ENVIRONMENTAL ASSESSMENT

Feral Swine Damage Management in New Mexico

Prepared by:

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Animal and Plant Health Inspection Service
Wildlife Services

Cooperating agencies:

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New Mexico Livestock Board

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United States Fish and Wildlife Service
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EXECUTIVE SUMMARY

Feral swine (*Sus scrofa*) can cause significant damage to property, agriculture (crops and livestock), native species, ecosystems, and historic and cultural resources. They can also pose a threat to the health of wildlife, domestic animals, and humans. The United States Department of Agriculture (USDA), Animal and Plant Health Inspection Service (APHIS), Wildlife Services (WS) program has been working with federal, state, territorial and local agencies; tribes; organizations; and private individuals to address specific localized feral swine damage problems.

In this analysis, the term feral swine is used to refer collectively to free-ranging swine. This term includes escaped (stray) domestic and pet swine and their descendants, Eurasian (Russian) wild boar and their hybrids. Terms used by other entities may include wild pig, feral pig, wild hog, and wild boar (USDA 2015).

Wildlife Services' nationally coordinated program has prepared this Environmental Assessment (EA) to evaluate ways this responsibility can be carried out to reduce feral swine conflicts in the State of New Mexico. The EA will evaluate the individual damage control activities and methods that could be conducted by WS to manage damage and threats caused by feral swine. WS chose to prepare this EA to facilitate planning, interagency coordination and the streamlining of program management, and to clearly communicate with the public the analysis of individual and cumulative impacts. This EA will assist WS in determining whether these activities could have a significant impact on the human environment based on past and present actions and the anticipation of receiving additional requests for expanded assistance. In addition, this EA has been prepared to evaluate and determine if there are any potentially significant or cumulative impacts on nontarget species and the environment from the proposed and planned damage management program.

Pursuant to the National Environmental Policy Act (NEPA) and the Council for Environmental Quality (CEQ) regulations, WS is preparing this EA to document the analyses associated with proposed federal actions and to inform decision-makers and the public, of reasonable alternatives capable of avoiding or minimizing adverse effects. In addition, the EA will facilitate planning, promote interagency coordination, and streamline program management analyses between WS and cooperating state agencies.

This EA analyzes four alternatives of Feral Swine Damage Management (FSDM) by which feral swine control could be carried out to reduce or eliminate individuals and localized populations, to protect natural resources, agriculture, private property, public property and human health and safety:

<u>Alternative 1 - Continue the Current WS Program (No Action)</u>
The No Action alternative is a procedural NEPA requirement (40 CFR 1502), is a viable and reasonable alternative that could be selected and serves as a baseline for comparison with the other alternatives. The No Action alternative is the continuation of an ongoing program and, as defined here, is consistent with the CEQ's definition (CEQ 1981).

<u>Alternative 2 - No Wildlife Services Program</u>
This alternative would eliminate WS involvement in FSDM in New Mexico. WS would not provide direct operational or technical assistance and requestors of WS services would have to conduct their own FSDM without WS input, or possibly seek assistance through New Mexico Livestock Board, Department of Agriculture or New Mexico Department of Game and Fish. Private individuals may also increase their efforts under this alternative if state agencies were unable to adequately respond to FSDM complaints.

Alternative 3 – Only Non-lethal FSDM Methods Used by WS

This alternative would not allow for lethal WS operational FSDM in New Mexico. This alternative would require WS to use only non-lethal methods to resolve feral swine damage problems. Non-lethal methods available for use by WS under this alternative would include various live capture techniques as well as hazing or harassment methods, such as propane exploders, pyrotechnics, and other scare devices. This alternative would not restrict other agencies or private individuals/hunters from using lethal control methods.

Alternative 4 - Technical Assistance Only

WS would only provide technical assistance for alleviating damage when requested. This alternative would not restrict other agencies or private individuals/hunters from using lethal or non-lethal control methods.

The reasons that a Feral Swine Damage Management program is needed are covered in Chapter 1. The potential methods that may be used and the aspects of the human and natural environment that could be affected are discussed in chapters 2 and 3.

After examining various aspects of the four alternatives, WS recommends Alternative 1- Continue the Current WS Program, no change in action. WS uses an Integrated Wildlife Damage Management (IWDM) approach, also known as Integrated Pest Management (WS Directive 2.105[1]), in which a combination of methods may be used or recommended to reduce wildlife damage. These methods may include alteration of cultural practices and habitat and behavioral modification to prevent or reduce damage. In most wildlife damage situations, the reduction of wildlife damage may require that the local populations of offending animal(s) be reduced through lethal means. However, in New Mexico, the stated goal, in cooperation with the National Feral Swine Damage Management Program is statewide eradication of feral swine.

[1] WS Policy Manual - Provides guidance for WS personnel to conduct wildlife damage management activities through Program Directives. WS Directives referenced in this EA can be found in the manual but will not be referenced in the Literature Cited Appendix.

TABLE OF CONTENTS

APPENDICES

LIST OF ACRONYMS AND ABBREVIATIONS

APHIS	Animal and Plant Health Inspection Service
BISON-M	Biota Information System of New Mexico
BO	Biological Opinion
bTB	Bovine Tuberculosis
CEQ	Council for Environmental Quality
CDC	Center for Disease Control
CSF	Classic Swine Fever
CFSPH	Center for Food Security and Public Health
DEA	Drug Enforcement Administration
EA	Environmental Assessment
EIS	Environment Impact Statement
EJ	Environmental Justice
EPA	Environmental Protection Agency
FAD	Foreign Animal Diseases
FDA	Food and Drug Administration
FIFRA	Federal Insecticide, Fungicide, and Rodenticide Act
FMD	Foot and Mouth Disease
FMIA	Federal Meat Inspection Act
FONSI	Finding of No Significant Impact
FSDM	Feral Swine Damage Management
IPM	Integrated Pest Management
IWDM	Integrated Wildlife Damage Management
MIS	Management Information System
MOU	Memorandum of Understanding
NEPA	National Environmental Policy Act
NHPA	National Historic Preservation Act
NMAC	New Mexico Department of Administrative Codes
NMDA	New Mexico Department of Agriculture
NMDGF	New Mexico Department of Game and Fish
NMSA	New Mexico Statutes Annotated
NWRC	National Wildlife Research Center
PCVAD	Porcine Circovirus Associated Disease
SIV	Swine Influenza Virus
SOP	Standard Operations Procedures
T&E	Threatened and Endangered
USDA	United States Department of Agriculture
USFWS	United States Fish and Wildlife Service
WDM	Wildlife Damage Management
WS	Wildlife Services

1.0 NEED FOR ACTION AND SCOPE OF ANALYSIS

1.1 Introduction

The United States Department of Agriculture (USDA), Animal and Plant Health Inspection Service (APHIS), Wildlife Services (WS) program in New Mexico receives requests for assistance to reduce or prevent damage to crops, pastures, natural resources, property and threats to human health and safety caused feral swine. Human/wildlife conflict issues are complicated by a wide range of public perceptions to wildlife and wildlife damage. What may be unacceptable damage to one person may be a normal cost of living with nature to someone else. Wildlife damage management (WDM) is the science of reducing damage or other problems associated with wildlife and is recognized as an integral part of wildlife management (The Wildlife Society 1992). WS uses an Integrated Wildlife Damage Management (IWDM) approach, also known as Integrated Pest Management (WS Directive 2.105), in which a combination of methods may be used or recommended to reduce wildlife damage. These methods may include alteration of cultural practices, habitat, or behavioral modification to prevent or reduce damage. The reduction of wildlife damage may also require that the local populations of offending animal(s) be reduced through lethal means.

WS is a cooperatively funded, service-oriented program that receives requests for assistance with wildlife damage management from private and public entities, including tribes and other governmental agencies. As requested, WS cooperates with land and wildlife management agencies to reduce wildlife damage effectively and efficiently in accordance with applicable federal, state, tribal, and local laws and Memoranda of Understanding (MOUs) between WS, other agencies. Under congressional direction, APHIS recently developed and began implementing a National Feral Swine Damage Management Program. This nationally coordinated program will oversee WS in preparing this Environmental Assessment (EA) to evaluate ways that this responsibility can be carried out to reduce feral swine conflicts in the State of New Mexico.

Feral swine *(Sus scrofa)* are a destructive invasive species, they have been introduced into numerous countries, including the United States. Feral swine are rapidly expanding their geographic range and their population continues to increase in the United States (Waithman et al. 1999, Ballari and Barrios-Garcia 2012). The feral swine population in New Mexico increased considerably from 1992-2004. WS began responding to feral swine damage complaints in 2005 and as complaints continued to grow over the next few years, a feral swine EA was prepared and completed in 2009 to better access any potential environmental effects of expanding Feral Swine Damage Management (FSDM) activities in New Mexico. In 2013, New Mexico received additional federal funding for FSDM which allowed WS New Mexico to respond to more feral swine damage complaints.

This EA will evaluate the individual damage control activities and methods that could be conducted by WS to manage damage and threats caused by feral swine. WS chose to prepare this EA to facilitate planning, interagency coordination and the streamlining of program management, and to clearly communicate with the public the analysis of individual and cumulative impacts. This EA will assist WS in determining whether these activities could have a significant impact on the human environment based on past and present actions.

1.2 Need for Action

Feral swine can cause significant damage to agricultural, natural, cultural resources, property, and they pose risks to human and animal health. The International Union for Conservation of Nature (IUCN), Invasive Species Specialist Group (ISSG) has included feral swine in their listing of "100 of the World's Worst Invasive Alien Species" (Lowe et al. 2000). The damage from feral swine to natural and agricultural resources can be substantial (Seward et al. 2004). Pimentel (2007) estimated damage caused by feral swine could be $300/animal/year.

Feral swine also damage habitat and natural resources in many ways. They can consume large quantities of herbaceous vegetation (3–5% of their body weight daily) and have been linked to 95% declines of understory vegetation in some systems (Cole et al. 2012). They can consume large amounts of seeds, nuts and seedlings that may ultimately reduce the potential for forest regeneration (Campbell and Long 2009), and may influence future over-story composition and reduce tree diversity directly through consumption of seeds (Tolson and LaCour 2013).

Soil disturbance and vegetation loss associated with trampling, wallowing, and rooting by feral swine increases erosion and associated problems with water contamination and siltation. Siltation and water contamination in stream reaches and coastal areas with swine activity have contributed to declines in aquatic organisms, including freshwater mussels and insects (West et al. 2009). In some areas, feral swine have been implicated as the cause of elevated waterborne bacteria levels in streams, including levels which exceeded thresholds for the protection of human health (Kaller et al. 2007).

Feral swine foraging, rooting, and wallowing can also damage landscaping, golf courses, recreational fields, cemeteries, parks, and lawns. Rooting by feral swine likewise damages roadsides, dikes, and other earthen structures. Cultural sites impacted by feral swine have included national historic sites, tribal sacred sites and burial grounds and archaeological sites and digs (Native American and European origin).

Feral swine can carry 30 viral and bacterial diseases, and nearly 40 parasites that may affect humans, domestic livestock, and wildlife species (Ruiz-Fons et al. 2008, Meng et al. 2009). Feral swine can also harbor the causative agents of important foodborne diseases such as *Escherichia coli* (E. coli), *Salmonella* spp. and trichinosis (Brown et al. 2018). Additionally, feral swine can transmit many of these diseases to pets, including pseudorabies. Dogs, particularly hunting dogs, become infected with pseuorabies after coming into contact with infected feral swine. Once a dog is infected, there is no treatment, and death typically occurs 48–72 hours after symptoms appear.

Feral swine populations in New Mexico expanded rapidly between 2004 and 2012 with the number of counties where feral swine presence was confirmed growing from two to seventeen (roughly half the counties in NM). Feral hog damage confirmed in NM by USDA/WS staff increased from $300 in FY 05 to over $215,000 in FY 08. Feral swine were distributed throughout the eastern half of New Mexico when removal efforts began in 2013, with heavier populations located along the Pecos River, in the Sacramento Mountains, along the Canadian River, and in northeastern counties along the Colorado state line, as well as in the far southwest corner of the state in the Bootheel region. Currently, significant populations of feral swine remain in only two NM counties (Lincoln and Otero), and small scattered sounders and individual pigs remain in many other areas. WS does not currently have access to some of these areas.

Feral swine have very high fecundity with population growth rates reportedly as high as 178%, though it typically is closer to 40%. Litters of feral swine in California consist of an average of 5.6 young per sow with two litters under favorable conditions produced yearly (Barrett 1978). Because of this high reproduction rate

and the negative effects that feral swine can have on wildlife and habitat, the New Mexico Department of Game and Fish (NMDGF) supports effective measures to minimize or eliminate damage caused by feral swine populations in New Mexico (Stewart Liley, Chief Wildlife Management, NMDGF, pers. comm.. 2018).

1.2.1 Need to Manage Damage to Agriculture

Feral swine are responsible for an estimated $1.5 billion or more in damage each year to agricultural commodities in the United States (Coblentz and Bouska 2004, Pimentel et al. 2007). Agricultural commodities that require irrigation, or have fruits, nuts, or rhizomes can attract crop depredation by feral swine (Coblentz and Bouska, 2004). Feral swine damage crops through consumption of crops and other behaviors, such as rooting, trampling, and wallowing, which can destroy fields or reduce productivity. Field crops commonly damaged by feral swine include sugar cane, corn, grain sorghum, wheat, oats, peanuts, and rice, among others. Vegetable crops, such as lettuce, spinach, melons, and pumpkins are also damaged (Schley and Roper 2003, Seward et al. 2004). Rooting out seeds and trampling seedlings impacts regeneration of forest plantations (Lipscomb 1989). Feral swine also can reduce the vigor of larger trees, retarding growth or causing a decline in nut crops, such as pecans and almonds (Campbell and Long 2009).

Damage to Crops and Livestock

The field crop industry in New Mexico cultivates corn, wheat, sorghum (milo), pecans, peanuts, cotton, chilies, beans, hay and alfalfa. The value of New Mexico's field crop industry is estimated at $214 million for the 2015-2016 season according to the USDA National Agiculrual Statistics Service (2017). During that same season, livestock sales totaled $895 million and all agriculture products are worth a total of $2.86 billion in New Mexico.

Figure 1 shows verified feral swine damage to agriculture in New Mexico reported in the WS Management Information System (MIS) from FY 2010 to August 2018. The value of damage only accounts for those instances where WS was contacted and assistance was requested in dealing with feral swine conflicts. This does not represent all damage that occurs in New Mexico.

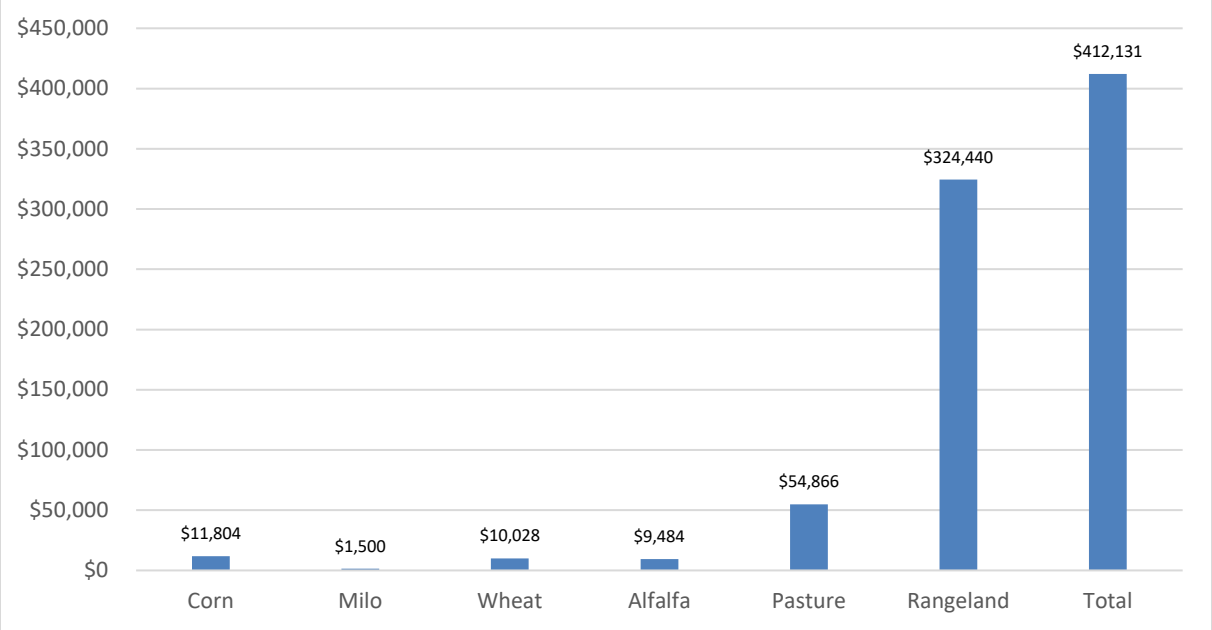


Figure 1. Verified damage to Agriculture from feral swine in New Mexico from FY10 – FY18.

Disease threats to Domestic Livestock

Livestock are susceptible to infection from a variety of diseases which can be transmitted by feral swine. Though biosecurity measures are in place at most farms in New Mexico, the extent to which these measures are in place varies from farm to farm; and the degree to which domestic livestock are exposed to diseases in feral swine depends on the extent of biosecurity on the premises. Disease transmission is likely to occur where domestic livestock and feral swine have a common interface, such as at water sources or livestock feeding areas. The contraction of any of these diseases listed below by domestic herds is likely to have a dramatic impact on the productivity and value of livestock commodities in New Mexico.

Bovine Tuberculosis (Btb)

Bovine TB is a chronic, debilitating disease of cattle, other ungulates, and humans. The causative agent of bTB is the bacterium *Mycobacterium bovis*. In 2008, New Mexico was downgraded from a TB Accredited-free state to a Modified Accredited status due to positive findings in Curry and Roosevelt counties. The change in status imposes restrictions on the transportation of cattle across state lines and can be severely detrimental to the cattle industry in the state. This status was lifted in 2011 after there were no positive findings after 48 consecutive months. Bovine TB can sometimes be harbored in wild ungulates such as feral swine or deer and have been known to re-infect domestic herds by acting as a reservoir for the disease making it extremely difficult to eradicate.

Porcine Reproductive and Respiratory Syndrome (PRRS)

PRRS is an economically important viral disease of swine, first recognized in the United States during the late 1980s (Holtkamp et al. 2013) and became endemic in most areas of swine production in the world by 1991 (Molina et al. 2009). A 2011 study estimates that, in the U.S., the total cost of productivity losses due to PRRS was $664 million, resulting from reproductive and respiratory problems to include late-term abortions, premature farrowing events, dead and mummified piglets, and persistent respiratory disease with secondary infections (Holtkamp et al. 2013). From 2010 through 2017, 97 blood serum samples collected by Wildlife Services from feral swine in New Mexico, PRRS was not detected in these samples.

Type 2 Porcine Circovirus (PCV2)

PCV2 is associated with a group of swine diseases known as Porcine Circovirus Associated Disease (PCVAD). PCVAD causes swine to suffer from a variety of wasting, respiratory, and reproductive difficulties and contributes to significant economic losses to the commercial swine industry. While PCV2 is necessary for disease, its presence alone does not always result in the development of PCVAD. PCV2 infection can lead to immunosuppression, and is usually found with other swine pathogens, such as PRRS and swine influenza virus (SIV) (Opriessnig and Halbur 2012).

Foot and Mouth Disease (FMD)

FMD is an extremely contagious vesicular viral disease of cloven-hoofed animals, both domestic and wild. FMD is characterized by fever, vesicular lesions, and erosions of the epithelium of the mouth, tongue, nares, and feet. The disease is rarely fatal in adult animals, but results in increased losses in the production of meat and milk; conversely, FMD may cause increased mortality rates in young animals. The combined effects of FMD have the potential to significantly impact livestock economies. FMD is considered a foreign animal disease (FAD), in that it is not detected in any animal population in the U.S.; in fact, the U.S. has been free of FMD since 1929.

Classical Swine Fever (CSF)

Similar to FMD, CSF is a FAD that can be transmitted between feral swine and livestock, and can adversely impact the American livestock industry. The U.S. has been CSF-free since 1978, but impacts to the industry due to an incursion by CSF would come from the high cost of disease control and eradication, the slaughter of infected/exposed swine, lost production, and export restrictions (Brown and Bevins 2018)

CSF, or hog cholera, is a viral septicemia of swine which causes fever, skin discoloration, conjunctivitis, diarrhea, and abortions. The most likely method of transmitting CSF virus is from the movement of apparently healthy, but infected, pigs, and from contaminated pork and pork products. The virus can be shed in any bodily secretion, and the most frequent route of infection is oronasal. Since 2007, Wildlife Services in New Mexico has sampled 641 feral swine for exposure to CSF; samples came from all 14 counties where feral swine where known to occur, none have tested positive.

Brucellosis

Swine brucellosis (SB) is caused by *Brucella suis*, a bacteria that is similar to the one that causes brucellosis in cattle. Cattle that are in close contact with swine harboring the disease may become infected (USDA 2005). Swine infected with the disease can develop clinical signs or appear healthy; making laboratory tests an important diagnostic tool. Infection can move through a herd quickly. Swine brucellosis is a zoonotic bacterial infection and is transmitted through oral and venereal routes (Thorne 2001). Boars can shed bacteria in their semen, and both sexes may experience short-term or permanent sterility. Infected sows may abort or give birth to weak piglets. Infection can also cause lameness. Since 2010, Wildlife Services in New Mexico has sampled 539 feral swine for exposure to SB; none have tested positive.

Pseudorabies Virus

Pseudorabies (also known as Aujesky's disease or "mad itch") is a viral disease most prevalent in swine, often causing newborn piglets to die. Older pigs can survive infection, becoming carriers of the pseudorabies virus for life. It is an alpha herpes virus and transmission usually occurs by oral or venereal contact (Wyckoff et al. 2009). Infected cattle and sheep can first show signs of pseudorabies by scratching and biting themselves. In dogs and cats, pseudorabies can cause sudden death. The virus is not known to cause illness in humans, but is fatal in dogs. Domestic swine in the United States recently achieved pseudorabies-free status after a 17-year effort and the expenditure of approximately $200 to $250 million dollars (Hutton et al. 2006).

Evidence of pseudorabies in New Mexico is at a relatively low apparent prevalence with the exception of past years sampling data from Quay County. Statewide, 646 samples showed 25 with evidence of pseudorabies (3.9%) Excluding Quay County, prevalence for PRV was 1.8 percent. PRV was evident in serum antibodies taken from feral swine from 2009 through 2017 (15/104 or 14% apparent prevalence) in Southern Quay County. This prevalence decreased to between 3 and 4 percent (3/87) during the 2011 to 2014 period. From 2015 to July 2018 no tests were positive for PRV among the 18 feral swine sampled in Southern Quay County.

Leptospirosis

Leptospirosis occurs regularly in domestic mammals, most notably in cattle, pigs, horses, and dogs. Any mammal species (domestic or wild) is potentially a maintenance or an accidental host (Leighton and Kuiken IN *Infectious Diseases of Wild Mammals, 3rd edition,* Williams and Barker, eds., 2001.)

For the years 2012 to 2017, antibody tests of feral swine serum showed leptospira bacteria to be widespread and with relatively high apparent prevalence in New Mexico feral swine samples. Positives occurred in 11 counties of 12 tested; the negative being in a county where only two samples were taken. There were positive antibodies for leptospires among almost 43% of 220 serum samples.

1.2.2 Need to Manage Feral Swine Damage to Property

The need to manage feral swine damage to property was evident when damage reports first began filtering into the WS New Mexico office in 2004. During FY 04, WS specialist confirmed $10,000 in damages. Those damages continued to increase through FY 2012 to $18,889 (MIS). In 2013, WS New Mexico received additional funding to allow an increased effort by to address these damage complaints and to provide an increased effort to eradicate feral swine from as many areas as possible. Figure 2 shows reported and verified feral swine damage to property from MIS from FY2010- July 2018.

Landscaping, Gardens, Golf Courses, Urban Parks, Roads

As populations of feral swine in North America have spread and increased in size they have also begun to expand into new habitats not previously occupied by feral swine (Extension 2012c) including urban and suburban environments. Feral swine can cause significant damage in suburban/urban areas with their foraging activities. The most common foraging impact observed is rooting. In urban areas this type of damage primarily affects grassed areas such as residential lawns, parks, golf courses, sports fields, and cemeteries. In addition to damaged turf, rooting can also cause other physical impacts to landscaping areas such as erosion, slope failure and down-grade sedimentation. Foraging by feral swine in developed areas can also result in the depredation of ornamental species planted in landscaped areas. Feral swine have also been observed damaging backyard fruit and vegetable gardens and are known to disperse garbage and refuse which can create litter and sanitary issues (Extension 2012c).

Additionally, rooting damage to levees and dikes caused by feral swine leaves the soil vulnerable to being washed away during a flood (SEAFWA 2012) and increases risk of flooding damage. In addition to costs associated with repair and prevention of feral swine damage to property, feral swine damage can adversely impact property values. Conversely, the presence of feral swine may be considered a positive impact on property values in areas where feral swine hunting is desired and permitted by law.

Feral swine can damage lawn irrigation and sprinkling systems by digging up and breaking the piping associated with these systems. There have been documented instances of feral swine accidentally entering commercial businesses and private residences. In these situations, feral swine can cause significant property damage trying to escape from the confined surroundings (Extension 2012c).

Pets

Unexpected, sudden encounters with feral swine in suburban areas have resulted in attacks of humans and their pets. These encounters are uncommon but appear to be increasing (Mayer 2013). Feral swine are potentially dangerous animals and have been known to be very aggressive when threatened or cornered. A recent human fatality occurred (a 59-year old woman) from a feral swine attack in Chambers County, Texas on November 24,2019. The presence of dogs being walked by their owners has been suggested to represent a hazard with respect to instigating feral swine attacks (Extension 2012c). Several reports document attacks, some fatal, by feral swine to domestic pets (Sanchez 2011, Burkhart 2012, Billi 2013).

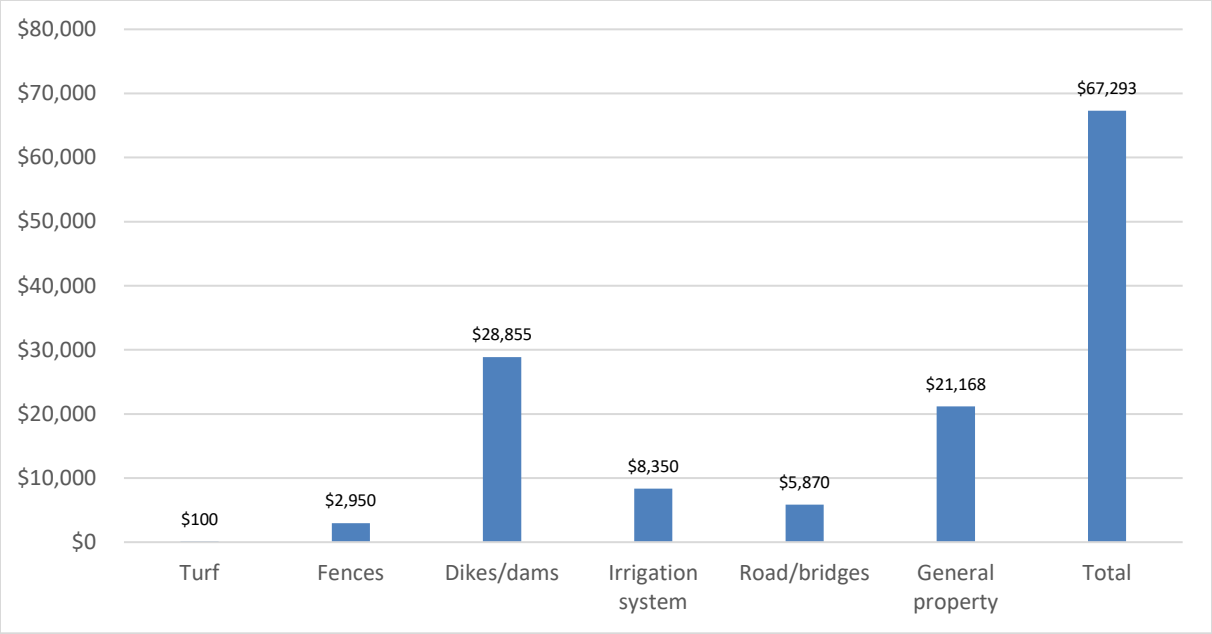


Figure 2. Reported and verified damage to Property from feral swine in New Mexico from FY10 – FY18.

1.2.3 Need to Manage Feral Swine Threats to Human Health and Safety

Feral swine can carry a number of parasites and diseases that potentially threaten the health of humans, livestock, and wildlife. Humans can be infected by several of these, including diseases such as brucellosis, leptospirosis, salmonellosis, toxoplasmosis, sarcoptic mange, E. coli, and trichinosis. Zoonotic diseases are diseases of animals which are communicable to humans. Feral swine are potential reservoirs for at least 30 different bacterial and viral diseases transmissible to humans, including swine brucellosis, swine influenza virus (SIV), toxoplasmosis, and leptospirosis.

Infection by zoonoses from feral swine may occur from direct exposure to carcasses, through contaminated food crops, or through secondary infection of a third host, where the disease is transmitted to other animals which then might transmit disease to humans. Brucellosis is a bacterial disease which is mainly spread among animals, but humans can become infected by coming in contact with contaminated animals or animal products. Brucellosis is rare in humans in the United States (Center for Food Security and Public Health 2009), but hunters may be infected through skin wounds or by accidentally ingesting the bacteria after cleaning infected animals. Anyone handling feral swine should take precautions such as using rubber gloves particularly when field dressing animals.

There are various species of the bacteria Brucella that can affect different animals, but most are associated with a limited number of hosts. Brucella suis is the species that infects domestic and feral pigs; it can occasionally affect horses (CFSPH 2009) and can be seen in dogs, cattle, bison and reindeer (USDA-APHIS-VS 2003). Swine brucellosis causes chronic inflammatory lesions in the reproductive organs and in the bones. Clinical disease includes lameness, paralysis, abortion, and birth of dead or weak piglets (USDA-APHIS-VS 2003, CFSPH 2009). B. suis strains (biovar 1 and 3) are highly pathogenic and can cause severe disease in humans (USDA-APHIS-VS 2003).

Feral swine may also act as re-assortment vessels for influenza viruses, whereby the re-assortment of viral DNA could lead to new strains of influenza viruses that could become easily transferrable to and among

humans. Also, if feral swine become infected by the protozoan Toxoplasma gondii, the causative agent of toxoplasmosis and a disease transmitted by cats, human infection can occur through direct ingestion of infected and undercooked meat. Similarly for Leptospira bacteria; if feral swine become infected, there is an increased potential that through direct contact with infected urine, or indirectly though waste run-off into streams, humans will become infected.

The WS program in New Mexico conducts disease surveillance in the feral swine population by means of its National Wildlife Disease Surveillance Program. Table 1 shows the number of positive results for each disease and the number of samples tested from FY2013-2017. Results show there is prevalence of pseudorabies, leptospirosis, swine influenza, toxoplasmosis and trichinosis.

Table 1. Diseases tested and Samples collected in New Mexico in FY 13-17

Apparent Prevalence (%) of Diseases in Feral Swine in New Mexico During Federal FY13-17										
	FY13		FY14		FY15		FY16		FY17	
Disease	Number Samples Tested	Number Positive (%)	Number Samples Tested	Number Positive (%)	Number Samples Tested	Number Positive (%)	Number Samples Tested	Number Positive (%)	Number Samples Tested	Number Positive (%)
Classical Swine Fever	77	0	54	0	41	0	31	0	38	0
Pseudorabies Virus	84	1 (1.2)	53	0	41	1 (2.4)	32	0	41	0
Swine Brucellosis	83	0	54	0	41	0	32	0	40	0
Swine Influenza Virus (nasal swab)	46	0	36	0	10	0	--	--	--	--
Swine Influenza Virus (serum)	77	0	53	1 (1.9)	42	1 (2.4)	28	0	39	1 (2.56)
Leptospirosis	74	25 (33.8)	54	40 (74.1)	11	4 (36.4)	26	12 (46.2)	6	1 (16.7)
Hepatitis E Virus	--	--	--	--	--	--	--	--	--	--
Foot and Mouth Disease	--	--	--	--	--	--	--	--	--	--
African Swine Fever	--	--	--	--	--	--	--	--	--	--
Toxoplasmosis	45	2 (4.4)	45	0	14	0	2	0	10	0
Genetics	0	--	5	--	37	--	30	--	54	--
Trichinosis	67	0	37	1 (2.7)	31	1 (3.2)	27	0	--	--

Vehicle Collisions

Feral swine collisions with vehicles are known to occur in the United States (Thompson 1977, Synatzske 1993, Mayer 2005). As the numbers of feral swine have increased, the frequency of feral swine-vehicle collisions has increased concurrently (Mayer and Brisbin 2009, Burns 2009, Mildenburg 2012). Mayer and Johns (2011) collected data from 179 feral swine-vehicle collisions in South Carolina occurring between 1968 and 2006 (Mayer and Johns 2011). Those accidents collectively involved 212 feral swine. The study found that feral swine-vehicle collisions occurred year-round and throughout the 24-hour daily time period. Most accidents were at night and the presence of lateral barriers was significantly more frequent at collision locations. Collisions with feral swine are most common in areas of preferred feral swine habitat. An evaluation of 311 wild pig-vehicle collisions in South Carolina determined that collisions were more likely in areas closer to streams and with less pine forest than would occur if collisions were randomly distributed

(Beasley et al. 2013). As discussed, human injuries were infrequent but potentially serious. The mean vehicle damage estimate was $1,173 (Mayer and Johns 2011). Strickand et al. (2020) provided an updated estimate of feral swine vehicle collisions that totaled more than 181,000,000. Based on traffic records from NM (Personal communication 8/24/18, Jason Lujan, NMDOT), feral swine vehicle collisions only average about 1.3 per year.

In addition to collisions with automobiles and motorcycles, feral swine have also been involved in collisions with trains and aircraft. Collisions with trains have been documented to occur in North America, Western Europe, and Asia. In 1988, two feral swine attempting to run across a runway at the Jacksonville International Airport collided with an F-16 fighter jet that was attempting to take off, destroying the $16 million aircraft in the subsequent crash (Extension 2012b).

1.2.4 Need to Protect Natural Resources

It has been well documented that feral swine disturb large areas of vegetation and soils through rooting, and it is documented that swine inhabiting coastal, upland, and wetland ecosystems are uprooting, damaging, and feeding on rare native species of plants and animals (Means 1999). Swine can disrupt natural vegetative communities, eliminate rare plants and animals, alter species composition within a forest including both canopy and low growing species (Lipscomb 1989, Frost 1993), increase water turbidity in streams and wetlands (reducing water quality and impacting native fishes), and increase soil erosion and alter nutrient cycling (Singer et al. 1982).

Feral swine may adversely affect stream ecosystems by causing erosion which increases sedimentation in streams, thereby negatively affecting wildlife that depends on clear water. Additionally, feral swine, through their waste products, can contribute to increased bacterial loads in waterways, enabling pathogens such as Leptospira spp. to be transported through the environment, potentially increasing the likelihood that other animals, including humans, might become infected. Figure 3 below shows the reported and verified damage by feral swine in New Mexico in the WS Management Information System (MIS) from FY 2010 to August 2018. The value of damage only accounts for those instances where WS was contacted and assistance was requested in dealing with feral swine conflicts. This does not represent all damage that occurs in New Mexico.

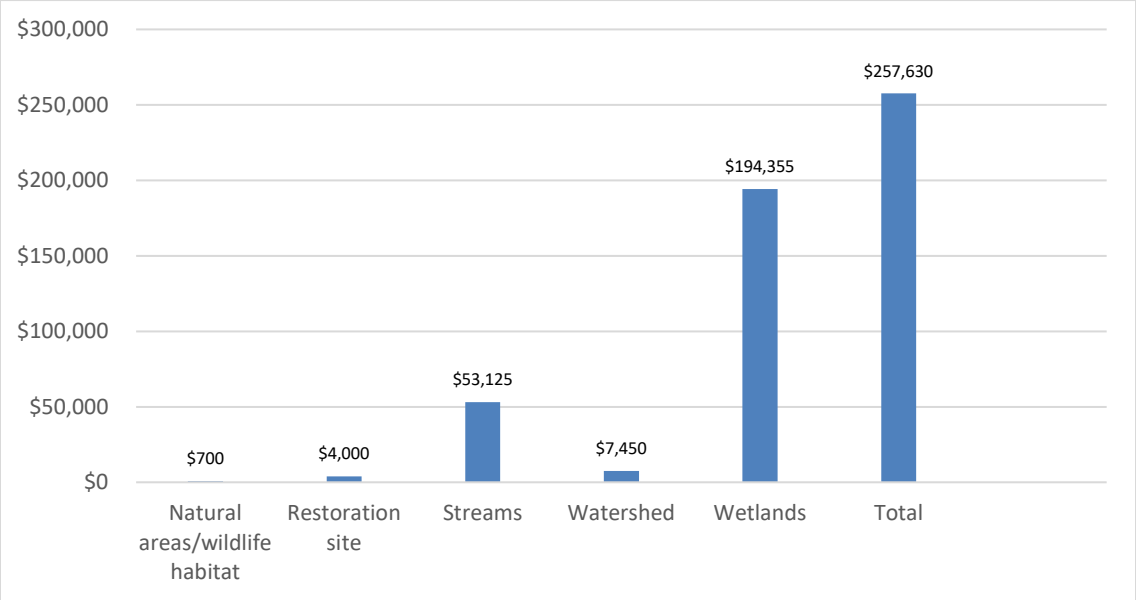


Figure 3. Reported and verified damage to Natural Resources from feral swine in New Mexico from FY10 – FY18.

An inductive model of suitable habitat for feral swine using GIS habitat data and GPS coordinates where feral swine had previously been taken by WS indicated that, based on limited data at the time, approximately 75% of the state was suitable habitat for feral swine (Calkins et al. 2009). Less than 1% of New Mexico is classified as riparian wetland, yet these habitats are used by 80% of the vertebrates classified as sensitive (NMDGF 2006). Damage to these fragile ecosystems could cause a significant decline or extinction of a number of New Mexico's plants and animals (Caulkins et al. 2009). Other notable potential negative impacts to New Mexico natural resources include competition with wildlife such as mast foods with Wild Turkey and black bears, destruction of Sacramento Mountain Salamander habitat in the Sacramento Mountains, predation on Lesser Prairie Chickens and their nests, habitat destruction and predation on the Dunes sagebrush lizard, the New Mexico Meadow Jumping Mouse, and the Peñasco Least Chipmunk.

Of the 10 NM counties inhabited by lesser prairie chicken, 8 were known to harbor feral swine populations when the project began. Currently, the majority of feral swine in this area have been eliminated (May 2014). Many were found a significant distance from the Pecos River and other flowing waters. They appear to be moving between stock tanks and other livestock waters while ranging over large distances. Telemetry and GPS collar data from this area indicate that feral swine may have variable home ranges of up to 250 square miles.

Additionally, feral swine are vectors for the transmission of diseases such as tuberculosis, brucellosis, pseudo rabies and leptospirosis, among others, to wildlife, livestock, and humans (Hutton et al. 2006). WS has conducted disease surveillance in NM feral swine populations since 2007 (recent results are listed above in Table 1). Positives for pseudorabies, swine brucellosis, hepatitis E, leptospirosis, toxoplasmosis, crytosporidia, giardia, salmonella, and E. coli have been found in multiple counties.

While there was some feral swine damage to moist soil units at Bitter Lakes National Wildlife Refuge prior to the start of feral swine eradication efforts in 2013, several swine were removed from the refuge and adjacent areas, and there have been no recent reports of damage. These moist soil units are normally left dry in the summer and fall months when most of the damage occurs. During the winter months when waterfowl are expected to arrive, these units are flooded to provide additional habitat for the migrating waterfowl.

1.3 National Environmental Policy Act and WS Decision-making

Pursuant to the NEPA and the CEQ regulations, WS is preparing this EA to document the analyses associated with proposed federal actions and to inform decision-makers and the public of reasonable alternatives capable of avoiding or minimizing adverse effects. The CEQ defines an EA as documentation that "...(1) briefly provides sufficient evidence and analysis for determining whether to prepare an [Environmental Impact Statement]; (2) aids an agency's compliance with NEPA when no environmental impact statement is necessary; and (3) facilitates preparation of an Environmental Impact Statement when one is necessary."

This EA will serve as a decision-aiding mechanism to ensure that WS infuse the policies and goals of the NEPA and the CEQ. This EA will also aid WS with clearly communicating the analysis of individual and cumulative impacts of proposed activities to the public. In addition, the EA will facilitate planning, promote interagency coordination, and streamline program management.

Individual wildlife damage management projects conducted by the WS program could be categorically excluded from further analysis under the NEPA, in accordance with APHIS implementing regulations for the NEPA (7 CFR 372.5(c), 60 FR 6000-6003). However, the purpose of this EA is to evaluate cumulatively the individual projects that WS could conduct to manage the damage and threats that feral swine cause, including those projects that WS could conduct at the request of cooperators. More specifically, the EA will assist WS with determining if alternative approaches to managing feral swine damage could potentially have significant individual and/or cumulative effects on the quality of the human environment that would warrant the preparation of an Environmental Impact Statement (EIS) in compliance with the NEPA and Council for Environmental Quality (CEQ) regulations.

This EA will assist in determining if the proposed cumulative management of feral swine damage could have a significant impact on the environment based on previous activities conducted by WS and based on the anticipation of conducting additional efforts to manage damage. WS' mission and directives would be to provide assistance when the appropriate property owner or manager requests such assistance, within the constraints of available funding and workforce. Therefore, it is conceivable that additional damage management efforts could occur beyond those efforts conducted during previous activities. Thus, this EA anticipates those additional efforts and the analyses would apply to actions that may occur in any locale and at any time within New Mexico as part of a coordinated program.

The analyses contained in this EA are based on information derived from WS' MIS, data from published documents, interagency consultations and public involvement. The EA evaluates the need for action to manage damage associated with feral swine in the state, the potential issues associated with wildlife damage management, and the environmental consequences of conducting alternative approaches to meeting the need for action while addressing the identified issues. WS initially developed the issues and alternatives associated with wildlife damage management in consultation with the New Mexico Department of Agriculture (NMDA) and the New Mexico Department of Game and Fish (NMDGF). To assist with identifying additional issues and alternatives to managing damage, WS will make this EA available to the public for review and comment prior to the issuance of a decision (either a Finding of No Significant Impact (FONSI) or a Notice of Intent to prepare an EIS).

1.4 Objectives

The primary objective of the WS program in New Mexico is to reduce localized damage to agriculture, natural and cultural resources, property, and human health and safety in cooperation with agency partners, and other entities where requested by landowners/managers. The proposal includes FSDM to protect agriculture, property, human health and safety, and natural resources, however, feral swine are considered and invasive species in New Mexico and as such, eradication is the desired goal for their population.

1.5 Decisions to be made

USDA APHIS WS is the lead agency for this EA and is therefore responsible for the scope, content, and the decisions to be made. Based on the scope of this EA, the decisions to be made are: 1) How should WS respond to the need for action to manage feral swine damage in the state? 2) Would the Preferred Alternative result in significant effects to the environment requiring the preparation of an EIS.

1.6 Scope of Analysis

This EA evaluates the proposed FSDM program and its activities in present or future programs throughout New Mexico. The proposal includes implementing FSDM for the protection of agriculture (livestock,

rangeland and crops), property (rural and urban parks and residential areas), human health and safety (vehicle collisions, zoonotic diseases), and natural resources (forests, wetlands, native plants and animals) in New Mexico.

This EA analyzes four alternatives by which feral swine control could be carried out to reduce or eliminate individuals and localized populations to protect natural resources, agriculture, private property, public property and human health and safety. The potential methods that may be used and the aspects of the human and natural environment that could be affected are discussed in Chapters 2 and 3.

1.6.1 Geographical Area and Land Designations

WS provides FSDM on federal, state, county and private lands in New Mexico. If WS were requested to conduct FSDM on federal lands for the protection of public resources, this EA would cover the actions implemented unless there are additional issues not analyzed in this EA, then the requesting federal agency would be responsible for complying with NEPA.

1.6.2 Site-Specificity

This EA analyzes potential impacts on the human environment as required by NEPA and addresses WS activities on all lands under Cooperative Agreement or Agreements for Control, or as otherwise covered by WS Work Plans. It also addresses the impacts of projects on areas where additional agreements with WS may be written in the reasonably foreseeable future in New Mexico. Because the proposed alternative is to continue the current program under this EA, and because the current program's goal and responsibility is to provide feral swine damage management when requested within the constraints of available funding and manpower, it is conceivable that additional feral swine damage management efforts would occur. Thus, this EA anticipates potential expansion and analyzes the impacts of such expanded efforts as part of the current program to protect natural resources, agriculture, property, and human health and safety.

Planning for feral swine damage must be viewed as being conceptually similar to federal or other agency actions whose missions are to stop or prevent adverse consequences from anticipated future events for which the actual sites and locations where they will occur are unknown but could be anywhere in a defined geographic area. Examples of such agencies and programs include fire and police departments, emergency response organizations, insurance companies, and other service agencies. Although some of the sites where feral swine damage is likely to occur and lead to requests for WS assistance can be predicted, all specific locations or times where such damage will occur in any given year cannot be predicted. This EA emphasizes major issues as they relate to specific areas; however, many issues can result from feral swine damage and therefore management decisions are based on site specific parameters. The standard WS Decision Model (Slate et al. 1992) and WS Directive 2.105 are the site-specific routine thought processes for determining methods and strategies to use or recommend for individual actions conducted by WS. However, the Decision Model is constrained by the limitations of the selected alterative and decision.

1.7 Agencies Involved in this EA and Their Roles and Authorities

Lead Agencies

United States Department of Agriculture (USDA), Animal and Plant Health Inspection Service (APHIS), Wildlife Services (WS)

USDA is authorized by law to protect American agriculture and other resources from damage associated with wildlife (Act of March 2, 1931 (46 Stat. 1468; 7 U.S.C. 8351–8352) as amended, and the Act of December 22, 1987 (101 Stat. 1329–331, 7 U.S.C. 8352). Within the USDA, this authority has been delegated to the APHIS-WS program. APHIS-WS' mission, developed through its strategic planning process, is: 1) *"to provide leadership in wildlife damage management in the protection of America's agricultural, industrial and natural resources, and 2) to safeguard public health and safety.*" APHIS-WS recognizes that wildlife is an important public resource greatly valued by the American people. By its very nature, however, wildlife is a highly dynamic and mobile resource that can cause damage to agriculture and property, pose risks to human health and safety, and affect industrial and natural resources.

APHIS-WS conducts programs of research, technical assistance, and applied management to resolve problems that occur when human activity and wildlife conflict. The USDA APHIS WS' the National Wildlife Research Center conducts research and provides technical assistance, including training, for governmental and non-governmental entities in management of wildlife hazard management. Memoranda of Understanding among WS and other governmental agencies also define WS' responsibilities in wildlife damage management. WS enters into Cooperative Agreements with entities to assist with specific wildlife damage management situations. WS' directives define program objectives and guide WS' activities in managing wildlife damage. WS is a fee-for-service agency.

Based on agency relationships, missions, and legislative mandates, WS is the lead agency and decision maker for this EA, and therefore responsible for the EA's scope, content, and outcome.

Cooperating Agencies

New Mexico Department of Agriculture. NMDA is authorized to cooperate with WS to conduct WDM. NMDA also regulates the pesticide laws in New Mexico. WS registers any pesticides it uses with NMDA. WS personnel that use pesticides in their job duties must be certified as a pesticide applicator through NMDA or be supervised by a certified pesticide applicator. No toxicants or repellents are currently registered for use on feral swine.

New Mexico Livestock Board. The New Mexico livestock board was established to govern the livestock industry of the state in the manner required by law per NMSA 77-2-1-3.

Participating Agencies

New Mexico Department of Game and Fish. NMDGF has the primary responsibility to manage all protected and classified wildlife in New Mexico, except federally listed T&E species, regardless of the land class on which the animals are found (New Mexico Revised Statutes (NMSA) Title 17). Feral swine in New Mexico are not classified as game animals or under the jurisdiction of NMDGF. However, feral swine negatively impact native wildlife managed by NMDGF and the expansion of this invasive species concerns them. Moreover, NMDGF supports effective measures to minimize or eliminate damage caused by feral swine populations in New Mexico.

U.S. Fish and Wildlife Service. USFWS has statutory authority to manage federally listed T&E species through the Endangered Species Act of 1973 (ESA) (16 USC 1531-1543, 87 Stat. 884) and migratory birds under the Migratory Bird Treaty Act of 1918 (16 USC 703-711; 40 Stat. 755), as amended. They are also responsible for managing refuges and conflicts with predators if they conflict with the refuge management goals.

U.S. Forest Service and Bureau of Land Management. These agencies have the responsibility to manage the resources of federal National Forests, National Grasslands, and public lands for multiple uses including livestock grazing, timber production, recreation and wildlife habitat, while recognizing the State's authority to manage wildlife populations. WS has memoranda of understanding (MOUs) with the USFS and the BLM for WDM work on federal lands and resources under their jurisdiction. These MOUs outline the specific cooperation and responsibilities of each agency. WS conducts WDM activities on U.S. Forest Service and Bureau of Land Management lands in accordance with all applicable laws and regulations. These agencies recognize WS's expertise in WDM and rely on WS to determine the appropriate methodologies for conducting WDM to reduce livestock and other resource losses.

1.8 Documents Related to this EA

Final Environmental Impact Statement – Feral Swine Damage Management: A National Approach
WS has prepared a programmatic feral swine environmental impact statement (EIS) to evaluate alternatives for a nationally coordinated feral swine damage management program in the U.S., American Samoa, Guam and the Commonwealth of the Northern Mariana Islands, U.S. Virgin Islands, and Puerto Rico (hereinafter USDA 2015). The Record of Decision (ROD), issued July 2015, selected a nationally coordinated, integrated Feral Swine Damage Management (FSDM) program. The selected alternative in the ROD incorporated all legally available FSDM methods and retained the flexibility to continue to work with local stakeholders under state or local level NEPA decisions, with local stakeholders to manage feral swine damage according to local feral swine management goals. This EA is consistent with the applicable findings, policies, and operational procedures evaluated in the Final EIS (FEIS).

1.9 Public Involvement

Per APHIS' NEPA implementing procedures and WS policy, this document is being noticed to the public through a legal notice published in *The Santa Fe New Mexican*, through the APHIS stakeholder registry (Gov Delivery), regulations.gov and by posting the pre-decisional EA on the APHIS website at: http://www.aphis.usda.gov/wildlife_damage/nepa.shtml.

After requesting review and input from cooperating and partner agencies and Tribes, WS will provide the public with a 30-day comment period on the pre-decisional EA. WS will use the same process to notify the public when the final EA and decision are available. Through the public involvement process, WS will clearly communicate to the public and interested parties the analysis of potential environmental impacts on the quality of the human environment. All public comments on the pre-decisional EA will be carefully considered prior to reaching a decision.

1.10 Rational for Preparing an EA rather than an EIS

Based on guidance from APHIS NEPA implementing procedures, 7 CFR 372.5(a) States: Actions normally requiring environmental impact statements. Actions in this class typically involve the agency, an entire program, or a substantial program component and are characterized by their broad scope (often global or nationwide) and potential effect (impacting a wide range of environmental quality values or indicators, whether or not affected individuals or systems may be completely identified at the time). Ordinarily, new or untried methodologies, strategies, or techniques to deal with pervasive threats to animal and plant health are the subjects of this class of actions. In addition, actions that may be considered "Highly Controversial" and its effects may be "Highly Uncertain," would prompt the preparation of an EIS.

However, the failure of any particular special interest group to agree with every act of a Federal agency does not constitute a controversy, and NEPA does not require the courts to resolve disagreements among various scientists as to the methodology used by an agency to carry out its mission (Marsh vs. Oregon Natural Resource Council, 490 US 360, 378 (1989)2). As has been noted in similar WS EAs, the effects on the quality of the human environment are not highly controversial. Although there is some opposition to [wildlife damage management], this action is not highly controversial in terms of size, nature, or effect. If in fact a determination is made through this EA that the proposed action would have a significant environmental impact, then an EIS would be prepared.

7 CFR 372.5(b) States: Actions normally requiring environmental assessments but not necessarily environmental impact statements. This class of APHIS actions may involve the agency as a whole or an entire program, but generally is related to a more discrete program component and is characterized by its limited scope (particular sites, species, or activities) and potential effect (impacting relatively few environmental values or systems). Individuals and systems that may be affected can be identified. Methodologies, strategies, and techniques employed to deal with the issues at hand are seldom new or untested. Alternative means of dealing with those issues are well established. Mitigation measures are generally available and have been successfully employed. Actions in this class include: (1) Policymaking and rulemakings that seek to remedy specific animal and plant health risks or that may affect opportunities on the part of the public to influence agency environmental planning and decision making.

Considering these guidelines, WS believes the proposed action is limited in scope. This EA is species-specific and is generally limited to particular sites where individual conflicts occur between property owners and feral swine. The methodologies, strategies and techniques employed are not new or untested and have been successfully employed. WS' intent in developing this EA has been to determine if the proposed action or the other alternatives could potentially have significant individual and/or cumulative impacts on the quality of the human environment that would warrant the preparation of an EIS. This EA addresses impacts for managing damage and threats to human safety associated with feral swine in New Mexico and evaluates individual and cumulative impacts to provide a thorough analysis.

As cited in 1.9 Public Involvement above, if new issues or alternatives are identified in the public involvement process or if the proposed action was determined to have significant impacts based on the context and intensity factors listed by the Council on Environmental Quality (CEQ) at 40 CFR 1508.27 it would require the preparation of an EIS. If this EA determines that an EIS is necessary, then WS would follow that course of action and issue a Notice of Intent to prepare an EIS.

1.11 Laws Related to this Discussion

Several federal laws and Executive Orders regulate wildlife damage management. WS complies with the following laws, relevant to this proposal, and consults and cooperates with other agencies as appropriate. Additionally, all FSDM activities would be conducted in accordance with applicable state and local regulations.

National Environmental Policy Act (NEPA) (42 U.S.C. 4321 et seq.). All federal actions are subject to NEPA (42 U.S.C. §§ 4321 et seq.). WS follows CEQ regulations implementing NEPA (40 CFR 1500 et seq.) and USDA (7 CFR 1b) and APHIS implementing regulation (7 CFR 372) as part of the decision-making process. These laws and regulations generally outline five broad types of activities to be accomplished as part of any project: public involvement, analysis, documentation, implementation, and

monitoring. NEPA also sets forth the requirement that all major federal actions be evaluated in terms of their potential to significantly affect the quality of the human environment for the purpose of avoiding or, where possible, mitigating and minimizing adverse impacts.

Pursuant to NEPA and CEQ regulations, this EA documents the analysis for potential impacts of a proposed federal action, informs decision-makers and the public of reasonable alternatives capable of avoiding or minimizing adverse impacts, and serves as a decision-aiding mechanism to ensure that the policies and goals of NEPA are infused into federal agency actions. This EA was prepared by integrating as many of the natural and social sciences as warranted, based on the potential effects of the proposed action. The direct, indirect, and cumulative impacts of the proposed action are analyzed.

Endangered Species Act (ESA) (16 U.S.C. 1531 et seq.). It is federal policy, under the ESA, that all federal agencies shall seek to conserve threatened and endangered (T&E) species and shall utilize their authorities in furtherance of the purposes of the Act (Sec.2(c)). For actions that "may affect" listed species, APHIS-WS conducts Section 7 consultations with the U.S. Fish & Wildlife Service (USFWS) to ensure that "any action authorized, funded or carried out by such an agency . . . is not likely to jeopardize the continued existence of any endangered or threatened species . . . Each agency shall use the best scientific and commercial data available" (Sec.7(a)(2)).

Depending on the species, the US Fish and Wildlife Service (USFWS) and the NOAA National Marine Fisheries Service (NMFS) are charged with implementation and enforcement of the Endangered Species Act of 1973, as amended and with developing recovery plans for listed species. Under the authority of the ESA, the USFWS acts to prevent the extinction of plant and animal species. It does this by identifying species at risk of extinction, designating ("listing") these species as threatened or endangered, providing protection for these species and their habitats, developing and implementing recovery plans to improve their status, and ultimately "delisting" these species and returning full management authority to the states and tribes.

While a species is listed, most management authority for the species rests with the USFWS/NMFS. However, the agency continues to work with other Federal agencies, states, and tribes along with private landowners to protect and recover the species. The USFWS helps ensure protection of listed species through consultations (section 7 of the ESA) with other Federal agencies. Under section 10 of the ESA, the USFWS also issues permits which provide exceptions to the prohibitions established by other parts of the Act. These permits provide for conducting various activities including scientific research, enhancement of propagation or survival, and incidental take while minimizing potential harm to the species. For species federally classified as threatened, the USFWS may also issue 4(d) rules which may allow for greater management flexibility for the species. The USFWS also issues grants for protection and enhancement of habitat and for research intended to improve the status of a listed species.

Federal Meat Inspection Act (FMIA). The Federal Meat Inspection Act (FMIA) applies to all meat or products obtained from any cattle, sheep, swine, goat, horse, mule, or other equines intended for distribution in commerce. Animals falling under jurisdiction of the FMIA must be inspected pre- and post mortem. Animals that are killed before they reach a slaughter facility are classified as "adulterated meat", and cannot be used for human food per the FMIA. Feral swine fall under authority of the FMIA, and therefore could only be donated to charitable organizations for use as food by needy individuals if they are delivered alive to a USDA approved feral swine slaughter facility. Chapter 12, subchapter 1, section 623 of the FMIA provides an exemption for persons having animals of their own raising and game animals slaughtered for their own use without inspection. This provision allows landowners to utilize feral swine

removed from their own property, with the understanding that meat derived from these feral swine will be consumed only by the landowner, his/her immediate family and/or nonpaying guests.

Controlled Substances Act. This law requires an individual or agency to have a special registration number from the federal Drug Enforcement Administration (DEA) to possess controlled substances, including those that could be used in capture and handling of feral swine.

National Historic Preservation Act (NHPA) of 1966 as amended (16 U.S.C. § 470). NHPA and its implementing regulations (36 CFR 800) require federal agencies to: 1) determine whether activities they propose constitute "undertakings" that can result in changes in the character or use of historic properties and, 2) if so, evaluate the effects of such undertakings on such historic resources and consult with the State Historic Preservation Office regarding the value and management of specific cultural, archaeological, and historic resources, and 3) consult with appropriate American Indian Tribes and Native Hawaiian Organizations (NHO) to determine whether they have concerns for traditional cultural properties or values in areas of these federal undertakings.

The Proposed Action would not cause major ground disturbance, does not cause any physical destruction or damage to property, would not cause any alterations of property, wildlife habitat, or landscapes, and does not involve the sale, lease, or transfer of ownership of any property. In general, such methods in the proposed action also do not have the potential to introduce visual, atmospheric, or audible elements to areas in which they are used that could result in effects on the character or use of historic properties. Therefore, the methods described under the Proposed Action are not generally the types of activities that would have the potential to affect historic properties or cultural values. If an individual activity with the potential to affect historic resources is planned under an alternative selected as a result of a decision on this EA, then site-specific consultation as required by Section 106 of the NHPA would be conducted as necessary.

Food, Drug, and Cosmetic Act. This Act, as amended, gives the Food and Drug Administration (FDA) the authorization to regulate the study and use of animal drugs. FDA could potentially regulate chemical sterilization drugs (e.g., GonaCon™) that could potentially be used by WS under this Act.

Executive Order on Environmental Justice. Executive Order (EO) 12898, Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations requires federal agencies to analyze disproportionately high and adverse environmental effects of proposed actions on minority and low-income populations. APHIS-WS has analyzed the effects of the proposed action and determined that implementation would not have adverse human health or environmental impacts on low-income or minority populations.

Executive Order on Protection of Children from Environmental Health and Safety Risks. Executive Order 13045 was passed to help protect children who may suffer disproportionately from environmental health and safety risks for many reasons. The analysis in Section 3.1.1 of this EA supports a conclusion of very low to no risk of adverse effects on human health and children from the Proposed Action. Implementation of the Proposed Action would not increase environmental health or safety risks to children.

Invasive Species - Executive Order 13112. Executive Order 13112 establishes guidance to federal agencies to prevent the introduction of invasive species, provide for the control of invasive species, and to minimize the economic, ecological, and human health impacts that invasive species cause. The Order states that each federal agency whose actions may affect the status of invasive species shall, to the extent practicable and permitted by law: 1) reduce invasion of exotic species and the associated damages, 2)

monitor invasive species populations and provide for restoration of native species and habitats, 3) conduct research on invasive species and develop technologies to prevent introduction, and 4) provide for environmentally sound control and promote public education of invasive species. WS Directive 2.320 provides guidelines for WS' actions in the management of invasive species in fulfillment of Executive Order 13112.

Native American Graves Protection and Repatriation Act. The Native American Graves Protection and Repatriation Act requires federal agencies to notify the Secretary of the Department that manages the federal lands upon the discovery of Native American cultural items on federal or tribal lands. Federal projects would discontinue work until a reasonable effort has been made to protect the items and the proper authority has been notified.

The Wilderness Act (Public Law 88-577(USC 1131-1136). The Wilderness Act established a national preservation system to protect areas "where the earth and its community life are untrammeled by man" for the United States. Wilderness areas are devoted to the public for recreational, scenic, scientific, educational, conservation, and historical use. This includes the grazing of livestock where it was established prior to the enactment of the law (Sept. 3, 1964) and WDM is an integral part of a livestock grazing program. The Act did leave management authority for fish and wildlife with the State for those species under their jurisdiction.

New Mexico State Legal Guidelines

NMSA 6.11.5-6. Taylor Grazing Act and Farm and Range Improvement Fund. These statutes allow Taylor Grazing Act monies collected by the U.S. government to be used for WDM.

NMSA 17.2.41. Endangered Species. This is the state law that provides special protection to state designated T&E species.

NMSA 17.3.46-47. Permits for Airborne Hunting. NMDGF can issue permits that allow the control of predators from aircraft under this statute. However, government employees are exempt.

NMSA 77.15.1-14. Predatory Wild Animals and Rodent Pests. These statutes allow the state of New Mexico to cooperate with and fund WS WDM.

NMSA 77-2-1 - 3. Creation of the New Mexico Livestock Board. This statute created the Livestock Board which, for a lack of laws that discuss the management of feral swine, governs the management of feral swine, ad hoc.

NMAC 19.30.2.1-11. Procedures for NMDGF to Handle Depredations Caused by Wildlife. These sections provide information for NMDGF and private landowners on how to handle wildlife damage on private and leased lands. In essence, these set the time frames for handling wildlife complaints for NMDGF. Under this law, NMDGF must provide landowners with short- and long-term solutions for depredation problems.

NMAC 19.32.2.11-12. Trap Inspection Requirements. These codes allow exemption from trap inspection requirements for personnel of NMDGF, NMDA, and WS who are acting in their official capacity in the control of depredating animals or for other management purposes.

2.0 ISSUES AND ALTERNATIVES

Chapter 2 contains a discussion of the issues relevant to the development and comparison of alternatives for FSDM, along with IWDM strategies, decision-making, and methods used by WS. Issues considered for detailed analysis represent a cause and effect relationship between the proposed action and potential significant effects that are necessary to analyze to make a reasoned choice between alternatives.

2.1 Introduction to issues and Alternatives

This chapter describes and identifies the issues and the alternatives that will be analyzed in this environmental assessment. NEPA requires consideration of reasonable and feasible alternatives, including a No Action Alternative to be used for comparison purposes. The following issues will be evaluated in detail for their potential environmental, social, and human health impacts as appropriate in Chapter 3, Environmental Effects. These issues have been identified based on WS' experience, previous EAs and public comments on those EAs.

Effects on Feral Swine Populations

Effects on Nontarget and T&E Species

Effects on Social and Cultural Values

Effects on Human Health and Safety

Humaneness / Ethics of FSDM Methods

In addition to identifying the issues, several criteria were used to help shape the alternatives and develop the range of "reasonable alternatives," as defined by the Council for Environmental Quality (CEQ 1981) for detailed evaluation. These criteria include:

Alternatives must respond to the Purpose and Need

Specifically, the project goal of reducing feral swine damage to agriculture, natural and cultural resources, property, animal health, and human health and safety in New Mexico by reducing or eliminating feral swine populations, in cooperation with agency partners and others.

Alternatives must comply with Federal Environmental Regulations

Specifically, they must be legally and environmentally sound, they must be based on the most current and available science and they must be economically and logistically feasible.

Alternatives must be Flexible

An alternative should be able to facilitate collaboration with agency partners and other cooperators. It should accommodate the variation found among state, territorial and local laws, management objectives, environmental conditions, or variations in funding levels.

2.2 FSDM Strategies used to develop the Alternatives

WS's activities are conducted to prevent or reduce wildlife damage to agricultural, industrial and natural resources; property; livestock; and threats to public health and safety on private and public lands. Activities are performed in cooperation with federal, state, local agencies, and private individuals. The WS program uses an Integrated Wildlife Damage Management (IWDM) approach (WS Directive 2.105), in which a combination of methods may be used or recommended to reduce wildlife damage. These methods may

include non-lethal techniques like alteration of cultural practices, habitat management, repellents, frightening devices, and physical exclusion to prevent or reduce damage. The reduction of wildlife damage may also require removal of individual animals, reducing the local animal populations through lethal means. In some instances, the goal may be to eradicate an invasive species. Program activities are conducted to reduce damage and risks to human and livestock health and safety, and are used as part of the WS Decision Model (Slate et al. 1992).

2.3 Integrated Wildlife Damage Management (IWDM)

As used and recommended by the WS program, IWDM encompasses the integrated application of approved methods simultaneously or sequentially as appropriate to reduce or prevent wildlife damage. The philosophy behind IWDM is to implement the best combination of effective management methods in the most cost-effective manner while minimizing the potentially harmful effects on humans, target and nontarget species, and the environment. IWDM may incorporate cultural practices (e.g., animal husbandry), habitat modification (e.g., exclusion), animal behavior modification (e.g., scaring), removal of individual offending animals, local population reduction or elimination or any combination of these, depending on the circumstances of the specific damage problem. The basic strategies included into a IWDM approach are as follows:

2.3.1 Technical Assistance Recommendations

"Technical assistance", as used herein, is information, demonstrations, and advice on available and appropriate wildlife damage management methods and approaches. The implementation of damage management actions is the responsibility of the requester. In some cases, WS provides supplies or materials that are of limited availability for use by non-WS entities. Technical assistance may be provided through a personal or telephone consultation, or during an on-site visit with the requester. Generally, several management strategies are described to the requester for short and long-term solutions to damage problems. These strategies are based on the level of risk, need, and the practicality of their application. In some instances, wildlife-related information provided to the requestor by WS results in tolerance/acceptance of the situation. In other instances, management options are discussed and recommended.

Under APHIS NEPA implementing regulations and specific guidance for the WS program, WS technical assistance is categorically excluded from the need to prepare an EA or EIS. However, it is discussed in this EA because it is an important component of the IWDM approach to resolving feral swine damage problems.

2.3.2 Operational Damage Management

Direct damage management assistance includes damage management activities that are directly conducted or supervised by WS personnel. Direct damage management assistance may be initiated when the problem cannot effectively be resolved through technical assistance alone and when a *Work Initiation Document for Wildlife Damage Management* is completed to provide for direct damage management by WS. The initial investigation defines the nature, history, and extent of the problem; species responsible for the damage; and methods available to resolve the problem. The professional skills of WS personnel are often required to effectively resolve problems, especially if restricted use pesticides are necessary or if the problems are complex.

From FY 2010 through FY 2018, WS has conducted 25,620 direct damage management actions (work tasks) in New Mexico to reduce conflicts and damage to agricultural resources, property, natural resources, and threats to human safety from feral swine. A list of the types of resources protected by WS is provided in Table 2.

Table 2. Protected Resources in New Mexico

Resource Protected from Feral Swine	WS Work Tasks
birds, pheasants (all) ag	1
birds, prairie chickens, lesser	973
birds, quail (all) ag	1
birds, turkey, wild	2
birds, z-(other)	4
birds, pheasant (all) nr	1
birds, quail (all) nr	1
buildings, residential	5
carrots	1
cattle (adult)	844
cattle (calves)	1013
cattle, adult (beef)	1823
cattle, adult (dairy)	1
cattle, calves (beef)	2203
clover	1
designated natural areas	146
dikes/dams/impoundments	2182
equine, horses (adult)	149
equine, horses (foals)	50
feed, livestock	18
fences	919
food items, non-human	46
fowl, chickens (other)	5
fowl, ducks (domestic)	1
gardens, veg./fruit/nuts	2
Goats, angora (adult)	1
Goats, z-(other adults)	1
goats, z-(other kids)	3
grains, corn (field)	94
grains, corn (sweet)	1
grains, milo	10
grains, oats	1
grains, rye	1
grains, wheat	1
grains, z-(other)	6
habitat, wildlife (general)	75
hay (stack/bales)	5
hayfields, alfalfa	461
hayfields, mixed species	65
hlth/sfty, human z-(general)	1421
irrigation ditch/drainage system	83
irrigation pipe system	644
irrigation drip line	1
landfills	1
mammals, deer, mule	5
mammals, elk (wapiti)	7
melons, cantaloupe	1
pasture	1112
peanuts	2
pets (companion/hobby animals)	23

property (general)	1143
rangeland	6811
reclamation/restoration site	101
recreational areas (other) **	6
roads/bridges	1747
seeds, bitterbrush	2
sheep (adult)	1
soil (i.e. erosion)	160
streams	671
swine (adult)	3
swine (piglets)	3
trees, pecan	1
trees, standing	64
trees, standing (mixed)	1
trees, standing/shrubs	4
turf and/or flowers	20
vehicles, land	1
watershed	375
wetlands	89
TOTAL	25,620

2.3.3 Educational Efforts

Education is an important element of WS program activities because wildlife damage management is about finding balance and coexistence between the needs of people and needs of wildlife. This is extremely challenging as nature has no balance, but rather, is in continual flux. In addition to the routine dissemination of recommendations and information to individuals or organizations sustaining damage, lectures, courses, and demonstrations are provided to producers, homeowners, state and county agents, colleges and universities, and other interested groups. Wildlife Services frequently cooperates with other agencies in education and public information efforts. Additionally, technical papers are presented at professional meetings and conferences so that WS personnel, other wildlife professionals, and the public are periodically updated on recent developments in damage management technology, programs, laws and regulations, and agency policies.

2.4 Wildlife Services Decision Making

WS personnel use a thought process for evaluating and responding to damage complaints which is depicted by the WS Decision Model and described by Slate et al. (1992) (Figure 4). Wildlife Services personnel are frequently contacted after requesters have tried or considered non-lethal methods and found them to be impractical, too costly, or inadequate to reduce damage. Wildlife Services personnel assess the problem, then evaluates the appropriateness and availability (legal and administrative) of strategies and methods based on biological, economic and social considerations. Following this evaluation, methods deemed to be practical for the situation are incorporated into a management strategy. After this strategy has been implemented, monitoring is conducted and evaluation continues to assess the effectiveness of the strategy. If the strategy is effective, the need for further management is ended. In terms of the WS Decision Model (Slate et al. 1992), most damage management efforts consist of continuous feedback between receiving the request and monitoring the results of the damage management strategy. The Decision Model is not a written documented process, but a mental problem-solving process common to most, if not all, professions.

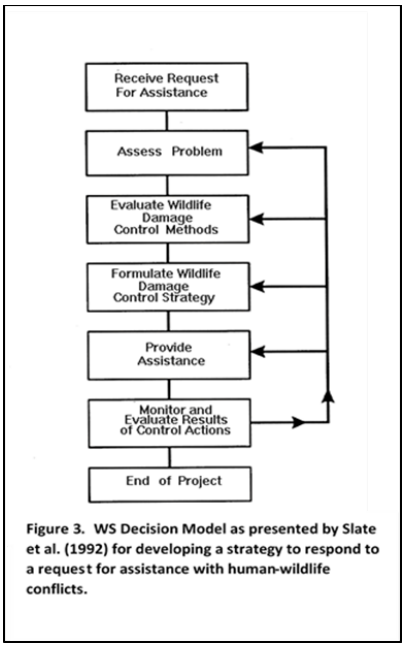


Figure 3. WS Decision Model as presented by Slate et al. (1992) for developing a strategy to respond to a request for assistance with human-wildlife conflicts.

Figure 4. WS Decision Model Slate et al. (1992).

2.4.1 Community-based Decision Making

The WS program in New Mexico follows the "co-managerial approach" to solve wildlife damage or conflicts as described by Decker and Chase (1997). Within this management model, WS could provide technical assistance regarding the biology and ecology of mammals and effective, practical, and reasonable methods available to the local decision-maker(s) to reduce damage or threats. This could include non-lethal and lethal methods depending on the alternative selected. Wildlife Services and other state, tribal and federal wildlife management agencies may facilitate discussions at local community meetings when resources are available.

Requests for assistance to manage damage caused by wildlife often originate from the decision-maker(s) based on community feedback or from concerns about damage or threats to human safety. As representatives of the community, the decision-maker(s) are able to provide the information to local interests either through technical assistance provided by WS or through demonstrations and presentations by WS on wildlife damage management activities. This process allows decisions on wildlife damage management activities to be made based on local input. They may implement management recommendations provided by WS or others on their own. They may request management assistance from WS, other wildlife management agencies, local animal control agencies, private businesses or other organizations.

2.4.2 Community Decision-Makers

The decision-maker for the local community would be elected officials or representatives of the community. The elected officials or representatives are popularly elected residents of the local community or appointees who oversee the interests and business of the local community. This person or persons would represent the local community's interest and make decisions for the local community or bring information back to a higher authority or the community for discussion and decision-making. Wildlife Services could provide technical assistance and make recommendations for damage reduction to the local community or local business community decision-maker(s). Direct control could be provided by WS only if requested by

the local community decision-maker, funding is provided, and if the requested direct control was compatible with WS' recommendations and allowed by the selected alternative.

2.4.3 Private Property Decision-Makers

In the case of private property owners, the decision-maker is the individual that owns or manages the affected property. The decision-maker has the discretion to involve others as to what occurs or does not occur on property they own or manage. Due to privacy issues, WS cannot disclose cooperator information to others. Therefore, individual property owner or managers make the determinations regarding involvement of others in the decision-making process for the site. Direct control could be provided by WS if requested, funding is provided, and the requested management is in accordance with WS' recommendations.

2.4.4 Public Property Decision-Makers

The decision-maker for local, state, or federal property would be the official responsible for or authorized to manage the public land to meet interests, goals, and legal mandates for the property. Wildlife Services could provide technical assistance to this person and recommendations to reduce damage. Direct control could be provided by WS if requested, funding provided, and the requested actions were within the recommendations made by WS. Public involvement would be conducted by the agency responsible for managing the site in accordance with agency procedures.

2.4.5 Native American and Tribal Decision-Makers

The decision-makers for Native American lands would be the officials responsible for or authorized to manage these lands and the land's resources identified under treaty rights, to meet interests, goals, and legal mandates for the property. Wildlife Services could provide technical assistance and recommendations to reduce damage. Direct control could be provided by WS if requested, funding provided, and the requested actions were within the recommendations made by WS. Tribes have not requested WS to provide assistance within New Mexico for the protection of resources on tribal lands. However, if a tribe contacted WS for assistance, the methods employed and potential impacts would be conducted in accordance with the established regulations and procedures for the affected group(s).

2.5 Methods

As depicted above in the WS decision model, when WS receives a request for assistance, the problem is first assessed and then the control methods to resolve the problem are evaluated. Control methods are generally broken down into two categories, Non-lethal and lethal methods.

2.5.1 Non-lethal Methods

Non-lethal methods are always evaluated before lethal methods are considered. It's only practical that if the problem can effectively be resolved using non-lethal methods, in most cases, it would be simpler and less intrusive than most lethal methods. Non-lethal methods are often times tried by the cooperators before requesting assistance from WS. In such a case, WS will evaluate rather or not the cooperator adequately tried the non-lethal methods and may recommend continued use of those methods or offer other non-lethal techniques to enhance the effort. Below are the common non-lethal methods used and recommended by WS.

Exclusion

Involves the physical exclusion of wildlife from protected resources and/or prevention of girdling, gnawing, rooting and general damage (i.e. tree wraps, fencing, electrical barriers, etc.).

Cultural methods and Habitat modification

These methods are typically implemented by agricultural producers or property owners. They consist primarily of non-lethal preventive methods which minimize exposure and/or reduce the amount or attractiveness of the protected resource to wildlife that would cause damage or pose a threat. A few examples of these types of techniques are: changing animal husbandry practices, switching to short variety crops, picking less palatable varieties of landscape plants, picking up and containing garbage in animal resistant containers, not leaving pet food out at night, and keeping the vegetation around the protected resource short or tall depending on management objectives.

Animal behavior Modification

These tactics refer to altering the animal's behavior to reduce damage. Some of these strategies may include but are not limited to the use of pyrotechnics, propane exploders, distress calls or other sound producing devices, visual or chemical repellents and livestock guarding dogs.

Non-lethal Capture Devices

These can include foot-hold traps, culvert traps, corral traps, catch poles, cable restraints and snares (used with a closing stop), nets, and box/cage traps to capture wildlife. These devices hold the animal until the Specialist arrives and relocates the animal (pursuant to State laws and regulations as appropriate). Alternatively, when monitoring for diseases in wildlife, samples may be collected and then the animal is released at the capture site. WS could also use these capture methods for animals to be outfitted with transmitters used for wildlife research.

Anesthetizing drugs

Drugs such as Ketamine, Telazol, Xylazine, and Yohimbine are used to capture, sedate, and handle animals involved in wildlife damage or disease situations. They may also be used to capture animals to receive transmitters for research purposes. These and other drugs are available for WS use, pursuant to State and Federal regulations, and are identified as approved drugs by the WS program through its Immobilization and Euthanasia Committee.

2.5.2 Lethal Methods

Lethal methods are used at the discretion of the specialist and are chosen by using the decision model and what is most appropriate for the situation while also considering local laws and WS policies. Detailed information and analysis of the effects from lethal methods is addressed in Chapter 3.

Lethal Capture Devices

Non-lethal capture devices as discussed above (foot-hold traps, snares, box/cage traps, culvert traps, corral traps, catch poles, nets, etc.) can also be used as lethal methods when the captured animal is killed via shooting or euthanasia chemicals discussed below.

Shooting

Shooting with firearms is sometimes used in managing wildlife damage problems particularly when lethal methods are deemed appropriate for the situation. Shooting is also used in some situations to supplement and reinforce dispersal techniques and to dispatch animals in traps. It is selective for target species and can be used in conjunction with spotlights, night vision, thermal imaging and other techniques.

Aerial Shooting

Aerial shooting from a helicopter by trained and certified USDA-APHIS-WS crewman using lead-free ammunition could be performed as a control measure in the state. This is commonly used in FSDM and has been identified as a very effective means to efficiently remove feral swine (Campbell et. al. 2010, Richardson 2010, West et.al. 2009). The WS program aircraft-use policy (APHIS-WS Directive 2.620 Aviation Safety and Operations) ensures that aerial shooting is conducted in a safe and environmentally sound manner, in accordance with applicable laws and regulations. Pilots and aircraft must be certified under established USDA-APHIS-WS program procedures and only properly trained employees are approved to shoot from aircraft.

Trailing dogs

Trailing dogs are commonly used to track and "bay" target feral swine. Dogs commonly used are different breeds of hounds such as blue tick, red-bone, and Walker. They become familiar with the scent of the animal they are to track and follow, and will strike (howl) when they smell them. Tracking dogs are trained not to follow the scent of nontarget species.

Euthanasia drugs

Sodium Pentobarbital and Potassium Chloride are commonly used to euthanize animals. These and other drugs are available for WS' use for wildlife damage or disease situations, pursuant to state and federal regulations and are identified as approved drugs by the WS Immobilization and Euthanasia Committee.

2.6 Field Operating Procedures for FSDM Methods

WS has a number of standard field operating procedures and operational policies. These policies and procedures are designed to prevent, reduce or compensate for any undesirable consequence that could occur as a result of an action from WS. These procedures are incorporated into all alternatives as applicable, except the no federal program alternative (Alternative 2). Most field procedures are instituted to abate specific issues while some are more general and relate to the overall program. Field procedures include those recommended or required by regulatory agencies such as EPA and these are listed where appropriate. Specific measures to protect resources such as T&E species that are managed by cooperating agencies (USFWS, NMDGF) are included in the lists below.

2.6.1 General field procedures used by WS in FSDM

- WS complies with all applicable laws and regulations that pertain to conducting FSDM on private and non-hunting public lands.
- WS coordinates with agency officials for work on non-hunting public lands to identify and resolve any issues of concern with FSDM.
- All personnel who use firearms would be trained according to WS' Directives.

- WS personnel adhere to all label requirements for chemical toxicants, repellents, and immobilization, euthanasia, and contraceptive drugs. EPA/FDA approved labels provide information on preventing exposure to people, pets, and T&E species along with environmental considerations. These label requirements generally preclude or reduce exposure to nontarget species, the public, pets, and the environment.

- WS' personnel would operate in accordance with WS Directive 2.210 (Compliance with federal, state and local laws and regulations) and WS Directive 2.450 (Traps and trapping devices).

- WS' personnel would use immobilizing drugs and euthanasia chemicals according to the United States Drug Enforcement Administration and United States Food and Drug Administration guidelines, along with WS' directives and procedures.

- WS' personnel would only use controlled substances registered with the United States Drug Enforcement Administration or the United States Food and Drug Administration.
- WS' personnel that use controlled substances would receive training and certification to use those substances.

- Pesticide and controlled substance use, storage, and disposal would conform to label instruction and other applicable laws and regulations, and Executive Order 12898.

- WS' personnel would dispose of carcasses retrieved in accordance with WS Directive 2.515.

2.6.2 WS Field Procedures Specific to Issues

The following is a summary of field procedures used by WS specific to the issues used to develop the Alternatives.

Effects on Feral Swine Populations

- Feral swine take is monitored. WS provides data on total take of target animal numbers to other agencies (NMDGF as appropriate).

- WS only targets those individuals or groups of target species identified as causing damage or posing a threat of damage.

- WS will not relocate feral swine because of concerns regarding feral swine disease, the impact of feral swine on human health and safety, property, agriculture, and natural resources.

- WS personnel would selectively place capture devices where there is recent (fresh) feral swine sign and depredation or damage activity. The smallest number of capture devices that will remove the offending animal(s) would be used. Due to trap check policies, animal welfare and nontarget species concerns and time limitations, WS personnel would be experienced at identifying recent feral swine sign and the efficient use and deployment of trap devices.

Effects on Nontarget and T&E Species

- WS' personnel would release nontarget animals live-captured in traps unless it was determined that the animal would not survive and/or that the animal could not be released safely.

- WS' personnel would dispose of carcasses retrieved in accordance with WS Directive 2.515.

- As appropriate, capture devices would be equipped in such a manner to reduce the potential of capturing nontarget animals.

- When conducting feral swine damage management activities via shooting, identification of the target would occur with consideration of the surrounding area and public safety.

- As appropriate, suppressed firearms would be used to minimize noise.

- WS personnel work with research programs such as NWRC to continually improve and refine the selectivity of management devices, thereby reducing nontarget take.

- When working in an area that has T&E species or has the potential for T&E species to be exposed to FSDM methods, WS personnel will know how to identify T&E species and apply or not apply FSDM methods accordingly.

- WS implements all requirements to protect federally listed species as issued in USFWS Section 7 consultations. These consultations provide species specific guidelines to ensure T&E species are not impacted. Communications and consultations with USFWS are re-initiated if there is any new information or if management actions change.

Effects on Human Health and Safety

- WS Specialists who use firearms and pyrotechnics are trained and certified by experts in the safe and effective use of these materials.

- Conspicuous warning signs, alerting people to the presence of traps or other FSDM methods, are placed at major access points when they are set in the field.

Humaneness of FSDM Methods

- Euthanasia procedures that do not cause pain or undue stress are used by trained WS personnel when practical and where safe.

- WS personnel euthanize captured target animals that are slated for lethal removal. The American Veterinary Medical Association's 2013 Guidelines and WS Directives 2.430 and 2.505 are followed for Euthanasia. Where euthanasia methods are not possible in some field situations, the animal is dispatched as humanely and quickly as possible.

- Trap monitoring devices would be employed where appropriate, which would minimize the amount of time feral swine may be confined to minimize pain and distress of live-captured swine.

- NWRC is continually conducting research to improve the selectivity and humaneness of wildlife damage management devices used by personnel in the field

2.7 Alternatives Considered in Detail

The following alternatives were developed to meet the need for action and address the identified issues with managing feral swine in New Mexico. Each of the below alternatives will be discussed in detail in chapter 3.

Alternative 1 – Continue the Current WS Program (No Action)

The No Action alternative is a procedural NEPA requirement (40 CFR 1502), is a viable and reasonable alternative that could be selected, and serves as a baseline for comparison with the other alternatives. The No Action alternative is the continuation of an ongoing program and, as defined here, is consistent with the CEQ's definition (CEQ 1981).

Alternative 2 – No Wildlife Services Program

This alternative would completely eliminate WS involvement in FSDM in New Mexico. WS would not provide direct operational or technical assistance and requestors of WS services would have to conduct their own FSDM without WS involvement.

Alternative 3 – Only Nonlethal FSDM Methods Used by WS

This alternative would not allow for lethal WS operational FSDM in New Mexico. This alternative would require WS to use only non-lethal methods to resolve feral swine damage problems.

Alternative 4 – Technical Assistance Only

Under this alternative, WS would cease from conducting direct control operations on behalf of cooperators to control feral swine damage and would only provide technical assistance or information.

2.8 Alternatives and Strategies Not Considered in Detail

Several alternatives were considered but not analyzed in detail. These alternatives have been raised from public comments in past feral swine EAs and the rationale for not considering these alternatives in detail are given below.

2.8.1 Compensation for Feral Swine Damage Loses

The Compensation Alternative would require the establishment of a system to reimburse persons impacted by feral swine damage. This alternative was eliminated from further analysis because no federal or state laws currently exist to authorize such action. Feral swine are destructive to numerous resources and compensation would not stop damages. A compensation program would require a substantial amount of funding to develop, investigate and validate damage claims, administer the program and pay claims. Compensation programs generally give little incentive to resource owners to limit damage through cultural FSDM methods and husbandry, or other practices and management strategies. Compensation programs are also not practical for reducing threats to human health and safety. WS and cooperating agencies in Hawai`i and nationally recognize the growing need to manage feral swine damages and a compensation

program would require additional resources that are currently not available would not help to achieve the overall goal of reducing feral swine damage.

2.8.2 Relocation Rather than Lethal Control of Feral Swine

Translocation is not appropriate for FSDM because feral swine are nonnative and the movement of feral swine from high-density, damage areas to areas of lower feral swine density facilitates spread of an invasive species. It should also be noted that the American Veterinary Medical Association (AVMA), the National Association of State Public Health Veterinarians, and the Council of State and Territorial Epidemiologists oppose the relocation of mammals due to the potential for disease transmission to a healthy local population. This is particularly true for mammals such as the feral swine, which have been shown to carry over 30 zoonotic diseases (Center for Disease Control 1990). Relocation of wildlife is also discouraged by WS policy (WS Directive 2.501) because it is not a biologically sound practice and typically the relocated individual does not remain in or near the release site. Furthermore, feral swine are considered and invasive species in New Mexico and as such, eradication is the desired goal for their population.

2.8.3 Develop a Statewide Bounty Program for Feral Swine

Bounties have been used in many states for over 150 years for a variety of animals, and in particular, coyotes. Among coyote bounty case histories, no documented evidence exist that bounty programs have temporarily or permanently reduced coyote numbers or abundance in any state (Bartel and Brunson 2003). Kansas enacted a $2 bounty on coyotes in 1877 and it remained in place until 1970. This bounty cost the state approximately $100,000 per year. After 93 years and approximately 9.3 million dollars in bounty payments, the results were overwhelmingly conclusive that the bounty system did not control coyotes and it did not control damage to poultry or livestock (Henderson 1987). Although feral swine are very different than coyotes, biologists believe their reproductive potential could make them equally or even more difficult to control with a bounty program.

Although nearly every state in the country has abandoned the idea of a bounty for predator control, Utah recently re-enacted a bounty on coyotes. Bartel and Brunson (2003) conducted a survey of the Utah bounty participants to determine the effectiveness of the program and to determine what motivated the bounty participants. The study determined that the bounty program did not produce the desired results in terms of increasing hunter participation or reducing the coyote population. They found little evidence that new hunters or trappers were recruited by the bounty program and the survey showed that the income from the bounty was the least important reason for participating. Enjoying the outdoors was the number one reason they participated. This implies that the people who participate in a bounty program are the ones that are likely to participate in hunting and trapping regardless of a bounty. Therefore the bounty was not enough of an incentive to recruit new hunters and it was not enough of an incentive for current hunters to increase their efforts significantly.

A bounty on feral hogs would likely cause some severe conflicts with the current strategy to control feral swine in New Mexico. First, by giving a value to feral swine in New Mexico it could provide an incentive to merely maintain current populations and could easily encourage more illegal releases of feral swine. Secondly, a bounty would make obtaining permission from landowners much more difficult to conduct FSDM because a landowner might see feral swine as having value and deny access to their property. Public hunting is not an effective means of control and due to the nature of feral swine (scatter under extreme hunting pressure), a bounty would likely achieve little control while scattering feral swine to new

areas. Additionally, a bounty program would likely result in fewer quality disease samples from harvested animals which would decrease overall disease surveillance.

3.0 ENVIRONMENTAL EFFECTS

Chapter 3 provides information needed for making informed decisions in selecting the appropriate alternative for meeting the purpose and need for the proposed action. NEPA requires federal agencies to determine whether their actions have a "significant impact on the quality of the human environment." The environmental consequences of the four alternatives are discussed below with emphasis on the issues presented in Chapter 2, with analysis of the direct, indirect, and cumulative effects, as applicable. The environmental consequences of each alternative are compared with the proposed action to determine if the real or potential impacts would be greater, lesser, or the same. Therefore, the proposed action or current program alternative serves as the baseline for the analysis and the comparison of expected impacts among the alternatives. The comparison of alternatives will be used to make a selection of the most appropriate alternative for WS FSDM activities.

Each major issue will be evaluated under each alternative and the direct, indirect and cumulative impacts will be estimated where applicable. NEPA describes the elements that determine whether or not an impact is "significant." Significance is dependent upon the context and intensity of the impact. The following factors were considered to evaluate the significance of the impacts on the human and natural environment that relate to context and intensity:

- Magnitude of the impact (size, number, or relative amount of impact) (intensity);
- Duration and frequency of the impact (temporary, seasonal impact, year round or ongoing) (intensity);
- Likelihood of the impact (intensity);
- Geographic extent; how widespread the program impact might be (intensity); and the legal status of a species that may be affected by the action (context).

3.1 Alternatives Considered in Detail and Their Associated Impacts

The issues identified in chapter 2 are addressed here in detail by alterative. This section analyzes the environmental consequences of the No Action Alternative (Continue the current program) with three other alternatives and compares these impacts with the projected environmental impacts of the Proposed Action.

3.1.1 Alternative 1 – Continue the Current WS Program (No Action)

The proposed action is to continue the current portion of WS operations that responds to requests for FSDM, and in response to increasing conflicts with agricultural and natural resources, property, and threats to human health and safety in New Mexico. To meet these goals WS would have the objective of responding to all requests for assistance and because eradication is the objective in New Mexico, WS, providing funding is available, would provide direct damage management assistance in which professional WS personnel conduct FSDM.

An IWDM approach would be implemented which would allow the use of all available legal techniques, used singly or in combination, to meet the need of each requestor for resolving conflicts with feral swine. Lethal and non-lethal methods used by WS were identified in 2.5. WS has also conducted detailed risk assessments (WS 2017a) involving each method and are cited throughout the document where each

method is discussed, these risk assessments can also be viewed at https://www.aphis.usda.gov/aphis/ourfocus/wildlifedamage/programs/nepa/ct-ws-risk_assessments. Upon completion of an WS Form 12A Work Initiation Document, FSDM and the methods described here by WS would be allowed in the state, when requested, on private property sites or public facilities where a need has been documented. All management actions would comply with appropriate federal, state, and local laws.

Effects on Feral Swine Populations (Under Alternative 1)

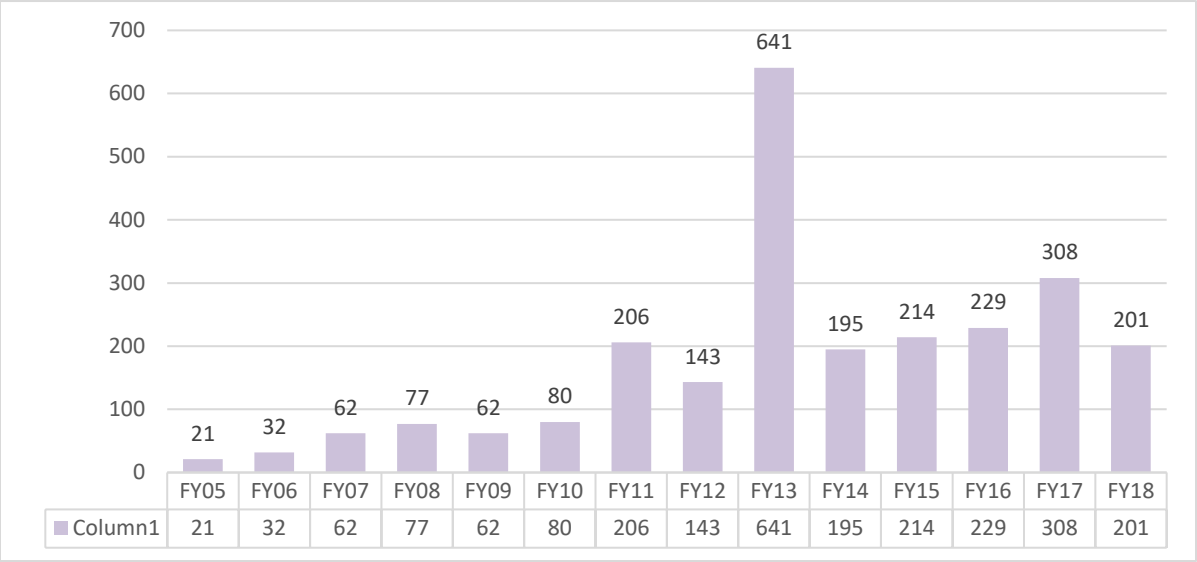
The authority for management of feral swine in New Mexico is the New Mexico Livestock Board and NMDA. These agencies and other State agencies such as NMDGF would prefer that feral swine be eradicated from the State because it is an invasive species and as noted in section 1.2 have caused considerable damage in the state.

Feral swine, being non-indigenous and because they cause damage to a variety of resources and negatively impact and compete with native flora and fauna, are considered by many wildlife professionals to be an undesirable component of North American wild and native ecosystems. Any reduction in feral swine populations in North America, even to the extent of complete eradication, is desirable (in most states) and would have a beneficial impact to native wildlife and the agricultural community.

With the development of the National Feral Swine Damage Management Program (NFSDMP) in 2014, a primary objective was to stabilize and eventually reduce the range and size of feral swine populations in the United States and territories in accordance with management objectives of states, territories and tribes. In New Mexico, the stated goal is eradication. Prior to the development of the NFSDMP, eradication, although a stated goal, did not appear to be feasible given existing funding levels. However, increased support through the NFSDMP to New Mexico has allowed the real possibility of eradication in the state.

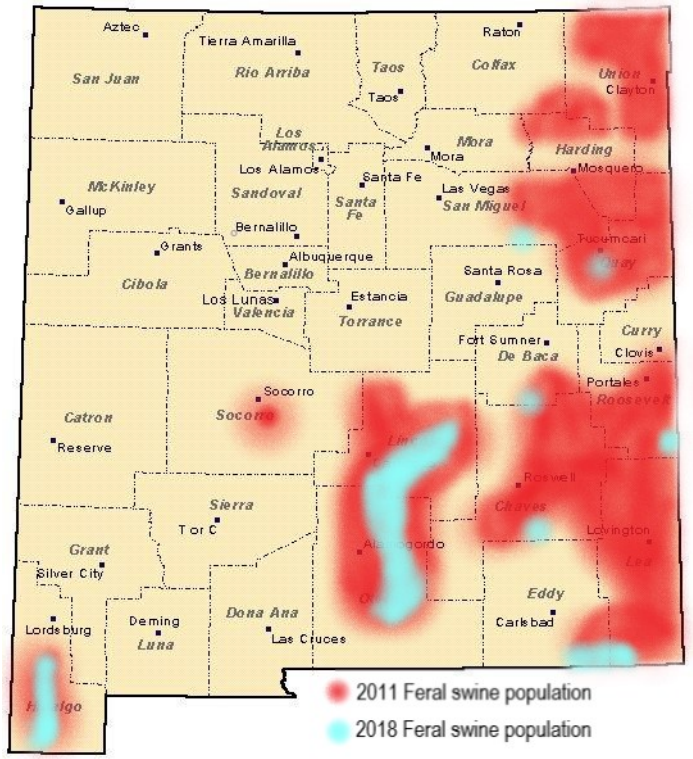
In 2013, just prior to the formation of the NFSDMP, New Mexico increased its surveillance efforts of feral swine in the state. WS-New Mexico identified 17 counties with the presence of feral swine. Sixteen of those counties have been actively worked by WS to remove feral swine. As noted below in Figure 5, control efforts also increased in 2013 as feral swine were discovered during enhanced surveillance. Feral swine numbers have increased steadily over the last decade in New Mexico, however, control efforts have increased as well and is depicted in WS take from FY05 – FY18 in Figure 5.

Figure 5. Feral swine take by WS each federal fiscal year in the state of New Mexico.



Although the WS' feral swine take in New Mexico has increased over the past decade, the overall feral swine distribution in the state has decreased. This has been a result of extirpating isolated populations of feral swine in the state. Figure 6 shows the estimated feral swine distribution from 2011 to 2018. The past and present feral swine population in New Mexico is unknown.

Figure 6. Estimated Feral Swine distribution in New Mexico



However, since WS-New Mexico's past and present feral swine population is unknown, we can only speculate if control efforts are achieving a population reduction. Without creditable population estimates,

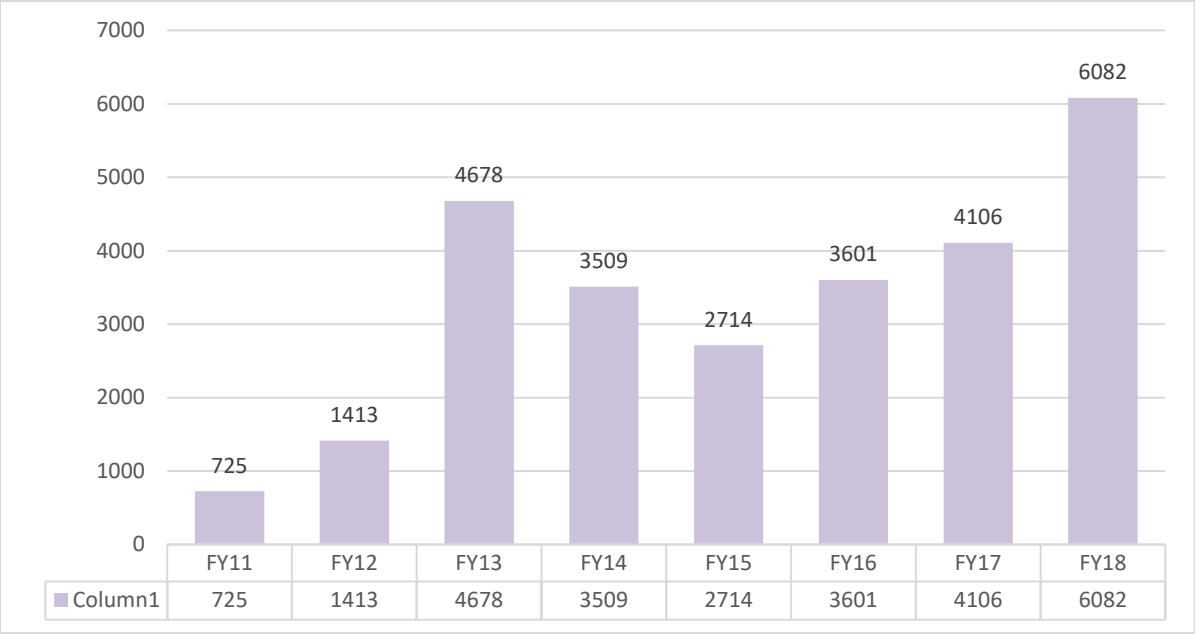
one legitimate measure to consider is relative abundance of feral swine. One way to estimate a population size or general abundance is to use a "Catch per unit Effort" (CPUE) measure. This is a commonly used method to estimate population sizes of species that can be difficult to count. It is often used in fisheries research to estimate the population size or abundance of fish species but it can also be applied to mammals such as feral swine in some instances if there is a reliable and measurable "Effort".

Catch per unit effort uses the theory of diminishing returns to estimate population size when it is not practical to obtain exact counts of individuals in an area. If a set of samples is taken continually from a population (feral swine annual take) and the individuals are not returned to the population, a decrease in numbers captured per unit effort is usually noted in later samples. If the rate of decrease is constant, it can be measured and used to estimate the total population size (Lancia et al. 1996).

The basic formula for a CPUE estimate is (Total Catch ÷ Effort = Catch Rate). Catch rate can also be noted as the population size or viewed as a catch rate. The primary element that gives validity to this estimate is the "effort" variable. Typically the "effort" needs to be standardized and constant, for example, when used in fisheries management, biologists deploy the same size nets in the same places at the same time of year each year to estimate fish populations. For our estimate, WS has effort data in the form of feral swine work tasks and annual feral swine take numbers that reflect "total catch". With those two variables, WS can calculate "catch rate" or an indication of population size.

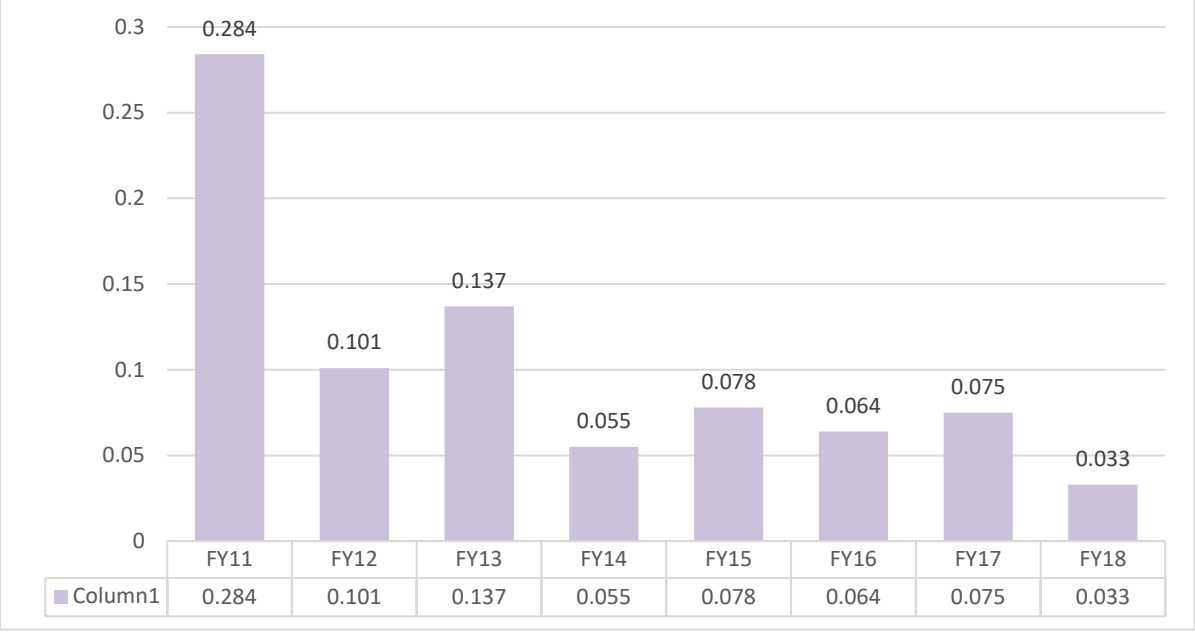
Typically, effort is measured in hunter hours or man hours. WS uses a Management Information System (MIS) to account for employee time and activities. Unfortunately, due to the nature of the system, information and time can be entered in several different ways based on the preference of the supervisor. This makes using the data difficult because the information can vary significantly between individuals and among different programs. As mentioned above, "effort" should be standardized and constant and due to the variability in how "time" is accounted for in MIS, it may not be a good indicator of effort. However, the basic premise of "effort" should be reflective in the "number" of work tasks completed because a work task must be completed every time an employee sets or checks traps, uses firearms or aircraft or conducts any type of direct control work as it relates to individual species take. The individual work tasks can have many variables and that data is difficult to extract and use for comparisons in many cases but the fact that an employee must complete "a" work task for a specific activity is a standard and constant. For that reason, WS has chosen to use "total number" of feral swine work tasks completed as opposed to "man hours" for the "effort" variable in this analysis. Figure 7 shows the total number of feral swine related work tasks entered by New Mexico WS employees from FY11 – FY18.

Figure 7. Number of Feral Swine Work tasks (Effort) from FY2011 – FY2018



Using the above work task numbers (effort), it is apparent that effort has steadily increased in the last eight years. Appling the CPUE formula from Lancia et al. 1996, *catch/effort=N* with N being an indication of population size or a catch rate. Figure 8 clearly shows the catch rates and or the population size has decreased substantially in the last eight years.

Figure 8. Feral Swine Catch Rates (Population size) from FY2011 – FY2018



Based solely on the annual take of feral swine from Figure 5, it would appear that abundance is increasing because the annual take has steadily increased from FY2005-FY2018. However, as seen in Figure 7 and

8 when the "effort" is analyzed in a CPUE formula, it clearly indicates a declining population. The current known feral swine distribution in Figure 6 also supports a declining population.

Based on case histories and literature reviews, extirpation from the state will be difficult but not impossible. Ditchkoff and West's (2007) conclusion that feral swine are difficult to eradicate due to their high reproductive potential is relevant to this analysis. Feral swine have the highest reproductive rate of any ungulate species (Read and Harvey 1989). Research in Australia suggests that feral swine can withstand a 70 percent population reduction and rapidly return to pre-control levels (Dziecolowski et al. 1992).

The feasibility of extirpation points to a case history example in Kansas. A population of feral swine at Fort Riley, KS was discovered on the 100,000 acre Army installation in 1993. WS was asked to cooperate and develop a control program in 1995 (Richardson et al. 1995). WS removed 385 feral swine from 1995-2000 via aerial hunting, cage traps, snares, and shooting. The last feral swine seen at the site was in 2000. After eighteen years of monitoring, no additional feral swine have been discovered at that site. WS-Kansas also extirpated an additional six isolated feral swine populations in the state from 2005-2010 by removing over 2000 feral swine. All of those locations have remained free from feral swine for several years and are believed to be successful extirpations. Currently WS-Kansas has eradicated approximately 90% of the feral swine in the state but continues to deal with immigrating feral swine along the Oklahoma border (C. Salter, WS-Kansas, pers. comm. 2018).

Several populations in New Mexico are of similar size and reside in similar habitat as Kansas. WS believes that with adequate funding and personnel, New Mexico can extirpate the majority of its feral swine population and similar to Kansas, resort to dealing with and managing immigrating feral swine from the Texas and Mexican border.

Effects on Nontarget and T&E Species (Under Alterative 1)

A common concern among members of the public and wildlife professionals, including WS personnel, is the potential impacts of FSDM on nontarget species.

While precautions are taken to prevent taking nontarget species, changes in behavioral patterns and other unanticipated events can result in the incidental take of nontarget species. These occurrences happen infrequently, and should not affect the overall populations of any species under the current program. Methods utilized for FSDM are applied in a highly selective manner, but methods such as foot snares and neck snares have the potential for capturing nontargets. Nontarget capture would be expected to be low because of the selectivity of the methods primarily used by WS in FSDM, including shooting, aerial shooting, traps with pan-tension devices, and large neck snares with stops. Species such as mule deer (*Odocoileus hemionus*) and coyotes (Canis latrans) are examples of species that could be captured.

Additionally, methods such as cage traps designed for feral swine often allow nontargets to be released unharmed. WS also implements field operating procedures (discussed in section 2.6) to avoid take of nontarget species, including T&E and sensitive species, and monitors any such take. By following these general field procedures and adhering to WS Directives and Policies, the potential for nontarget take is significantly reduced. Despite precautionary measures, it is possible that some nontarget take could occur.

However, from FY 2010 to FY 2018, WS captured 24 nontarget animals. Of the nontarget take, two badgers *(Taxidea taxus)* were euthanized, the remaining 22 (2 black bear *(Ursus americanus)*, 1 mule deer, 1 elk *(Cervus elaphus)*, 11 collared peccary *(Pecari tajacu)*, and 7 wild turkey *(Meleagris gallopavo)* were captured in large cage traps and were released unharmed. During the same time period, WS captured and removed 2,217 feral swine which equates to a nontarget catch rate of approximately 1.0%

and a lethal rate of .09%. Due to the extremely low nontarget take while conducting FSDM for eight fiscal years, WS does not anticipate future nontarget take would be significant under this Alternative.

Additionally, New Mexico WS has not taken any state or federally listed T&E species incidental to FSDM and does not anticipate such an occurrence following the Reasonable and Prudent Measures and the Terms and Conditions of BOs obtained from USFWS for those species that could potentially be affected. In addition to New Mexico WS not taking or capturing any T&E species while conducting FSDM, no T&E species have been taken or captured under any aspect of the New Mexico WS program. Thus, while risks exist, they are very minimal.

Unintentional capture and take of nontarget species while conducting FSDM activities would not have a negative effect on nontarget species' populations, and beneficial effects from the removal of feral swine to protect native habitat is expected to outweigh any negative effects of nontarget take. WS' historic nontarget take is generally a very small percentage of the nontarget species populations. Nontarget species that are most often associated with FSDM activities are generally common species, often game animals or other species monitored by state, territorial or tribal natural resources agencies. Nationwide and statewide populations of such species are generally stable, and associated with other forms of regulated mortality, such as hunting and trapping, without adverse effects on the populations. Effects on nontarget species are assessed at the state, territorial, tribal, or regional level, where local resource management agencies can help to provide data on population size, trends, and other sources of known take.

Effects on nontarget species populations are typically negligible and are temporary. Significant cumulative effects at the programmatic level are not expected since nontarget take from FSDM methods is low, take would not be concentrated in any one area, nontarget take is typically of species that are widespread and abundant, and no population effects are seen. WS works with federal, state or tribal natural resource managers, communicating the risks of FSDM and evaluating effects on nontarget species to further ensure that cumulative take of any species would not have negative effects on the population. For these reasons, there would not be adverse cumulative effects on nontarget species populations.

Effects of Trapping Devices

Placement and use of traps and other capture devices is primarily determined by the individual Specialist, taking into consideration terrain, weather, and target/nontarget species in the area. Professional judgment is used to determine the locations and quantity of devices placed. The use of all trapping devices by WS employees in New Mexico is guided by WS Directive 2.450, Risk Assessments (WS 2019a, WS 2019b) and state policy 2.450NM. These directives, policies and general field practices help to minimize nontarget captures.

Cage traps are required to be inspected or checked at least once per day with an extended check of twice per week allowed if adequate conditions are met. WS employees will ensure that adequate conditions such as food, water and shade are present during an extended trap check to provide acceptable animal welfare conditions for both target and nontarget animals. These conditions would allow for most nontargets to be released unharmed, therefore, cage/corral traps are not anticipated to have any negative effect on any nontarget species populations.

Leg and neck snares would only be used where they would not pose a risk to pets or other animals. The potential for capturing free roaming dogs in a leg and/or neck snare exists, but would be minimized by placement in feral swine specific areas (trails, wallows or rubs). The use of pan tension devices on leg snares can also avoid or reduce the capture of nontarget animals and is required in New Mexico. Other

efforts such as the use of snare stops on neck snares that prevent the snare from closing down below a certain size (allowing nontargets to pull loose) can also be used to reduce nontarget capture. It is not anticipated that leg or neck snares would have a significant effect on any nontarget species populations in New Mexico.

Effects of Shooting

Shooting is conducted for feral swine with rifles and shotguns and is very selective for the target species. Shooting is sometimes used as a primary method for FSDM. However, shooting is generally conducted when other forms of control like trapping are unsuccessful due to trap shy animals or lack of bait acceptance particularly during the summer months. It is conducted in areas where it is safe to discharge firearms and can be very effective at removing select animals.

In these situations, the use of firearms is typically used in conjunction with spotlighting or specialized equipment such as night-vision (starlight scopes, infrared, or thermal imaging scopes). Shooting is limited to locations where it is legal and safe to discharge firearms. Safety precautions and firearm usage are conducted under WS Directive 2.615 and analyzed in Risk Assessment (WS 2019e) which concluded that the use of firearms is of low risk to WS personnel, the public, nontarget species, and environment. The use of firearms would be selective for target species since identification of an individual would be made prior to shooting. Use of firearms does not usually affect nontarget animals except for the occasion where the sound of a firearm may temporarily startle or scare an animal when the firearm is discharged. Therefore, the use of firearms would not affect nontarget species.

Effects of Lead Ammunition

Agencies and members of the public have expressed concerns regarding the potential for adverse environmental impacts and risks to nontarget species, specifically scavengers, from the materials used in ammunition. The majority of concerns expressed pertain to the use of lead ammunition and this section correspondingly focuses on risks associated with lead (e.g., Kostnett 2009). WS has analyzed its lead usage in a Risk Assessment (WS 2017e.) and concluded the affects were minimal. WS uses lead-free ammunition when practical, effective, and available to mitigate and/or minimize the effects of its use of lead ammunition on the environment, wildlife, and public health and in compliance with federal or state regulations on the use of lead ammunition. WS has specific ammunition and firearm requirements to maximize performance, safety, and humaneness (Caudell et al. 2012). Precision performance of bullets is essential for project efficacy, safety, humaneness (shot placement to result in rapid death) (McPherson 2005, Caudell et al. 2009). WS will not use lead ammunition where prohibited by land owners/managers, however availability of an acceptable substitute may affect cost or feasibility of a project. Current non-lead shot substitutes being considered for use are four times as expensive as traditional lead ammunition. WS is utilizing non-lead shot where available and practical, however, lead shot may be used when acceptable non-lead alternatives are not available. Risk of ricochet is a safety concern when working at airports, in areas near residences, and other sensitive sites and for the protection of WS personnel. Ammunition which conveys it's full energy to the target animal and which results in low or no pass through is needed for reasons of humaneness (instant or near-instant incapacitation) and to reduce safety risks associated with wounded animals traveling from the project site.

The lethal removal of feral swine with firearms by WS to alleviate damage or threats would occur from the use of shotguns, rifles or handguns. In an ecological risk assessment of lead shot exposure in non-waterfowl birds, ingestion of lead shot was identified as the biggest concern rather than just contact with lead shot or lead leaching from shot in the environment (Kendall et al. 1996). Bird sensitivity to lead from

exposure to ammunition such as lead shot, bullets, or bullet fragments has been studied. Clinical signs of lead poisoning in birds are observed when blood lead concentrations reach 20 to 50 µg/dL while severe clinical signs are observed at concentrations exceeding 100 µg/dL. Clinical signs of lead poisoning include wing droop, anemia, and weakness in affected birds (The Wildlife Society 2008). The effects of the ingestion of lead shot have been noted in various avian species. Pain et al. (2009), in a review regarding the impacts of lead shot and bullets on terrestrial birds, documented impacts to 33 raptor species and 30 other species including, but not limited to, ground nesting birds, cranes, and upland game birds. Lead impacts from spent ammunition have also been noted in numerous waterfowl species (Trannel and Kimmel 2009). Cruz-Martinez et al. (2012) evaluated data on 1,277 bald eagles admitted to the University of Minnesota Raptor Rehabilitation Center from January 1966 to December 2009. Of the birds admitted 334 were identified as elevated lead cases (322 live, 12 dead). They detected significantly increased odds for elevated lead levels based on season (late fall and early winter), deer hunting rifle zone and age of bird (adult birds). Eagles submitted to the rehabilitation center that came from hunting zones where rifles were used were at a higher risk of elevated lead levels than eagles from hunting zones where only shotguns were permitted. The difference was attributed to the fact that rifle bullets were more likely to fragment into small pieces that would be more readily ingested by eagles. Similar seasonal patterns in lead exposure corresponding with hunting season have been reported for ravens (Craighead and Bedrosian 2008). An individual lead pellet has been shown to result in lead toxicosis in waterfowl and ground nesting birds. Lethal and sublethal impacts have been noted with the experimental ingestion of 2000 mg (10 pellets of Number 4 lead) of lead in bald eagles (Eisler 1998). The 00 shot frequently used to remove swine is relatively large (over 8mm diameter). The size of the shot would likely reduce risks of accidental ingestion by smaller birds seeking grit. Shot is also unlikely to fragment on contact compared with some types of bullets (Cruz-Martinez et al. 2012). Consequently, it may be easier for scavengers to detect and avoid lead than other ammunition. Large shot and bullet fragments are also more likely to be regurgitated (cast) with other undigested food items such as hair, feathers and bone fragments.

Deposition of lead into soil could occur if, during the use of a firearm, the projectile passes through feral swine, if misses occur, or if the carcass was not retrieved. Laidlaw et al. (2005) reported that, because of the low mobility of lead in soil, all of the lead that accumulates on the surface layer of the soil is generally retained within the top 20 cm (about 8 inches). In addition, concerns occur that lead from bullets deposited in soil from shooting activities could contaminate ground water or surface water from runoff. Stansley et al. (1992) studied lead levels in water that was subjected directly to high concentrations of lead shot accumulation because of intensive target shooting at several shooting ranges. Lead did not appear to "transport" readily in surface water when soils were neutral or slightly alkaline in pH (i.e., not acidic), but lead did transport more readily under slightly acidic conditions. Although Stansley et al. (1992) detected elevated lead levels in water in a stream and a marsh that were in the shot "fall zones" at a shooting range, the study did not find higher lead levels in a lake into which the stream drained, except for one sample collected near a parking lot. Stansley et al. (1992) believed the lead contamination near the parking lot was due to runoff from the lot, and not from the shooting range areas. The study also indicated that even when lead shot was highly accumulated in areas with permanent water bodies present, the lead did not necessarily cause elevated lead levels in water further downstream. Muscle samples from two species of fish collected in water bodies with high lead shot accumulations had lead levels that were well below the accepted threshold standard of safety for human consumption (Stansley et al. 1992).

Craig et al. (1999) reported that lead levels in water draining away from a shooting range with high accumulations of lead bullets in the soil around the impact areas were far below the "action level" of 15 parts per billion as defined by the EPA (i.e., requiring action to treat the water to remove lead). The study

found that the dissolution (i.e., capability of dissolving in water) of lead declines when lead oxides form on the surface areas of the spent bullets and fragments (Craig et al. 1999). Therefore, the transport of lead from bullets or shot distributed across the landscape was reduced once the bullets and shot formed crusty lead oxide deposits on their surfaces, which served to reduce naturally the potential for ground or surface water contamination (Craig et al. 1999). Those studies suggest that, given the very low amount of lead being deposited and the concentrations that would occur from WS' activities to reduce feral swine damage using firearms, lead contamination of water from such sources would be minimal to nonexistent.

Since those feral swine removed by WS using firearms could be lethally removed by other entities using the same methods in the absence of WS' involvement, WS' assistance with removing those animals would not be additive to the environmental status quo. The amount of lead deposited into the environment could be lowered by WS' involvement in damage management activities due to the proficiency training received by WS' employees in firearm use and accuracy. The training of WS' employees in proficient firearms use would increase the likelihood that feral swine were lethally removed humanely in situations that ensure accuracy and that misses occur infrequently, which further reduces the potential for lead to be deposited in the soil from misses and the need for multiple shots. Based on current information, the risks associated with lead projectiles that could be deposited into the environment from WS' activities would be below any level that would pose any risk from exposure or significant contamination of the water or the environment.

Effects of Aerial Shooting

Shooting from an aircraft is a commonly used FSDM method. Aerial shooting is species specific and can be used for immediate control to reduce livestock and natural resource losses if weather, terrain, and cover conditions are favorable. Fixed-wing aircraft are most frequently used in flat and gently rolling terrain whereas helicopters, with better maneuverability, have greater utility and are safer over rugged terrain and timbered areas. In broken timber or deciduous cover, aerial shooting is more effective in winter when snow cover improves visibility and leaves have fallen. The WS program aircraft-use Directive 2.620 helps ensure that aerial shooting is conducted in a safe and environmentally sound manner and in accordance with federal and state laws. The WS Risk Assessment (WS 2019d) also address aerial shooting in detail and concluded the risks to nontarget and T&E wildlife to be minimal. Pilots and aircraft must be certified under established WS program procedures and only properly trained WS employees are approved as crewman.

A potential source of an effect on wildlife is from low-level flights associated with aerial shooting disturbing wildlife, including threatened and endangered (T&E) species. A number of studies have looked at the response of various wildlife species to aircraft overflights. The National Park Service (1995) reviewed studies on the effects of aircraft overflights on wildlife. The report revealed that a number of studies documented responses by certain wildlife species suggesting adverse impacts could occur. Few, if any studies, have proven that aircraft overflights cause significant long-term adverse impacts on wildlife populations, although the report stated it is possible to draw the conclusion that impacts to populations are occurring. It appears that some species will frequently or, at least occasionally, show adverse responses to even minor overflight occurrences. In general, it appears that the more serious potential impacts occur when overflights are frequent such as hourly and over long periods of time which represents "chronic exposure." Chronic exposure situations generally involve areas near commercial airports and military flight training facilities. WS spends very little time in one area when conducting aerial shooting operations. In most cases, while in search mode, WS will either fly a grid pattern searching for a particular species or key in on specific habitat in search of the target species (i.e. thick cover for feral swine). In either case, operations are brief and even when the target species is located, operations are complete within minutes and the aircraft moves to the next location so any disturbance to other wildlife from the aircraft is minimized.

Several examples of wildlife species that have been studied with regard to low-level flights are available in the literature. Low-level overflights of 2-3 minutes in duration by a fixed-wing airplane and a helicopter produced no "drastic" disturbance of tree-nesting colonial waterbirds, and, in 90% of the observations, the individual birds either showed no reaction or merely looked up (Kushlan 1979). Conomy et al. (1998) quantified behavioral responses of wintering American black ducks (*Anas rubripes*), American wigeon (*Anas americana*), gadwall (*Anas strepera*), and American green-winged teal (*Anas crecca carolinensis*) exposed to low-level flying military aircraft in North Carolina and found that only a small percentage (2%) of the birds reacted to the disturbance. They concluded that such disturbance was not adversely affecting the time-activity budgets of these species. Mexican spotted owls (*Strix occidentalis lucida*) (Delaney et al. 1999) did not flush when chain saws and helicopters were greater than 110 yards away; owls flushed to these disturbances at closer distances and were more prone to flush from chain saws than aircraft overflights. Owls returned to their predisturbance behavior 10-15 minutes following the event and researchers observed no differences in nest or nestling success (Delaney et al. 1999).

Similarly, the USFS (2002) found that Mexican spotted owls showed only minor behavioral changes to F-16 fly-bys during training runs, but less behavioral changes than to natural and other man-made occurrences. Andersen et al. (1989) conducted low-level helicopter overflights directly at 35 red-tailed hawk (*Buteo jamaicensis*) nests and concluded their observations supported the hypothesis that red-tailed hawks habituate to low-level flights during the nesting period; results showed similar nesting success between hawks subjected to such overflights and those that were not. White and Thurow (1985) did not evaluate the effects of aircraft overflights, but found that ferruginous hawks (*Buteo regalis*) are sensitive to certain types of ground-based human disturbance to the point that reproductive success may be adversely affected. However, military jets that flew low over the study area during training exercises did not appear to bother the hawks, and nor did the hawks get alarmed when the researchers flew within 100 feet in a small fixed-wing aircraft (White and Thurow 1985). White and Sherrod (1973) suggested that disturbance of raptors by aerial surveys with helicopters may be less than that caused by approaching nests on foot. Ellis (1981) reported that five species of hawks, two falcons (*Falco* spp.), and golden eagles (*Aquila chrysaetos*) were "incredibly tolerant" of overflights by military fighter jets, and observed that, although birds frequently exhibited alarm, negative responses were brief and the overflights never limited productivity. Grubb et al. (2010) evaluated golden eagle response to civilian and military (Apache AH-64) helicopter flights in northern Utah. Study results indicated that golden eagles were not adversely affected when exposed to flights ranging from 100 to 800 meters along, towards and from behind occupied cliff nests. Eagle courtship, nesting and fledging were not adversely affected, indicating that no special management restrictions were required in the study location.

Aircraft overflights have also been analyzed for various mammal species. Krausman et al. (1986) reported that only 3 of 70 observed responses of mule deer to small fixed-wing aircraft overflights at 150 to 500 feet above ground resulted in the deer changing habitats. They believed that the deer may have been accustomed to overflights because the study area was near an interstate highway that was frequently followed by aircraft. VerCauteren and Hygnstrom (2002) noted that when studying the efficacy of hunting to manage deer populations, that when deer were flown over during their censuses, they typically just stood up from their beds, but did not flush. In addition, WS aerial operations personnel frequently observe deer and antelope standing apparently undisturbed beneath or just off to one side of aircraft. Krausman and Hervert (1983) reported that, in 32 observations of the response of bighorn sheep (*Ovis canadensis*) to low-level flights by small fixed-wing aircraft, 60% resulted in no disturbance, 21% in "slight" disturbance, and 19% in "great" disturbance. Another study (Krausman et al. 1998) found that 14% of bighorn sheep had elevated heart rates that lasted up to 2 minutes after an F-16 flew over at an elevation of 400 feet, but it did

alter the behavior of penned bighorns. Weisenberger et al. (1996) found that desert bighorn sheep (*O. c. nelsoni*) and mule deer had elevated heart rates for 1 to 3 minutes and became alert for up to 6 minutes following exposure to jet aircraft. Fancy (1982) reported that only 2 of 59 bison groups showed any visible reaction to small fixed-wing aircraft flying at 200-500 feet above ground. These studies indicate that ungulates are relatively tolerant of aircraft overflights, even those that involve noise at high decibels.

WS has actively used fixed- and rotary-wing aircraft for aerial WDM activities in areas inhabited by wildlife for years. The fixed-wing aircraft used by WS are relatively quiet whereas the helicopter is somewhat noisier. WS conducts aerial WDM activities on areas only under agreement and concentrates efforts during certain times of the year to specific areas such as lambing grounds. WS (2005, 2006, and 2011) looked at the issue of aerial shooting overflights on wildlife and found that WS had annually flown less than 20 min/mi^2 on properties under agreement; basically WS flies very little over any one property under agreement in any given year. As a result, no known problems to date have occurred with WS aircraft overflights on wildlife nor are they anticipated in the future. WS avoids other wildlife when seen and not the target of an operation such as white-tailed deer and grouse leks. Based on the above information and analysis, it is reasonable to conclude that WS aerial low-level flights should not cause any adverse impacts to nontarget species, including those that are listed as T&E.

Effects of Trailing/Tracking Dogs

Trailing dogs are commonly used to track and "bay" target feral swine. Dogs commonly used are different breeds of hounds such as blue tick, red-bone, and Walker. They become familiar with the scent of the animal they are to track and follow, and will strike (howl) when they smell them. Tracking dogs are trained not to follow the scent of nontarget species. WS Specialists typically find the track of the target species and put their dogs on it. If the track is not too old, the dogs can follow the trail and bay the animal. When the dogs bay the animal, it usually seeks refuge in a thicket on the ground at bay. The dogs stay with the animal until the WS Specialists arrives and dispatches it. A possibility exists that dogs will switch to a fresher trail of a nontarget species while pursuing the target species. This usually occurs with dogs that are trained to follow other animals as well. However, this is a non-desirable trait for tracking dogs and dog handlers watch for and provide training to prevent this behavior. Dogs would will be handled exclusively by trained WS' personnel and will be used as tracking/detection. Dogs can be used in conjunction with aerial removal efforts to help locate feral swine and they can also be used as a valuable tool to locate and remove the last few individuals when the eradication effort is nearing completion.

From FY11 to FY15, APHIS-WS lethally took (using dogs) an average annual total of 2,165 target animals and captured and freed 6 target animals; this take consisted of 13 different species. In addition, WS hazed an annual average of 40,068 target birds that involved 109 species, (mostly mixed blackbirds). The only unintentional targets taken were 2 American Coots from FY11 to FY15. Dogs actually captured the coots and they were euthanized as a result; the coots were being hazed, but it was not meant for the dogs to capture them. Considering these were not meant for euthanasia, the unintentional take was 0.02% of the animals captured by dogs nationwide over the last five years.

Dogs tend to focus on the wildlife or their scent that they are trained to target. Nontarget wildlife could be unintentionally captured or harassed as dogs pursue target wildlife. This could happen especially if a nontarget animal was injured, unhealthy, or surprised and easily caught or scared by a dog. However, as noted in the above data, this occurrence is very rare. It is possible that a nontarget animal could be temporarily disturbed by a trailing dog during the eradication effort but that disturbance would be considered insignificant.

Effects on Biodiversity

The WS program does not attempt to eradicate any native wildlife species in New Mexico. WS operates in accordance with all applicable federal and state laws and regulations enacted to ensure the viability of native species. Impacts on nontarget species populations due to WS's lethal FSDM activities are minor. Given the non-native status of feral swine in New Mexico and the associated damage that feral swine can cause to natural resources, any activities that reduce the density of feral swine in specific areas would likely enhance biodiversity in the area by reducing habitat destruction, competition and predation. The need for action in Chapter 1 of this EA describes the potential adverse effects that feral swine could have on natural resources within the state. The reduction/elimination of feral swine populations in New Mexico could provide some benefit to native animals and native plants.

Effects on T&E Species

Special efforts are made to avoid jeopardizing T&E species through biological evaluations of the potential effects of FSDM and the establishment of general field procedures including special restrictions or mitigation measures. WS-New Mexico has reviewed the current list (Table 3) of state and federally listed threatened, endangered or candidate species within the state of New Mexico. Species effects determinations were made for each species and where applicable (federal species), were submitted to the USFWS for concurrence pursuant to Section 7 of the Endangered Species Act. Affect determinations are not required for state listed species under ESA, however, the same avoidance and mitigation measures are incorporated into FSDM activities as for federal listed T&E species. WS-New Mexico consulted with USFWS concerning potential impacts of WDM methods on T&E species and completed a Biological Assessment (BA) in a programmatic informal consultation on August 15, 2014. WS-New Mexico received a letter of concurrence from the USFWS on December 16, 2014.

WS-New Mexico abides by all the established standard operating procedures (SOPs) identified in the 2014 BA to minimize or nullify any potential impact on these species. USFWS (2014) concurred with the SOPs and WS species determination effects while also providing additional conservation measures for the Canada lynx and recommending the continued adherence to the WS programmatic Mexican gray wolf BO (USFWS 2011). The Section 7 consultation ensures that potential impacts to T&E species will be avoided or minimized. WS monitors activities to ensure that if there are any substantive changes in T&E species status or if management activities change and/or are modified in a way that may affect a T&E species, WS-New Mexico will initiate an updated consultation with USFWS to ensure any direct or indirect effect on a T&E species can be adequately analyzed.

Table 3. State and Federal Species listed as threatened, endangered, or candidate in New Mexico.

Common Name	Scientific Name	Status†	Determination‡
ANIMALS			
Invertebrates			
Alamosa Springsnail	*Pseudotryonia alamosae*	FE SE	NE
Chupadera Springsnail	*Pyrgulopsis chupaderae*	FE SE	NE
Cooke's Peak Woodlandsnail	*Ashmunella macromphala*	ST	NA
Dona Ana Talussnail	*Sonorella todseni*	ST	NA
Florida Mountainsnail	*Oreohelix florida*	SE	NA
Gila Springsnail	*Pyrgulopsis gilae*	ST	NA
Hacheta Grande Woodlandsnail	*Ashmunella hebardi*	ST	NA
Koster's Springsnail	*Juturnia kosteri*	FE SE	NE

Common Name	Scientific Name	Status†	Determination‡
Lake Fingernailclam	*Musculium lacustre*	ST	NA
Lilljeborg's Peaclam	*Pisidium lilljeborgi*	ST	NA
Long Fingernail Clam	*Musculium transversum*	ST	NA
Mineral Creek Mountainsnail	*Oreohelix pilsbryi*	ST	NA
New Mexico Springsnail	*Pyrgulopsis thermalis*	ST	NA
Noel's Amphipod	*Gammarus desperatus*	FE SE	NE
Ovate Vertigo (Snail)	*Vertigo ovata*	ST	NA
Paper Pondshell	*Utterbackia imbecillis*	SE	NA
Pecos Assiminea (Snail)	*Assiminea pecos*	FE SE	NE
Pecos Springsnail	*Pyrgulopsis neomexicana*	ST	NA
Roswell Springsnail	*Pyrgulopsis roswellensis*	FE SE	NE
Sangre De Christo Peaclam	*Pisidium sanguinichristi*	ST	NA
Shortneck Snaggletooth (Snail)	*Gastrocopta dalliana dalliana*	ST	NA
Socorro Isopod	*Thermosphaeroma thermophilum*	FE SE	NE
Socorro Springsnail	*Pyrgulopsis neomexicana*	FE SE	NE
Star Gyro (Snail)	*Gyraulus crista*	ST	NA
Swamp Fingernailclam	*Musculium partumeium*	ST	NA
Texas Hornshell	*Popenaias popeii*	FC SE	NE
Wrinkled Marshsnail	*Stagnicola caperata*	SE	NA
Amphibians			
Chiricahua Leopard Frog	*Rana chiricahuensis*	FT	MANLAA
Western Narrowmouth Toad	*Gastrophryne olivacea*	SE	NA
Jemez Mtns. Salamander	*Plethodon neomexicanus*	FE SE	MANLAA
Lowland Leopard Frog	*Lithobates yavapaiensis*	SE	NA
Boreal Toad	*Anaxyrus boreas*	SE	NA
Sacramento Mtn. Salamander	*Aneides hardii*	ST	NA
Sonoran Desert Toad	*Bufo alvarius*	ST	NA
Reptiles			
Dunes Sagebrush Lizard	*Sceloporus arenicolus*	SE	NA
Gila Monster	*Heloderma suspectum*	SE	NA
Gray-banded Kingsnake	*Lampropeltis alterna*	SE	NA
Gray-checkered Whiptail	*Aspidoscelis dixoni*	SE	NA
Green Rat Snake	*Senticolis triaspis*	ST	NA
Mottled Rock Rattlesnake	*Crotalus lepidus lepidus*	ST	NA
Mountain Skink	*Eumeces callicephalus*	ST	NA
Narrow-headed Gartersnake	*Thamnophis rufipunctatus*	FT ST	NE
NM ridge-nosed rattlesnake	*Crotalus willardi obscurus*	FT SE	MANLAA
Northern Mexican Garter Snake	*Thamnophis eques megalops*	FT SE	MANLAA
Plainbelly Water Snake	*Nerodia erythrogaster*	SE	NA
Slevin's Bunchgrass Lizard	*Sceloporus slevini*	ST	NA
Giant Spotted Whiptail	*Aspidoscelis stictogramma*	ST	NA
Western Ribbon Snake	*Thamnophis proximus*	ST	NA
Western River Cooter	*Pseudemys gorzugi*	ST	NA
Fish			
Arkansas River Shiner	*Notropis girardi (Native pop.)*	FT SE	MANLAA
Beautiful shiner	*Cyprinella formosa*	FT	NE

Common Name	Scientific Name	Status†	Determination‡
Bigscale Logperch	*Percina macrolepida (Native pop.)*	ST	NA
Blue Sucker	*Cycleptus elongatus*	SE	NA
Chihuahua Chub	*Gila nigrescens*	FT SE	MANLAA
Colorado Pikeminnow	*Ptychocheilus lucius*	FE SE	MANLAA
Gila chub	*Gila intermedia*	FE SE	MANLAA
Gila Topminnow	*Poeciliopsis occidentalis*	FE ST	MANLAA
Gila Trout	*Oncorhynchus gilae*	FT ST	MANLAA
Gray Redhorse	*Moxostoma congestum*	SE	NA
Greenthroat Darter	*Etheostoma lepidum*	ST	NA
Loach Minnow	*Tiaroga cobitis*	FE SE	MANLAA
Mexican Tetra	*Astyanax mexicanus*	ST	NA
Pecos Bluntnose Shiner	*Notropis simus pecosensis*	FT SE	MANLAA
Pecos Gambusia	*Gambusia nobilis*	FE SE	MANLAA
Pecos Pupfish	*Cyprinodon pecosensis*	ST	NA
Peppered Chub	*Macrhybopsis tetranema*	ST	NA
Razorback Sucker	*Xyrauchen texanus*	FE	MANLAA
Rio Grande Silvery Minnow	*Hybognathus amarus*	FE SE	MANLAA
Roundtail Chub	*Gila robusta*	SE	NA
Southern Redbelly Dace	*Phoxinus erythrogaster*	SE	NA
Spikedace	*Meda fulgida*	FE SE	MANLAA
Suckermouth Minnow	*Phenacobius mirabilis*	ST	NA
White Sands Pupfish	*Cyprinodon tularosa*	ST	NA
Zuni Bluehead Sucker	*Catostomus discobolus yarrowi*	FE SE	MANLAA
Birds			
Abert's Towhee	*Melozone aberti*	ST	NA
Arizona Grasshopper Sparrow	*Ammodramus savannarum ammolegus*	SE	NA
Baird's Sparrow	*Ammodramus bairdii*	ST	NA
Bald Eagle	*Haliaeetus leucocephalus alascanus*	ST	NA
Bell's Vireo	*Vireo bellii arizonae & medius*	ST	NA
Boreal Owl	*Aegolius funereus*	ST	NA
Buff-collared Nightjar	*Caprimulgus ridgwayi ridgwayi*	SE	NA
Broad-billed Hummingbird	*Cynanthus latirostris magicus*	ST	NA
Brown Pelican	*Pelecanus occidentalis carolinensis*	SE	NA
Common Black-Hawk	*Buteogallus anthracinus anthracinus*	ST	NA
Common Ground-Dove	*Columbina passerine pallescens*	SE	NA
Costa's Hummingbird	*Calypte costae*	ST	NA
Elegant Trogon	*Trogon elegans canescens*	SE	NA
Gila Woodpecker	*Melanerpes uropygialis uropygialis*	ST	NA
Gould's Wild Turkey	*Meleagris gallopavo mexicana*	ST	NA
Gray Vireo	*Vireo vicinior*	ST	NA
Least Tern (interior population)	*Sterna antillarum athalassos*	FE SE	MANLAA
Lucifer Hummingbird	*Calothorax lucifer*	ST	NA
Mexican Spotted Owl	*Strix occidentalis lucida*	FT	MANLAA
Neotropic Cormorant	*Phalacrocorax brasilianus*	ST	NA
Northern Aplomado Falcon	*Falco femoralis septentrionalis*	FE SE	MANLAA
Northern Beardless-Tyrannulet	*Camptostoma imberbe ridgwayi*	SE	NA

Common Name	Scientific Name	Status†	Determination‡
Peregrine Falcon	*Falco peregrinus anatum & tundrius*	ST	NA
Piping Plover	*Charadrius melodus circumcinctus*	FT ST	MANLAA
Southwestern Willow Flycatcher	*Empidonax traillii extimus*	FE SE	MANLAA
Thick-billed Kingbird	*Tyrannus crassirostris*	SE	NA
Varied Bunting	*Passerina versicolor versicolor*	ST	NA
Violet-crowned Hummingbird	*Amazilia violaceps ellioti*	ST	NA
Western Yellow-billed Cuckoo	*Coccyzus americanus occidentalis*	FT	MANLAA
Whiskered Screech-Owl	*Megascops trichopsis asperus*	ST	NA
White-eared Hummingbird	*Hylocharis leucotis borealis*	ST	NA
White-tailed Ptarmigan	*Lagopus leucura altipetens*	SE	NA
Whooping Crane	*Grus Americana*	FE SE	NE
Yellow-eyed Junco	*Junco phaeonotus palliatus*	ST	NA
Mammals			
Arizona Montane Vole	*Microtus montanus arizonensis*	SE	NA
Arizona Shrew	*Sorex arizonae*	SE	NA
Black-footed Ferret	*Mustela nigripes*	FE SX	NE
Canada Lynx	*Lynx Canadensis*	FT SE	MANLAA
Jaguar	*Panthera onca*	FE	NA
Least Shrew	*Cryptotis parva*	ST	NA
Lesser (Southern) Long-nosed Bat	*Leptonycteris curasoae yerbabuenae*	ST	NA
Mexican Gray Wolf	*Canis lupus baileyi*	FE SE	MANLJ
Mexican Long-nosed Bat	*Leptonycteris nivalis*	FE SE	MANLAA
NM Meadow Jumping Mouse	*Zapus hudsonicus luteus*	FE SE	MANLAA
Organ Mtns. Colorado Chipmunk	*Tamias quadrivittatus australis*	ST	NA
Oscura Mtns. Colorado Chipmunk	*Tamias quadrivittatus oscuraensis*	ST	NA
Pacific Marten	*Martes caurina*	ST	NA
Peñasco Least Chipmunk	*Tamias minimus atristriatus*	FC SE	NE
Southern Pocket Gopher	*Thomomys umbrinus*	ST	NA
Spotted Bat	*Euderma maculatum*	ST	NA
Western Yellow Bat	*Lasiurus xanthinus*	ST	NA
White-sided Jackrabbit	*Lepus callotis*	ST	NA
PLANTS			
Gypsum wild-buckwheat	*Eriogonum gypsophilum*	FT	NE
Holy Ghost ipomopsis	*Ipomopsis sancti-spiritus*	FE	NE
Knowlton's cactus	*Pediocactus knowltonii*	FE	NE
Kuenzler hedgehog cactus	*Echinocereus fendleri v. kuenzleri*	FT	NE
Lee's pincushion cactus	*Coryphantha sneedii v. leei*	FT	NE
Mancos Milk-vetch	*Astragalus humillimus*	FE	NE
Mesa Verde cactus	*Sclerocactus mesae-verdae*	FT	NE
Pecos sunflower	*Helianthus paradoxus*	FT	NE
Sacramento Mountains thistle	*Cirsium vinaceum*	FT	NE
Sacramento prickly poppy	*Argemone pleiacantha pinnatisecta*	FE	NE
Sneed pincushion cactus	*Coryphantha sneedii v.sneedii*	FE	NE
Todsen's pennyroyal	*Hedeoma todsenii*	FE	NE
Wright's Marsh Thistle	*Cirsium wrightii*	FC	NE
Zuni fleabane	*Erigeron rhizomatus*	FT	NE

Status: F-Federal; S-State; T=Threatened; E=Endangered; C=Candidate; X-Believed extirpated.
Determination: NE=No effect; NA=Not Applicable (state species), MANLAA=May affect, not likely to adversely affect, MANLJ=May affect, not likely to jeopardize.

Below is brief summary and rational for the effects determinations WS made for the T&E species in New Mexico. Specific information on the individual species is analyzed in the 2014 WS BA. WS uses general field procedures, operating policies and WS directives to avoid take of T&E and sensitive species and monitors any such take. WS in New Mexico has not taken a T&E or sensitive species incidental to FSDM and does not anticipate such an occurrence by following the Reasonable and Prudent Alternatives and Measures and Terms and Conditions of the 2014 USFWS section 7 letter of concurrence. Thus, we expect that risks exist, but are very minimal.

Birds

New Mexico T&E birds may nest and/or forage within the proposed FSDM project areas in New Mexico. FSDM actions may inadvertently disturb New Mexico T&E birds while conducting WDM activities if a bird is present in the action area. WDM activities such as setting feral swine traps, disturbance from shooting, aircraft, etc. may have a temporary negative affect on these species. However, WS analyzed these potential direct and indirect impacts to these species and concluded that by incorporating avoidance and minimization measures outlined in the 2014 BA and the standard field operating procedures described in Section 2.6.2, the probability of FSDM activities adversely affecting New Mexico birds are insignificant and discountable. The USFWS has concurred with WS' determination that FSDM activities in New Mexico may affect, but are not likely to adversely affect the Piping Plover, Least Tern (interior Pop.), Yellow-billed Cuckoo, Mexican Spotted Owl, and Southwestern Willow Flycatcher, that may be present within the project areas.

Mammals

The Lesser Long-nosed bat, Mexican Long-nosed bat, and the New Mexico Meadow Jumping Mouse are federally listed endangered species. The USFWS has concurred with WS' determination that FSDM activities in New Mexico may affect, but are not likely to adversely affect these species. WS personnel will discuss any FSDM projects with USFWS prior to conducting these activities in their critical habitat.

The Jaguar is an endangered species in New Mexico. The USFWS concurs with WS that FSDM activities may affect, but is not likely to jeopardize the Jaguar with reasonable and prudent measures outlined in a programmatic 1999 BO when working within occupied range of the jaguar. USFWS also issued an incidental take statement in the BO. Direct take for depredating jaguars, though, can only be covered under a separate permit and consultation with USFWS. WS in New Mexico abides by the BO (USFWS 1999 a, b). The BO was reviewed in 2012 and deemed still complete and effective.

Reasonable and prudent measures include:

1. All animal damage control activities of this program within occupied range of the jaguar will be conducted in such a manner so as to minimize any risk to the jaguar.

2. All WS cooperators within the occupied range of the jaguar will be informed by WS of the status of the jaguar and the specifics of its protection under the Act.

3. All appropriate permits will be obtained prior to any predator control activities.

4. WS will investigate reports of any and all observations of jaguars or signs of jaguar presence in the general vicinity (50 miles) of any active WS animal control activities which may affect the jaguar, in

cooperation with the appropriate State wildlife agency and Jaguar Conservation Team. WS will provide USFWS with a report of such investigations as well as any animal control activities conducted by WS within occupied habitat of the jaguar.

5. All WS employees that may be expected to conduct activities which may affect jaguars will receive adequate training.

Terms and Conditions for the jaguar include:

The following terms and condition implements reasonable and prudent measure number one:

1a. Animal damage control activities which may possibly adversely affect the jaguar authorized by WS within the occupied range of the jaguar shall require identification of the target animal to species before control activities are carried out. If the identified animal is a jaguar, that animal shall not be subject to any control actions, and the Service and appropriate State wildlife agency shall be contacted immediately.

1b. Within the occupied range of the jaguar, leghold traps shall be restricted to rubber-padded (or equivalent) traps with a jaw spread equivalent to a #3 Victor or smaller. Trapping within occupied habitat of the jaguar shall only be conducted on a limited, case-by-case basis. The Service shall be notified by WS prior to the use of traps within occupied habitat of the jaguar. All traps within occupied habitat are to be checked daily, and the WS Specialist must have appropriate equipment on-hand to release a jaguar unharmed. The daily check requirement can be met by use of remote transmitters that signal whether a trap has been sprung.

1c. The use of neck snares within the occupied range of the jaguar shall not include occupied habitat of the jaguar, and shall be limited to agricultural/grassland habitats only, avoiding riparian corridors.

1d. If, within occupied habitat of the jaguar, a mountain lion or black bear is the offending animal, dogs will be a first choice if conditions are appropriate, to target the animal rather than less selective methods of control. If a jaguar is inadvertently chased and/or treed by the dogs, the dogs shall be called off immediately once it is realized the animal is a jaguar.

1e. Foot snares shall only be used within occupied habitat of the jaguar on a limited case-by-case basis. The Service shall be contacted by WS prior to the use of foot snares within occupied habitat. Foot snares shall only be used at confirmed lion or bear kills at fresh prey remains. When foot snares are used in occupied habitat they must be checked daily, and the WS agent must have appropriate equipment on-hand to release a jaguar unharmed. The daily check requirement can be met by use of remote transmitters that signal whether a trap has been sprung.

1f. The use of M-44's within the occupied range of the jaguar shall not include occupied habitat of the jaguar, shall be limited only to agricultural/grassland habitats avoiding riparian corridors, and shall be baited only with fetid meat attractants (which felids generally avoid).

1g. If the presence of a jaguar is confirmed within the vicinity (50 miles) of on-going or planned animal control activities, WS shall immediately contact the Service to review what control activities are being implemented where, and if additional measures are necessary to protect the jaguar.

1h. If any WS activities results in the capture, injury, or death of a jaguar, the Service and appropriate State wildlife agency must be contacted immediately, and all WS activities using similar capture methods within the occupied range of the jaguar must be immediately curtailed while consultation with the Service in reinitiated. If a jaguar is inadvertently captured, the WS agent, using best professional judgment, should determine the condition of the animal (giving special attention to weather conditions, potential for heat stress, and any injuries) and if the jaguar is in eminent threat of further injury or mortality, it shall be immediately released. If the jaguar appears in satisfactory condition, the WS agent shall immediately initiate communication to the Arizona Game and Fish Department, Service, and New Mexico Department of Game and Fish as appropriate, to ascertain expected response time for personnel permitted to tranquilize and radio-collar the jaguar (as provided for under the Jaguar Conservation Strategy). If this response time would require the animal to be confined for a period of more than 24 hours, result in additional injury, or threaten its life, the jaguar is to be released immediately.

The following term and condition implements reasonable and prudent measure number two:

2a. WS cooperators within the occupied range of the jaguar shall be informed by WS by letter that take of a jaguar, including harm, injury, and harassment, is prohibited under the Act and could result in prosecution. Also, WS shall provide information, as available, on the identification of jaguar sign, and other information regarding the conservation of the species.

The following term and condition implements reasonable and prudent measure number three:

3a. Any animal damage control activities authorized or carried out by WS shall be conducted only after all appropriate permits (e.g., Federal, State, or other) have been obtained.

The following term and condition implements reasonable and prudent measure number four:

4a. WS in coordination with the Service and, if possible, the Jaguar Conservation Team and appropriate State wildlife agency, shall as soon as practical (but within three days) investigate all credible reports of jaguars within the vicinity (50 miles) of any active animal control activities which may affect the jaguar. The investigations shall include appropriate field collection of data. WS is encouraged to coordinate these investigations with the appropriate State wildlife agency and Jaguar Conservation Team, and use the procedures for investigating observations and possible depredation by jaguar developed under the Jaguar Conservation Strategy. Any access to private land in order to complete an investigation shall require the permission of the landowner. The investigation and reporting to the Service may be accomplished through the cooperative efforts of the Jaguar Conservation Team.

4b. WS will cooperate with the Service and, if possible, the Jaguar Conservation Team and appropriate State wildlife agency, to investigate any reports of jaguars in **occupied range**. The investigation and reporting to the Service may be accomplished through the cooperative efforts of the Jaguar Conservation Team.

4c. A detailed report of each jaguar observation investigation conducted by WS shall be provided to the Service and the Jaguar Conservation Team within 30 days of the occurrence of each incident.

4d. An annual monitoring report shall be submitted to the Service by December 31 of each year, covering the previous fiscal year (October through September), detailing any and all animal damage control activities conducted within occupied habitat of the jaguar.

The following term and condition implements reasonable and prudent measure number five:

5a. All WS employees who conduct predator damage management activities within occupied range of the jaguar shall be trained by experienced personnel to identify jaguars and jaguar sign, on procedures for recording and reporting jaguar observations, on appropriate release techniques for jaguars which may be caught in snares of traps, and on identification of livestock depredations that may be caused by jaguars. Training will be conducted in coordination, if possible, with the appropriate State wildlife agency and Jaguar Conservation Team. Updated training will be conducted as new information on the jaguar becomes available.

WS also has also agreed to the following Conservation Recommendations from the 1999 B.O.

1. The service recommends that WS fund and/or carry out research in cooperation with the Jaguar Conservation Team to: (1) determine the distribution of jaguar habitat within the southwestern United States, and (2) determine the possible or actual distribution of jaguars within that habitat.

2. WS continues active participation on the Jaguar Conservation Team.

3. WS seeks opportunities to promote conservation of the jaguar through dissemination of education materials for WS agents, management agencies, and the public.

On July 22, 2021, USFWS issued a final rule to comply with a court order to vacate Unit 6 and the New Mexico portion of Unit 5 from the March 5, 2014, final rule designating approximately 764,207 acres of land in New Mexico and Arizona as critical habitat for the jaguar (Panthera onca) under the Endangered Species Act of 1973, as amended. This final rule removes approximately 110,438 acres of land within New Mexico from the designation of critical habitat for the jaguar. This ruling removes all jaguar critical habitat in New Mexico.

Therefore, we conclude that FSDM implemented by WS continues to be the same as that identified in the 1999 BO. We do not believe that the jaguar BO needs to be updated and that WS will continue to abide by the Reasonable and Prudent Measures and Terms and Conditions as given in the 1999 BO (USFWS 1999a, b) and included here.

The Mexican Gray Wolf is federally listed as an endangered nonessential experimental species. Some tools used in FSDM such as traps and snares have the potential of taking a wolf. WS will continue to abide by the Reasonable and Prudent Measures and Terms and Conditions of the 2014 BA (and the 2011 BO referenced in the 2014 BA) as well as incorporating the avoidance and minimization measures described in Section 2.6.2. WS has agreed to the following implementation measures in the 2011 BO:

1. WS shall coordinate WDM Program activities to reduce the likelihood of impact to the species by contacting the FWS New Mexico Ecological Services Field Office (NMESFO), the FWS Mexican Wolf Recovery Program Coordinator, the Mexican Wolf Interagency Committee(s), the Mexican Wolf

Interagency Field Team, and other appropriate Federal, State, and Tribal agencies prior to conducting WDM Program activities in Mexican wolf range.

2. WS personnel who conduct WDM Program activities in occupied wolf range shall be knowledgeable at a professional level in identification of Mexican wolf, their habitat and use of habitat, and their sign.

3. WS shall release any Mexican wolf inadvertently captured alive, and report the incident to the Interagency Field Team located in Alpine, Arizona and NMESFO within 24 hours, unless: (A) the animal has sustained an injury which appears to be life threatening without veterinary attention; or (B) protocol has been established and agreed to with the NMESFO for handling, marking, radio-collaring, or maintaining such animals in captivity. If an animal sustained a serious injury, WS shall take immediate steps to report the incident to the NMESFO and proceed under their direction.

4. WS shall establish a 25-mile radius around the point of any incidental take of a naturally-occurring Mexican wolf. The area shall be treated as occupied Mexican wolf range or habitat until further investigation and surveys can be conducted. WS shall cease the activity resulting in the take, as well as all other activities with the potential to incidentally take Mexican wolf in the occupied range, and shall immediately reinitiate consultation with the FWS.

5. When conducting predator damage management activities for species other than Mexican wolves in occupied Mexican wolf range, WS shall conduct a daily trap check while using padded jaw traps with a jaw spread equivalent to #3 soft catch or larger or foot or leg snares. Traps shall be equipped with a drag in those cases where there is some question that the stake might not hold a wolf (i.e., loose soil) and connections shall be welded or otherwise securely fastened. All traps have the potential to capture juvenile wolves, and therefore, shall not be used in proximity to occupied dens and rendezvous sites from June 1 to October 1 unless Mexican wolf is targeted for a control action.

6. WS shall not use M-44 devices, LPCs, and neck snares without break away devices in occupied Mexican wolf range unless approved on a case-by-case basis by the FWS or the FWS's designated agent. Neck snares shall not be used near den or rendezvous sites unless they are being used to specifically target Mexican wolf. For the Mexican wolf, M-44 devices, LPCs, and neck snares shall not be used within a 5-mile buffer around pack home ranges or individual tracks or locations (see definition of occupied habitat).

In addition WS will adhere to the following RPM's to minimize impacts of incidental take of Mexican wolf by WS personnel conducting WDM Program activities outside the boundaries of the Mexican Wolf Experimental Population Area and also within the boundaries of the National Wildlife Refuge System lands and National Park System/National Monument lands located inside the Mexican Wolf Experimental Population Area boundaries.

1. WS will assist the FWS and appropriate Federal, State, and Tribal agencies by maintaining interagency coordination and information exchange; and by reporting occurrences, livestock depredations, and incidental take of Mexican wolf.

2. WS will implement measures and adjust its normal WDM Program activities in occupied Mexican wolf range to minimize incidental take of Mexican wolf in accordance with the terms and conditions below. WS'

measures and adjustments of WDM Program activities in the southwestern United States will minimize the potential for WDM Program activities to adversely impact the species.

WS will comply with the following terms and conditions, which implement the reasonable and prudent measures, described above and outline required reporting/monitoring requirements.
The following terms and conditions implement Reasonable and Prudent Measure #1.

1. WS shall maintain regular (annual or more frequent) contact and coordination with the FWS Mexican Wolf Recovery Program Coordinator, Interagency Committee(s), the Mexican Wolf Interagency Field Team, the NMESFO, and other appropriate Federal, State, and Tribal agencies to keep apprised of locations and information on the presence of Mexican wolf.

2. WS shall report the incidental take of Mexican wolf to the NMESFO, State, and Tribal wildlife agencies within 24 hours. Additional time shall be allowed for remote areas with limited access. Cause of death or injury shall be reported, if known.

3. WS shall notify the NMESFO and appropriate State and Tribal agencies of any Mexican wolf occurrence.

4. WS shall notify the appropriate officials, including but not limited to the FWS Mexican Wolf Recovery Program Coordinator, Interagency Committee(s), the Mexican Wolf Interagency Field Team, and the NMESFO when WS has evidence suspecting Mexican wolf predation on livestock or threat to public health and safety.

5. WS shall provide FWS with an annual monitoring report of incidental take of Mexican wolf.

The following condition implements Reasonable and Prudent Measure #2.

1. WS shall ensure that personnel implementing WS WDM Program activities follow the Implementing Procedures above.

WS in New Mexico will continue to abide by the 2011 BO, and has developed SOP's limiting shooting distance and night hunting to avoid future inadvertent take of a Mexican wolf. Therefore, WS concludes that the USFWS (2011) BO is satisfactory.

The Black-footed ferret is federally listed as endangered nonessential experimental species. There are currently two black-footed ferret reintroduction sites in New Mexico. If any FSDM activities are anticipated within these areas, WS would consult with the USFWS. The types of traps and snares that would be used for FSDM would have no impact on black-footed ferrets. The mesh size of cage traps would be large enough to allow ferrets access in or out without injury. Snares are too large and simply have no possibility of catching a ferret. WS has never taken a black-footed ferret and does not anticipate such an occurrence conducting FSDM in New Mexico.

The Canada Lynx is listed as threatened. FSDM will have little potential to adversely affect the lynx because feral swine are not likely to be found in lynx habitat (high-altitude). FSDM methods of primary concern are snares, however, feral swine snares are large and heavy and even if a lynx were to be present in an area where FSDM was being conducted, the likelihood of catching a lynx in a feral swine snare would

be rare. However, WS will implement the following species specific conservation measures identified in the 2014 USFWS Letter of Concurrence and abide by the SOP's listed in the 2014 BA.

1. Provide training to WS personnel in the identification of lynx and lynx sign, and snowshoe hare and their sign if conducting predator damage management activities within lynx habitat.

2. WS personnel will not use fetid baits and attractants in coyote sets within lynx habitat, and within 100 meters of any conifer forest type above 8,000 feet elevation (above sea level).

3. WS personnel will utilize leg-hold traps and foot or leg snares set for larger predators (e.g., mountain lions, black bears, and wolves) equipped with pan tension devices sufficient to reduce the likelihood of capturing lynx or other animals up to 35 pounds (e.g., 8 to 10 pound trip weight) within 100 meters of any conifer forest type above 8,000 feet elevation (above sea level).

4. WS personnel will not set neck snares for coyotes or bobcats within 100 meters of any conifer forest type above 8,000 feet elevation (above sea level)

5. WS personnel will not use M-44 devices or large gas cartridges within 100 meters of any conifer forest type above 8,000 feet elevation (above sea level).

6. WS personnel will remove a tracking dog from trailing a lynx.

7. WS personnel will provide the USFWS an annual report detailing implementation of these conservation measures.

Basically, the 2014 USFWS Letter of Concurrence limits the use of neck and foot snares, leghold traps, M-44s to areas outside lynx habitat. Additionally, trailing dogs are to be taken off a lynx, if they inadvertently change from another target species to a lynx. The Service concluded that based on the low frequency of lynx in New Mexico and the implementation of these conservation measures, WS activities on the lynx is insignificant and discountable.

Reptiles

There are three federal listed threatened reptiles within the project areas of New Mexico. The Northern Mexican Gartersnake, Narrow-headed Gartersnake, and New Mexican Ridge-nosed Rattlesnake. The USFWS has concurred with WS determination that FSDM activities in New Mexico may effect, not likely to adversely affect these species because the effects would be wholly beneficial. WS personnel will discuss any FSDM projects with USFWS prior to conducting these activities in occupied, proposed or designated critical habitat.

Invertebrates

There are eight endangered invertebrate species found within the proposed FSDM project areas in New Mexico. The Noel's Amphipod, Roswell Springtail, Koster's Springtail, Pecos Assiminea Snail, Chupadera Springtail, Socorro Springtail and Alamosa Springtail. The USFWS has concurred with WS determination that FSDM activities in New Mexico would have no negative effects on these species and any effects would likely be wholly beneficial. WS personnel will discuss any FSDM projects with USFWS prior to conducting these activities in occupied, proposed or designated critical habitat.

Amphibians

The Jemez Mountains Salamander is a federal endangered species found within the proposed FSDM project areas in New Mexico. FSDM activities in the salamander's range could have a beneficial impact, therefore WS believes that FSDM may affect, not likely to adversely affect and will consult with USFWS on FSDM projects conducted in occupied or designated critical habitat for the salamander.

The Chiricahua Leopard Frog is a federal threatened species found within the proposed FSDM project areas in New Mexico. FSDM activities in the frog's range could have a beneficial impact, therefore WS believes that FSDM may affect, not likely to adversely affect and will consult with USFWS on FSDM projects conducted in occupied or designated critical habitat for the frog.

Fish

The Rio Grande Silvery Minnow, Colorado Pike Minnow, Gila Chub, Razorback Sucker, Zuni Bluehead Sucker, Pecos Gambusia, Spikedace and Gila Topminnow are federal endangered species found within the proposed FSDM project areas in New Mexico. WS has determined that the proposed FSDM project may affect, not likely to adversely affect these species, because the actions would be discountable or beneficial. WS would consult with the USFWS on projects in occupied, proposed, and designated critical habitat.

The Arkansas River Shiner, Chihuahua Chub, Gila Trout, and Pecos Bluntnose Shiner are federal threatened species found within the proposed FSDM project areas. WS has determined that the proposed FSDM project may affect, not likely to adversely affect these species, because the actions would be discountable or beneficial. WS would consult with the USFWS on projects in occupied, proposed, and designated critical habitat

Plants and Critical Habitat

FSDM, for the most part, has little chance of taking threatened and endangered plants, because WS FSDM activities do not alter their habitat and most plant species are surviving in areas unlikely to be visited by WS personnel. The Sacramento Prickly Poppy, Mancos Milk-vetch, Todsen's Pennyroyal, and Holy Ghost Ipmompsis, Sneed Pincushion Cactus, Kuenzler Hedgehog Cactus are endangered. The Sacramento Mountains Thistle, Mesa Verde Cactus, Lee Pincushion Cactus, Zuni Fleabane, Gypsum Wild-buckwheat, and Pecos Sunflower are threatened. WS have made no effect determinations for all of the remaining species listed above. WS personnel review project areas for T&E plant species and would discuss any FSDM projects with USFWS prior to conducting these activities in occupied, proposed or designated critical habitat

Feral swine, being non-indigenous and because they cause damage to a variety of resources and negatively impact and compete with native flora and fauna, are considered by many wildlife professionals to be an undesirable component of North American wild and native ecosystems. Any reduction in feral swine populations in North America, even to the extent of complete eradication, is desirable and would have a beneficial impact to native wildlife.

Effects on Social and Cultural Values (Under Alternative 1)

Social impacts implies the consequences to human populations of any of the proposed actions that may alter the ways in which people live, work, play, relate to one another, organize to meet their needs and

generally cope as members of society. The term also includes cultural impacts involving changes to the norms, values, and beliefs that guide and rationalize their perception of themselves and their society.

Although feral swine are an introduced invasive species to New Mexico, feral swine are not classified as game animals or under the jurisdiction of the NMDGF. However, feral swine negatively impact native wildlife managed by NMDGF and the expansion of this invasive species concerns them. Moreover, NMDGF supports effective measures to minimize or eliminate damage caused by feral swine populations in New Mexico.

However, feral swine could be viewed by some people in New Mexico as "wildlife" and people generally regard wildlife as providing economic, recreational, and aesthetic benefits (Decker and Goff 1987), and the mere knowledge that wildlife exists is a positive benefit to many people.

Another problem with feral swine is that people move them to expand their population to increase hunting and harvest opportunities. In 2009, the New Mexico state legislature passed a law making it illegal to import, hold, release or sell feral hogs or operate a commercial wild hog hunt. Some people might be concerned that removing feral pigs for damage management activities would affect sport and subsistence hunting opportunities and be a waste of an important food resource. It is unlikely that the proposed alternative impacts sport and subsistence hunting opportunities. The proposed action would also have little to no impact on hunting on private lands since WS only works on property when requested and funded. It is unlikely that a private landowner having provided hunter access would have WS conduct FSDM in the same area.

Private individuals may be involved in removing feral swine from private property to control damage but this is not considered sport or subsistence hunting but animal damage management. At the same time, recreational hunting can indirectly assist with some damage control but the primary purpose would be to provide food, trophies and recreational opportunities. In New Mexico, due to the feral swine being classified as an unprotected species with no license requirement and unlimited harvest, WS has been an advocate of cooperating with the public hunter whenever possible to help manage damage caused by feral swine. NMDGF provides WS contact information in their Hunting Rules and Information about current hunting locations for feral swine in New Mexico. Hunters on public or private lands may help alleviate damage to crops, sensitive plants and other natural resources on these lands. However, WS also recognizes that depending on management objectives, such as extirpation from a specific area, public hunting is not generally effective at eliminating populations of feral swine (Richardson et al. 1995, Bevins et al. 2014).

WS will only agree to conduct FSDM operations, if requested and funded, and in areas where no other animal damage management operator is engaged. WS also offers technical assistance to the public on ways to conduct better FSDM. WS actions on tribal lands are only conducted at the tribe's request and under signed agreement; thus, the tribes have control over any potential conflict with cultural resources on tribal properties.

Effects on Human Health and Safety (Under Alternative 1)

FSDM has the potential to affect human health and safety whether implemented by WS, other agencies, or the public. Some people may have concerns that FSDM methods, in particular the use of firearms, hunting dogs and snares by WS personnel could pose a threat or cause injuries to people or pets, and possibly harm the environment. Impacts resulting from implementing FSDM methods can range from direct injury to

indirect impacts (e.g., impacts to water quality). As noted in the need for action, FSDM is also conducted in some areas to reduce risks to human and pet health and safety from feral swine vehicle collisions, transfer of zoonotic diseases and aggressive feral swine. WS incorporates many measures as SOPs to minimize or nullify risks to the public.

FSDM methods which may pose risks to human health and safety include firearms, use of aircraft for monitoring, snares, foot-hold traps, pyrotechnics for hazing, cage traps, drugs, and handling feral swine carcasses. When used by WS, the proposed FSDM methods pose minimal threat to human health and safety. No adverse effects on human health and safety have occurred or have been reported to occur from WS' use of FSDM methods. FSDM operations are implemented only by request, and only as specified in MOUs, cooperative service agreements, or similar documents developed in coordination with landowners and managers. WS employees who conduct FSDM activities are knowledgeable in the safe and effective use of the methods and relevant APHIS-WS Directives. Safety considerations are always considered in the decision making process as outlined in the WS Decision Model (Slate et al. 1992). Safety risks depend not only on the method used, but also on the location and timing of use. Property ownership or jurisdiction and land use are considered in assessing safety risks. For example, private property in a rural area with limited or controlled access would raise fewer safety concerns with FSDM methods than would a public park. In both cases, close coordination with either the landowner or land manager helps to ensure that human safety risks are minimized. Some measures to reduce risks on public lands include avoiding high use areas, working in closed areas, or timing operations to occur when the public is not present (off-season, at night, or early morning). Another routine precaution taken regardless of land ownership is posting warning signs at access points. The risks and additional precautions specific to the methods are discussed below.

A work initiation document would list the methods the cooperator agreed could potentially be used on property owned or managed by the cooperator. At the time the document is prepared, and as needed thereafter, WS would consult with the landowner regarding any risks which may be associated with the proposed methods and strategies to reduce or prevent risks.

Shooting

Shooting with shotguns or rifles is used to reduce feral swine damage when lethal methods are determined to be appropriate. Shooting is selective for target species. To help ensure safe use and awareness, WS employees who use firearms during official duties are required to attend an approved firearm safety-training course and to remain certified for firearm use in accordance with the WS Directive 2.615. As a condition of employment, WS employees who carry and use firearms are subject to the Lautenberg Domestic Confiscation Law (18 USC § 922(g)(9)), which prohibits firearm possession by anyone who has been convicted of a misdemeanor crime of domestic violence. A safety assessment based on site evaluations, coordination with cooperating and local agencies (if applicable), and consultation with cooperators would be conducted before firearms are deemed appropriate to alleviate or reduce feral swine damage and threats to human safety at a site. WS would work closely with cooperators to ensure all safety issues were considered before firearms would be included in agreements and used. In addition, WS analyzed firearms risks in a Risk Assessment (WS 2019e) which concluded that the use of firearms is of low risk to WS personnel, the public, nontarget species, and environment.

The use of lead ammunition during shooting activities has the potential to impact human health and safety. The toxicity of lead to humans has been well documented due to its widespread historical and current use. Lead affects the neurological system, cardiovascular system, renal system, immune system, hematological system, and developmental system in humans and other mammals. The body integrates lead into its composition by substituting lead for other essential elements or nutrients, such as calcium which is used in

many different processes in the body. Children are especially vulnerable since they are able to absorb lead more efficiently and are in contact more with media that may be contaminated with lead. Prolonged lead exposure in children may cause damage to the brain and nervous system, behavioral problems, anemia, liver and kidney damage, hearing loss, hyperactivity and developmental delays. Lead is also a probable human carcinogen and is considered mutagenic.

Lead exposure and risk to human health from FSDM activities is not expected to result in significant risk to any subgroups of human populations (such as WS personnel, and the general public, including minority populations, children, and hunters). There is potential for exposure and risk to WS personnel who handle lead ammunition. However, exposure and risk is expected to be low because firearms are used outdoors reducing inhalation exposure from lead fumes and dust that may occur during firing. In addition, APHIS policies and practices for WS personnel handling firearms would reduce the potential effects of lead exposure as well as reduce the potential for injuries related to discharging a firearm.

The Meat Inspection Act requirements for pre and post mortem inspections of swine prior to entering the public food supply (e.g., food banks), therefore feral swine recovered by WS personnel from lead shooting would not be donated to food banks. Swine taken by WS could be donated to and consumed by the landowner/manager. Risks to these individuals are expected to be similar to risks hunters experience when consuming game meat that they harvest. In a 2008 study by the CDC and North Dakota Departments of Health, Agriculture, and Game and Fish, blood lead levels were checked in 738 volunteers who made varying use of wild game harvested with lead bullets (Iqbal 2008). Study results indicated that there was a slight elevation in blood lead levels in individuals who ate a lot of wild game, but no participant had blood lead levels higher than the CDC recommended threshold of 10 g/dl – the level at which CDC recommends case management. Additionally, the mean blood level for the study population was lower than that of the overall U.S. population.

Feral swine that are killed by WS personnel and left on site could potentially be obtained and consumed by individuals other than the landowner/manager. This is not expected to be a significant exposure pathway because carcasses left in the field would typically be away from roads or other public areas and would not be fit for human consumption due to rapid scavenging and decomposition of the carcass. Feral swine that are wounded during shooting by WS personnel could occasionally be harvested later by hunters. In this scenario, there is the potential for lead exposure from bullets or fragments to be present in tissue that could be used for human consumption. However, this type of exposure is expected to be minor for several reasons. First, the goal of WS personnel when using ammunition is efficient and effective lethal control, ensuring a quick, humane death. Secondly, areas where fragments of lead may occur would be noticed by hunters and those fragments removed during preparation of the meat for consumption. Finally, the potential for lead exposure would be reduced in cases where WS personnel can use non-lead ammunition. Over time, the use of lead ammunition is expected to decrease as non-toxic shot becomes more readily available. Therefore, the low potential for lead exposure from activities related to FSDM is expected to result in negligible risk.

Use of Aircraft

WS uses aerial operations to conduct FSDM in most states. Aerial wildlife operations, like any other flying, may result in an accident. WS pilots and crewmembers are trained and experienced to recognize the circumstances that lead to accidents and have thousands of hours of flight time. The national APHIS-WS Aviation Program has increased its emphasis on safety, including funding for additional training, the establishment of a WS Flight Training Center and annual recurring training for all pilots and crewmembers.

In addition, WS conducted a detailed risk assessment in 2019 (WS 2019d.). Still, accidents may occur and the environmental consequences should be evaluated.

Fires and Spills. Information was obtained from Mr. Norm Wiemeyer, Chief, NTSB Denver Field Office (pers. comm. 2000), the agency responsible for investigating aviation accidents, on the potential for fires and fuel spills in 2000 due to concerns from environmental organizations. Mr. Wiemeyer stated that he had no recollection of any major fires caused by any government aircraft; he had been in that position since 1987. Mr. Jacob Wimmer has been the WS National Aviation Safety Manager and Inspector in Charge since November 2005. Mr. Wimmer has investigated all accidents and incidents since that date and has a good working knowledge of accidents and incidents from 2000, since Mr. Wiemeyer's statement. Mr. Wimmer was able to confirm that WS aircraft have caused no major fires as a result of their operations. The only fire that was a result of WS aerial operations was at a Utah accident site in June 2007. The airplane crashed, ignited a post-crash fire, but fire spread no further than the impact debris field and extinguished itself. The period of greatest fire danger typically occurs during the hotter summer months, but WS ordinarily conducts fewer aerial shooting operations during these months because ground cover and other conditions are not conducive for finding target animals. Since APHIS-WS aircraft have not caused any major ground or forest fires for many years in hundreds of thousands of hours flying, it is reasonable to assume that the risk of this occurring is minimal.

Petroleum Products Contamination. WS aircraft have caused no contamination due to leakage or spillage of petroleum products. There have been no reported fuel spills as a result of aircraft refueling operations either at fixed base operations or in field operations. No fuel or oil spillage has resulted through accident or incident and in all cases fuel tanks, fuel lines, oil tanks and oil lines have remained intact with the exception of the accident in Utah in 2007. The only rupture or leakage was a result of the accident named in the Fires and Spills section, but it was consumed by the subsequent fire before any seepage could occur.

Mr. Wiemeyer of NTSB stated that aviation fuel is extremely volatile and will evaporate within a few hours or less to the point that even its odor cannot be detected. Jet A fuel does not pose a large environmental problem if spilled, even at the maximum amounts that could be used by WS. It is a straight chained hydrocarbon with little benzene present and microbes would quickly break-down any spill residue through aerobic action (J. Kuhn, Montana Department of Environmental Quality, pers. comm., 2001). The quantities used by WS aircraft are relatively small (52 gallon maximum in a fixed-wing aircraft and 91 gallon maximum in the helicopters used by WS), and during much of each flight the amount of fuel on board would be considerably less than these maximum amounts. In some cases, not all of the fuel would be spilled. Thus, there should be little environmental hazard from unignited fuel spills. WS believes the low probability of a crash and subsequent spill, and one record of a minor fuel spill occurring from its aircraft fleet, poses negligible risk to the environment.

For privately owned aircraft, the aircraft owner or his/her insurance company is responsible for clean-up of spilled oils and other fluids, but only if required by the owner or manager of the property on which the accident occurred. In the case of Bureau of Land Management (BLM), USFS, and National Park Service lands, the land managing agency generally requires soil to be decontaminated or removed and properly disposed of. With the size aircraft used by WS, the quantities of oil capable of being spilled in any accident are small (i.e., 6-8 quarts maximum for reciprocating (piston) engines and 3-5 quarts for turbine engines) with minimal chance of causing environmental damage. Aircraft used by WS are single engine models, so the greatest amount of oil that could be spilled in one accident would be about 8 quarts. Due to the low

quantities of oil on any given WS aircraft, the low probability of a crash, and subsequent spill, the risk to the environment is negligible.

Petroleum products degrade through volatilization and bacterial action, particularly when exposed to oxygen (EPA 2000). Thus, small quantity oil spills on surface soils can be expected to biodegrade readily. Even in subsurface contamination situations involving underground storage facilities, which would generally be expected to involve larger quantities than would ever be involved in a small aircraft accident, EPA guidelines provide for *natural attenuation* or volatilization and biodegradation to mitigate environmental hazards (EPA 2000). Thus, even where oil spills in small aircraft accidents are not cleaned up, the oil would not be expected to persist in the environment and would occur in such small quantities that the risk to drinking water and aquatic ecosystems is negligible.

The WS Risk Assessment (WS 2019d) also address aerial shooting in detail and concluded the risks to people from crashes and the environment from fires and spills as a result of an accident are minimal.

Tracking/Trailing Dogs

In some situations, WS employs the use of tracking/trailing dogs to locate or pursue feral swine. WS personnel are aware of and will abide by WS Directive 2.445, which requires that WS personnel handle and maintain trained dogs such that the dogs do not pose a threat to people or domestic animals. Dog usage is also analyzed in detail in Risk Assessment (WS 2017h). Dogs would only be used in areas where WS has landowner or land manager permission to use the technique. The use of well-trained dogs by experienced handlers is not expected to result in adverse impacts on human health or safety.

Carcass Disposal

A number of variables must be considered when making local decisions about the best way to manage feral swine carcasses. Carcasses would be disposed of according to federal, state, and local regulations and according to APHIS policies (WS Directives 2.515, 2.210, and 2.510). WS has identified that carcasses of feral swine removed during FSDM activities may be buried on site in some local situations, or buried in approved landfills, the number of carcasses disposed of in any given area would be minimal. The potential for carcasses to harbor diseases may be unknown unless the feral swine were specifically targeted for disease monitoring. In general, very little information is available regarding the length of time disease agents persist in the burial environment or the potential for dissemination from the burial site. Concerns stem from the fact that burial, unlike some other disposal methods such as incineration or rendering, serves only as a means of eliminating carcass material, but does not necessarily eliminate disease agents that may be present (NABCC 2004). The question arises as to the possibility that disease agents could disseminate from the burial site and pose a risk to human health (NABCC 2004). In any case, feral swine that are host to a disease agent would have died in place and/or may have spread the disease to other swine or other animals if not removed in FSDM. Thus, overall risks from onsite burial or composting may not exceed the status quo as long as carcass numbers are not concentrated.

Carcasses may also be kept by the landowner/manager for their use and use by family and employees. However, there are risks to human health from consuming feral swine that may not necessarily occur with domestic swine. Feral swine are known to carry diseases, such as swine brucellosis, which have been eradicated from the commercial swine herds in the U.S. or which are uncommon in meat from domestic swine due to biosecurity and handling and production practices (Pederson et al. 2014, CDC 2009, 2014). People can contract these diseases and others through contact with animal body fluids and tissues while processing carcasses and/or through improperly cooked meat. When landowners request to keep feral

swine for their use, WS will inform them of the health risks associated with handling and consumption of feral swine and proper precautions to minimize risks (e.g., Davis and Ivey 2011, CDC Undated 1990).

The risks to human health and safety stemming from feral swine carcass disposal would be negligible since carcasses are either donated to the landowner or land manager, left or buried on site or buried in approved landfills. As per WS Directive 2.515, all carcass disposals will be made in a manner that demonstrates WS' recognition of public sensitivity to the viewing of wildlife carcasses. WS will also refer to Appendix H in the Feral Swine Damage Management EIS (USDA 2015) that provides guidance on carcass disposal. The potential for the general public to encounter a feral swine carcass would be expected to be extremely remote.

Traps and Snares

The use of live-capture traps, foothold traps, and snares has been identified as a potential issue. Live-capture traps available for feral swine would typically be walk-in style traps where feral swine enter, but are unable to exit. Foothold snares and neck snares would typically be set in areas where human and pet activity was minimal or could be controlled to ensure public safety. Signs as well as direct communication with people warning of the use of those tools in the area would be prominently posted to increase awareness that those devices were being used and to avoid the area. Therefore, if left undisturbed, risks to human safety would be minimal. However, there can be incidents of injury or death with pets from the use of snares. In situations where there is this potential, WS may elect to use alternative capture devices such as corral traps or cage traps.

Immobilization and Euthanasia Drugs

Immobilizing drugs and euthanasia chemicals would be used infrequently. Immobilizing drugs would be limited to situations where swine would be sedated to fit radio collars and/or to collect samples and then be released. When euthanasia chemicals are administered, immobilizing drugs would also be administered prior to euthanasia. Immobilization of feral swine minimizes stress to the animal and reduces the likelihood of injury to the individual captured and for the safety of personnel handling the swine. Immobilizing drugs would be administered according to recommended methods and doses from published sources. If feral swine were immobilized for sampling or to be fitted with a radio collar and released, risks could occur to human safety if harvest and consumption occurred prior to the end of the withdrawal period for the drug. WS marks animals which have received immobilization drugs with a tag that provides a phone number to contact before consumption. WS personnel that may use drugs for immobilization and euthanasia are certified through WS and abide by WS policies and SOPs and applicable federal, state, territorial, tribal, and local laws and regulations.

In general, due to the cost of the drugs, the need to handle each animal and concerns regarding disposal, euthanasia chemicals would rarely be used as part of FSDM. Euthanasia chemicals would be administered after live capture and immobilization and under close monitoring. Euthanized feral swine are disposed of in accordance with APHIS-WS' Directives (2.430 and 2.515) and therefore, would not be available for harvest and consumption. New Mexico will utilize Immobilization and Euthanasia and all employees will be trained according to WS policies and procedures.

GonaCon™

Reproductive inhibitors are currently under investigation as a potential nonlethal option to help reduce feral swine populations and associated damage. However, at this time, no methods are currently approved by EPA or FDA for feral swine control. Of the methods currently under investigation, the injectable formulation

of GonaCon™ is the most likely to be available for FSDM in the near future. Data on this type of use are sufficient for analysis of risks associated with this method and are presented in this EA. Consequently, in the event that an injectable formulation of GonaCon™ is registered for use in feral swine, it could be available for use without additional supplementation of this EA. Because of the many issues that have not yet been resolved regarding the impacts of feed-based reproductive inhibitors, these methods would be subject to additional NEPA analysis prior to inclusion in any APHIS FSDM operational program.

Available toxicity data for GnRH suggests the active ingredient is essentially non-toxic to mammals. This is reflected in the lowest toxicity (Category IV) for acute oral, dermal, inhalation, and ocular exposure routes determined by EPA/Office of Pesticide Programs (OPP) (USEPA 2009). The potential exposure to humans is the greatest for workers; however, exposure and subsequent risk is expected to be minimal based on label requirements and restrictions. Labeled requirements regarding personal protective equipment (PPE) and prohibition of allowing pregnant women from handling the product may reduce the exposure and risk to this portion of the population. Additionally, GonaCon™ is classified as a Restricted Use Pesticide and all users must be certified pesticide applicators, or be under the supervision of a certified pesticide applicator. For both EPA/OPP approved GonaCon™ labels for use in deer is further restricted to WS or state wildlife management agency personnel or persons working under their authority. The product label for equines (wild horses and burros), is restricted to employees of WS and Veterinary Services (VS), Bureau of Land Management (BLM), USFWS, National Park Service (NPS), U.S. Department of Defense (DoD), federally recognized native American tribes, state agencies responsible for wild or feral horse and burro management, public and private wild horse sanctuaries, or persons working under their authority. In addition, both labels specify that applicators are not to use these products near humans, domestic animals, and pets and the products are required to be registered with states prior to use. A labelled use for feral swine would be anticipated to have similar restrictions to those proposed for the current labels resulting in minimal risk to workers and the general public.

The other subgroup of the population that could be exposed to GonaCon™ are people who harvest and consume feral swine that are treated with GonaCon™. The potential for exposure and risk to this part of the population is also expected to be minimal. In addition, exposure to GnRH would only be anticipated for meat that is consumed at the injection site immediately after dosing. The half-life of GnRH is short (< 1 hour) and would degrade prior to the animal being harvested. However, if a person does consume a treated game animal shortly after administration, that person is unlikely to be adversely affected because the active ingredient GnRH is a protein, which is digested into its component amino acids instead of absorbed intact in the digestive tract of mammals.

GonaCon™ meets the requirements of the Animal Medicinal Drug Use Clarification Act of 1994 (21 CFR 530) and would prevent any adverse effects on human health with regard to this issue. WS also conducted a risk assessment that concluded there to be no adverse effects (WS 2017d). All APHIS-WS personnel who handle and administer chemical methods would be properly trained in the use of those methods. Training and adherence to agency directives (see WS Directive 2.430) would ensure the safety of employees applying chemical methods. Feral swine euthanized by WS or taken using chemical methods would be disposed of in accordance with WS Directive 2.515. All euthanasia would occur in the absence of the public, whenever possible, which would minimize risks.

Sodium Nitrite, HOGGONE®

The product HOGGONE® is a sodium nitrite based bait that has been developed in Australia. The product is a toxicant bait developed for lethal control of feral swine. It is currently being field tested in the U.S. and pending positive test results, efforts will be made to register the product with the EPA. The product has

been in development for several years and results are very promising but currently the data is still insufficient to analyze its potential use as an operational tool. If the tool is made available, it would be subject to additional NEPA analysis prior to inclusion in any WS FSDM operational program.

Disease Impacts on Human Health and Safety

WS works with cooperators on a case-by-case basis to assess the nature and magnitude of feral swine conflicts including providing information on the limitations about what we know regarding health risks associated with feral swine. Cooperators may consider even a low level of risk to be unacceptable and others may wish to eliminate or minimize risks before human illness occurs because of conditions on their site. In most cases, the risk of contracting a disease from feral swine is relatively low. Although reports of human illness associated with feral swine are rare, this may be due to the lack of reported human cases (Amass 1998). There are likely illnesses contracted from swine that people may perceive as the common flu that are left untreated, unreported, or misdiagnosed (Hutton et al. 2006).

While current biosecurity and herd health procedures minimize the occurrence of disease in domestic swine herds, diseases such as those discussed in this EA can be costly to treat. FSDM, if successful, could reduce the potential for zoonotic disease transmission between feral swine and humans reduce the number of swine-vehicle related accidents and injuries from aggressive feral swine.

Other Impacts on Human Health and Safety

Feral swine increase sedimentation in water by damaging vegetation and increasing soil erosion. Increased levels of pathogenic bacteria and fecal coliform have been discovered in water bodies as a result of feral swine defecation in or near them (Kaller et al. 2007). FSDM in select areas could potentially decrease this risk.

Feral swine also represent a potential source of meat, but donations of feral swine as a food source is not practical, feasible, or allowed in most cases. Food Safety Inspection Service has ruled that all swine are subject to the Federal Meat Inspection Act and even if donated are considered to be in commerce; therefore, all animals must be processed under inspection at an official establishment. Additionally, many states may require additional clearances such as health certificates. Thus, based on these limitations, feral swine are not likely to be donated to charities. Carcasses may be left with individual property owners where the swine were killed for personal consumption, if requested and allowed by law. In this case, information is provided to the landowner on health risks and on precautions to take to minimize risks while handling the carcass and cooking the meat. Hunting feral swine can also be a source of low cost supplemental food for some families. Removing offending individuals from feral swine populations would not decrease the population in many areas under the Current FSDM Program. Consequently, impacts on use of feral swine as supplemental food under this alternative are likely limited and localized.

In conclusion, no adverse effects on human health and safety have occurred or have been reported to occur from WS activities conducted. The overall risks to human safety from the Current FSDM Program are low. FSDM benefits human health and safety by reducing the potential for zoonotic disease transmission between feral swine and humans and by reducing the potential for swine related vehicle accidents and other conflicts with swine.

Humaneness / Ethics of FSDM Methods (Under Alternative 1)

The perceptions regarding whether or not FSDM methods are justified will depend, in part, on individual perceptions of the humaneness of the action. Individual perceptions of humaneness can vary depending

on a range of factors, which can include the risk of harm to individual target animals, the nature and duration of any adverse impacts on individual animals, and the selectivity of the method (i.e., risk to nontarget species).

In the context of impact on individual target animals, nonlethal methods are commonly considered more humane than lethal methods. Some individuals would likely prefer methods such as frightening devices, repellents, fencing or educational programs. However, these methods would generally only be applicable to relatively limited areas and, except for the educational programs, would not address the issue of an increasing national feral swine population. Opinions regarding the ethics of reproductive inhibitors would be mixed, with some individuals approving of the method because it is a nonlethal strategy and others opposed because there is insufficient information regarding risks to nontarget species and humans and/or perceptions that interfering with reproduction is an unacceptable intrusion on individual animals' rights and wellbeing. In terms of selectivity, risk of adverse impacts from repellents and frightening devices are likely to be minimal. Fencing, depending on design, also has the potential to impact movements or cause injury or mortality in nontarget animals.

Lethal methods which result in a quick, painless, and relatively stress-free death are generally preferable in terms of humaneness (AVMA 2013). For example, when using firearms as a control method, WS personnel are trained to place shots that result in quick death and minimize pain and suffering. In this context, shooting would be considered to be among the most humane methods available. Additionally, risks to nontarget species are negligible. Foothold traps and snares could be considered undesirable and inhumane by some perhaps because of the time between when an animal is captured and its death. These devices also have the potential to capture and injure or kill nontarget animals. Implementation of Association of Fish and Wildlife Agencies (AFWA) Best Management Practices (BMPs), when applicable, helps to ensure that the program minimizes the pain and suffering to individual target animals, however there are no specific AFWA BMPs for feral swine (AFWA 2006). Because WS uses methods in a highly target-specific manner, very few nontarget animals are captured. Most often, nontarget animals that are caught can be easily released unharmed. Humaneness concerns associated with pursuit with dogs include risk of injury to the dog or the feral swine and stress to swine during pursuit. Dogs would not be used to kill swine and swine located through use of dogs would be killed via gunshot.

The disposition of animals lethally removed has also been identified by members of the public as a factor in considerations regarding the humaneness and ethics of FSDM. Some individuals will perceive lethal removal of animals for any reason to be an inhumane and a morally unacceptable solution. However, for other individuals, knowledge that the animals removed are put to a "good use" may impact their acceptance of lethal methods. In sport hunting, lethal removal that results in use of all or most of the animal for food, or cultural and religious purposes is generally accepted by the public. Similarly, in wildlife damage management, projects that result in animals being donated to programs which feed individuals in need are generally better accepted than programs that only result in burial or other forms of animal disposal. WS donates animals taken during damage management efforts if permitted by state, federal, territorial, and tribal regulations and if donation can be conducted in a safe and practical manner. Unfortunately, the inspection requirements of the Meat Inspection Act make donation of feral swine for human consumption prohibitively expensive and impractical to implement in most situations. However, feral swine are offered to landowners and managers for their personal use in accordance with the Act. Although this will be considered a more appropriate disposition for the animals, concerns remain regarding diseases in feral swine that may not be encountered in commercially available meat.

The goal of the New Mexico WS FSDM program is to reduce damage to agriculture, natural and cultural resources, property, and human health and safety. This alternative would use the WS Decision Model (Slate et al. 1992; Figure 3) and an integrated management approach to develop the most effective site specific management plans while minimizing adverse impacts on the human environment. Factors considered in the decision model include, but are not limited to, considerations of humaneness of individual methods and the varying philosophies regarding the need for FSDM. WS personnel are trained in the safe and effective use of FSDM methods and use these methods as humanely as possible. WS Directives (http://www.aphis.usda.gov/wildlifedamage) provide details on measures used to address concerns regarding the humaneness of FSDM methods and measures to minimize the risk of adverse impacts from FSDM.

In summary, the current FSDM Program in New Mexico is ethical and humane. For any individual or group who accepts the idea that feral swine are an invasive species in New Mexico, cause damage to various resources, and require control in many situations would likely find this alternative to be acceptable or even insufficient, based on knowledge about feral swine biology, the damage they are capable of, and values that include preservation of the environment. Groups or individuals who believe that human control of wildlife in any way is wrong are not likely to find this alternative to be acceptable. Because no changes to current approaches would be made, this alternative would also probably be unacceptable to groups or individuals who specifically object to lethal or non-lethal control of feral swine. In addition, any groups or individuals who generally object to the ethics or humaneness of current WS activities would likely continue to object this alternative.

3.1.2 Alternative 2 – No Wildlife Service Program

This alternative eliminates WS involvement in FSDM in New Mexico. WS would not be available to provide operational or technical assistance and land owners would have to conduct their own FSDM without WS involvement or possibly seek assistance through NMDGF or local hunters. This EA describes FSDM methods that could be employed by private individuals or other agencies under this alternative. However, information on future developments in non-lethal and lethal management techniques from NWRC, the world leader in developing tools for WDM, would also not be available to producers or resource owners.

Effects on Feral Swine Populations (Under Alternative 2)

Under this alternative, WS would have no effect on the feral swine population in New Mexico. Private efforts to reduce or prevent feral swine damage would likely increase but without any involvement from WS (direct control or technical assistance) overall private efforts would likely be less successful which could result in slightly less feral swine take than that under Alternatives 1, 3 and 4 where WS would still be involved with FSDM. The use of illegal or ill-advised methods to control feral swine would likely be the highest under this alternative and could lead to unknown impacts on the feral swine population. Private efforts to reduce feral swine damage frequently result in relocation of captured feral swine to other areas which could spread the problem and increase the risk of disease transmission to unaffected populations.

Effects on Nontarget and T&E Species (Under Alterative 2)

Wildlife Services would have no effect on nontarget species under this alternative. Negative impacts on livestock or native species may increase without WS control actions. Private control operators are not required to consult with the FWS when engaged in FSMD activities on private lands frequented by T&E species and may cause more disturbances to these species than WS. Private efforts to reduce or prevent feral swine damage would likely result in less experienced persons implementing control methods which

could lead to greater take of nontarget wildlife than under alternative 1 (current program). It is conceivable that frustration caused by the inability to reduce damages could lead to the unwise or illegal use of some methods which could impact local nontarget and T&E species populations. Finally, feral swine would be least likely to be controlled efficiently under this alternative and, thus, their impacts would be greatest under this alternative.

Effects on Social and Cultural Values (Under Alternative 2)

Under this alternative, Wildlife Services would have no FSDM program. Hunting for recreation or subsistence would not be impacted under this alternative, but more private animal damage control operators would be expected to be used to assist landowners with swine damage on some properties. Feral swine that are located on private property and are causing damage could only be addressed by private individuals. Some members of the public still expect government agencies to assist with wildlife damage management. This alternative would not fulfill that expectation in terms of providing a government source for assistance since local and state governments do not provide WDM operational assistance to the public in New Mexico. Economic damages would be expected to continue or increase without WS assistance.

Effects on Human Health and Safety (Under Alternative 2)

Under this alternative it is possible that less experienced personnel implementing FDSM methods could lead to greater risk to human health and safety than a federal FSDM program. WS personnel are required to adhere to specific requirements for training and certification in the use of several FSDM methods. Hazards to human health and safety could be greater under this alternative if personnel implementing the action do not have the same level of training in FSDM methods as WS personnel. As noted in the need for action, FSDM is also conducted in some areas to reduce risks to human and pet health and safety from feral swine-vehicle collisions, transfer of zoonotic diseases and aggressive feral swine. WS would no longer conduct disease surveillance activities under this alternative. Without a federal FSDM program it is likely that these risks may not be addressed effectively.

Humaneness / Ethics of FSDM Methods (Under Alternative 2)

Under this alternative, methods viewed by some persons as inhumane would likely be employed by private individuals. Use of traps, snares and shooting by private individuals would probably increase. This could result in less experienced persons doing the control work and consequently could cause an increase in nontarget take of wildlife and potentially greater animal suffering. It is hypothetically possible that frustration caused by the inability to reduce damages could lead to illegal use of methods such as chemical toxicants or other inhumane and unethical methods which could result in increased animal suffering. Thus, WS believes it would be likely that more animal suffering could occur under this alternative.

3.1.3 Alternative 3 – Only Nonlethal FSDM Methods Used by WS

This alternative would require WS to use only non-lethal methods to resolve feral swine damage problems. Non-lethal methods available for use by WS under this alternative would include various live capture techniques as well as hazing or harassment methods, such as propane exploders, pyrotechnics, and other scare devices. This alternative would not restrict other agencies or private individuals/hunters from using lethal control methods.

Effects on Feral Swine Populations (Under Alternative 3)

Under this alternative, WS would not lethally remove any feral swine. Without WS conducting some level of lethal FSDM activities, private efforts would likely increase. The effect on feral swine populations from private control efforts is unregulated and therefore unknown; however it is likely that this take would increase slightly over alternative 2 because WS could be providing technical advice to other entities conducting lethal control operations. The overall feral swine take could be slightly higher than alternative 2 (no WS program), but likely less than alterative 1 (current program) due to the lack of direct WS involvement in lethal control, there could be similar consequences to alternative 2 (no WS program) such as increased use of illegal or ill-advised methods and or the potential for more feral swine to be relocated.

Effects on Nontarget and T&E Species (Under Alterative 3)

Under this alternative, WS take of nontarget animals would probably be less than Alternative 1 (current program) because no lethal FSDM would be conducted by WS. However, nontarget take would not differ substantially from the current program because the current program takes very few nontarget animals. The impact on nontarget species through private control efforts is unknown because these efforts are not regulated and there is no government oversight of feral swine take on private property. Under this alternative, WS could still assist cooperators with non-lethal techniques and technical assistance, which would provide some technical expertise that may help reduce some risks to nontarget and T&E species. However, the impact on nontarget and T&E species would likely be higher without the direct involvement, expertise and professionalism of WS personnel to conduct lethal removal of feral swine.

Effects on Social and Cultural Values (Under Alternative 3)

Under this alternative, the effects on hunting for subsistence and recreation, as well as animal control activities would be similar to Alternative 2 (no WS program) because WS would not be conducting any lethal control of feral swine and therefore would not directly impact any local feral swine populations. However, WS could still be available to provide technical assistance and other non-lethal methods to assist cooperators with feral swine damage.

Effects on Human Health and Safety (Under Alternative 3)

Using non-lethal methods only would not eliminate problem animals or reduce the local feral swine population resulting in the potential for the damage to continue in areas where only non-lethal methods were being used. Fencing is a non-lethal method and is very effective in eliminating the problem in an enclosed area, but not in adjacent areas. Under this alternative, WS would not be able to continue the current level of disease surveillance activities. This is largely due to the fact that disease surveillance is a by-product of an active direct control program that includes lethal take of feral swine. Wildlife Services could be requested to conduct disease surveillance apart from a direct control program but it would be more costly and the agency is not adequately funded to accomplish disease surveillance in this manner and therefore reduced disease surveillance activities under this alternative would result in increased risks on human health and safety. It is anticipated that under this alternative, fewer feral swine could be removed depending on the level of effort expended by state agencies and the public and therefore risks to human health and safety could increase.

Humaneness / Ethics of FSDM Methods (Under Alternative 3)

Perceptions of the humaneness of a non-lethal methods only FSDM program could be viewed more favorably by some individuals than the Current FSDM Program (Alternative 1); however, to those

individuals who view feral swine as a destructive species that requires control, this alternative may not be viewed as efficient or ethical. This alternative will decrease the number of feral swine lethally removed by WS compared to the current program (Alternative 1), however, other entities, including land owners/managers and private operators, would implement lethal control in place of WS. The humanness of those actions is reliant upon the operator's level of education and skill at using the lethal method. WS employees receive considerable training and stay up-to-date on the current research into humanness of methods, and this level of expertise cannot be guaranteed with non-WS operators. It is also conceivable that due to the lack of WS involvement in lethal control, results could be similar to alterative 2 (no WS program) in that inexperienced personnel conducting lethal control could use illegal, inhumane or unethical methods.

3.1.4 Alternative 4 – Technical Assistance Only

WS would only provide technical assistance for alleviating damage when requested. This alternative would not restrict other agencies or private individuals/hunters from using lethal or non-lethal control methods. The WS program regularly provides technical assistance to individuals, organizations, and other federal, state, and local government agencies for managing feral swine damage. Technical assistance includes collecting information about the species involved, the extent of the damage, and previous methods that the cooperator has attempted to resolve the problem. WS then provides information on appropriate methods that the cooperator may consider to resolve the damage themselves. Types of technical assistance projects may include a visit to the affected property, written communication, telephone conversations, or presentations to groups such as homeowner associations or civic leagues.

This alternative would place the immediate burden of operational damage management work on the resource owner, other governmental agencies, and/or private businesses. Those persons experiencing damage or are concerned with threats posed by feral swine could seek assistance from other governmental agencies, private entities, or conduct damage management on their own. Those persons experiencing damage or threats could take action using those methods legally available to resolve or prevent feral swine damage as permitted by federal, state, and local laws and regulations or those persons could take no action.

Effects on Feral Swine Populations (Under Alternative 4)

Under this alternative WS would have no direct effect on feral swine populations in New Mexico because WS actions would be limited only to providing information on FSDM. By providing technical assistance only to individuals or cooperators, feral swine take should be slightly higher than alternative 2 (no WS program) and would likely be very similar to alternative 3 (non-lethal only by WS). The lack of direct WS involvement in lethal FSDM could also have similar negative consequences such as those explained in alternative 2.

Effects on Nontarget and T&E Species (Under Alterative 4)

Under this alternative WS would have no impact on nontarget species, however, other entities conducting the work may have an increased impact on nontargets. Other factors would essentially be the same as described in Alternative 3 (Non-lethal only).

Effects on Social and Cultural Values (Under Alternative 4)

Under this alternative hunting for recreation, as well as animal control activities would have the same effect as Alternative 2 (No WS program).

Effects on Human Health and Safety (Under Alternative 4)

Providing only technical assistance would have similar effects on managing feral swine damage as Alternatives 3 (Non-lethal only). In general, the risks to human health and safety and the environment from WS using firearms, snares, and cage traps would not occur, and the use of these methods could be slightly less depending on the level of effort expended by the state and private individuals on FSDM. Increased use of firearms by less experienced and trained private individuals would probably occur without WS direct operational assistance which would likely increase human safety risks, similar to Alternative 3. Also, as under Alternative 3, people frustrated from a lack of an organized control effort could resort to the unwise or illegal use of methods that could also have an effect on human safety, pets, and the environment.

Humaneness / Ethics of FSDM Methods (Under Alternative 4)

Under this Alternative, WS would only provide technical assistance to individuals requesting assistance with feral swine damage. Therefore, WS would not use those methods that individuals may consider inhumane, however, such methods are still likely to be employed by private individuals. Use of traps, snares and shooting by private individuals would probably increase. Similar to Alternative 2, this could result in less experienced persons doing control work with similar results. Greater take and suffering of nontarget wildlife could result. It is hypothetically possible that frustration caused by the inability to reduce losses could lead to illegal use of chemical toxicants which might result in increased animal suffering.

3.2 Issues Not Considered for Comparative Analysis

3.2.1 Wildlife Damage is a Cost of Doing Business

WS is aware that some people feel federal FSDM should not be allowed until economic losses reach some arbitrary pre-determined threshold level. One issue identified as a concern is that WS or other entities should establish a threshold of loss before employing lethal methods to resolve damage and that wildlife damage should be a cost of doing business. In some cases, cooperators likely tolerate some damage and economic loss until the damage reaches a threshold where the damage becomes an economic burden. The appropriate level of allowed tolerance or threshold before employing lethal methods would differ among cooperators and damage situations. In addition, establishing a threshold would be difficult or inappropriate to apply to human health and safety situations. For example, vehicles striking feral swine can lead to property damage and can threaten occupant safety. Therefore, addressing the threats of feral swine accidents prior to an actual accident occurring would be appropriate.

3.2.2 Cost-benefit Analysis of FSDM

The CEQ does not require a formal, monetized cost-benefit analysis to comply with NEPA. Consideration of this issue is not essential to making a reasoned choice among the alternatives WS is considering. However, the methods determined to be most effective to reduce damage and threats to human safety caused by feral swine and that prove to be the most cost effective would likely receive the greatest application. As part of an integrated approach and as part of the WS Decision Model, evaluation of methods would continually occur to allow for those methods that were most effective at resolving damage or threats to be employed under similar circumstance where feral swine were causing damage or posing a threat.

3.2.3 Resources Not Affected by the Proposal

The actions discussed in this EA involve minimal to no ground disturbance or construction, and will not alter or destroy property, habitats, or landscapes. Any ground disturbance would be extremely minor (from the use of vehicles or setting corral traps). When habitat modification is recommended it is almost always conducted by the landowner and is subject to all federal, state and county laws, regulations, and permits. The proposed methods do not have the potential to introduce visual, atmospheric, or audible elements to areas in which they are used that could result in effects on the character or use of historic properties. In addition, the following resource values are either not affected, or are not expected to be significantly affected by any of the alternatives analyzed: soils, geology, minerals, water quality/quantity, flood plains, wetlands, air quality, prime and unique farmlands, aquatic resources, vegetation, and historic or cultural resources. Other than the minor uses of fossil fuels for normal operations, there are no irreversible or irretrievable commitments of resources.

3.2.4 Donation of Feral Swine Taken by FSDM for Human Consumption

The Federal Meat Inspection Act (FMIA) applies to all meat or products obtained from any cattle, sheep, swine, goat, horse, mule, or other equines intended for distribution in commerce. Animals falling under jurisdiction of the FMIA must be inspected pre- and post mortem. Animals that are killed before they reach a slaughter facility are classified as "adulterated meat", and cannot be used for human food per the FMIA. Feral swine fall under authority of the FMIA, and therefore could only be donated to charitable organizations for use as food by needy individuals if they are delivered alive to a USDA approved feral swine slaughter facility. Transporting live feral swine to slaughter facilities also increases the potential for spreading disease to domestic swine at facilities were swine are being held prior to slaughter. Donated feral swine are not eligible for an inspection exemption due to 21 USC 464(c) and §623(a). Therefore, feral swine would not be donated to food banks.

3.2.5 Climate Change Analysis of FSDM

The State of the Climate in 2012 report indicates that since 1976, every year has been warmer than the long-term average (Blunden and Arndt 2013). Global surface temperatures in 2012 were among the top ten warmest years on record with the largest average temperature differences in the United States, Canada, southern Europe, western Russia and the Russian Far East (Osborne and Lindsey, 2013). Impacts of this change will vary throughout the United States, but some areas will experience air and water temperature increases, alterations in precipitation and increased severe weather events. The distribution and abundance of a plant or animal species is often dictated by temperature and precipitation. According to the EPA (2013), as temperatures continue to increase, the habitat ranges of many species are moving into northern latitudes and higher altitudes. Species adapted to cold climates may struggle to adjust to changing climate conditions (e.g., less snowfall, range expansions of other species).

WS-New Mexico considers the best available information when assessing program impacts on the environment, thus new information about climate effects on vulnerable resources would be considered appropriately. Currently, evidence for effects from global climate change from or to current or proposed FSDM activities in New Mexico is lacking. Consequently, WS-New Mexico expects no climate-related impacts to or from its proposed activities. WS-New Mexico remains committed to monitoring program effects on target species and on other environmental resources, in coordination with the appropriate resource management agencies. Finally, by keeping ESA Section 7 consultations with the USFWS up-to-date (Section 3.1.1), WS-New Mexico ensures that its FSDM activities would not jeopardize even the most vulnerable species.

3.3 Summary of Impacts

3.3.1 Alternative 1 – Continue the Current WS Program (No Action)

Effects on Feral Swine Populations

The New Mexico Livestock Board, the NMDA and other State agencies such as NMDGF would prefer that feral swine be eradicated from the State because it is an invasive species and as noted in section 1.2 have caused considerable damage in the state.

With the development of the National Feral Swine Damage Management Program (NFSDMP) in 2014, a primary objective was to stabilize and eventually reduce the range and size of feral swine populations in the United States and territories in accordance with management objectives of states, territories and tribes. In New Mexico, the stated goal is eradication. Prior to the development of the NFSDMP, eradication, although a stated goal, did not appear to be feasible given existing funding levels. However, increased support through the NFSDMP to New Mexico has allowed the real possibility of eradication in the state.

In 2013, New Mexico increased its surveillance efforts of feral swine in the state. WS-New Mexico identified 17 counties with the presence of feral swine. Sixteen of those counties have been actively worked by WS to remove feral swine. As noted in Figures 5, 7 & 8, control efforts increased in 2013 as feral swine were discovered during enhanced surveillance. Feral swine numbers have increased steadily over the last decade in New Mexico, however, control efforts have increased as well.

Based on case histories and literature reviews, extirpation from the state will be difficult but not impossible. WS believes that with adequate funding and personnel, New Mexico can extirpate the majority of its feral swine population and resort to dealing with and managing immigrating feral swine from the Texas and Mexican border.

Effects on Nontarget and T&E Species

The majority of WS FSDM projects involve protecting property, health and safety and are generally in agricultural areas. Before FSDM activities are conducted in natural areas or wildlife areas managed by state, federal or military agencies, WS requires the requester to comply with NEPA and the ESA by consulting with USFWS. WS has consulted with USFWS on all FSDM project areas and implement a variety of measures to ensure no T&E species are negatively impacted by FSDM.

Effects on Social and Cultural Values

Social impacts generally refer to actions that may alter the way in which people live, work, play, relate to one another, and organize to meet their needs as members of society. The term also includes cultural impacts involving changes to the norms, values, and beliefs that guide and rationalize their perception of themselves and their society.

A common problem with feral swine is that people move them to expand their population to increase hunting and harvest opportunities. In 2009, the New Mexico state legislature passed a law making it illegal to import, hold, release or sell feral hogs or operate a commercial wild hog hunt. Some people could perceive that removing feral pigs for damage management activities would affect sport hunting opportunities. It is unlikely that the proposed alternative impacts sport hunting opportunities.

Although feral swine are an introduced invasive species to New Mexico, and are not classified as game animals or under the jurisdiction of the NMDGF, feral swine negatively impact native wildlife managed by

NMDGF and the expansion of this invasive species concerns them. Moreover, NMDGF supports effective measures to minimize or eliminate damage caused by feral swine populations in New Mexico.

Effects on Human Health and Safety

The proposed FSDM methods pose minimal threat to human health and safety. No adverse effects on human health and safety have occurred or have been reported to occur from WS' use of FSDM methods. FSDM operations are implemented only by request, and only as specified in MOUs, cooperative service agreements, or similar documents developed in coordination with land owners and managers. WS employees who conduct FSDM activities are knowledgeable in the safe and effective use of the methods and use them under specific WS Directives. Safety considerations are always considered in the decision making process as outlined in the WS Decision Model. Safety risks depend not only on the method used, but also on the location and timing of use. Property ownership or jurisdiction and land use are considered in assessing safety risks.

Humaneness / Ethics of FSDM Methods

Current considerations for the perspectives on the ethics or humaneness of feral swine control activities would continue under this alternative. WS would continue to follow all applicable policies, guidelines and WS directives when conducting any future feral swine damage management. The current FSDM program in New Mexico is ethical and human. However, because no changes to current approaches would be made, groups or individuals who generally object to the ethics or humaneness of current WS activities, would likely continue to object this alternative.

3.3.2 Alternative 2 – No Wildlife Services Program

Effects on Feral Swine Populations

WS would have no effect on the feral swine population in New Mexico. Private efforts to reduce or prevent feral swine damage would likely increase but without any involvement from WS (direct control or technical assistance) overall private efforts would likely be less successful which could result in slightly less feral swine take than that under Alternatives 1, 3 and 4.

Effects on Nontarget and T&E Species

WS would have no effect on nontarget species or T&E species. Negative impacts to livestock or native species may increase without WS control actions. Private control operators are not required to consult with the USFWS when engaged in FSMD activities that may be frequented by T&E species and may cause more disturbances to these species than WS.

Effects on Social and Cultural Values

Wildlife Services would have no effect on the social or economic resources associated with feral swine under this alternative. Some members of the public expect government agencies to assist with wildlife damage management. This alternative would not fulfill that expectation in terms of providing a federal source for assistance. Economic damages would be expected to continue or increase without assistance.

Effects on Human Health and Safety

Under this alternative it is possible that less experienced personnel implementing FDSM methods could lead to greater risk to human health and safety than a federal FSDM program. APHIS-WS personnel are required to adhere to specific requirements for training and certification in the use of several FSDM

methods. Hazards to human health and safety could be greater under this alternative if the personnel implementing do not have the same level of training in FSDM methods as APHIS-WS personnel. As noted in the need for action, FSDM is also conducted in some areas to reduce risks to human and pet health and safety from feral swine-vehicle collisions, transfer of zoonotic diseases and aggressive feral swine. Without a federal FSDM program it is likely that these risks may not be addressed as effectively.

Humaneness / Ethics of FSDM Methods

Under this alternative, methods viewed by some persons as inhumane would likely be employed by private individuals. Use of traps, snares and shooting by private individuals would probably increase. This could result in less experienced persons doing the control work and consequently could cause an increase in nontarget take of wildlife and potentially greater animal suffering.

3.3.3 Alternative 3 – Only Nonlethal FSDM Methods Used by WS

Effects on Feral Swine Populations

The effect on feral swine populations from private control efforts is unregulated and therefore unknown, however, it is likely that this take could increase slightly over alternative 2 (No WS program) because WS would be available to provide technical assistance to other entities conducting lethal control operations.

Effects on Nontarget and T&E Species

The impact on nontarget species through private control efforts is unknown because these efforts are not regulated and there is no government oversight of feral swine take on private property. The impact on nontarget species could be higher without the involvement, expertise and professionalism of WS personnel.

Effects on Social and Cultural Values

Without the ability to use lethal control, it is unlikely that cooperators would use WS to protect resources. Resource damages could be higher or cost the cooperator more if reliance on private providers is the only choice. Private providers would not be regulated and are not accountable to the public. Effects under this alternative would be similar to alternative 2 (No WS program).

Effects on Human Health and Safety

Using non-lethal methods only would not eliminate problem animals or reduce the feral swine population resulting in the potential for the damage to continue in areas not subject to such action. Wildlife Services would not be expected to continue the current level of disease surveillance activities under this alternative, since a large part of disease surveillance is a by-product of an active direct control program with lethal take.

Humaneness / Ethics of FSDM Methods

This alternative will decrease the number of feral swine lethally removed by WS compared to the current program (Alternative 1), however, other entities, including land owners/managers and private operators, would implement lethal control in place of WS. Due to the lack of WS involvement in lethal control, results could be similar to alterative 2 (no WS program) in that inexperienced personnel conducting lethal control could use illegal, inhumane or unethical methods.

3.3.4 Alternative 4 – Technical Assistance Only

Effects on Feral Swine Populations

WS would have no effect on feral swine populations in New Mexico because WS action would be limited only to providing information on FSDM. The effects on the population by other entities conducting operational work in the absence of WS operations would be similar to Alternatives 2 and 3.

Effects on Nontarget and T&E Species

WS would have no impact on nontarget or T&E species, however, other entities conducting the work may have an increased impact on T&E or other nontarget species.

Effects on Social and Cultural Values

Without the ability to use lethal control, it is unlikely that cooperators would use WS to protect resources. Resource damages could be higher or cost the cooperator more if reliance on private providers is the only choice. Private providers would not be regulated and are not accountable to the public.

Effects on Human Health and Safety

Providing only technical assistance would have a very similar effect on managing feral swine damage as Alternative 3 (Non-Lethal Methods Only). The effects on disease issues would also be similar to what was described in Alterative 3.

Humaneness / Ethics of FSDM Methods

WS would only provide technical assistance to individuals requesting assistance with feral swine damage. Therefore, WS would not use those methods that individuals may consider inhumane, however, such methods are still likely to be employed by private individuals. Greater take and suffering of nontarget wildlife could result. It is possible that frustration caused by the inability to reduce feral swine damages could lead to illegal use of chemical toxicants or other illegal methods which might result in increased animal suffering.

3.3.5 Summary Table

Table 4: Summary of Environmental Effects by Alternative

Environmental Resource	Alternative 1: Continue the Current WS Program	Alternative 2: No WS Program	Alternative 3: Only Nonlethal FSDM Methods Used by WS	Alternative 4: Technical Assistance Only
Effects on Feral Swine populations	Localized extirpations, possible eradication from the state.	No effect, possible increase.	No effect, possible increase.	No effect, possible increase.
Effects on Nontarget and T&E Species	No effect, Not likely to adversely affect, Not likely to Jeopardize	No effect, possible increased disturbances to T&E species due to lack of federal involvement.	No effect, possible increased disturbances to T&E species due to lack of federal	No effect, possible increased disturbances to T&E species due to lack of federal

			involvement in direct control methods.	involvement in direct control methods.
Effects on Social and Cultural Values	No adverse effect on recreational hunting.	No adverse effect.	No adverse effect.	No adverse effect.
Effects on Human Health and Safety	No adverse effect.	Possible greater risk to human health and safety due to less experienced individuals implementing FSDM methods.	Possible greater risk due to lack of disease monitoring by WS.	Possible greater risk due to lack of disease monitoring by WS.
Humaneness / Ethics of FSDM Methods	Current program is ethical and humane. Professional involvement in FSDM ensures humane methods.	Possible increase of less humane methods due to lack of federal involvement.	Possible increase of less humane methods due to lack of federal involvement with lethal methods.	Possible increase of less humane methods due to lack of federal involvement with lethal methods.

3.4 Conclusions

The action proposed by this environmental assessment is the implementation of an Integrated Pest Management approach to control the damage of and potentially eliminate feral swine in New Mexico. The proposed action is intended to provide benefit to New Mexico's economy and ecology by reducing negative economic and environmental impacts from feral swine damage. All feral swine control activities that may take place will comply with relevant laws, regulations, policies, orders, and procedures, including the Endangered Species Act, Migratory Bird Treaty Act, and FIFRA. The current program alternative provides the lowest overall negative environmental consequences combined with the highest positive effects.

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APPENDIX B. Responses to Public Comments

WS made the EA available to the public for review and comment by a legal notice published in the Albuquerque Journal from July 24, 2020 through July 26, 2020, and the Santa Fe New Mexican from July 22, 2020 through July 24, 2020. WS made the EA available to the public for review and comment on the APHIS website on July 20, 2020 and on the federal e-rulemaking portal at the regulations.gov website beginning on July 17, 2021. WS also sent out direct mailings to local known stakeholders and an electronic notification to stakeholders registered through the APHIS Stakeholder Registry. The public involvement process ended on August 31, 2020.

During the public comment period, WS received four comment responses on the draft EA. Comments are summarized here along with WS' responses.

Comment – The commenter supports the implementation of Alterative 1 which continues the current integrated programmatic approach to manage feral swine damage and to continue the effort to extirpate them from New Mexico.

Response: WS developed alternative approaches to meet the need for action and to address the identified issues associated with managing damage caused by feral swine. If WS implements Alternative 1, WS would continue the current integrated methods approach to manage damage caused by feral swine while continuing the effort to eliminate feral swine from New Mexico. Section 3.1 analyzes the environmental consequences of each of the alternative approaches in comparison to determine the extent of actual or potential impacts on the issues, including Alternative 1. Based on the analyses of the alternative approaches that WS developed in detail within the EA, including individual and cumulative impacts of those alternative approaches, WS will issue a decision for the final EA.

Comment – WS should consider implementing a bounty program to address feral swine in New Mexico.

Response: As discussed in the EA, Section 2.8.3 considers a bounty program but provides rationale for not considering it in detail.

Comment – WS sneaks into areas with no notice to anyone.

Response: WS only provides assistance after receiving a request for such assistance and only after the entity requesting assistance and WS sign a work initiation document. Therefore, the decision-maker for what activities WS conducts is the entity that owns or manages the affected property. The decision-makers have the discretion to involve others as to what occurs or does not occur on property they own or manage. Therefore, in the case of an individual property owner or manager, the involvement of others and to what degree they involve others in the decision-making process would be a decision made by that individual. Section 2.4 in the EA discusses WS' co-managerial approach to making decisions.

Comment – WS should not use taxpayer funding.

Response: WS identified an alternative approach that would involve no Wildlife Services program (see Section 3.1.2) which would essentially be no taxpayer funding. Three other alternatives were also

considered in the EA. Each alternative provides rationale for their implementation and is summarized in Section 3.3.

Comment – The commenter provided recently published information about the projected amount of damage feral swine cause by vehicular accidents in the United States.

Response: WS reviewed the information and determined it did not substantially change the information in the EA but did decide to include the information into the EA. WS thanks the commenter for the information.