

# **Draft Environmental Assessment**

## **for Sport Fishing on Alamosa National Wildlife Refuge**

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Prepared by

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## Table of Contents

<b>1.0</b>	<b>Introduction.....</b>	<b>3</b>
1.1	Proposed Action.....	3
1.2	Background.....	3
1.3	Purpose and Need for the Proposed Action .....	5
<b>2.0</b>	<b>Alternatives.....</b>	<b>6</b>
2.1	Alternatives Considered.....	6
	Alternative A – Open Refuge to Recreational Sport Fishing – Proposed Action Alternative	6
	Alternative B – Current Management – No Action Alternative .....	7
<b>3.0</b>	<b>Affected Environment and Environmental Consequences .....</b>	<b>8</b>
3.1	Affected Environment.....	8
	Riparian Habitat on the Refuge.....	8
	Wetland Habitat on the Refuge.....	9
	Upland Habitat on the Refuge.....	10
3.2	Environmental Consequences of the Action.....	10
3.3	Cumulative Impact Analysis.....	28
3.4	Mitigation Measures and Conditions .....	30
3.5	Monitoring .....	30
3.6	Summary of Analysis.....	30
	Alternative A – Proposed Action Alternative.....	32
	Alternative B – No Action Alternative .....	32
3.7	List of Sources, Agencies and Persons Consulted:.....	32
3.8	List of Preparers .....	33
3.9	State Coordination .....	33
3.10	Tribal Consultation .....	33
3.11	Public Outreach.....	33
3.12	Determination .....	34
3.13	References.....	35

**List of Figures**

Figure 1. Proposed Fishing Areas on Alamosa National Wildlife Refuge ..... 4

**List of Tables**

Table 1. Affected Natural Resources and Anticipated Direct and Indirect Impacts of the Proposed Action and Any Alternatives ..... 12

Table 2. Affected Visitor Use and Experience and Anticipated Direct and Indirect Impacts of the Proposed Action and Any Alternatives..... 22

Table 3. Affected Cultural Resources and Anticipated Direct and Indirect Impacts of the Proposed Action and Any Alternatives..... 23

Table 4. Affected Refuge Management and Operations and Anticipated Direct and Indirect Impacts of the Proposed Action and Any Alternatives..... 24

Table 5. Affected Socioeconomics and Anticipated Direct and Indirect Impacts of the Proposed Action and Any Alternatives ..... 26

Table 6. Anticipated Cumulative Impacts of the Proposed Action and Any Alternatives ..... 28

Table 7. Summary of Anticipated Impacts of the Proposed Action and Any Alternatives ..... 31

**Appendices**

**Appendix A** Other Applicable Statutes, Executive Orders, and Regulations ..... 39

# **Draft Environmental Assessment for Sport Fishing on Alamosa National Wildlife Refuge**

**Date:** February 25, 2020

This Environmental Assessment (EA) is being prepared to evaluate the effects associated with this proposed action and complies with the National Environmental Policy Act (NEPA) in accordance with Council on Environmental Quality regulations (40 Code of Federal Regulations [CFR] 1500-1509) and Department of the Interior (43 CFR 46; 516 DM 8) and United States (U.S.) Fish and Wildlife Service (Service) (550 FW 3) regulations and policies. NEPA requires examination of the effects of proposed actions on the natural and human environment.

## **1.0 Introduction**

### **1.1 Proposed Action**

The Service is proposing to open sport fishing opportunities on Alamosa National Wildlife Refuge (NWR) in accordance with the refuge's 2019 sport fishing plan (Figure 1). Waters that can sustain a recreational fishing program, that pose minimal damage to sensitive habitats or species, and that have safe public access points would be opened to fishing. Public fishing would be conducted according to State of Colorado regulations, except where other refuge-specific conditions may apply to reduce habitat, wildlife disturbance, or other use conflicts.

This proposed action is often iterative and evolves during the process as the agency refines its proposal and learns more from the public, tribes, and other agencies. Therefore, the final proposed action may be different from the original. The final decision on the proposed action will be made at the conclusion of the public comment period for the EA and the Draft 2020-2021 Refuge-Specific Sport Fishing Regulations. The Service cannot open a refuge to fishing until a final rule has been published in the federal register formally opening the refuge to fishing.

### **1.2 Background**

National wildlife refuges are guided by the mission and goals of the National Wildlife Refuge System (Refuge System), the purposes of an individual refuge, Service policy, and laws and international treaties. Relevant guidance covers the National Wildlife Refuge System Administration Act of 1966 (NWRSA), as amended by the National Wildlife Refuge System Improvement Act of 1997 (Improvement Act), Refuge Recreation Act of 1962, and selected parts of the CFR and Fish and Wildlife Service Manual.

Alamosa NWR was established July 25, 1963 under the authority of the 1929 Migratory Bird Conservation Act (45 Stat. 1222; 16 U.S. Code Section 715d) “. . . for use as inviolate sanctuaries, or for any other management purposes, for migratory birds.”

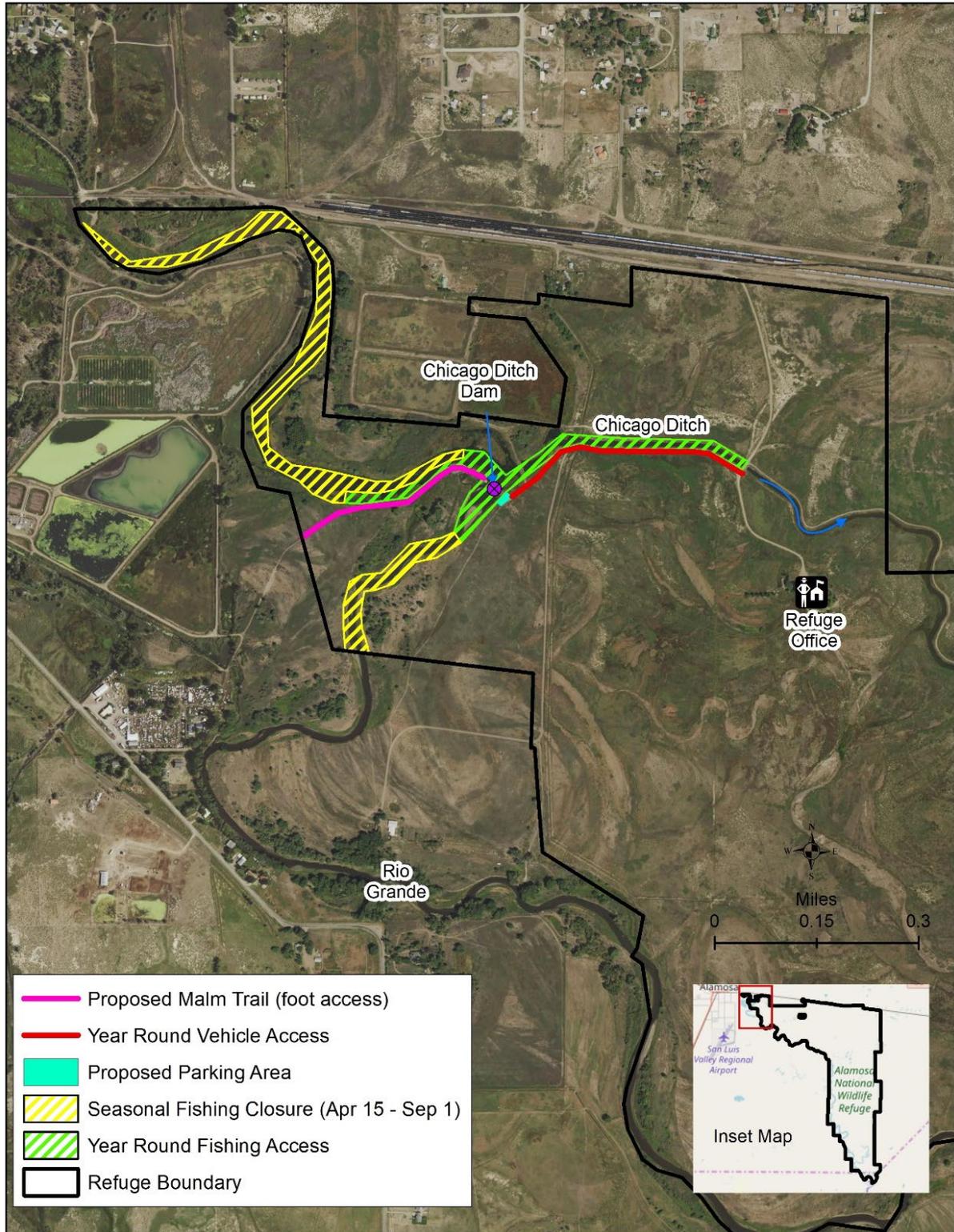


Figure 1. Proposed Fishing Areas on Alamosa National Wildlife Refuge.

The mission of the Refuge System, as outlined by the NWRSA, as amended by the Improvement Act (16 U.S. Code 668dd et seq.), 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 U.S. for the benefit of present and future generations of Americans.”*

The NWRSA mandates the Secretary of the Interior in administering the Refuge System to (16 U.S. Code 668dd[a][4]):

- provide for the conservation of fish, wildlife, and plants, and their habitats within the Refuge System;
- ensure that the biological integrity, diversity, and environmental health of the Refuge System are maintained for the benefit of present and future generations of Americans;
- ensure that the mission of the Refuge System described at 16 U.S. Code 668dd(a)(2) and the purposes of each refuge are carried out;
- ensure effective coordination, interaction, and cooperation with owners of land adjoining refuges and the fish and wildlife agency of the states in which the units of the Refuge System are located;
- assist in the maintenance of adequate water quantity and water quality to fulfill the mission of the Refuge System and the purposes of each refuge;
- recognize compatible wildlife-dependent recreational uses as the priority public uses of the Refuge System through which the American public can develop an appreciation for fish and wildlife;
- ensure that opportunities are provided within the Refuge System for compatible wildlife-dependent recreational uses;
- monitor the status and trends of fish, wildlife, and plants in each refuge.

Therefore, it is a priority of the Service to provide for wildlife-dependent recreation opportunities, including hunting and fishing, when those opportunities are compatible with the purposes for which the refuge was established and the mission of the Refuge System.

Before acquisition (in 2003) of the part of the refuge where opening sport fishing is being proposed, local citizens would access the area to fish for game fish (primarily northern pike and common carp). After the acquisition of this parcel, the area was closed to recreational sport fishing. Throughout the development of the refuge’s comprehensive conservation plan (CCP) and Environmental Impact Statement (EIS) (2015), some members of the public expressed a desire to open this area for sport fishing. Currently, no sport fishing opportunities exist on the refuge.

### **1.3 Purpose and Need for the Proposed Action**

The purpose of this proposed action is to provide compatible wildlife-dependent recreational opportunities on Alamosa NWR. The need of the proposed action is to meet the Service’s priorities and mandates as outlined by the NWRSA to “recognize compatible wildlife-dependent recreational uses as the priority general uses of the Refuge System” and “ensure that

opportunities are provided within the Refuge System for compatible wildlife-dependent recreational uses” (16 U.S. Code 668dd[a][4]).

The San Luis Valley NWR Complex CCP and EIS (2015) proposed to provide new recreational sport fishing opportunities on a part of the refuge.

The objectives of the sport fishing plan directly support several of the refuge’s long-term management goals. In general, the objective of this sport fishing plan is to provide anglers with a safe, high quality fishing experience while: (1) maintaining fish populations at optimum levels, (2) minimizing negative effects to other wildlife populations, and (3) minimizing conflicts with other wildlife-dependent public uses on the refuge. For a complete review of the refuge’s management goals and objectives, see the complex 2015 CCP and EIS. The fishing program will be conducted to meet these objectives, which covers providing quality recreational fishing opportunities for the public. The Service believes these objectives would support healthy fish and wildlife populations in addition to supporting the maintenance of the biological integrity, diversity, and environmental health of the refuge.

Recreational fishing would provide the public with a wildlife-dependent recreational opportunity while promoting an appreciation and wise use of the refuge’s aquatic resources. There would be opportunities to observe natural relationships and the diversity necessary for a healthy ecosystem. The public would gain valuable knowledge through brochures, maps, and interpretive literature available and distributed at the refuge. Providing sport fishing opportunities could help instill a conservation ethic and stewardship of natural resources. Regulation and information signs would also be available at sites open for fishing. Through these resources, the public would obtain an understanding of natural resource management and of the Service’s role in preserving and protecting natural resources. Visitors would also develop an appreciation and an awareness of the roles they play within the ecosystem.

## **2.0 Alternatives**

### **2.1 Alternatives Considered**

#### **Alternative A – Open Refuge to Recreational Sport Fishing – Proposed Action Alternative**

The refuge has prepared a fishing plan, presented with this document, and referred to here as the Proposed Action Alternative. Under the Proposed Action Alternative, public fishing would be conducted according to Colorado Parks and Wildlife (CPW) regulations, with some added refuge-specific conditions to protect fish, wildlife, and habitat, and reduce potential conflicts among other public uses.

Sport fishing opportunities would be allowed along the banks of the Rio Grande, in areas just above and below the Chicago Dam as well as the Chicago Ditch from the Chicago Ditch Diversion to the crossing (culvert) of the entrance road to the current San Luis Valley NWR Complex headquarters office (Figure 1). At this time, although difficult to estimate, the level of use by anglers would be five or less use days per week (less than 200 use days annually).

Bank fishing would be allowed with rod and reel, hook and line, bow, or any other method of take allowed per state regulations. The use would be conducted along the banks of bodies of water in designated areas. Anglers would use existing access points along the Chicago Ditch as well as a proposed access trail. Anglers would be allowed to park along the road paralleling the

Chicago Ditch from the access road to the complex headquarters to the Chicago Ditch Diversion. A parking area near the Chicago Dam would need to be developed. Signage and informational brochures would be developed to show designated sport fishing areas and refuge-specific regulations. The voluntary use of non-lead sinkers is encouraged.

Under this alternative, parts of the designated sport fishing area would be closed seasonally (April 15 to September 1, annually) to reduce effects from angler disturbance on the federally endangered southwestern willow flycatcher (*Empidonax traillii extimus*). Areas to be closed would be signed and identified in informational brochures.

Under the proposed action alternative, opening the refuge to fishing would promote one of the priority public uses of the Refuge System. Providing opportunities for visitors to fish could promote stewardship of our natural resources and increase public appreciation and support for the refuge.

All or parts of the refuge open for sport fishing could be closed at any time if necessary for public safety, for providing wildlife sanctuary, or for any other administrative reasons.

In general, sport fishing would be consistent with state regulations about proper licensing rules, species, seasons, and method of take. Additionally, the following refuge-specific regulations would apply.

- Fishing is only allowed within the designated fishing area.
- Fires are prohibited, except portable gas stoves in established parking areas.
- The refuges are open for day use access from 1 hour before sunrise until 1 hour after sunset.
- Camping and overnight parking is prohibited.
- All personal property, including fishing line, bait containers, and other trash must be removed at the end of each day.
- Use or possession of alcohol or controlled substances on the refuges is prohibited.
- The entire designated fishing area or any part thereof may be closed to fishing for the protection of habitat and wildlife resources, management activities, or safety issues as decided by the project leader.

This alternative offers increased opportunities for public hunting and fishing and fulfills the Service's mandate under the Improvement Act. The Service has decided that the hunt plan is compatible with the purposes of the refuge and the mission of the Refuge System.

### **Alternative B – Current Management – No Action Alternative**

Under the no action alternative, current management direction would continue. Under this alternative, the refuge would remain closed to fishing. Carrying out this alternative would not facilitate wildlife-dependent priority use that has been found to be compatible with the purposes of the refuge and the mission of the Refuge System.

### 3.0 Affected Environment and Environmental Consequences

#### 3.1 Affected Environment

Alamosa NWR, encompassing 12,026 acres in Alamosa County, is located within the San Luis Valley (SLV), Colorado. The SLV is a large, flat intermountain basin ranging in elevation from 2,286 to 2,438 meters that is bounded by the San Juan Mountains to the west and the Sangre de Cristo Mountains to the north and east. Classified as a cold desert, the SLV exhibits cool dry summers and cold winters. Mean annual precipitation for the valley floor ranges from 18 to 23 centimeters, most of which falls during the months of July and August.

Across the refuge, the diversity of vegetation, soils, and hydrologic conditions provide numerous habitat types for a wide array of wildlife species. Some species are generalists, while others need a specific combination of resources to meet annual lifecycle needs. The following describes the riparian, wetland, and upland habitats that comprise the refuge.

#### **Riparian Habitat on the Refuge**

Riparian habitat on the refuge is restricted to approximately 229 acres near the Rio Grande. Overstory riparian vegetation consists primarily of coyote willow (*Salix exigua*), peach-leaf willow (*Salix amygdaloides*), and crack willow (*Salix fragilis*), as well as narrowleaf cottonwood (*Populus angustifolia*). Other shrub species include Wood's rose (*Rosa woodsii*) and golden currant (*Ribes aureum*). The herbaceous understory consists of various grasses, sedges, Baltic rush (*Juncus balticus*), and forbs. Narrowleaf cottonwoods are a small part of the woody vegetative community and crack willow occurs as scattered, individual plants. Peach-leaf willow, while abundant in a few patches, is primarily represented by scattered individuals or small groups of plants throughout the riparian corridor.

#### ***Characteristic Wildlife***

Observations by refuge staff and infrequent surveys have documented more than 80 bird species using riparian habitats for foraging, migration, or nesting. Primary nesting birds include red-tailed hawk (*Buteo jamaicensis*), Swainson's hawk (*Buteo swainsoni*), American kestrel (*Falco sparverius*), northern flicker (*Colaptes auratus*), western kingbird (*Tyrannus verticalis*), western wood-pewee (*Contopus sordidulus*), American robin (*Turdus migratorius*), yellow warbler (*Dendroica petechia*), common yellowthroat (*Geothlypis trichas*), song sparrow (*Melospiza melodia*), American goldfinch (*Carduelis tristis*), Brewer's blackbird (*Euphagus cyanocephalus*), and Bullock's oriole (*Icterus bullockii*). Although numbers have declined in recent years, the federally endangered southwestern willow flycatcher (*Empidonax traillii extimus*) nests in the willow habitat on the refuge. Small and medium-sized mammals using riparian habitats include deer mouse (*Peromyscus maniculatis*), meadow vole (*Microtus pennsylvanicus*), long-tailed vole (*Microtus longicaudus*), masked shrew (*Sorex cinereus*), western harvest mouse (*Reithrodontomys megalotis*), least chipmunk (*Tamias minimus*), beaver (*Castor canadensis*), porcupine (*Erithizon dorsatum*), and raccoon (*Procyon lotor*). Bat species such as Yuma myotis (*Myotis yumanensis*) and little brown bat (*Myotis lucifugus*) are also regularly found in riparian habitats. Large mammals include mule deer (*Odocoileus hemionus*) and elk (*Cervus canadensis*). Amphibians using riparian habitats include chorus frog (*Pseudacris triseriata*), northern leopard frog (*Rana pipiens*), and tiger salamander (*Ambystoma tigrinum*), as well as reptiles, including the western terrestrial garter snake (*Thamnophis elegans*).

## **Wetland Habitat on the Refuge**

The refuge supports a diversity of wetland types, including temporary or ephemeral wetlands interspersed with native shrublands, semi-permanent wetlands, such as oxbows along the Rio Grande, and created wetlands. Collectively, these wetlands support a range of plant communities that vary in composition and structure, including open water with aquatic vegetation, short-emergent, tall-emergent, playa, and transitional communities dominated by saltgrass (*Distichlis spicata*).

Short-emergent, or wet meadow, habitat is the most abundant wetland type on the refuge, encompassing approximately 5,426 acres. Grasses and grass-like plants characterize the wet meadow habitat, which is seasonally flooded to depths less than 15 inches. The dominant species in this habitat are cool-season plants that require water early in the growing season. Most of the short-emergent habitat on the refuge is dominated by a dense growth of Baltic rush, although other species such as spikerush (*Eleocharis spp.*), alkali muhly (*Muhlenbergia asperifolia*), curly dock (*Rumex crispus*), Calamagrostis spp., foxtail barley (*Hordeum jubatum*), short-awn foxtail (*Alopecurus aequalis*), and sedges (*Carex spp.*) are locally abundant. Invasive weeds such as Canada thistle (*Cirsium arvense*) and tall whitetop (*Lepidium latifolium*) are present in some areas.

Tall-emergent habitat on the refuge, encompassing approximately 1,561 acres, is associated with semi-permanent to permanent water that is usually more than 15 inches deep. Cattails (*Typha spp.*), hardstem bulrush (*Schoenoplectus acutus*), and phragmites (*Phragmites australis*) dominate these deeper water areas. This vegetative community is typically found lining edges of ponds, levees, and canals, or as large contiguous patches or islands in areas of open water.

### ***Characteristic Wildlife***

Wetlands in the SLV, particularly those found on the refuge, are vitally important to birds because they provide migration, foraging, resting, and breeding habitat. More than 100 bird species have been documented using the wetland habitats on the refuge complex. At least 11 species of waterfowl nest on the refuge, such as Canada goose (*Branta Canadensis*), mallard (*Anas platyrhynchos*), gadwall (*Anas strepera*), blue-winged teal (*Anas discors*), cinnamon teal (*Anas cyanoptera*), green-winged teal (*Anas crecca*), northern shoveler (*Anas clypeata*), northern pintail (*Anas acuta*), redhead (*Aythya americana*), American wigeon (*Anas americana*), and ruddy duck (*Oxyura jamaicensis*). Many shorebirds use refuge wetlands, especially short-emergent and transition habitats, for foraging and nesting. American avocet (*Recurvirostra americana*), black-necked stilt (*Himantopus mexicanus*), Wilson's phalarope (*Phalaropus tricolor*), Wilson's snipe (*Gallinago delicate*), killdeer (*Charadrius vociferous*), and spotted sandpiper (*Actitis macularia*) have been documented nesting on the refuge. White-faced ibis (*Plegadis chihi*) forage extensively in wetland habitats on the refuge, as do snowy egret (*Egretta thula*) and black-crowned night-heron (*Nycticorax nycticorax*). Species such as American bittern (*Botaurus lentiginosus*), sora (*Porzana carolina*), and Virginia rail (*Rallus limicola*) also nest and forage in wetland habitats on the refuge. Common yellowthroat, yellow-headed blackbird (*Xanthocephalus xanthocephalus*), red-winged blackbird (*Agelaius phoeniceus*), western meadowlark (*Sturnella neglecta*), marsh wren (*Cistothorus palustris*), savannah sparrow (*Passerculus sandwichensis*), and vesper sparrow (*Pooecetes gramineus*) can be found foraging and nesting in and around the wetland habitats.

Many species of mammals use wetland habitat on the refuge, including elk, deer, coyote (*Canis latrans*), muskrat (*Ondatra zibethicus*), weasel (*Mustela spp.*), deer mice, and meadow vole. The SLV is a cold mountain desert and, as such, supports a limited number of amphibians and reptiles; however, tiger salamander (*Ambystoma tigrinum*), chorus frog (*Pseudacris triseriata*), leopard frog (*Rana pipiens*), Woodhouse's toad (*Bufo woodhousii*), plains spadefoot toad (*Scaphiopus bombifrons*), great plains toad (*Bufo cognatus*), and western terrestrial garter snake (*Thamnophis elegans*) are found on the refuge.

### **Upland Habitat on the Refuge**

Salt desert shrub communities and dominate most upland habitats on the refuge. Fourwing saltbush (*Atriplex canescens*), shadscale (*Atriplex confertifolia*), and winterfat (*Krascheninnikovia lanata*) may also be abundant locally. Native bunchgrasses occupy the understory, but the distribution and density of these species is dependent on precipitation. Typical species include Indian ricegrass (*Oryzopsis hymenoides*), alkali sacaton (*Sporobolus airoides*), western wheat grass (*Pascopyrum smithii*), needle and thread (*Hesperostipa comata*), ring muhli (*Muhlenbergia torreyi*), and blue grama (*Bouteloua gracilis*). Native forbs are abundant in the understory during years of high precipitation.

### ***Characteristic Wildlife***

Bird diversity and densities tend to be relatively low in semi-desert shrubland and other upland habitats because of structural and floristic simplicity. Species common to these upland habitats are mourning dove (*Zenaida macroura*), western meadowlark, loggerhead shrike (*Lanius ludovicianus*), sage thrasher (*Oreoscoptes montanus*), and Brewer's sparrow (*Spizella breweri*). Areas where grasses dominate have the potential to support rare grassland dependent species such as vesper sparrow.

Numerous mammal species use upland habitats on the refuge, including elk, white-tailed jackrabbit (*Lepus townsendii*), Wyoming ground squirrel (*Spermophilus elegans*), northern grasshopper mouse (*Onychomys leucogaster*), northern pocket gopher (*Thomomys talpoides*), Ord's kangaroo rat (*Depodomys ordii*), plains pocket mouse (*Perognathus flavescens*), silky pocket mouse (*Perognathus flavus*), and thirteen-lined ground squirrel (*Spermophilus tridecemlineatus*).

Tables 1 through 6 provide additional, brief descriptions of each resource affected by the proposed action.

For more information about the affected environment, please see chapter 2 of the refuge's CCP and EIS, available at: <https://www.fws.gov/mountain-prairie/refuges/planningPDFs/SLV/SLV%20CCP%20HIGH%20RES.pdf>.

## **3.2 Environmental Consequences of the Action**

This section analyzes the environmental consequences of the action on each affected resource, including direct and indirect effects. This EA only covers the written analyses of the environmental consequences on a resource when the effects on that resource could be more than negligible and therefore considered an "affected resource." Any resources that would not be more than negligibly affected by the action have been dismissed from further analyses.

Tables 1 through 5 provide:

- a brief description of the affected resources in the proposed action area;
- impacts of the proposed action and any alternatives on those resources, including direct and indirect effects.

Table 6 provides a brief description of the cumulative impacts of the proposed action and any alternatives.

Impact Types:

- *Direct effects* are those which are caused by the action and occur at the same time and place.
- *Indirect effects* are those which are caused by the action and are later in time or farther removed in distance but are still reasonably foreseeable.
- *Cumulative impacts* result from the incremental effects of the action when added to other past, present, and reasonably foreseeable future actions regardless of what agency (federal or non-federal) or person undertakes such other actions.

**Table 1. Affected Natural Resources and Anticipated Direct and Indirect Impacts of the Proposed Action and Any Alternatives**

<p><b>Affected Resources</b></p>	<p><b><u>Alternative A (Proposed Action)</u></b></p> <p><i>Sport fishing opportunities would be opened on Alamosa NWR. Waters that can sustain a recreational fishing program, that pose minimal damage to sensitive habitats or species, and that have safe public access points would be opened to fishing, in accordance with state regulations and refuge-specific conditions.</i></p>	<p><b><u>Alternative B (No Action)</u></b></p> <p><i>Current management of Alamosa NWR would continue and the refuge would remain closed to fishing.</i></p>
<p><b>Species to be Fished</b></p>		
<p>Recreational fishing would be open for the seasons and species as regulated by CPW. Some areas downstream of the Chicago dam would be seasonally closed during the growing and breeding season, occurring April 15 to September 1st annually, to reduce effects to willow and cottonwood regeneration and human disturbance for the federally endangered southwest willow flycatcher.</p> <p>Fishing pressure would maintain itself as the availability of fish increase and decrease with wet and dry cycles, whether managed or naturally occurring.</p> <p>The Rio Grande is currently open to fishing on other public lands as well as surrounding private land. The composition of fish species that may occur in the reaches of the Rio Grande on the refuge include common carp, tench, northern pike, black bullhead, fathead chub, Rio Grande chub, white sucker, and possibly brown trout and largemouth bass.</p>	<p>Recreational fishing could potentially cause negative effects to fish populations if it occurs at unsustainably high levels or is not managed properly. Potential effects from fishing include direct mortality from harvest and catch and release, injury to fish caught and released, changes in age and size class distribution, changes in reproduction capacity and success, loss of genetic diversity, altered behavior, and changes in ecosystems and food webs (Cline et al. 2007; Lewin et al. 2006).</p> <p>Of the species allowed to be fished in waters on the refuge, only common carp, northern pike, and bullhead are likely to be taken. For these species, quantified population estimates do not exist on the refuge because these species are not a focus of conservation or sport fishing priorities for CPW. However, general observations reveal that these species are plentiful in the waters of the refuge. There is a possibility that trout species (rainbow and brown) could be taken. However, warmer water temperatures and altered river flows highly restrict trout species from occurring in waters on the refuge.</p> <p>In general, anglers tend to target older and larger fish which often have greater reproductive capacity. Selective removal could reduce the population's overall reproductive success. Catch and release fishing could also affect individual fish, including injury and immediate or delayed mortality. The likelihood of mortality depends on the type of fishing gear used, where the fish was hooked, how the fish is handled, angler experience, and environmental conditions. Fish caught and released with nonlethal injuries could be exposed to parasites, or bacterial or fungal infections. Handling fish also increases stress, which could lead to changes in physiology and behavior (Lewin et al. 2006).</p>	<p>Under this alternative, all refuge waters would continue to be closed to recreational fishing. Disadvantages of this alternative include inability to promote a priority use of the Refuge System. There would be no additional cost or economic improvements associated to surrounding towns. There would be no additional effects to fish species.</p>

<p style="text-align: center;"><b>Affected Resources</b></p>	<p style="text-align: center;"><b><u>Alternative A (Proposed Action)</u></b></p> <p style="text-align: center;"><i>Sport fishing opportunities would be opened on Alamosa NWR. Waters that can sustain a recreational fishing program, that pose minimal damage to sensitive habitats or species, and that have safe public access points would be opened to fishing, in accordance with state regulations and refuge-specific conditions.</i></p>	<p style="text-align: center;"><b><u>Alternative B (No Action)</u></b></p> <p style="text-align: center;"><i>Current management of Alamosa NWR would continue and the refuge would remain closed to fishing.</i></p>
<p>Of these species, it is anticipated that northern pike and common carp (both non-native species to this area) would be the most popular species sought after by anglers. Other species would most likely be incidentally caught in low numbers.</p>	<p>Since fishing generally removes individuals from a population, at high levels it could lead to reduced population sizes and loss of genetic diversity. The loss of genetic diversity could ultimately reduce a population's fitness, resilience, and ability to adapt to environmental changes and stressors. The higher the fishing mortality, the greater these types of effects would be (Lewin et al. 2006).</p> <p>While fishing does remove individuals from the population, we, the Service, do not expect that projected fishing pressure would affect the refuge's fish population as a whole. Additionally, it is predicted that the species most affected would be common carp and northern pike, both of which are non-native. Furthermore, because of their behavior, carp are known to increase the ammonia content, the turbidity or level of sedimentation in the water, and the biomass of phytoplankton, that is, algae (Badiou and Goldsborough 2015). Excess levels of algae could deplete oxygen, kill aquatic vegetation, and leach toxins into the waterway (Anderson et al. 2002). It is possible that increased mortality of common carp by fishing could help mitigate some of their effects and improve habitat for other fish species and aquatic vegetation. However, it is unknown whether fishing would decrease carp populations enough to have an effect.</p> <p>Additionally, anglers are most likely to target northern pike, which are known to feed opportunistically on a variety of fish, their own species, leeches, frogs, crayfish, mice, muskrats, and ducks (Harvey 2009). Increased fishing could potentially remove some of the pressure on the population of these prey species from the northern pike. However, there is some research showing that culling northern pike has backfired by decreasing the intraspecific competition and cannibalism rates (Harvey 2009).</p>	

<b>Affected Resources</b>	<b><u>Alternative A (Proposed Action)</u></b>	<b><u>Alternative B (No Action)</u></b>
	<p><i>Sport fishing opportunities would be opened on Alamosa NWR. Waters that can sustain a recreational fishing program, that pose minimal damage to sensitive habitats or species, and that have safe public access points would be opened to fishing, in accordance with state regulations and refuge-specific conditions.</i></p>	<p><i>Current management of Alamosa NWR would continue and the refuge would remain closed to fishing.</i></p>
	<p>The refuge’s fishing pressure is projected to be sustainable. We estimate less than 200 angler use days annually. Although it is difficult to estimate angler success, it is anticipated that fewer than 200 common carp, 40 northern pike, and less than 20 bullhead would be removed from waters on the refuge. This constitutes a small percentage of the overall population size for these species. The proposed area to be open for fishing comprises only a small part of the entire Rio Grande river, and it is predicted that the population throughout the water way would replace the removed fish . Anglers would be required to abide by state laws and regulations in addition to the seasonal closure of some fishing areas by the refuge.</p>	
<b>Other Wildlife and Aquatic Species</b>		
<p>The diverse mix of wetland, riparian, and upland habitat on the refuge provide for the habitat needs of many assemblages of mammals, reptiles, amphibians, and birds, including the federally endangered southwestern willow flycatcher. More than 100 species of birds have been documented in the various habitats on the refuge. Some of these birds are year-round residents, but many pass through the refuge during migration to and from wintering and breeding grounds, while others come to the refuge to breed or spend the winter.</p>	<p>The primary habitat type where sport fishing activities would occur is riparian habitat. Although riparian habitat occupies less than 1 percent of the land area in the western U.S., it is disproportionately important for wildlife in general and birds in particular (Krueper 1993; Ohmart 1994; Pase and Layser 1977; Szaro 1980; and Thomas et al. 1979). In the Southwest, riparian habitats support a higher diversity of breeding birds than all other western habitats combined (Anderson and Ohmart 1977; Johnson and Haight 1985; Rosenberg et al. 1991; and Skagen et al. 1998). As such, potential disturbance to wildlife, particularly birds, is certainly of concern.</p> <p>Fishing has the potential to disturb wildlife, particularly birds, that use riparian habitats within or immediately near the designated sport fishing area. It is anticipated that “trailing” would occur from anglers walking along the river banks, concentrating human activities to these areas.</p>	<p>Because there would be no fishing under this alternative, there would be negligible effects to other wildlife and aquatic species. Because northern pike are a predatory species, predation rates on other fish species and amphibians would remain unchanged. Common carp are known to reduce water quality and compete for resources in some situations. Under this alternative, effects on water quality and competition levels would remain unchanged.</p>

<p style="text-align: center;"><b>Affected Resources</b></p>	<p style="text-align: center;"><b><u>Alternative A (Proposed Action)</u></b></p> <p><i>Sport fishing opportunities would be opened on Alamosa NWR. Waters that can sustain a recreational fishing program, that pose minimal damage to sensitive habitats or species, and that have safe public access points would be opened to fishing, in accordance with state regulations and refuge-specific conditions.</i></p>	<p style="text-align: center;"><b><u>Alternative B (No Action)</u></b></p> <p><i>Current management of Alamosa NWR would continue and the refuge would remain closed to fishing.</i></p>
<p>Habitats on the refuge support numerous species of small, medium, and large mammals such as various rodent species, porcupines, skunk, and raccoons, as well as mule deer and elk. Although the altitude, climate, and relative isolation of the SLV limits the number of amphibians and reptiles found on the refuge, some of the more common species include western chorus frog, northern leopard frog, and western terrestrial garter snake.</p> <p>CPW is stocking Rio Grande chub, a state species of special concern, into rivers including the Rio Grande. The refuge supports the protection and perpetuation of Rio Grande chub populations.</p>	<p>Disturbance from fishing activities, such as walking along the river banks or wading in the river, could have both immediate and long-term effects on birds. The immediate response of many birds to disturbance would be a change in behavior, such as cessation of foraging, fleeing, or altering reproductive behavior (Knight and Cole 1991). Over time, energetic losses from flight, decreased foraging time, or increased stress levels would come at the cost of energy resources needed for individuals' survival, growth, and reproduction (Geist 1978). In addition, the presence of humans in wildlife habitat could result in animals avoiding parts of their normal range (Gander and Ingold 1997; Hamr 1988). This loss of otherwise suitable habitat could be sufficient to reduce the carrying capacity of some habitats for wildlife. Disturbance from humans could also affect nest defense if birds are continually flushing away from nesting sites.</p> <p>Numerous studies have documented altered bird communities in association with human disturbance. For example, Miller et al. (1998) found that the composition and abundance of bird species were altered near areas where recreational activity occurred, such as in trails, in both grassland and forest ecosystems.</p> <p>Some species, such as vesper sparrow, western meadowlark, grasshopper sparrow, western wood-pewee, pygmy nuthatch, solitary vireo, and chipping sparrow, did not occur or occurred in lower densities, near areas where human activity was common, like trails, whereas some species, mainly generalists, were more abundant. This study showed that most bird species were found in reduced numbers. The "zone of influence" of surrounding human activity appeared to be approximately 75 meters, however, Townsend's solitaires appeared even more sensitive as they exhibited reduced numbers as far as 100 meters. Results described in Miller et al. (1998) concur with those of Hickman (1990), who found that nature trails, where human activity was higher, altered bird community composition. He reported that habitat edge species, such as blue jays, American robins, and brown-headed cowbirds, were more abundant on sites with human activity on nature trails.</p>	

<p style="text-align: center;"><b>Affected Resources</b></p>	<p style="text-align: center;"><b><u>Alternative A (Proposed Action)</u></b></p> <p><i>Sport fishing opportunities would be opened on Alamosa NWR. Waters that can sustain a recreational fishing program, that pose minimal damage to sensitive habitats or species, and that have safe public access points would be opened to fishing, in accordance with state regulations and refuge-specific conditions.</i></p>	<p style="text-align: center;"><b><u>Alternative B (No Action)</u></b></p> <p><i>Current management of Alamosa NWR would continue and the refuge would remain closed to fishing.</i></p>
	<p>Kangas et al. (2010) also found that the occurrence and composition of a bird community was altered because of visitor use. In their study, ground-nesting birds were found in lower abundance near highly visited areas and seemed to be sensitive to human disturbance. Although birds nesting in trees and shrubs appeared to be more tolerant to human disturbance than ground nesters, they still showed decreased occurrence in locations with high levels of human disturbance. Similarly, Heil et al. (2007) found that areas of higher human use altered avian communities, guilds, and populations. Their research discovered that human use of trails negatively affected 6 of 28 bird species (four of which were species of conservation concern). Because habitat condition did not differ between areas with trails and without, they concluded that human use of the area decreased habitat quality.</p> <p>Additionally, van der Zande et al. (1984) reported a negative relationship between the intensity of recreation occurring on trails and the density for 8 of 13 avian species, with some being more sensitive than others. Similarly, van der Zande and Vos (1984) found that 11 of the 12 most common bird species exhibited lower numbers in areas where recreational use was more common than in areas with fewer visitors.</p> <p>For some birds, human intrusion, such as, the presence of humans in the environment, can reduce abundance, species richness, and community composition (Kangas et al. 2010; Riffell et al. 1996), uncouple foraging relations within guilds (Skagen et al. 1991), reduce hatching and fledging success (Safina and Burger 1983), and compromise nest defense (Keller 1989). Reijnen and Foppen (1994) found that in areas where disturbance affected primary song, birds appeared reluctant to establish nesting territories. Gutzwiller et al. (1994) reported that even a single pedestrian moving through a bird's territory was enough to reduce the occurrence and consistency of primary song. Because their songs are an integral part of breeding behavior, such as territory defense and mate attraction, it is reasonable to believe that birds are sensitive to human disturbance and may be reluctant to establish nest sites where human activity is frequent (Gutzwiller et al. 1997).</p>	

<b>Affected Resources</b>	<b><u>Alternative A (Proposed Action)</u></b>	<b><u>Alternative B (No Action)</u></b>
	<p><i>Sport fishing opportunities would be opened on Alamosa NWR. Waters that can sustain a recreational fishing program, that pose minimal damage to sensitive habitats or species, and that have safe public access points would be opened to fishing, in accordance with state regulations and refuge-specific conditions.</i></p> <p>Not only has it been shown that areas of higher human activity can alter avian abundance and community composition, but rates of nest success could be affected. For example, Miller et al. (1998) found elevated rates of nest predation near trails versus further away. Similarly, in riparian habitats, Miller and Hobbs (2000) found that corvids, such as black-billed magpies, caused greater rates of nest predation near recreational trails versus further away, possibly as a result of this species being attracted to areas of human use (Knight and Temple 1995).</p> <p>Because of the preponderance of scientific literature documenting the effects of human activities on wildlife and birds, we expect minor to moderate short and long-term negative effects on the species richness, abundance, and breeding success as a result of the recreational sport fishing program. However, this could result in only negligible effects as the expected the number of anglers would be low.</p> <p>Mitigation measures to reduce the potential of human disturbance on riparian birds, especially the southwestern willow flycatcher, and other wildlife species include a seasonal closure (from April 15 to September 1, annually) of a part of the designated sport fishing area. A seasonal closure would also reduce the trampling and destruction of willow and cottonwood plants (southwestern willow flycatcher habitat), allowing these plant species a greater opportunity to reproduce, expand, and reach full stature. As such, the effects of angler disturbance is expected to be negligible because of the seasonal closure and low (less than 200 angler use days annually) fishing pressure.</p> <p>CPW is restocking the Rio Grande chub, a native fish species to the river. Historically, they were one of the most abundant species in Rio Grande basin, but have disappeared because of the introduction of nonnatives and land management practices (Rees et al. 2005). Nonnatives such as brown trout and northern pike have been known to feed on them, while common carp and white sucker can increase competition for resources (Rees et al. 2005). Increased fishing of common carp and northern pike could relieve some of the pressure caused by interspecific competition and predation on their populations.</p>	<p><i>Current management of Alamosa NWR would continue and the refuge would remain closed to fishing.</i></p>

<p><b>Affected Resources</b></p>	<p><b><u>Alternative A (Proposed Action)</u></b></p> <p><i>Sport fishing opportunities would be opened on Alamosa NWR. Waters that can sustain a recreational fishing program, that pose minimal damage to sensitive habitats or species, and that have safe public access points would be opened to fishing, in accordance with state regulations and refuge-specific conditions.</i></p>	<p><b><u>Alternative B (No Action)</u></b></p> <p><i>Current management of Alamosa NWR would continue and the refuge would remain closed to fishing.</i></p>
<p><b>Threatened and Endangered Species and Other Special Status Species</b></p>		
<p>The southwestern willow flycatcher is a small neotropical migrant whose breeding habitat is restricted to relatively dense stands of trees and shrubs in riparian ecosystems in the arid southwestern United States (USFWS 2002). The southwestern willow flycatcher was listed as federally endangered in 1995 (USFWS 1995). All riparian habitat on the refuge is designated Critical Habitat for southwestern willow flycatcher.</p>	<p>As described above, the primary habitat type where sport fishing activities would occur is riparian habitat. Although riparian habitat occupies less than 1 percent of the land area in the western U.S., it is disproportionately important for wildlife generally, and birds in particular (Krueper 1993; Ohmart 1994; Pase and Layser 1977; Szaro 1980; and Thomas et al. 1979). In the Southwest, riparian habitats support a higher diversity of breeding birds than all other western habitats combined (Anderson and Ohmart 1977, Johnson and Haight 1985, Rosenberg et al. 1991; and Skagen et al. 1998). As such, potential disturbance to wildlife, particularly birds, is certainly of concern.</p> <p>Because southwestern willow flycatchers rely almost exclusively on relatively dense stands of trees and shrubs for breeding, foraging, and migration, any potential negative effects of a recreational sport fishing program on either the physical destruction (breaking or destroying existing plants), reproduction and spread (seedling establishment and growth), or disturbance by humans is of high concern.</p> <p>It is anticipated that trails would be developed, through “trailing,” along the banks of the Rio Grande as anglers walk to and from fishing spots. As trails are formed, trampling and removal of vegetation are generally the first consequences (Roovers et al. 2004). Human use of trails often increases the bulk density of the soil, which decreases soil porosity and changes moisture content, aeration, and the availability of soil nutrients in ways that contribute to further losses of existing vegetation along trails and restrict new plant establishment (Hall and Kuss 1989; Kuss and Hall 1991; Kuss 1983; and Weaver and Dale 1978). Because it is anticipated that trail formation would be primarily restricted to the bank of the river, negligible to minor effects would occur throughout the entire riparian area.</p>	<p>Because there would be no fishing allowed under this alternative, there would be no effects to threatened and endangered species or other special status species.</p>

<b>Affected Resources</b>	<b><u>Alternative A (Proposed Action)</u></b>	<b><u>Alternative B (No Action)</u></b>
	<p><i>Sport fishing opportunities would be opened on Alamosa NWR. Waters that can sustain a recreational fishing program, that pose minimal damage to sensitive habitats or species, and that have safe public access points would be opened to fishing, in accordance with state regulations and refuge-specific conditions.</i></p>	<p><i>Current management of Alamosa NWR would continue and the refuge would remain closed to fishing.</i></p>
	<p>As described above, numerous studies have documented changes to bird communities and reproductive success as a result of effects from human disturbance. Although there is a lack of information relating directly to southwestern willow flycatcher, it is reasonable to believe that this specialist species would show similar responses, such as lower abundance and breeding success, as other avian species.</p> <p>It is anticipated that there would be minor to moderate short- and long-term negative effects on southwestern willow flycatchers.</p>	
<b>Vegetation</b>		
<p>Refuge vegetation is comprised of three main categories: (1) riparian areas, (2) wetlands, and (3) uplands. Riparian areas are plant communities contiguous to and affected by surface or subsurface hydrologic features of perennial or intermittent rivers, streams, or drainage ways. Riparian areas on the refuge are primarily restricted to 229 acres along the Rio Grande and are dominated by multiple species of willows, cottonwood, and various grasses, sedges, baltic rush, and forbs. Many small and medium-sized mammals use riparian habitat. Large mammals such as mule deer and elk. as well as amphibians, also use the riparian habitat.</p> <p>The refuge has multiple wetland types, and they feature a variety of vegetation such as cool season grasses, cattails, bullrush, and invasive weeds.</p>	<p>Opening fishing near the dam could cause trampling of vegetation and erosion from foot traffic as anglers walk to and access the Rio Grande and Chicago ditch. Increased foot traffic could lead to barren earth, compact soil, erosion, and increased sedimentation in waterways (O’Toole et al. 2009). Soil compaction often negatively effects the ability of plants to absorb water, which in turn leads to smaller leaf area and reduced levels of photosynthesis (Kozlowski 1999). Severe compaction can force plant roots into an anaerobic state because of impaired respiratory ability and can prevent seed germination and growth (Kozlowski 1999). Erosion of soil from foot traffic on trails and the river bank could affect and alter the riparian vegetation and habitat and contribute to sedimentation.</p> <p>Another effect of vegetation trampling is reduced height, density, and diversity of the plant community (O’Toole et al. 2009). It is possible that increased traffic on current paths and creation of new paths for water access by anglers could contribute to the reduction of willow, cottonwood, and other riparian vegetation that species, such as the endangered southwestern willow flycatcher, require.</p>	<p>There would be no effects to vegetation, because no fishing would be allowed and so there would be no additional human disturbance on vegetation.</p>

<b>Affected Resources</b>	<b><u>Alternative A (Proposed Action)</u></b>	<b><u>Alternative B (No Action)</u></b>
<p>Salt desert shrub communities comprised primarily of rubber rabbitbrush and greasewood typically dominate the upland habitat on the refuge.</p> <p>The refuge has put efforts into restoring willow and cottonwood along the riparian areas. They provide important habitat for the southwestern willow flycatcher and a variety of other species.</p>	<p><i>Sport fishing opportunities would be opened on Alamosa NWR. Waters that can sustain a recreational fishing program, that pose minimal damage to sensitive habitats or species, and that have safe public access points would be opened to fishing, in accordance with state regulations and refuge-specific conditions.</i></p> <p>Disturbed habitats associated with trails could encourage colonization and spread of invasive plant species, which are often adapted to disturbance (Flory and Clay 2009; Hobbs and Huenneke 1992; and Pauchard and Alaback 2006). The invasion of habitats by invasive plant species is one of the leading threats to biodiversity and could alter ecosystem structure and function (Braithwaite et al. 1989; Vitousek et al. 1987; Walker and Smith 1997; and Yurkonis et al. 2005).</p> <p>The refuge would mitigate effects from increased foot traffic by closing fishing in some of the area downstream of the Chicago Dam. A part of the sport fishing area would be closed from April 15 to September 1 annually to protect vegetation regeneration during the growing period. Part of the proposed trail (Malm Trail) has a pre-existing road. Use of this road for fishing access should not create additional effects to vegetation. Because the proposed area to be opened for fishing is small, the overall effect would be minimal.</p>	<p><i>Current management of Alamosa NWR would continue and the refuge would remain closed to fishing.</i></p>
<b>Geology and Soils</b>		
<p>The refuge has 29 soil series and land types, with three main associations. The Alamosa-Vastine-Alluvial association is the primary type surrounding the Rio Grande River, and covers the largest amount of area on the refuge. Deep, dark soils with a loamy and occasionally sandy or clay texture characterize association. This soil type is typical of areas that are flooded in the spring and that feature a high water table.</p>	<p>The creation of trails to access the river could cause some soil compaction and erosion. However, areas open to fishing would already include the Malm Trail and an access road, or would be seasonally closed during the growing season. We expect minimal effects on geological resources or soils.</p>	<p>There would be no additional effects to geological resources or soils.</p>

<b>Affected Resources</b>	<b><u>Alternative A (Proposed Action)</u></b>	<b><u>Alternative B (No Action)</u></b>
<b>Water Resources</b>		
The Rio Grande River passes through the refuge, and the Chicago Dam is used to divert the refuge's water right into the Chicago ditch.	Fishing and the creation of trails near the river could lead to bank destabilization and erosion, both of which contribute to river sedimentation and other changes in river morphology. While this is a potential effect, the proposed sport fishing program should result in negligible to minor effects to bank destabilization and erosion because seasonal closures during periods of higher river flows, that is, spring and summer, would restrict access to areas that are most susceptible.	There would be no additional effects to water resources.

Key: CPW = Colorado Parks and Wildlife; NWR = National Wildlife Refuge; SLV = San Luis Valley

**Table 2. Affected Visitor Use and Experience and Anticipated Direct and Indirect Impacts of the Proposed Action and Any Alternatives**

<p><b>Affected Resources</b></p>	<p><b><u>Alternative A (Proposed Action)</u></b></p> <p><i>Sport fishing opportunities would be opened on Alamosa NWR. Waters that can sustain a recreational fishing program, that pose minimal damage to sensitive habitats or species, and that have safe public access points would be opened to fishing, in accordance with state regulations and refuge-specific conditions.</i></p>	<p><b><u>Alternative B (No Action)</u></b></p> <p><i>Current management of Alamosa NWR would continue and the refuge would remain closed to fishing.</i></p>
<p>The Alamosa NWR has an estimated average 3,975 visitor use days. Visitors enjoy a variety of recreational activities related to the six wildlife-dependent recreational uses, hunting, fishing, wildlife observation, photography, interpretation, and environmental education, which the Improvement Act identifies as the priority uses.</p> <p>There are opportunities for waterfowl, upland bird, and small game hunting in designated areas on the refuge. The four-mile Rio Grande Nature Trail, the Bluff Overlook Trail, and auto tour route all provide wildlife viewing and self-guided interpretation opportunities for visitors on the refuge. There are no areas now open to fishing nor significant environmental education programs on the refuge.</p>	<p>Under the proposed action, an increase of trail use near the fishing area would increase slightly on the Malm Trail. However, it is anticipated there would be negligible additional effects to current recreation from anglers. The Malm Trail would only allow foot travel to reduce soil erosion and noise pollution and would create new wildlife viewing and photography opportunities. We expect little to no negative effects on current visitor use and experience, because the recreation opportunities and areas of the refuge open to visitors are geographically separate from the proposed sport fishing area. In addition, the proposed action could positively affect the visitor use and experience on the refuge by offering a new opportunity.</p>	<p>There would be no additional effects to visitor use and experience. However, not conducting a recreational sport fishing program would not provide an additional wildlife-dependent visitor use opportunity.</p>

Key: NWR = National Wildlife Refuge

**Table 3. Affected Cultural Resources and Anticipated Direct and Indirect Impacts of the Proposed Action and Any Alternatives**

<p><b>Affected Resources</b></p>	<p><b><u>Alternative A (Proposed Action)</u></b></p> <p><i>Sport fishing opportunities would be opened on Alamosa NWR. Waters that can sustain a recreational fishing program, that pose minimal damage to sensitive habitats or species, and that have safe public access points would be opened to fishing, in accordance with state regulations and refuge-specific conditions.</i></p>	<p><b><u>Alternative B (No Action)</u></b></p> <p><i>Current management of Alamosa NWR would continue and the refuge would remain closed to fishing.</i></p>
<p>Alamosa NWR contains 100 or more recorded historical and archeological sites. These sites contain artifacts and structures that span a time frame up to 12,000 years ago.</p>	<p>We expect no effects to cultural resources in the proposed area because of the pre-existing disturbed state of that land because of the past installation of the Chicago ditch and maintenance road.</p>	<p>There would be no additional effects to cultural resources.</p>

Key: NWR = National Wildlife Refuge

**Table 4. Affected Refuge Management and Operations and Anticipated Direct and Indirect Impacts of the Proposed Action and Any Alternatives**

<p><b>Affected Resources</b></p>	<p><b><u>Alternative A (Proposed Action)</u></b></p> <p><i>Sport fishing opportunities would be opened on Alamosa NWR. Waters that can sustain a recreational fishing program, that pose minimal damage to sensitive habitats or species, and that have safe public access points would be opened to fishing, in accordance with state regulations and refuge-specific conditions.</i></p>	<p><b><u>Alternative B (No Action)</u></b></p> <p><i>Current management of Alamosa NWR would continue and the refuge would remain closed to fishing.</i></p>
<p><b>Land Use</b></p>		
	<p>Under the proposed action, an increase in use of refuge trails and roads would occur. Foot access to the sport fishing area would occur on the proposed Malm Trail. However, the number of anglers anticipated to access the sport fishing area along the trail would be minimal, resulting in a minor increase in the total number of people using this trail. Additionally, the trail currently exists as a refuge administrative access road. We expect no additional negative effects on this trail as a result of anglers accessing the sport fishing area. Vehicle access to the sport fishing area would occur on an existing gravel administrative access road used frequently by refuge staff. No additional negative effects to this road are expected by the anticipated increased level of vehicle use by anglers. A parking area on the south side of the Chicago Dam is expected to be developed. However, this area is mostly graveled already and refuge staff use it as a parking area and a vehicle “turn around” area. Additional signage and parking area fencing would be required. We expect negligible negative effects as a result of parking lot development.</p>	<p>There would be no change in use of refuge facilities (roads, trails, parking lots).</p>

Affected Resources	<p align="center"><b><u>Alternative A (Proposed Action)</u></b></p> <p><i>Sport fishing opportunities would be opened on Alamosa NWR. Waters that can sustain a recreational fishing program, that pose minimal damage to sensitive habitats or species, and that have safe public access points would be opened to fishing, in accordance with state regulations and refuge-specific conditions.</i></p>	<p align="center"><b><u>Alternative B (No Action)</u></b></p> <p><i>Current management of Alamosa NWR would continue and the refuge would remain closed to fishing.</i></p>
<b>Administration</b>		
	<p>Administering the fishing program would annually require staff time from the refuge managers, senior biologist, maintenance workers, administrative assistant, and law enforcement officers to coordinate with CPW staff; develop an informational publication with regulations; produce news releases; respond to angler inquiries; conduct angler and visitor outreach; reduce conflicts among users; conduct law enforcement; maintain boundary posting and parking areas; monitor effects to wildlife, habitat, and visitor use; and make sure of public safety. The annual cost of the complex's proposed fishing program is estimated to be \$10,000 (0.77 percent) of the overall complex operating budget of approximately \$1,300,000. This cost covers staff and operating expenses for refuge law enforcement, refuge staff activities associated with evaluating potential adverse effects to other refuge resources, as well as preparing annual publications and special signage, managing habitat conditions and access, and monitoring recreational fishing activities.</p> <p>The proposed sport fishing program would require additional signage, potential new infrastructure, such as parking area development, and other start-up costs. Fully carrying out this proposed sport fishing program would become possible only with an increased budget. During the first few years, starting the program would be done with existing staffing, so it would redirect effort from other high-priority habitat and public use programs.</p>	<p>Under this alternative there would be no additional costs or staff time.</p>

Key: CPW = Colorado Parks and Wildlife; NWR = National Wildlife Refuge

**Table 5. Affected Socioeconomics and Anticipated Direct and Indirect Impacts of the Proposed Action and Any Alternatives**

<p><b>Affected Resources</b></p>	<p><b><u>Alternative A (Proposed Action)</u></b>  <i>Sport fishing opportunities would be opened on Alamosa NWR. Waters that can sustain a recreational fishing program, that pose minimal damage to sensitive habitats or species, and that have safe public access points would be opened to fishing, in accordance with state regulations and refuge-specific conditions.</i></p>	<p><b><u>Alternative B (No Action)</u></b>  <i>Current management of Alamosa NWR would continue and the refuge would remain closed to fishing.</i></p>
<p><b>Local and Regional Economies</b></p>		
<p>According to the data provided by the U.S. Census, the population of Alamosa County was 15,445 in 2010, with a predicted population of 16,683 (8.1 percent growth rate) in 2018. The town of Alamosa population was predicted to be 9,997 in 2018, a 12.9 percent increase from the 8,780 people recorded in the 2010 census. From 2010 to 2025, the population of the SLV is projected to increase by 14 percent, indicating slow growth compared to state growth rates for Colorado (26 percent increase).</p>	<p>Because of the low socioeconomic status of the local community and surrounding counties, opening fishing on the refuge could provide a food source and low expense recreation opportunities that would positively affect the local economy. The proposed fishing area would be near the town, which could significantly cut the travel costs and time commitment required to reach fishing spots in the surrounding mountains.</p> <p>Additionally, because of the large Latino population in Alamosa and SLV, this alternative could create opportunities for underrepresented populations to take part in fishing.</p> <p>In the 2011 National Survey of Fishing, Hunting, and Wildlife Associated Recreation, approximately 767,000 residents and non-residents fished in Colorado. The total expenditures for fishing-related activities in Colorado was equal to \$648,563,000 in 2011. Visitors participating in this use on the refuge could provide some economic improvement to local economies by purchasing goods and services at businesses around the refuge. However, because of a variety of nearby choices for fishing that feature more desirable fish, such as trout, opening fishing on the refuge would likely have minimal positive effect on the amount of visitors brought into the region.</p> <p>Overall, we expect minimal positive effects on the local economy and no negative effects.</p>	<p>There would be no additional effects to the socioeconomic status of the area.</p>

<p style="text-align: center;"><b>Affected Resources</b></p>	<p style="text-align: center;"><b><u>Alternative A (Proposed Action)</u></b></p> <p style="text-align: center;"><i>Sport fishing opportunities would be opened on Alamosa NWR. Waters that can sustain a recreational fishing program, that pose minimal damage to sensitive habitats or species, and that have safe public access points would be opened to fishing, in accordance with state regulations and refuge-specific conditions.</i></p>	<p style="text-align: center;"><b><u>Alternative B (No Action)</u></b></p> <p style="text-align: center;"><i>Current management of Alamosa NWR would continue and the refuge would remain closed to fishing.</i></p>
<p>Residents in the city of Alamosa tend to be younger, less affluent, and less educated than the average person in Alamosa County and the state of Colorado. The number of people reported in poverty in Alamosa city is higher than Alamosa County and significantly higher than the average for Colorado. The SLV is one of the most impoverished regions in Colorado, with some counties almost half the state average income. Economically in 2009, 18 percent of employment was in the public administration sector; 11 percent of employment was in arts, entertainment, recreation, and accommodations and food service; and the third highest sector with 11 percent of total employment was agriculture, forestry, fishing, hunting, and mining.</p>		
<p><b>Environmental Justice</b></p>		
<p>Executive Order 12898, Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations, requires all federal agencies to incorporate environmental justice into their missions by identifying and addressing disproportionately high or adverse human health or environmental effects of their programs and policies on minorities and low-income populations and communities.</p>	<p>The Service has not identified any potential high and adverse environmental or human health effects from this proposed action or any of the alternatives. The service has identified the low income and minority communities within the City of Alamosa, as well as the entire SLV, as potentially being positively affected by the proposed action.</p>	<p>There would be no additional effects to the low income and minority communities within the City of Alamosa, as well as the entire SLV.</p>

Key: NWR = National Wildlife Refuge; SLV = San Luis Valley; U.S. = United States

### 3.3 Cumulative Impact Analysis

Cumulative impacts are defined as “the impact on the environment which results from the incremental impact of the action when added to other past, present, and reasonably foreseeable future actions regardless of what agency (federal or non-federal) or person undertakes such other actions” (40 CFR 1508.7).

For more information on the national cumulative impacts of the Service’s hunting and fishing program on the Refuge System, see the Cumulative Impacts Report.

**Table 6. Anticipated Cumulative Impacts of the Proposed Action and Any Alternatives**

<b>Other Past, Present, and Reasonably Foreseeable Activity Impacting Affected Environment</b>	<b>Descriptions of Anticipated Cumulative Impacts</b>
<b>Fishing</b>	
<p>CPW supports new recreational sport fishing opportunities for resident and non-resident anglers. Opening sport fishing on Alamosa NWR would provide anglers, especially SLV residents, new fishing opportunities near the City of Alamosa.</p>	<p>In general, sport fishing would be consistent with state regulations about proper licensing rules, species, seasons, and method of take. Although other species of fish would be available to anglers, common carp and northern pike would be the most sought after because neither species has any bag, possession, or size limits. These non-native species provide unique and exciting fishing opportunities for anglers that are not found in the surrounding “high mountain” streams and rivers.</p> <p>Opening new recreational sport fishing opportunities on the refuge should have no to negligible effects on overall fish numbers or distribution in the Rio Grande. Few to no trout species are expected to be taken on the refuge. Because trout are not a species that would be expected to occur in waters on the refuge, no additional fishing pressure would occur for trout species. Although fishing pressure for common carp, northern pike, and bullhead would increase, it is expected to be minimal because of the limited number of anglers expected (less than 200 angler use days), coupled with the small overall area that is proposed to be open for recreational sport fishing.</p>
<b>Other Wildlife-Dependent Recreation</b>	
<p>Because the area encompassing the proposed fishing area is currently closed to public access, any increase in angler presence could affect the habitat and wildlife resources in the area.</p>	<p>Under the proposed action, an increase in foot traffic on the proposed Malm Trail, which would provide access to the fishing area would most likely occur. This could result in increased human disturbance along the trail. Access to parts of the designated fishing area would be closed during the growing and breeding season from April 15 to September 1 to reduce soil erosion and compaction, trampling of vegetation, and disturbance to wildlife, especially the southwestern willow flycatcher. Some anglers might walk off-trail to access the fishing area, creating new trails, trampling new vegetation, and affecting drainage. However, because anglers would not use the same path every time, we expect those effects to be minimal.</p>

Other Past, Present, and Reasonably Foreseeable Activity Impacting Affected Environment	Descriptions of Anticipated Cumulative Impacts
	<p>Most likely, level of use would not be large enough to create significant negative effects. In addition to the Malm Trail, access to the designated fishing area would include vehicle access on an existing administrative access road to a proposed parking area near the Chicago Dam. The ease of vehicle access would result in an increase in human use of the area. However, it is not anticipated that levels of angler participation would be high, resulting in fairly low to moderate levels of human disturbance in the designated fishing area.</p> <p>In the 2011 National Survey of Fishing, Hunting, and Wildlife Associated Recreation, approximately 767,000 residents and non-residents fished in Colorado. The total expenditures for fishing-related activities in Colorado was equal to \$648,563,000 in 2011. Visitors participating in this use on the refuge could provide some economic improvement to local economies by purchasing goods and services at businesses around the refuge. However, because of a variety of nearby choices for fishing that feature more desirable fish, such as trout, opening fishing on the refuge would likely have minimal positive effect on the number of visitors brought into the region.</p>
<b>Development and Population Increase</b>	
<p>According to the data provided by the U.S. Census, the town of Alamosa population was predicted to be 9,997 in 2018, a 12.9 percent increase from the 8,780 people recorded in the 2010 census. From 2010 to 2025, the population of the SLV is projected to increase by 14 percent, indicating slow growth compared to state growth rates for Colorado (26 percent increase).</p>	<p>Alamosa City, Alamosa County, and surrounding areas all feature a small base population in addition to their slower growth rates. We expect negligible increases in fishing pressure as a result of these low growth rates. These lower growth rates, and the associated limited development pressure, would result in negligible effects to fish habitat quality throughout the drainage.</p> <p>Additionally, there are multiple fishing areas within a reasonable distance that have more desirable fish, such as trout. These locations would likely draw most anglers even as the area population increases. Furthermore, CPW was given the power to regulate the price of fishing licenses based on management costs and resource use (CPW 2019). This should allow the state to regulate and respond to the increase in fishing and population.</p>
<b>Use of Lead Tackle</b>	
	<p>Although lead sinkers are legal to use in Colorado, it would be discouraged in refuge waters through outreach with anglers. Anglers may choose to use non-lead alternatives such as tin, steel, or ceramic sinkers. This could reduce the effects of lead to wildlife and the environment. The overall effect of using lead sinkers in refuge waters is anticipated to be negligible and would add little to the accumulation of lead in the environment.</p>

Other Past, Present, and Reasonably Foreseeable Activity Impacting Affected Environment	Descriptions of Anticipated Cumulative Impacts
<b>Climate Change</b>	
	Warming, whether it results from anthropogenic or natural sources, is expected to affect a variety of natural processes and associated resources. However, the complexity of ecological systems means that there is a tremendous amount of uncertainty about the effect climate change would have. Climate change predictions for the region include change in runoff, less snow, and less water because of lack of snowmelt. Climate change could affect flow and temperature of the river, while the increased angling could affect fish populations. However, the proposed action would most likely be completely sustainable as anglers would primarily target common carp and northern pike. Additionally, the refuge would mitigate effects of reduced water flow by closing the Malm Trail during the growing season to reduce the stress on the riparian plant community. The refuge does not foresee any significant effects that this sport fishing program would add to the already anticipated effects of climate change.

Key: CPW = Colorado Parks and Wildlife; NWR = National Wildlife Refuge; SLV = San Luis Valley

### 3.4 Mitigation Measures and Conditions

Because human disturbance has been shown to negatively effect wildlife communities by altering species richness, abundance, and breeding success, an annual seasonal closure (from April 15 to September 1) would be carried out on a part of the designated fishing area to protect habitat and breeding activities for the federally endangered southwestern willow flycatcher.

### 3.5 Monitoring

We plan to annually examine sport fishing activities on the refuge, and may administratively alter or close areas because of factors, such as staffing, safety issues, fishing demand, effects to other refuge programs like other public uses or habitat management activities, adjacent landowner issues and conflicts, climate change, wildlife disease, mission change, endangered species concerns, or any other compatibility issues.

### 3.6 Summary of Analysis

The purpose of this EA is to briefly provide enough evidence and analysis for determining whether to prepare an Environmental Impact Statement or a Finding of No Significant Impact.

**Table 7. Summary of Anticipated Impacts of the Proposed Action and Any Alternatives**

Affected Environment	Proposed Alternative	No Action Alternative
Fished Species	Conducted in accordance with state regulations to make sure fish populations are sustainable and reduce adverse effects	No effects
Other Wildlife and Aquatic Species	<p>Minor to moderate short- and long-term negative effects could occur to various wildlife species, especially birds. Some changes to species richness, abundance, and breeding success could occur, with the level of change dependent on angler presence.</p> <p>A part of the designated sport fishing area would be closed annually from April 15 until September 1 to reduce effects from vegetation trampling and human disturbance on habitat and wildlife resources.</p>	No effects
Threatened and Endangered Species	Minor to moderate short- and long-term negative effects could occur on populations of the federally endangered southwestern willow flycatcher. Depending on the level of angler presence, effects to abundance and breeding success could occur.	No effects
Vegetation	Trailing along the banks of the Rio Grande is expected to occur, resulting in the reduction and possible elimination of vegetation on the trail. The extent of vegetation effects would most likely be restricted to the narrow trail and result in negligible negative effects across the designated fishing area as a whole.	No effects
Geology and Soils	Compaction of soil resulting from foot traffic is expected to occur as well as some increase in soil erosion. These effects are expected to be negligible.	No effects
Air Quality	No effects	No effects
Water Resources	Fishing and the creation of trails near the river could lead to bank destabilization and erosion, both of which contribute to river sedimentation and other changes in river morphology. While this is a potential consequence, it would have negligible to minor effects on water resources.	No effects

Affected Environment	Proposed Alternative	No Action Alternative
Cultural Resources	No effects	No effects
Visitor Use and Experience	Would add a new quality wildlife-dependent recreational activity for the public to take part in and enjoy.	Because no new recreational sport fishing opportunity would be available, negative effects would occur.
Socioeconomics	Would improve local economy and possibly state revenue through fishing license sales.	No economic improvements would occur.
Refuge Management and Operations	Negligible effects would occur. Some additional money would be necessary to develop a parking area. Some increase in refuge staff time, primarily that of law enforcement, would be necessary but minimal.	No effects

**Alternative A – Proposed Action Alternative**

Providing recreational sport fishing opportunities on the refuge in accordance with CPW regulations, along with refuge-specific regulations as needed, such as an annual seasonal closure on a part of the designated fishing area, would result in minimal effects on habitat and wildlife resources or the human environment. Allowing recreational sport fishing on the refuge directly supports objectives of the San Luis Valley NWR Complex CCP and EIS (2015) by providing new recreational sport fishing opportunities on a part of the refuge as well as promoting a priority public use of the Refuge System. Providing sport fishing opportunities would support local economies and promote an appreciation and wide use of the refuge’s aquatic resources.

The Service plans to annually examine sport fishing activities on the refuge, and may administratively alter or close areas because of factors such as staffing; safety issues; fishing demand; effects to other refuge programs, such as other public uses or habitat management activities; adjacent landowner issues and conflicts; climate change; wildlife disease; mission change; endangered species concerns; or any other compatibility issues.

**Alternative B – No Action Alternative**

Under this alternative, all refuge waters would continue to be closed to recreational sport fishing. The no action alternative would result in the inability of the refuge to provide a priority wildlife-dependent public use opportunity on the refuge. There would be no additional cost to the refuge associated with this alternative, nor an economic improvement to the community. There would be no effect to habitat or wildlife resources.

**3.7 List of Sources, Agencies and Persons Consulted:**

The refuge’s sport fishing program has been developed in coordination CPW regional and area managers. This coordination was accomplished through formal and informal meetings. Public

and tribal input on the proposed recreational sport fishing opportunities was solicited during the public scoping period during the development of the complex's 2015 CCP and EIS.

### **3.8 List of Preparers**

<b>Name</b>	<b>Position</b>	<b>Work Unit</b>
Scott G. Miller	Wildlife Biologist	San Luis Valley NWR Complex
Elizabeth Tsang	Natural Resource Specialist	San Luis Valley NWR Complex

### **3.9 State Coordination**

The refuge's sport fishing program has been developed in coordination with CPW regional and area managers. This coordination was accomplished through formal and informal meetings as well as solicitation of CPW comments on the sport fishing objectives detailed in the 2015 CCP and EIS.

Following the adoption of this sport fishing plan, conducting it will occur with consultation and coordination with CPW and will be a combination of formal and informal activities based upon the nature of issues, if any, to be addressed. Refuge and CPW staff will consult on issues about law enforcement.

### **3.10 Tribal Consultation**

The details of this recreational sport fishing plan were outlined in the San Luis Valley NWR Complex's CCP and EIS (2015). Public scoping for the CCP and EIS began in March 2011 with the release of a public involvement summary and planning update that described the CCP process. The Service sent letters of notification about the planning process, including an invitation to join the planning team to the following tribes: Cochiti Pueblo, Pueblo of Santa Clara, Pueblo of Laguna, Pueblo of Zuni, Pueblo of Picuris, Pueblo of San Ildefonso, Pueblo of Acoma, Pueblo of Santa Ana, Pueblo of Taos, Pueblo of Jemez, Uintah and Ouray Ute Indian Tribe, Southern Ute Tribe, Ute Mountain Tribe, Jicarilla Apache Nation, Ohkay Owingeh, and Navajo Nation.

### **3.11 Public Outreach**

The details of this recreational sport fishing plan were outlined in the San Luis Valley NWR Complex's CCP and EIS (2015). Public scoping for the CCP and EIS began in March 2011 with the release of a public involvement summary and planning update that described the CCP process. Nine public meetings during the scoping, development of the alternatives, and public review of the draft CCP and EIS were held and information was posted on the complex's webpage. Additionally, letters of notification about the CCP and EIS planning process were sent to many federal and state agencies and met and briefed the county.

### 3.12 Determination

This section will be filled out upon completion of any public comment period and at the time of finalization of the Environmental Assessment.

- The Service’s action will not result in a significant impact on the quality of the human environment. See the attached “**Finding of No Significant Impact.**”
- The Service’s action **may significantly affect** the quality of the human environment and the Service will prepare an Environmental Impact Statement.

Preparer Signature: \_\_\_\_\_ Date: \_\_\_\_\_

Name/Title/Organization: \_\_\_\_\_

\_\_\_\_\_

Reviewer Signature: \_\_\_\_\_ Date: \_\_\_\_\_

Name/Title: \_\_\_\_\_

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**APPENDIX A OTHER APPLICABLE STATUTES, EXECUTIVE ORDERS, AND REGULATIONS**

<b>Statutes, Executive Orders, and Regulations</b>
<b>Cultural Resources</b>
<p>American Indian Religious Freedom Act, as amended, 42 U.S. Code 1996 – 1996a; 43 CFR 7</p> <p>Antiquities Act of 1906, 16 U.S. Code 431-433; 43 CFR 3</p> <p>Archaeological Resources Protection Act of 1979, 16 U.S. Code 470aa – 470mm; 18 CFR 1312; 32 CFR 229; 36 CFR 296; 43 CFR 7</p> <p>National Historic Preservation Act of 1966, as amended, 16 U.S. Code 470-470x-6; 36 CFR 60, 63, 78, 79, 800, 801, and 810</p> <p>Paleontological Resources Protection Act, 16 U.S. Code 470aaa – 470aaa-11</p> <p>Native American Graves Protection and Repatriation Act, 25 U.S. Code 3001-3013; 43 CFR 10</p> <p>Executive Order 11593 – Protection and Enhancement of the Cultural Environment, 36 Fed. Reg. 8921 (1971)</p> <p>Executive Order 13007 – Indian Sacred Sites, 61 Fed. Reg. 26771 (1996)</p>
<b>Fish and Wildlife</b>
<p>Bald and Golden Eagle Protection Act, as amended, 16 U.S. Code 668-668c, 50 CFR 22</p> <p>Endangered Species Act of 1973, as amended, 16 U.S. Code 1531-1544; 36 CFR 13; 50 CFR 10, 17, 23, 81, 217, 222, 225, 402, and 450</p> <p>Fish and Wildlife Act of 1956, 16 U.S. Code 742 a-m</p> <p>Lacey Act, as amended, 16 U.S. Code 3371 et seq.; 15 CFR 10, 11, 12, 14, 300, and 904</p> <p>Migratory Bird Treaty Act, as amended, 16 U.S. Code 703-712; 50 CFR 10, 12, 20, and 21</p> <p>Executive Order 13186 – Responsibilities of Federal Agencies to Protect Migratory Birds, 66 Fed. Reg. 3853 (2001)</p>
<b>Natural Resources</b>
<p>Clean Air Act, as amended, 42 U.S. Code 7401-7671q; 40 CFR 23, 50, 51, 52, 58, 60, 61, 82, and 93; 48 CFR 23</p> <p>Wilderness Act, 16 U.S. Code 1131 et seq.</p> <p>Wild and Scenic Rivers Act, 16 U.S. Code 1271 et seq.</p> <p>Executive Order 13112 – Invasive Species, 64 Fed. Reg. 6183 (1999)</p>
<b>Water Resources</b>
<p>Coastal Zone Management Act of 1972, 16 U.S. Code 1451 et seq.; 15 CFR 923, 930, 933</p> <p>Federal Water Pollution Control Act of 1972 (commonly referred to as Clean Water Act), 33 U.S. Code 1251 et seq.; 33 CFR 320-330; 40 CFR 110, 112, 116, 117, 230-232, 323, and 328</p> <p>Rivers and Harbors Act of 1899, as amended, 33 U.S. Code 401 et seq.; 33 CFR 114, 115, 116, 321, 322, and 333</p> <p>Safe Drinking Water Act of 1974, 42 U.S. Code 300f et seq.; 40 CFR 141-148</p> <p>Executive Order 11988 – Floodplain Management, 42 Fed. Reg. 26951 (1977)</p> <p>Executive Order 11990 – Protection of Wetlands, 42 Fed. Reg. 26961 (1977)</p>

Key: CFR = Code of Federal Regulations