be planned, conducted, and coordinated with staff and other agencies to maintain compliance with regulations and assess species populations and numbers harvested.

4.5.6 Summary of Cumulative Effects

These actions would have both direct and indirect effects (e.g., additional species open to hunting would result in increased public use, thus increasing vehicular traffic, disturbance, etc.); however, these would be minor cumulative effects from the proposed action. No new units would be opened to other wildlife-dependent recreation during non-hunting periods, there would

be no expected increase in visitation and the direct benefits to the economic to the local community would remain the same.

National Wildlife Refuges, including San Bernardino National Wildlife Refuge, would conduct hunting programs within the framework of State and Federal regulations. By maintaining hunting regulations that are as, or more, restrictive than the State, individual refuges ensure that they are maintaining seasons which are supportive of management on a regional basis.

4.6 Environmental Justice

Executive Order 12898 “Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations” to focus federal attention 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 directs federal agencies to develop environmental justice strategies to aid in identifying and addressing disproportionately high and adverse human health or environmental effects of their programs, policies, and activities on minority and low-income populations. The Order is also intended to promote nondiscrimination in federal programs substantially affecting human health and the environment, and to provide minority and low-income communities’ access to public information and participation in matters relating to human health or 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 be beneficial for the environment over the long-term and people in the surrounding communities.

4.7 Unavoidable Adverse Effects

As proposed under alternative, continuation of hunting on the Refuge may result in some unavoidable adverse impacts. Some desert cottontail rabbit, upland game and migratory birds would be killed; however, these species are a renewable resource and there would be no discernible effect on the populations. There would also be some short-term disturbance to other resident wildlife, but these impacts are expected to be minimal.

4.8 Irreversible and Irretrievable Commitment of Resources

None of the alternatives would result in a large commitment of nonrenewable resources.

Project implementation would require a small commitment of fossil fuels (diesel and gasoline), oils, and lubricants used by heavy equipment and vehicles for road maintenance. Parking areas would be maintained and law enforcement activities may become necessary.

4.9 Summary of Impacts by Alternative

Table 4.9-1 Summary of Environmental Consequences by Alternative:

4.9 Summary of Impacts by Alternative

Table 4.9-1 Summary of Environmental Consequences by Alternative:

Environmental Resource	Alternative A: Current Management	Alternative B: Expanded Hunting	Alternative C: Closed to Hunting
Impacts to Air Quality	very slight decrease in air quality due to vehicle emissions and the stirring of road dust.	Same as alternative A with minor increase in some hunting activities	Slight increase in air quality due to no hunting.
Impacts to Water Quality and Quantity	No direct impacts	Same as alternative A with minor increase in some hunting activities	Decrease in all hunting activities
Impacts to Soils	Minimal direct negative impacts due to vehicle and foot traffic	Same as alternative A with minor increase in some hunting activities	Decrease in all hunting activities
Impacts on Habitat	Minimal direct impacts due to foot traffic (trampling of vegetation)	Same as alternative A with minor increase in some hunting activities	Decrease in all hunting activities.
Impacts on Resident Wildlife	Minimal direct negative effect (some disturbance and harvest); Minor indirect effects mitigated by use of non-toxic ammunition.	Same as alternative A with minor increase in some hunting activities	Decrease in all hunting activities
Impacts to Migratory Species	Minor direct negative effect (some disturbance and harvest)	Same as alternative A with minor increase in some hunting activities	Decrease in all hunting activities
Impacts on Threatened and Endangered Species	Potential minor impacts are possible Yaqui chub and topminnow but not expected.	Same as alternative A with minor increase in some hunting activities	Same as alternative A but decrease in some hunting activities
Impacts on Socioeconomic Resources	No change	Same as alternative A with minor increase in some hunting activities	Same as alternative A but decrease in some hunting activities
Impacts to Visitor Service/Recreation	No change	Minor positive effect (opening areas to deer hunting)	Minor negative: (closing areas to hunting, loss of 1% of visitation)
Impacts on Public Health and Safety	Minor risk (minimized by spreading hunters out over large area)	Same as alternative A	Decrease because closure of all hunting activities.
Impacts of Refuge Facilities	No change	Same as alternative A with minor increase with slight increase in hunter use on roads	decrease in use of some roads

5.0 CONSULTATION, COORDINATION and DOCUMENT PREPARATION

San Bernardino NWR staff is working with Department of Arizona Game and Fish concerning the proposed hunting plan maintaining the current hunting opportunities within the existing hunt units.

5.1 Staff Consulted in the Preparation of This Document

Project Leader
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6.0 APPENDICIES

Appendix A DEFINITION OF TERMS

Carrying capacity is the maximum population of a particular organism that a given environment can support without detrimental effects.

Effects

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.

Impact Type

Beneficial/positive impacts are those resulting from management actions that maintain or enhance the quality and/or quantity of identified Refuge resources or recreational opportunities.

Adverse/negative impacts are those resulting from management actions that degrade the quality and/or quantity of identified refuge resources or recreational opportunities.

Duration of Impacts

Short-term impacts affect identified refuge resources or recreational opportunities; they occur during implementation of the management action but last no longer.

Medium-term impacts affect identified refuge resources or recreational opportunities that occur during implementation of the management action; they are expected to persist for some time into the future though not throughout the life of the CCP.

Long-term impacts affect identified refuge resources or recreation opportunities; they occur during implementation of the management action and are expected to persist throughout the life of the Plan and possibly longer.

Intensity of Impact

Insignificant/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.