Supplemental Staff Report Supporting CEQA Exemption

TO: Shasta County Board of Supervisors

FROM: Paul Kjos, Agricultural Commissioner

DATE: January 25, 2017

SUBJECT: Wildlife Services program/CEQA compliance

Wildlife damage management is the science of reducing damage or other problems associated with wildlife and is recognized as an integral part of wildlife management, including reducing human/wildlife conflicts. (The Wildlife Society 2010). Responsible wildlife management requires adherence to the following professional standards: (1) develop and promote sound stewardship of wildlife resources and the environments upon which wildlife and humans depend, (2) undertake an active role in preventing human-induced environmental degradation, (3) increase awareness and appreciation of wildlife values, and (4) seek the highest standards in all activities of the wildlife profession. (The Wildlife Society 2010, USDA 2015c [2015 Pre-Decision Environmental Assessment (EA) in the North California District APHIS-WS Program [North District EA] (USDA 2015c)], p. 9.)[1]

The United States Department of Agriculture (USDA), Animal and Plant Health Inspection Services (APHIS), Wildlife Services (collectively, "Wildlife Services") is authorized by law with managing a program to reduce human/wildlife conflicts.[2] Various statutes and regulations,

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[1] The North District EA was prepared by United States Department of Agriculture (USDA), Animal and Plant Health Inspection Services (APHIS), Wildlife Services (collectively, "Wildlife Services") to analyze the potential environmental impacts associated with mammal damage management in the North California District Wildlife Services program. The North California District includes Shasta County. (USDA 2015c, p. 23; USDA 2004a [Biological Assessment for California Wildlife Services program Integrated Wildlife Damage Management, July 8, 2004], p. 56.) The North District EA reflects programs evaluated in two earlier pre-decision EAs for the District: "Predator Damage Management for the Protection of Livestock and Property in the California APHIS-WS North District" (USDA 2003e) and "Mammal Damage Management for the Protection of Human Health and Safety, Property, Agricultural Resources and Natural Resources in California" (USDA 2005d). The North District EA will also supersede a 1997 EA and decision entitled "Wildlife Damage Management for the Protection of Livestock, Property and Human Health and Safety in the California [Animal Damage Control] North District." (USDA 1997a.) The North District EA was released for public comment on June 3, 2015 (http://www.regulations.gov/#!docketDetail;D=APHIS-2014-0052); although the EA is currently in draft form, this supplemental staff report references the data contained in the EA because it constitutes the most current data available.

[2] The Secretary of Agriculture is authorized to carry out wildlife damage management programs necessary to protect the Nation's agricultural and other resources. The Secretary has delegated this authority to APHIS. Within APHIS, the authority resides with the Wildlife Services program. (USDA 2015c, pp. 9-10; see also 7 U.S.C. 426-426c; 46 Stat. 1468 [the Act of March 2, 1931];

including the Wildlife Services Directives, authorize Wildlife Services to enter into Cooperative Service Agreements (Cooperative Agreements) with federal agencies, states, local jurisdictions, individuals, and public and private agencies to reduce the risks of injurious animal species and/or nuisance mammals and birds and those mammal and bird species that are reservoirs for zoonotic disease. (7 U.S.C. 426-426c; 46 Stat. 1468; USDA 2013b; USDA 2015d)

This staff report has been prepared to analyze and address the potential environmental impacts associated with the County's proposed action to continue contracting with Wildlife Services to implement the Integrated Wildlife Damage Management (IWDM) Program, and to determine the appropriate level of environmental review as required by the California Environmental Quality Act (CEQA). As discussed in detail below, County staff recommends the Board of Supervisors authorize Wildlife Services to implement the IWDM Program and adopt a Notice of Exemption finding the County's action exempt from CEQA.

Project Proposal

Wildlife Services is authorized by statute to enter into Cooperative Service Agreements with local jurisdictions to reduce the risks of human/wildlife conflicts. (7 U.S.C. 426-426c; 46 Stat. 1468; USDA 2013b; USDA 2015d) Before wildlife damage management is conducted pursuant to such Cooperative Service Agreements, the local jurisdiction and Wildlife Services must also execute a Wildlife Services Work Plan. (USDA 2015c, p. 11.)

The proposed project is to continue the current and longstanding IWDM Program for protection of livestock, crops, property, human health and safety, and natural resources in the County by entering into the following contracts:

(1) The Cooperative Service Agreement between Shasta County and Wildlife Services (Cooperative Agreement) (Shasta County 2016); and

(2) The Work and Financial Plan between Shasta County and Wildlife Services, for July 1, 2016 – June 30, 2017 (Work Plan) (Shasta County 2016b).

Together, the Cooperative Agreement and the Work Plan maintain the IWDM Program by which the County contracts with Wildlife Services to "protect residents, property, livestock, crops, and natural resources from damage caused by predators and other nuisance wildlife."(Shasta County 2016a; USDA and CDFA Memorandum of Understanding (MOU), p. 2, USDA and CDFW MOU, pp. 1-2.)

Public Law 100-202, Dec. 22, 1987. Stat. 1329-1331 (7 U.S.C. 426c) [the Rural Development, Agriculture, and Related Appropriations Act, as amended in Fiscal Year 2001].)

Environmental Review Required Pursuant to CEQA

Baseline for Environmental Review

CEQA requires a lead agency to analyze impacts of a proposed project on the existing environment. (CEQA Guidelines, § 15125 (a).) The impacts are ordinarily compared to the actual environmental conditions existing at the time of CEQA analysis, or the "baseline" conditions. The general rule is that the baseline must reflect the physical conditions existing at the time environmental analysis begins. (*Communities for a Better Environment v. South Coast Air Quality Management District* (2010) 48 Cal.4th 310, 320, 323.) This is true even if the "current condition" includes unauthorized and even environmentally harmful conditions that never received environmental review, and may never receive environmental review as a result of becoming part of the environmental baseline. (*Citizens for East Shore Parks v. State Lands Com*. (2011) 202 Cal.App.4th 549, 561 (*East Shore Parks*).)

Here, because the project being evaluated is the continuation of the existing IWDM Program, the environmental baseline necessarily includes implementation of the Program in substantially its present form. This is consistent with CEQA and case law establishing that "the baseline for a continuing project is the current environmental condition including the project, even if the project has not undergone prior environmental review." (*Center for Biological Diversity v. Department of Fish and Wildlife* (2015) 234 Cal.App.4th 214, 248; *East Shore Parks, supra*, 202 Cal.App.4th at p. 559.) How the current environmental condition came to exist "is irrelevant to CEQA baseline determinations – even if it means preexisting development will escape environmental review under CEQA." (*East Shore Parks, Supra,* 202 Cal.App.4th at p. 559.)

CEQA Exemptions

The Legislature has provided that certain projects are statutorily exempt from CEQA review. In addition, the CEQA Guidelines list a number of categorical exemptions of "classes of projects" that the Resources Agency has determined to be exempt from CEQA review because they do not have a significant effect on the environment. A project that does not qualify for either a statutory or categorical exemption may nevertheless be exempt from CEQA under what is known as the "common sense exemption," which applies "where it can be seen with certainty that there is no possibility that the activity in question may have a significant effect on the environment." (*Muzzy Ranch Co. v. Solano County Airport Land Use Com*. (2007) 41 Cal.4th 372, 386, fn. 5 (*Muzzy Ranch*).)

Categorical exemptions are subject to certain exceptions. (CEQA Guidelines, § 15300.2.) For example, a categorical exemption "shall not be used for an activity where there is a reasonable possibility that the activity will have a significant effect on the environment due to unusual circumstances." (*Id*, subd. (c).) Although the Guidelines do not define the term "unusual circumstances," case law has interpreted that term as meaning "some feature which is unusual relative to the typical circumstances related to an otherwise typically exempt project," such as the project's size or location (*Berkeley Hillside Preservation v. City of* Berkeley (2015) 60 Cal.4th 1086, 1105 (*Berkeley Hillside*); *Santa Monica Chamber of Commerce v. City of Santa Monica* (2002) 101 Cal.App.4th 786, 801;.)

The project has been found to be categorically exempt under CEQA Guidelines sections 15307 and 15308; and exempt under the "common sense exemption" pursuant to CEQA Guidelines section 15061(b)(3). There are no unusual circumstances triggering an exception to the

categorical exemptions. When a project is found to be exempt, no further environmental review is required. The lead agency need only prepare and file a "notice of exemption," citing the relevant statute or section of the CEQA Guidelines and including a brief statement of reasons to support the finding of exemption. (*CREED-21 v. City of San Diego* (2015) 234 Cal.App.4th 488, 501.) The applicable exemptions and supporting statement of reasons are provided below.

Section 15061 (b)(3) Exemption ("Common Sense")

The project is exempt from CEQA pursuant to the "common sense" exemption under CEQA Guidelines section 15061(b)(3) because substantial evidence shows with certainty that there is no possibility that the IWDP Program might have a significant effect on the environment. (*Muzzy Ranch, supra,* 41 Cal.4th at p. 380; *Berkeley Hillside, supra,* 60 Cal.4th at p. 1098.) Substantial evidence supporting this conclusion includes, but is not limited to:

1. The IWDM Program has been implemented continuously over the last 17 years and there is no evidence that the Program has had an adverse effect on the environment.

    - Wildlife Services works in partnership with other federal and state agencies that have legal jurisdiction over land management, wildlife and other resources, and its activities are conducted in accordance with applicable federal, state and local laws, cooperative agreements, agreements for control, MOUs, and other applicable documents.

    - In 1919, the first cooperative predator control program between the federal government (through the U.S. Biological Survey) and Counties began; the U.S. Biological Survey and County supplied funds to employ hunters and trappers. Shasta County began its own Predatory Animal Damage Control Program in 1961. The existing Predatory Animal Damage Control Program began in 1998. A formal Cooperative Agreement was adopted by Shasta County and Wildlife Services in 1998, providing the framework for the current management program. The Cooperative Agreement was in place from 1998 through 2014. In June 2014, the County entered into a new Cooperative Agreement with a one-year term.

    - The proposed project is an IWDM Program that encourages the use of all effective and appropriate legally available techniques and methods, used singly or in combination, to meet the needs of the requestors for resolving conflicts with wildlife. Using IWDM strategy effectively is the task of Wildlife Services personnel who are trained professionals and equipped to handle damage situations. The resource, species, location, type of damage, and the available biologically sound, cost-efficient and legal methods are analyzed by District personnel prior to use to determine the best action to take to reduce or eliminate a conflict with wildlife.

    - The strategies used to resolve wildlife problems in the IWDM Program include technical assistance (education, information and advice) and operational management. Technical assistance is the primary method used in responding to requests for assistance. The implementation of technical assistance recommendations is the responsibility of the requestor based on information, demonstrations, and advice on available and appropriate wildlife damage management demonstration son the proper use of management devices and information on animal husbandry, habitat management, and animal behavior

modification that could reduce damage. As a last resort, operational management assistance is initiated when a problem cannot be effectively resolved through technical assistance. The nature, history, and extent of the problem, species responsible for the damage, and methods available to resolve the problem are documented. Wildlife Services considers the biology and behavior of the damaging species and other factors. The recommended strategy(ies) may include any combination of preventive and corrective actions that could be implemented by the requester, Wildlife Services, or other agency personnel, as appropriate.

- CDFW concluded in 2004 that the total number of all target species taken by California Wildlife Services and all other known mortality was within sustainable harvest levels. (CDFW 2004.) This conclusion was confirmed in the recently released North District EA. (USDA 2015c, p. 91.) The species subject to wildlife damage control efforts are common species that are not listed as threatened, endangered, or fully protected species. Project effects are limited to the immediate project area, and cumulatively, do not affect the viability of any population in the state. California Wildlife Services conforms to all federal and applicable state regulations and policies that protect target species. (USDA 2015c, pp. 47-48.)

- California Wildlife Services determined the District program would have no effect on any listed fish, invertebrate, marine animal or plant species because it does not affect habitat or does not work in the range of the species. Wildlife Services consulted with both USFWS and CDFW regarding its wildlife management activities. Both USFWS and CDFW concurred with California Wildlife Services' determination that the District program is not likely to adversely affect federal or state listed threatened and endangered species. No non-targeted listed threatened or endangered species have been taken by the ongoing District program. (USDA 2015c, p. 75.)

- As the agency tasked with protection of species in the State of California, CDFW issues individual depredation permits after confirming damage or nuisance by a problem animal. Requirements such as method of carcass disposal, use of traps, and specified or prohibited kinds of traps or ammunition are identified in the permit, as well as the time period for which the permit is valid. The most recent reporting data indicates that during the 2013-2014 bobcat harvest, an estimated 1,639 bobcats were taken statewide; in Shasta County, 1 bobcat was taken by Wildlife Services. The 2011-2012 feral pig hunting season resulted in 60,349 wild pig permits, of those only 2,948 were successful takes; only 1 feral hog per year is taken over the time period of June 2010 to July 2014.(CDFW 2012.) The 2013-2014 take of black bears in Shasta County was 6 while the number of individual bear permits issued statewide was 209. (CDFW 2011c.) In 2013, 137 individual mountain lion permits were issued statewide, 14 of which were from Shasta County. (CDFW 2015e.)

- Statewide, the number of non-target animals killed and/or caught and released unharmed in the District under the Wildlife Services program in 2013 represented less than 1% of the total California Wildlife Services take. The number of non-target animals killed statewide is extremely low (18 freed and one raccoon and one skunk

killed.) With emphasis on cage trapping in urban areas, many captured non-target animals can be released unharmed. In Shasta County from 2012-2014, only four non-target animals were trapped (one fox and three opossum) and all were released unharmed. (USDA 2015e, USDA 2015f)

2. The IWDM Program is subject to environmental review under existing state and federal statutory schemes and, as such, there is no possibility that the IWDM Program might have a significant effect on the environment.

    - The MOUs and federal law provide that the performance of wildlife damage management activities by Wildlife Services is subject to compliance with federal environmental laws, including NEPA, the Federal Endangered Species Act, and any other applicable environmental statutes. To this end, the USDA/APHIS prepared an Environmental Impact Statement for the Animal Damage Control program in 1994. Moreover, the North District EA was prepared by Wildlife Services to analyze the potential environmental impacts associated with mammal damage management in the North California District Wildlife Services program.

    - There has been close to three decades of environmental review under existing and state federal statutory schemes, including but not limited to: Draft Environmental Document: Environmental Checklist for Changes to the 1988-89 Hunting and Trapping Regulations. (CDFW 1988); California Department of Fish and [Wildlife] Final Environmental Document 2003 – Wild Pig Hunting (CDFW 2003); Draft Environmental Document, Sections 265, 460-467, and 472-480, Title 14, California Code of Regulations Regarding Furbearing and Nongame Mammal Hunting and Trapping (CDFW 2004); Draft Environmental Document: Sections 365, 366, 367.5, 401, 708 Title 14, California Code of Regulations Regarding Bear Hunting (CDFW 2011a); Environmental Assessment: Predator Damage Management for the Protection of Livestock and Property in the California APHIS-WS North District (USDA 1997a); Animal Damage Control Program Final Environmental Impact Statement (1997b); Cooperating Agency Review Draft, Environmental Assessment, Mammal Damage Management in the Wildlife Service's Program's North District, California (2013a); Pre-Decisional Environmental Assessment: Feral Swine Damage Management by the California Wildlife Services Program (2014c); and Draft Environmental Impact Statement: Feral Swine Damage Management, a National Approach (2014b).

    - CDFW is the agency that is charged with protecting natural resources throughout the state. (Fish & G. Code, § 1802.) CDFW, not the County, issues depredation permits for the IWDM Program. Specifically, CDFW issues depredation permits for black bear, mountain lions, feral pigs, bobcats, beavers, deer, elk, and turkeys. (CDFW 2015d, Garcia 2014.) Individual depredation permits are issued by a CDFW biologist or game warden after confirming damage or nuisance by a problem animal. (CDFW 2015d.) Requirements such as method of carcass disposal, use of traps, and specified or prohibited kinds of traps or ammunition are identified in the permit, as well as the time period the permit is valid for. (CDFW 2015d.) CDFW's implementing regulations identify the issuance of a depredation permit as a ministerial action. (§ 757, subd. (b)(4).)

Class 7 and Class 8 Categorical Exemptions ("Actions by Regulatory Agencies to protect natural resources and the environment")

The project is exempt from CEQA pursuant to the Class 7 and Class 8 categorical exemptions as classes of projects undertaken by regulatory agencies to protect natural resources and the environment. Substantial evidence supporting this conclusion includes, but is not limited to:

1. The purpose of the IWDM Program is to "protect residents, property, livestock, crops, and natural resources from damage caused by predators and other nuisance wildlife."

    - The fundamental intent of the program is to reduce human-wildlife conflicts. Wildlife Services is tasked with managing the damage caused by such conflicts. The Wildlife Services program provides services at the request of affected land owners and/or resource managers. Wildlife Specialists provide a higher percentage of their services to agricultural property owners on ranchlands, vineyards and commercial timberlands throughout the County. In the urban setting, the Wildlife Specialists engage in wildlife exclusion, technical assistance, and removal of problem wildlife for resource owners that are experiencing damage or conflicts. Occasionally the Wildlife Specialists will also provide assistance to public land managers to control problem wildlife. This management approach aims to reduce or eliminate wild animal damage to agricultural products, human health and safety, property, natural resources, and reduce the environmental effects from wildlife damage management activities while operating within applicable Federal, State, and local laws and regulations.

    - The IDWM has helped reduce human-coyote interaction. Coyote attacks on humans have increased in many urban fringe areas as well as urban and suburban areas in California. There have been 111 coyote attacks on humans resulting in injuries to 136 individuals in California from 1977 through 2004. (Timm et al. 2007.) The majority of the attacks occurred in the last 10 years, indicating that the problem is increasing. (Timm et al. 2003; Timm et al. 2007.) Wildlife Services' assistance in reducing wildlife disease risks through surveillance, monitoring and response helps safeguard humans from the threat of zoonotic diseases and bioterrorist threats by responding to requests for assistance through the IWDM Program. (USDA 2015c, p. 18; see also Burroughs 2002.)

    - Conflicts between humans and wildlife are common in the County. Damaging wildlife in Shasta County include a range of species that prey on livestock and wildlife, cause property and other resources damage and threaten human health and safety. The IWDM Program provides assistance to protect livestock, crops, human health and safety and property from wildlife damage.

    - Total agricultural losses in Shasta County were $330,211 in fiscal year 2013-2014; of total agricultural losses, reported livestock loss totaled approximately $40,552 in fiscal year 2013-2014 (USDA 2015m). Agricultural loss numbers are not representative of the actual damage that has occurred. Actual damages are higher than those reported to the State or District, because only a fraction of the total losses attributable to predators is reported or confirmed by Wildlife Services.

The numbers would be considerably higher without wildlife management programs such as the proposed Shasta County IWDM Program. (USDA 2015c, p. 15.)

2. Natural resource and environmental protection offered by the Wildlife Services program can take many forms, including protecting our forests, protecting Threatened and Endangered species, protecting wetlands and reducing erosion.

    - The WS program can alleviate predator pressures on threatened and endangered species, when necessary. For example, if muskrats are found destroying or altering the riparian environment of the Shasta crayfish, the program could be engaged to control those predators to increase the survivability of the special status species.

    - Typically, feral swine root extensively in concentrated areas, causing significant soil displacement and killing shallow-rooted plants that are in the area. These disturbed sites are more susceptible to erosion and provide loose soil that can easily move off-site as a sediment discharge into waterways. These impacts occur more frequently where moist soil is present, like riparian areas and vernal pools. Trapping feral swine and removing them from problem areas therefore protects natural resources.

    - California native habitats have only recently become home to large populations of feral swine. Feral swine consume up to 1,300 pounds of food per year, affecting the food chain necessary to maintain species diversity and stable populations. Management of feral swine may help reduce food source competition with other species such as deer, turkey, black bear, and squirrels. The IWDM Program enables inexperienced land owners who are not expertly trained to contract with Wildlife Services Specialists, thereby limiting the potential capture of non-target species such as deer, raccoons, foxes, skunks, and opossums. (Larson 2006, p. 296.)

The federal and state environmental documents prepared by Wildlife Services and CDFW, respectively, recognize that part of the purpose of depredation activities is to avoid impacts to listed species under FESA and CESA. The State MOUs also recognize this as a fundamental purpose of the contracts that allow Wildlife Services to operate on state lands. This purpose, coupled with the significant regulatory and environmental protections in place for these activities, supports the County's conclusion that implementation of the IWDM Program serves to maintain the environment subject to rigorous existing environmental protection procedures. The Class 7 and Class 8 exemptions apply to the IWDM Program. (See 14 C.C.R. §§ 15307, 15308; see also *Save the Plastic Bag Coalition v. County of Marin* (2013) 218 Cal.App.4th 209, 228 [county properly determined that ordinance banning plastic bags came within Class 7 and Class 8 exemptions].)

<u>No exceptions to the exemptions apply</u>

Categorical exemptions are subject to certain exceptions. (CEQA Guidelines, § 15300.2.) For example, a categorical exemption "shall not be used for an activity where there is a reasonable possibility that the activity will have a significant effect on the environment due to unusual circumstances." (*Id*, subd. (c).)

The majority opinion in *Berkeley Hillside, supra,* 60 Cal.4th at p. 1086 sets forth a clear two-part test for applying the unusual circumstances exception to projects that the Secretary of the Natural Resources Agency has found do not have significant effects on the environment – in this case, projects that fall within the class 7, class 8 and/or "common sense" exemptions. Under the first prong of the test, the lead agency's determination that a project should not be removed from the exempt class of projects must be supported by substantial evidence. Where the agency's determination is supported by substantial evidence, a court must uphold its determination and there is no further inquiry. As explained by the majority opinion, "reviewing courts, after resolving all evidentiary conflicts in the agency's favor and indulging in all legitimate and reasonable inferences to uphold the agency's finding, must affirm that finding if there is any substantial evidence, contradicted or uncontradicted, to support it. [Citations.] (*Id.* at p. 1114.)

When unusual circumstances *are* established, the second prong of the test is triggered and "[a]n agency must evaluate potential environmental effects under the fair argument standard, and judicial review is limited to determining whether the agency applied the standard 'in [the] manner required by law.'" (Public Resources Code § 21168.5.)

In other words, the traditional substantial evidence standard of review applies to a lead agency's threshold determination whether a project is unusual "In determining whether the environmental effects of a proposed project are unusual or typical, local agencies have discretion to consider conditions in the vicinity of the proposed project." Only if a lead agency concludes unusual circumstances *are* present is the fair argument standard implicated. In that event, "it is appropriate for agencies to apply the fair argument standard in determining whether 'there is a reasonable possibility of a significant effect on the environment due to unusual circumstances.' (Guidelines, § 15300.2, subd. (c).)"

The County has determined that no unusual circumstances exist and thus the categorical exemptions are not subject to any applicable exception. The substantial evidence supporting this determination includes, but is not limited to, the following:

- The Program has been in existence continuously for at least the last 17 years and there is no evidence the Program has had an adverse effect on the environment. As such, depredation activities have been occurring annually for many years and ceasing such activities would in fact result in a "change" to current conditions.

- 35 other counties throughout the State operate the same or similar program and there is nothing unusual about Shasta County's implementation of the Program.

- While death and harm to wildlife may be considered by some as "unusual", the wildlife subject to damage management control measures under the IWDM Program are not threatened, endangered, or fully protected species under state or federal law and therefore are not protected species for purposes of CEQA. In other words, impacts to non-threatened species such as coyotes and muskrats would not be considered significant under CEQA and would not be subject to environmental review; and in fact, in many instances endangered, threatened and fully protected species are afforded further protection as a result of the IWDM Program. Staff has determined that no unusual circumstances exist and thus the categorical exemptions are not subject to any applicable exception.

Maintaining viable populations of all native species is of concern to the public and biologists within the state and federal land and wildlife management agencies, including Wildlife Services and the County. Wildlife Services conforms to all federal and applicable state regulations and policies that protect target species. Wildlife Services gives preference to non-lethal methods where practical and effective (USDA 2009b), and as a result, non-lethal methods are recommended with higher frequency over lethal methods under the current IWDM Program (Harper 2015a).

Purpose of the IWDM Program

As is true throughout the United States, wildlife habitat in the County has been altered as human populations expand and land is used for human needs. These human needs often compete with wildlife, which increases the potential for conflicting human-wildlife interactions. The Wildlife Services program summarizes the relationship of wildlife values and wildlife damage as follows:

> "Wildlife has either positive or negative values, depending on varying human perspectives and circumstances…Wildlife generally is regarded as providing economic, recreational and aesthetic benefits…and the mere knowledge that wildlife exists is a positive benefit to many people. However, the activities of some wildlife may result in economic losses to agriculture and damage to property…Sensitivity to varying perspectives and values is required to manage the balance between human and wildlife needs. In addressing conflicts, wildlife managers must consider not only the needs of those directly affected by wildlife damage but a range of environmental, socio-cultural and economic considerations as well."

(USDA 2015c, p. 9.)

Conflicts between humans and wildlife are common in the County. The purpose of the IWDM Program is to resolve conflicts with selected species that have caused damage to resource owners in the County. Damaging birds and mammals in California include a range of species that prey on livestock and wildlife, cause property and other resources damage and threaten human health and safety. In the North District, CDFW has management authority and responsibility for resident wildlife including furbearers, game species and nongame mammals that cause damage, including: badger, bobcat, coyote, gray fox, red fox, black-tailed jackrabbit, muskrat, Virginia opossum, desert cotton-tail rabbit, raccoon, striped skunk, western spotted skunk, and California ground squirrel. (USDA 2015c, p. 11.) Bobcats may only be taken under permit issued by CDFW either for human health and safety or agricultural and property protection. CDFW can request assistance from Wildlife Services for any species under CDFW's primary responsibility. (USDA 2015c, pp. 12, 13.)

Feral swine, deer, beaver, elk, bobcat, turkeys, mountain lion, black bear and gray squirrel are managed by CDFW pursuant to Fish and Game Code sections requiring CDFW to issue a permit to authorize the removal of individual animals that damage specified resources. (USDA 2015c, p. 23.) Current state policies enable lethal removal of wild pigs by sport hunters and property owners threatened with property damage. (USDA 2014 c)

Coyotes, badgers, skunks, weasels, raccoons, and blackbirds may be taken year-round with no restriction and furbearers can be taken at any time if they are found destroying livestock or

poultry. This is allowed because current population levels of these species can generally sustain a high level of removal without irreparable consequences. (USDA 2015c, p. 42.)

The IWDM Program provides assistance to protect livestock, crops, human health and safety and property from wildlife damage. Wildlife Services' control actions statewide are targeted at offending coyotes, black bears, mountain lions, bobcats, red fox, gray fox, beavers, muskrats, raccoons, striped and spotted skunks, opossums, weasels, badgers, marmots, feral pigs, feral dogs and cats, blackbirds, crows, starlings, gulls, raptors, pigeons, waterfowl and other species that cause damage. (USDA 2004a, p. 57.)

Within the County, the target species for the IWDM Program include coyote, raccoon, muskrat, striped skunk, Virginia opossum, bobcat, feral dogs, gray fox, black bear, mountain lion, feral swine, and blackbirds, cowbirds, sparrows and starlings. (USDA 2015c.) The following sections discuss the various aspects of the IWDM Program, including wildlife damage management to protect agriculture, human health and, property and natural resources.

Wildlife Damage Management to Protect Agriculture

Cattle and calves are most vulnerable to predation (killing, harassment or injury resulting in monetary losses to the owner) during calving, and less vulnerable at other times of the year. However, sheep and especially lambs can sustain high predation rates throughout the year. In California, farmers and ranchers suffered predation losses of cattle and calves valued at more than 4.1 million dollars in 2010 (National Agricultural Statistics Service (NASS) 2011) and sheep and lambs valued at almost 1.4 million dollars in 2009 (NASS 2010). Coyotes were responsible for the majority of cattle, calf, sheep and lamb losses to predators state-wide. (NASS 2010*;* USDA 2015c, pp. 13-14.)[3] In the North District, 1,927 animals (cattle, calves, sheep, lambs, goats, pigs, and poultry) were lost to predation in 2013, and the value of this confirmed and reported livestock loss totaled $188,560. (USDA 2015c, p. 16.)

In the County, total agricultural losses were $330,211 in fiscal year 2013-2014. (USDA 2015 m.) Of total agricultural losses, reported livestock loss totaled $40,552 in fiscal year 2013-2014 (USDA 2015 m) while wildrice operators reported losses in excess of $50,000 from wildlife species (USDA 2015e).

Notably, the livestock loss numbers are not representative of the actual damage that occurred. Actual damages are higher than those reported to the State of California or District, because only a fraction of the total losses attributable to predators is reported to or confirmed by Wildlife Services. Based on scientific studies and recent livestock loss surveys from NASS, Wildlife Services only confirms about 19% of the total adult sheep and 23% of the lambs actually killed by predators. (USDA 2015c, p. 15.) Moreover, these numbers would be considerably higher without wildlife damage management programs such as the IWDM Program proposed in the County. In areas without some level of damage management, studies show losses of adult sheep and lambs can be as high as 8.4% and 29.3%, respectively (Henne 1975, Munoz 1977, O'Gara 1983); other studies indicate that sheep and lamb losses are much lower (2% of adult

[3] In general, coyotes inflict high predation rates on livestock, as evidenced by a study in southern Idaho concluding coyotes accounted for 93% of all predator-killed lambs and ewes in nine sheep bands in shed lambing operations (Nass 1977) and by a similar study in Wyoming concluding coyotes were the predominant predator on sheep. (Tigner et al. 1977.)

sheep, 4.7% of lambs and 0.9% of calves) where damage management is applied. (Nass 1977; Tigner et al. 1977; DeCalesta 1987; USDA 2015c, pp. 13-14.)

Damage inflicted by wildlife upon agricultural operations is not limited to damage to traditional livestock production. The following are examples of other types of damage to agricultural resources: muskrat and ground squirrel damage to hay fields, crops and pastures; coyote, raccoon and ground squirrel damage to vegetable and fruit crops and to irrigation systems; ground squirrel damage to pastures, rangeland and fruit, nut and row crops; and lion, coyote or bobcat predation on small enterprise operations with rabbits, chickens, sheep goats or other animals (USDA 2015c, p. 17). Damages to crops in Shasta County totaled $276,731 in FY 2013-2014 (USDA 2015 m).

Feral swine damage to agricultural resources occurs in several forms, including direct consumption of crops, rooting, trampling and wallowing damage, contamination, perceived damage and predation of livestock. Feral swine readily make use of many crops grown throughout the state. While row crops and hay are common sites for intrusion, feral swine are becoming more common in vineyards and orchards as well. Feral swine are omnivorous and will kill calves and lambs and also occasionally kill adult animals that are vulnerable while giving birth. (Pavlov et al. 1982; Choquenot et al. 1997; USDA 2014c, p. 10.)

One commonly cited national estimate of annual damage to row crops uses an estimate of $200 in agricultural crop damage per feral swine per year and a U.S. feral swine population estimate of 4 million animals to generate a nationwide estimate of $800 million in damages to the U.S. agricultural sector annually. (Pimentel 2005.) This estimate is likely very conservative because it uses a conservative estimate of the national feral swine population and it does not consider livestock predation, disease transmission, or environmental degradation. Damage reported by California agricultural commissioners in 2004 exceeded $2.1 million in 2012 dollars. (Seward et al. 2004; USDA 2014c, pp. 9, 43.) Over the past 7 years, landowners with property ownership totaling less than 2% of the State's total acreage have reported an estimated $4.6 million in feral swine damage to California Wildlife Services. Damages reported to California Wildlife Services represent only a fraction of actual damages occurring throughout the state. (USDA 2014c, p. 10.)

Wildlife Damage Management to Protect Human Health and Safety

Human health and safety concerns include, but are not limited to: animal attacks on humans that result in injuries or death; disease threats from rabies and plague outbreaks where predators act as reservoirs; odor and noise nuisances from skunks and raccoons under houses; and airstrike hazards from coyotes or other predators crossing runways at airports or airbases. Coyotes, raccoons, skunks, opossums, gray fox, bobcats, and free ranging dogs also kill and harass pets, eat pet food and/or pose disease threats to pets and humans. (USDA 2015c, p. 17.) In 2013, North District personnel received reports of 911 wildlife related health and human safety incidents. (USDA 2015c, p. 19.)

Coyote attacks on humans have increased in many urban fringe areas as well as urban and suburban areas in California. There have been 111 coyote attacks on humans resulting in injuries to 136 individuals in California from 1977 through 2004. (Timm et al. 2007.) The majority of the attacks occurred in the last 10 years, indicating that the problem is increasing. (Timm et al. 2003; Timm et al. 2007.) The number of coyote conflicts in California with pets/hobby animals between 1997 and 2004 totaled 3,168, with $684,509 in losses. By comparison, from

2005-2012, that number increased to 11,747 with $909,168 in losses. (MIS 2012.) These studies and others indicate the highly adaptable coyote may be losing its fear of humans, and regard small children as prey. (Baker et al. 1998.)[4]

Wildlife Services also plays an active role in surveillance and monitoring of wildlife diseases such as rabies, plague, Lyme disease, and West Nile Virus. Zoonotic diseases (diseases transmissible from wildlife to humans) are one of the leading infectious causes of illness and death to humans. (Burroughs 2002.) Rabies is frequently carried in skunks, bats, fox and other animals. Plague can be carried in coyotes and other predators, as well as ground squirrels and other rodents. Wildlife Services' assistance in reducing wildlife disease risks through surveillance, monitoring and response helps safeguard humans from the threat of zoonotic diseases and bioterrorist threats by responding to requests for assistance through the IWDM Program. (USDA 2015c, p. 18; see also Burroughs 2002.)

As one example, feral swine can pose a threat to human safety from disease transmission and from being struck by vehicles and aircraft. Feral swine are potential reservoirs for at least 30 viral and bacterial diseases. (Davidson et al. 1997; Samuel et al. 2001; Williams et al. 2001) and 37 parasites (Forrester 1991) that are transmissible to humans. This makes them a serious threat to human health and livestock production. Brucellosis, salmonellosis, toxoplasmosis, trichinosis, bovine tuberculosis, and tularemia are some of the common disease that can be carried by feral swine that are also known to infect humans. (Hubalek et al. 2002; Seward et al. 2004; Stevens 2006.) While transmission of diseases from feral swine to humans is rare (Amass 1998), California has been the site of several foodborne pathogen outbreaks attributed to feral swine. In September 2006, an outbreak of E.coli O157 was linked to consumption of fresh, bagged baby spinach, with 26 states and Canada reporting 205 cases of illness and 3 deaths. (Jay et al. 2007.) The exact mechanism of in-field contamination of the plants is unknown, but potential environmental sources include contaminated fecal material (domestic livestock, wildlife, human), water, soil amendments (compost), or bio aerosols. However, findings of *E. coli* and campylobacter in feral swine feces in the area suggest that they may have contributed to the contamination of the plants. (USDA 2014c, p. 12.) Aside from food safety concerns during this outbreak, several other economic impacts were also discovered including marketability of associated plant crops and land lease losses in areas of known feral swine intrusion. (USDA 2014c, pp. 10, 36.)

Regarding collisions with motor vehicles and aircraft, the California Highway Patrol documents more than 1800 vehicle/animal collisions each year. (CHP SWITRS 2006-2010.) A central coast resident was awarded an $8.6 million settlement from the State of California after his 2003 collision with a feral swine near Carmel. It was determined that the State knew feral swine were crossing this stretch of highway but took no action to prevent it. (USDA 2014c, p. 12.)

Wildlife Damage Management for the Protection of Property

Reports of coyote attacks on pets have steadily risen in the past several years in California, with 62 complaints in 1991 and 582 reports in 2003 (again, many more cases were reported to veterinarians and animal regulation organizations where Wildlife Services has no program in

[4] For example, after a child was killed by a coyote in Glendale, California, city and county officials trapped 55 coyotes in an 80-day period from within ½ mile of the home, an unusually high number for such a small area. (Howell 1982.)

place.) (Baker et al. 1998; USDA 2015c, p. 18.) In 2013, damages to property in the North District totaled $202,000. (USDA 2015c, p. 19.) In Shasta County specifically, reported and verified wildlife damages to property totaled $22,050 in fiscal year 2013-2014. (USDA 2015 m).

The IWDM Program would provide for responses to these complaints, as well as to requests from land and homeowners to alleviate property damage from coyotes, raccoons, skunks and badgers including, but not limited to: damage to golf courses, parks, schools and residential and commercial properties, as well as odor problems and disease threats from burrowing raccoons, skunks, opossums, ground squirrels and badgers; damage to irrigation systems from coyotes biting holes in pipes; and threats to human safety where coyotes and other mammals are present on runways during aircraft takeoffs and landings. (USDA 2015c, p. 18.)

Feral swine behavior during feeding and the search for feed is termed rooting. This activity turns sod and topsoil over which often leaves the area bare of vegetation and susceptible to erosion and colonization of invasive weeds. Feral swine dig or root in the ground with their nose in search of desired roots, grubs, earthworms, and other food sources. When this natural activity takes place in developed areas it results in damage to landscaping, golf courses, roads, drainage ditches and can lead to erosion issues. (USDA 2014c, p. 12.)

Wildlife Damage Management for the Protection of Natural Resources

Natural resources protection in the North District is associated with managing damage from muskrats to protect levees, agricultural fields, residential property, roads, and stream banks and other riparian areas. Muskrats can cause damage to roads, levees, and irrigation systems when they burrow next to roads, bridges and irrigation head gates. They also burrow into stream banks and undermine the integrity of the banks, causing erosion, sedimentation, and collapse of the bank. Muskrats became established in Shasta County after they were brought in to the area in the early 1900s and escaped from fur farms. Historically, muskrats tunneled into levees which has led to the collapse of a levees on the Fall River and on Big Lake. In these areas, the water level was higher than the adjacent lands and the tunneling and subsequent levee failure caused severe flooding. (Storer 1937; USDA 2015c, p. 18.) Reports of damages to natural resources in the North District totaled $13,339 in 2013, while Shasta County specifically reported $5,500 in natural resource damage in 2013-2014 (USDA 2015 m).

Expanding feral swine populations in California and elsewhere are widely viewed as a major conservation problem because of ecological damage. (Mayer et al. 1991; see also Schooley [public comment] 2015.) In areas where population densities are high or predators are absent (most islands), feral pigs can cause a significant conservation problem because they may serve as reservoirs of disease (Pavlov et al. 1992), and their rooting can threaten endemic plant populations (Kastdalen 1982), alter soil processes (Lacki et al. 1983), and enhance the spread of exotic grasses (Aplet et al. 1991). Feral swine may also compete with native species for limited food resources (Ilse et al. 1995) and consume the eggs of ground-nesting birds and reptiles (McFarland et al. 1974; Challies 1975; Cruz et al. 1987; Waithman et al. 1999). (USDA 2014c, p. 10; see also Massei et al. 2004.)

Native species and their habitats evolve together. Since California native habitats have only recently become home to large populations of feral swine, native species have had little time to adapt. Researchers have observed and documented a strong and consistent feral swine-related reduction in the number and size of oak tree seedlings in oak woodland habitats at research sites in California. (Sweitzer et al. 2002.) Research from other areas of North America and

worldwide indicate that lethal management may help reduce ecological damage caused by feral swine. (Choquenot et al. 1993, Engeman et al. 2004.) Feral swine competition for mast crop as a food resource is also of great concern. Mast crops such as beechnut, acorns and hickory nuts are an important food source for deer, turkey, black bear, and squirrels. (Knee 2011.) Each adult feral swine can consume up to 1,300 pounds of mast per year. (Knee 2011.) Consumption of hard mast by feral swine in forests also reduces the potential for forest regeneration, further affecting the food chain necessary to maintain species diversity and stable populations. (Campbell et al. 2009; USDA 2014c, p. 11.)

Plant forage makes up approximately 88% of a feral swine's dietary composition and is consumed year-round. (Mayer et al. 2009.) This high dependence on vegetation may be why feral swine can cause their greatest damage to environmentally sensitive areas. (Campbell et al. 2009.) Feral swine can reduce recruitment of saplings, increase the spread of invasive plants, prevent forest regeneration, reduce seedlings and seedling survival, and eliminate understory. (Campbell et al. 2009.) Rooting behavior by feral swine in beech forest understory was found to be so severe that recovery was unlikely to occur. (Bratton 1975.) Where feral swine reduced herbaceous and belowground vegetation, recovery time was expected to take more than 3 years. (Howe et al. 1981.) Feral swine reduce the amount of vegetative ground cover and leaf litter, reducing the critical microclimatic conditions necessary for seedling establishment and growth in forests. (Chavarria et al. 2007.) In terrestrial plant communities, disturbance can threaten native communities by promoting the spread of invasive, exotic plant species. (Tierney et al. 2006.) Following disturbance through feeding activities by feral swine, the percent cover of native perennial grasses recovered at a consistently slower rate than exotic grasses. (Tierney et al. 2006.) Tierney et al. (2006) also found that removing or reducing the size of feral swine populations is an effective technique for restoring native perennial grasses. (USDA 2014c, p. 10.)

Habitat damage by feral swine is most pronounced in wet environments. (Engeman et al. 2004.) Wet soils may make it easier for feral swine to obtain the foods they favor, such as the roots, tubers and bulbs that are characteristic of many wetland plants. Choquenot et al. (1993) found that there appeared to be a strong correlation between soil moisture and rooting damage. Aquatic macrophytes are a key component of habitat in wetlands, providing both an important food resource and structural complexity to the waterscape for associated biota. (Thomaz et al. 2008.) Macrophytes are an aquatic plant that grows in or near water and are emergent, submergent, or floating. The destruction of wetland vegetation by feral swine was also found to alter production and respiration regimes causing anoxic (depleted of dissolved oxygen) conditions. (Doupe et al. 2010.) Lower dissolved oxygen levels caused chronic sub-lethal effects for the associated biota. (USDA 2014c, p. 11.)

It is difficult to assign dollar amounts to ecological damage, but certainly feral swine damage to threatened and endangered plants is significant if it affects the survival of a species or population. Feral swine also predate native wildlife, especially young and injured wildlife, and ground nesting birds, their nestlings and eggs. (Beach 1993.) Finally, feral swine can be very damaging to different habitats, especially wetlands. Their rooting and foraging can completely destroy the understory in forests and make trees less stable during windstorms. Their wallowing and foraging can also significantly damage wetlands, which may be important for threatened and endangered and sensitive species such as fish. (USDA 2014c, p. 12.)

Notably, some non-target species may actually benefit from feral swine management. As an example, ground nesting bird species such as California quail benefit from any reduction in nest destruction or predation from feral swine. In addition, the reduction of feral swine is beneficial to wetland habitats of threatened and endangered plants, fish, invertebrates, and amphibians such as the California tiger salamander. (USDA 2014c, p. 54.)

The Proposed IWDM Program

The proposed action is to continue the longstanding IWDM Program in the County for the protection of livestock (including bees), crops, property, human health and safety, and natural resources. The objective of IWDM, as conducted in the proposed action, is to minimize loss or the risk of loss to the above resources by responding to all public requests with technical assistance (advice or demonstrations) or operational management. Wildlife Services personnel would provide technical assistance to resource owners covering a variety of methods that could be used to resolve problems and where it is appropriate for the resource owners to resolve the problem themselves. Wildlife Services personnel would also assist resource owners through educational programs on damage identification, prevention, and reduction, and by providing information on management activities such as guard dogs or by temporarily loaning some tools such as cage traps. (USDA 2015c, p. 12.)

Operational assistance would mostly be provided for situations that require the use of methods and techniques that are challenging or unsuitable for the public to implement, especially those that may involve lethal management measures. Resource owners that are provided operational assistance would also be encouraged to use additional management strategies and sound husbandry practices, when and where appropriate, that could potentially further reduce damage. (USDA 2015c, p. 12.)

The proposed project is an IWDM program that encourages the use of all effective and appropriate legally available techniques and methods, used singly or in combination, to meet the needs of the requestors for resolving conflicts with wildlife. Most situations require professional expertise, an organized management effort, and may include the use of several of the available methods to sufficiently reduce or eliminate the damage. Using IWDM strategy effectively is the task of Wildlife Services personnel who are trained professionals and equipped to handle damage situations. The resource, species, location, type of damage, and the available biologically sound, cost-efficient and legal methods are analyzed by District personnel prior to use to determine the best action to take to reduce or eliminate a conflict with wildlife. (USDA 2014d; USDA 2015c, p. 12.)

The strategies used to resolve wildlife problems in the IWDM Program include technical assistance (education, information and advice) and operational management. Technical assistance is the primary method used in responding to requests for assistance. Individuals calling for assistance are given advice and information on ways to reduce predation on livestock, damage to property or avoid attracting nuisance wildlife onto their property. The implementation of technical assistance recommendations is the responsibility of the requester based on information, demonstrations, and advice on available and appropriate wildlife damage management methods provided by Wildlife Services personnel. Technical assistance includes demonstrations on the proper use of management devices (*i.e.,* propane exploders, exclusionary devices, cage traps, etc.) and information on animal husbandry, habitat management, and animal behavior modification that could reduce damage. Technical

assistance is provided following consultation or an on-site visit with the requester, and 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 practical application. (USDA 2015c, pp. 35-36; USDA 2014c, pp. 26-27.)

Operational management assistance is initiated when the problem cannot effectively be resolved through technical assistance. The initial investigation defines the nature, history and extent of the problem, species responsible for the damage, and methods that would be available to resolve the problem. Professional skills of Wildlife Services personnel are often required to effectively resolve problems, or the problem is complex requiring the direct supervision of a wildlife professional. Wildlife Services considers the biology and behavior of the damaging species and other factors. The recommended strategy(ies) may include any combination of preventive and corrective actions that could be implemented by the requester, Wildlife Services, or other agency personnel, as appropriate. (USDA 2015c, p. 36.)

A wide range of methods are available for resource owners and Wildlife Services personnel to use to resolve damage situations. These fall into different categories including: cultural practices (*e.g.*, shed lambing and guard animals); habitat and behavior modification (*e.g.*, exclusion, chemical repellents, and hazing with pyrotechnics); and operational actions (*e.g.*, traps, shooting, and pesticides). Each of these is discussed in more detail below.[5]

Cultural Practices

Animal Husbandry

This category includes modifications in the level of care and attention given to poultry and livestock, shifts in the timing of breeding and births, selection of less vulnerable livestock species to be produced where predation risk is too great, and the introduction of human custodians or guarding animals to protect livestock. The level of care or attention given to livestock may range from daily to seasonal. Generally, as the frequency and intensity of livestock handling increases so does the degree of protection. The risk of depredation can be reduced when livestock are nightly gathered to make them unavailable during the hours when depredating animals are most active. Additionally, the risk of depredation is usually greatest with immature livestock. This risk can be minimized by holding expectant females in pens or sheds to protect females during birthing and by holding newborn livestock in pens for the first two weeks. Shifts in breeding schedules can also reduce the risk of depredation by altering the timing of births to coincide with the greatest availability of natural prey or to avoid seasonal concentrations of predators. (USDA 2014c, p. 29; USDA 2015c, Appendix C p. 9.)

The use of human custodians and guarding animals can also provide significant protection in some instances. The supply of proven guarding dogs is generally quite limited, requiring that most people purchase and rear a pup. Therefore, there is usually a four-to-eight month period of time necessary to raise a guarding dog before it becomes an effective deterrent to predators. Since 25 to 30% of dogs are not successful, there is a reasonable chance that the first dog raised as a protector will not be useful. The effectiveness of guarding dogs may not be sufficient

[5] In addition, Wildlife Services uses Standard Operating Procedures (SOPs) to prevent, reduce or compensate for negative impacts that otherwise might result. SOPs include those recommended or required by regulatory agencies such as Environmental Protection Agency (EPA), as well as specific measures to protect threatened and endangered species. (See USDA 2014c, pp. 37-41 and USDA 2015c, pp. 43-44 for list of general and specific SOPs.)

in areas where there is a high density of predators, where livestock widely scatter in order to forage, or where dog-to-livestock ratios are less than recommended. Guarding dogs often harass and kill non-target wildlife. (USDA 2014c, p. 29.)

Altering animal husbandry to reduce wildlife damage has many other limitations. Nightly gathering may not be possible where livestock are in many fenced pastures and where grazing conditions require livestock to scatter. Hiring extra herders, building secure holding pens, and adjusting the timing of births is usually expensive. The timing of births may be related to weather or seasonal marketing of young livestock. The expense associated with a change in husbandry practice may exceed the savings. (USDA 2015c, Appendix C p. 9.)

Modification of Human Behavior

Wildlife Services may recommend alteration of human behavior to resolve potential conflicts between humans and wildlife. For example, Wildlife Services may recommend the elimination of feeding feral swine if that is occurring. This includes inadvertent feeding by improper disposal of garbage. Feral swine adapt well to living near humans, but their proximity to humans may result in damage to property. However, it is difficult to consistently enforce no-feeding regulations and to effectively educate all people concerning the potential liabilities of feeding wildlife. Another problem with feral swine is that people move them to expand their population to increase hunting and harvest opportunities. Wildlife Services, along with most resource agencies, discourage this practice because it can greatly expand the feral swine population. (USDA 2014c, p. 30.)

As another example, Wildlife Services may recommend the elimination of feeding of wildlife that occurs in parks, forest, or residential areas. Eliminating wildlife feeding and handling can reduce potential problems, but many people who are not directly affected by problems caused by wildlife enjoy wild animals and engage in activities that encourage their presence. It is difficult to consistently enforce no-feeding regulations and to effectively educate all people concerning the potential liabilities of feeding wildlife. (USDA 2015c, Appendix C, p. 9.)

<u>Habitat and Behavior Modification</u>

Exclusion

Physical exclusion (*e.g.*, fences and similar barriers) restricts the access of wildlife to resources. These methods provide a means of appropriate and effective prevention of site specific damage management problems and can reduce the risks of disease transmission between feral swine and domestic animals. Fences constructed of woven wire or multiple strands of electrified wire can be effective in some areas for bear damage to apiaries, but fencing does have limitations. To receive a depredation permit for bear damage to apiaries, the beekeeper is required to have a functional electric fence in place. Even an electrified fence is not predator proof and the expense may exceed the benefit in most cases. If large areas are fenced, the predators have to be removed from the enclosed area to make it useful. Some fences inadvertently trap or affect the movement of non-target wildlife. Physical exclusion methods impede the use of areas by some wildlife species, so use of these methods must be carefully considered especially in areas where migratory mammals, such as mule deer, pass. (USDA 2014c, p. 29; USDA 2015c, Appendix C, p. 10.)

Entrance barricades of various kinds are used to exclude bobcats, coyotes, foxes, opossums, raccoons, or skunks, from dwellings, storage areas, gardens, or other areas. Metal flashing may be used to prevent entry of small rodents to buildings. Sheathing or tree protectors can be used

in some situations to avoid damage to trees but may be impractical where there are numerous trees to protect. (USDA 2015c, Appendix C, p. 10.)

Frightening Devices

Frightening devices may use sound, lights, pursuit or other methods to disperse animals from the area to be protected. These methods are best suited for short-term protection of relatively small areas. Methods which use light and sound such as pyrotechnics and propane cannons are often of limited efficacy because the animals eventually become accustomed to the stimulus and cease to respond to the device. Although frightening devices can be effective for limited areas, there is the risk of relocating the problem from one area to another. (USDA 2014c, p. 29.)

The success of frightening methods depends on animals' fear of, and subsequent aversion to offensive stimuli. Once animals become habituated to a stimulus, they often resume their damaging activities. Persistent effort is usually required to consistently apply frightening techniques and then vary them sufficiently to prolong their effectiveness. Over time, some animals learn to ignore commonly used scare tactics. In many cases animals frightened from one location become a problem at another. The effects of frightening devices on non-target wildlife must also be considered. For example, sensitive birds may be disturbed or frightened from nesting sites. (USDA 2015c, Appendix C, p. 11.)

Electronic Distress Sounds

Distress and alarm calls of various animals have been used singly and in conjunction with other scaring devices to successfully scare or harass animals. Many of these sounds are available in digital format. Calls should be played back to the animals from either fixed or mobile equipment in the immediate or surrounding area of the problem. Animals react differently to distress calls; their use depends on the species and the problem. Calls may be played for short (few second) bursts, for longer periods, or even continually, depending on the severity of damage and relative effectiveness of different treatment or "playing" times. Some artificially created sounds also repel birds in the same manner as recorded "natural" distress calls. (USDA 2015c, Appendix C, p. 11.)

Chemical Repellants

Chemical repellents are compounds that prevent consumption of food items or use of an area. They operate by producing an undesirable taste, odor, feel, or behavior pattern. Effective and practical chemical repellents should be nonhazardous to wildlife; nontoxic to plants, seeds, and humans; resistant to weathering; easily applied; reasonably priced; and capable of providing good repelling qualities. The reaction of different animals to a single chemical formulation varies, and for any species there may be variations in repellency between different habitat types. Development of chemical repellents is expensive and cost prohibitive in many situations. Chemical repellents are strictly regulated, and suitable repellents are not available for many wildlife species or wildlife damage situations. (USDA 2015c, Appendix C, p. 12.)

Aversive Conditioning

Reducing wildlife damage through aversive conditioning is achieved through the use of many techniques. The objective of this approach is to alter the behavior of or repel the target species, remove specific individuals from the population, reduce local population densities, or suppress/extirpate exotic species populations to eliminate or reduce the potential for loss or damage to property and natural resources. Some of these methods include:

- Propane Exploders operate on propane gas and are designed to produce loud explosions at controllable intervals. They are strategically located (*i.e*., elevated above the vegetation) in areas of high animal concentrations to frighten them from the problem site. Because animals are known to habituate to sounds, exploders must be moved frequently and used in conjunction with other scare devices. Exploders can be left in an area after dispersal is complete to discourage animals from returning. (USDA 2015c, Appendix C, p. 11; USDA 2014c, p. 30.)

- Pyrotechnics, shell-crackers and scare cartridges are commonly used to repel wildlife. Shell-crackers are 12 gauge shotgun shells containing firecrackers that are projected up to 75 yards in the air before exploding. They can be used to frighten wildlife and are most often used to scare them to prevent crop depredations. The purpose is to produce an explosion between the animal and their objective, the crop or vulnerable livestock. Noise bombs, whistle bombs, racket bombs, and rocket bombs are fired from 15 millimeter flare pistols. They are used similarly to shell-crackers but are projected for shorter distances. Noise bombs are firecrackers that travel about 75 feet before exploding. Whistle bombs are similar to noise bombs, but whistle in flight but do not explode. They produce a noticeable response because of the trail of smoke and fire, as well as the whistling sound. Racket bombs make a screaming noise in flight and do not explode. Rocket bombs are similar to noise bombs but may travel up to 150 yards before exploding. (USDA 2015c, Appendix C, p. 12; USDA 2014c, p. 30.) California Wildlife Services has had no accidents involving the use of firearms or pyrotechnics in the application of feral swine demand management. (USDA 2014c, p. 56.)

- Lights, such as strobe, barricade, and revolving units, are used with mixed results to frighten wildlife. Brilliant lights, similar to those used on aircraft, are most effective in frightening night feeding mammals. These extremely bright-flashing lights have a blinding effect, causing confusion that reduces the animal's ability to locate food. However, most animals rapidly become accustomed to such lights and their long-term effectiveness is questionable. In general, the type of light, the number of units, and their location are determined by the size of the area to be protected and by the power source available. (USDA 2015c, Appendix C p. 12; USDA 2014c, p. 30.)

- The Electronic Guard (siren strobe-light device) is a battery-powered, portable unit that houses a strobe light and siren. The device activates automatically at nightfall and is programmed to discharge periodically throughout the night. Efficacy of strobe-sirens is highly variable, but in certain situations, this device has been used successfully to reduce coyote and bear depredation. The technique has proven most successful when used at "bedding grounds" where sheep gather to sleep for the night. The device, however, is a short-term tool used to deter predation until other damage management methods are implemented. (USDA 2014c, p. 30.)

<u>Operational Actions</u>

Proposition 4, passed in 1998, prohibited the use of sodium cyanide and sodium monoflouroacetate and steel jawed leghold traps in the State of California (tribal lands are exempt from state law). Padded leghold trap use is restricted to protecting public health and safety. In *Nat. Audubon Society v. Davis* (N.D.Cal. 2000) 144 F.Supp.2d 1160, the United States District Court for the Northern District of California granted preliminary declaratory relief, allowing the use of padded-jaw traps for the protection of endangered species. Lethal wildlife damage management methods that Wildlife Services can currently use in California include aerial hunting, ground based shooting, neck snares, conibear traps and gas cartridges, each of

which is described below. (USDA 2004a, p. 57.) Notably, aerial gunning, gas cartridges, or chemical immobilizing will *not* be used in the proposed IWDM program.

Cage and Corral Traps

These traps come in a variety of styles to target different species. The most common traps are cage traps. Cage traps are usually rectangular, made from wood or heavy gauge wire mesh. These traps are used to capture animals alive and can often be used where lethal tools would be too hazardous. Cage traps are well suited for use in trapping bears and lions. Other types of cage traps are corral traps and drive-traps. Often, target animals such as feral swine and bear are allowed to feed in a cage until they get used to coming and going. A trip wire that closes the entrance, a one-way door, or other device is set to capture the animal when it comes to feed; these will often capture multiple animals at one location. Cage traps usually work best when baited with foods attractive to the target animal. (USDA 2014c, p. 31; USDA 2015c, Appendix C, p. 13.)

Corral or cage style traps large enough to hold multiple animals will be utilized in areas frequented by feral swine. The size of traps may be up to 20 feet wide by 20 feet long. They will likely be set near water sources, riparian areas or groves of oak trees where feral swine are likely to congregate and forage. Traps will be set to avoid resource damage within areas of sensitive biological, cultural or watershed resources. Installation of traps may involve minor ground disturbance with the installation of fence posts and anchors, as well as the activity of the feral swine while they are inside the traps. Traps will be baited with grain or other food attractive to feral swine. After feral swine are trapped they will be euthanized quickly with lethal gun shots in a humane manner and the carcasses disposed of off-site in compliance with applicable regulations or left on site if removal is not feasible. Trapping locations in remote areas may be logistically supported by helicopter as needed or trapping may also be supported by limited use of packstock; stock would be restricted to designated trails. (USDA 2014c, p. 31-32.) California Wildlife Services has not had any incidents using mechanical methods for wildlife management where the public or pets were injured. (USDA 2014c, p. 56.)

Snares

Snares made of wire or cables are among the oldest wildlife management tools and are generally not affected by inclement weather. They can be used effectively to catch most species. Snares may be employed as either lethal or live-capture devices depending on how or where they are set. Snares set to capture an animal by the neck are usually lethal but stops can be attached to the cable to make the snare a live capture device. Snares positioned to capture the animal around the body can be a useful live-capture device, but they are more often used in conjunction with euthanasia. Snares can also be used to capture animals by the legs, but leg-snares are not often set for feral swine. Snares can be effectively used wherever a target animal moves through a restricted lane of travel (*e.g.*, trails through vegetation). When a target animal moves forward into the loop formed by the cable, the noose tightens and the animal is held. The catch-pole snare is used to capture or safely handle problem animals. This device consists of a hollow pipe with an internal cable or rope that forms an adjustable noose at one end. The free end of the cable or rope extends through a locking mechanism on the end opposite of the noose. By pulling on the free end of the cable or rope, the size of the noose is reduced sufficiently to hold an animal. Catch poles are used primarily to remove live animals from traps without danger to or from the captured animal. Also, most snares incorporate a breakaway feature to release non-target wildlife and livestock. (USDA 2014c, p. 32; USDA 2015c, Appendix C, p. 12.)

The foot or leg snare is a spring-powered non-lethal device, activated when an animal places its foot on the trigger. In some situations using snares to capture wildlife is impractical due to the behavior or animal morphology of the animal, or the location of many wildlife conflicts. Snares must be set in locations where the likelihood of capturing non-target animals is minimized. The Wildlife Services program uses a leg snare with a built-in pan tension device that can be set to exclude capturing animals lighter than the target animal. (USDA 2015c, Appendix C, p. 13.)

The Collarum is a non-lethal, spring-powered, modified neck snare device that is primarily used to capture coyotes. It is activated when an animal bites and pulls a cap with a lure attractive to coyotes, whereby the snare is projected from the ground up and over the head of the coyote. As with other types of snares, the use of the Collarum device to capture coyotes is greatly dependent upon finding a location where coyotes frequently travel where the device can be set. Collarums must also be set in locations where the likelihood of capturing non-target animals is minimized. (USDA 2015c, Appendix C, p. 14.)

A number of specialized “quick-kill” traps are used in wildlife damage management work. They include Conibear, snap, gopher, and mole traps. Conibear traps are used mostly in shallow water or underwater to capture beaver. The Conibear consists of a pair of rectangular wire frames that close like scissors when triggered, killing the captured animal with a quick body blow. Conibear traps have the added features of being lightweight and easily set. Snap traps are common household rat or mouse traps usually placed in buildings. These traps are often used to collect and identify rodent species that cause damage so that species-specific management tools can be applied. If an infestation is minor, these traps may be used as the primary means of management. Glue boards (composed of shallow, flat containers of an extremely sticky substance) may be used as an alternative to snap traps. Spring-powered harpoon traps are used to reduce damage caused by surface-tunneling moles. Soil is pressed down in an active tunnel and the trap is placed at that point. When the mole reopens the tunnel, it triggers the trap and is killed. Two variations of scissor-like traps are also used in burrows for both mole and pocket gopher damage reduction. (USDA 2015c, Appendix C, p. 14.) California Wildlife Services has not had any incidents using mechanical methods for wildlife management where the public or pets were injured. (USDA 2014c p. 56.)

Shooting

Shooting is conducted with hand guns, rifles, and shotguns and is very selective for the target species. Shooting is frequently performed in conjunction with calling particular predators such as lions, coyotes, bobcats, and fox. Trap-wise coyotes are often vulnerable to calling. Shooting is limited to locations where it is legal and safe to discharge firearms. Shooting may be ineffective for controlling damage by some species and may actually be detrimental to control efforts. Shooting is used selectively for target species but may be relatively expensive because of the staff hours sometimes required. Nevertheless, shooting is an essential control method. For example, many airports have perimeter fences for security purposes that also confine resident deer populations. These deer frequently stray onto active runways and pose a significant threat to aircraft. Removal of these deer may be effectively achieved by shooting. (USDA 2015c, Appendix C, p. 14.)

Shooting is sometimes used as the primary method in feral swine management operations. Often, though, shooting is only used opportunistically where a Wildlife Services Specialist sees the target swine in the damage area. Shooting can also be used in conjunction with spotlighting and for lethal reinforcement to ensure the continued success in swine scaring and harassment efforts. In situations where the feeding instinct is strong, feral swine can quickly adapt to scaring and harassment efforts unless the IWDM Program is periodically supplemented by shooting.

Shooting is limited however to locations where it is legal and safe to discharge firearms. (USDA 2014c, p. 32.)

Tracking Dogs or Trailing Dogs

Trained dogs are used primarily to locate, pursue, or decoy animals. Training and maintaining suitable dogs requires considerable skill, effort, and expense. There must be sufficient need for dogs to make the effort worthwhile. (USDA 2015c, p. 15.) 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 howl when they smell them. Tracking dogs are trained not to follow the scent of non-target species. Wildlife Services Specialists find the track of the target species and put their dogs on it. Typically, if the track is not too old, the dogs can follow the trail and bay the animal. When trained dogs are used, handlers will be at the site of encounters between target animals and dogs as soon as possible to minimize stress to the target and reduce potential injury to the dog. Dogs will not be allowed to kill the target animal. When the objective is removal, the target will be euthanized as quickly as possible; for feral swine the most common method of euthanizing is via mortal gunshot. Animals intended to be captured alive (e.g., research, Judas operations) will be protected from trained dogs once handlers are onsite. When the dogs bay the animal, it usually seeks refuge in a thicket on the ground at bay or in a tree. The dogs stay with the animal until the Wildlife Services Specialists arrives and dispatches, tranquilizes, or releases it, depending on the situation. (USDA 2014c, p. 33.)

The most effective approach to resolving wildlife damage problems is to integrate the use of several of the above-referenced methods, either simultaneously or sequentially. The IWDM Program would integrate and apply practical methods of prevention and reduce damage by wildlife while minimizing harmful effects of damage reduction measures on humans, other species, and the environment. IWDM may incorporate resource management, physical exclusion and deterrents, and population management, or any combination of these depending on the characteristics of specific damage problems.

In selecting damage management techniques for specific damage situations and the methods under each alternative, consideration is given to the responsible species and the magnitude, geographic extent, duration and frequency, and likelihood of wildlife damage. Consideration is also given to the status of target and potential non-target species, local environmental conditions and affects, social and legal aspects, and relative costs of damage reduction options. The cost of damage reduction may sometimes be a secondary concern because of the overriding environmental, legal, and animal welfare considerations. These factors are evaluated in formulating damage management strategies that incorporate the application of one or more techniques.

Potential Issues of Concern

Statewide, the effects on any wildlife population are a very low magnitude of impact and well below any established sustainable harvest level for species managed for harvest by CDFW (CDFW 2004). CDFW concluded in 2004 that the total number of all target species taken by California Wildlife Services and all other known mortality was within sustainable harvest levels. Project effects are limited to the immediate project area, and cumulatively, do not affect the viability of any population in the state. Finally, California Wildlife Services conforms to all federal and applicable state regulations and policies that protect target species. (USDA 2015c, pp. 47-48.)

Nevertheless, a number of groups and concerned citizens have raised potential issues of concern, including the effects of taking certain species under the IWDM Program. These issues are summarized below for the Board's consideration.

Effects on Target Species Populations

Maintaining viable populations of all native species is of concern to the public and biologists within the state and federal land and wildlife management agencies, including Wildlife Services and the County. Target species under the County's proposed IWDM Program include: coyote, feral swine, muskrats, beaver, bobcat, black bear, mountain lion, gray fox, raccoon, spotted skunk, Virginia opossum, and feral dogs. The effects of taking wildlife under the IWDM program are described below for each of the targeted species. For additional context, information regarding the impacts of State-wide and District-wide wildlife damage management programs are also provided where available for each species.

Coyote (nongame animal)

Coyotes are a widely distributed and an abundant nongame permanent resident in California and are found in almost all habitats, including agricultural and residential areas. (CDFW 2004; Zeiner et al. 1990.) Because they are common and not state or federally listed, impacts to coyotes are typically not included as part of CEQA Biological Resources analyses. Coyotes are highly prolific and able to rebound rapidly from harvest pressure. While removing animals from small areas at the appropriate time can protect vulnerable resources (such as birthing and young livestock), immigration of coyotes from the surrounding area replaces the animals removed. (Stoddart 1984; USDA 2015c, p. 53.)

Estimating the statewide coyote population requires use of coyote biology and population dynamics and population density multiplied by the number of square miles of each land type. (CDFW 2004.) The North District coyote population estimated by CDFW ranges from 104,386 to 521,932. Population densities of coyotes vary throughout the District and are reflected in high and low estimates. The low density (conservative) estimates were used in the North District EA to determine program impacts, thus presenting a worst case population impact scenario. Under the current District program, District personnel removed an annual average of 1,605 coyotes over a 4-year period spanning 2010-2013. This level of take is 1.54% (actual) and 2.05% (inflated 33%) of the lowest estimated District population. The District cumulative and hunting and trapping take represents 22.6% of the estimated District low population. This rate of take is considered a low magnitude of impact on the District coyote population. (USDA 2015c, p. 53.)

Pitt et al. (2001) assessed the impact of removing a set proportion of a coyote population during one year and then allowing the population to recover. In the model, all populations recovered within 1 year when <60% of the population was removed. Recovery occurred within 5 years when 60-90% of the population was removed. Pitt et al. (2001) also evaluated the impact of removing a set proportion of the population every year for 50 years. When the removal rate was <60% of the population, the population size was the same as for an unexploited population. These findings are consistent with an earlier model developed by Connolly and Longhurst (1975), and revisited by Connolly (1995), which indicated that coyote populations could withstand an annual removal of up to 70% of their numbers and still maintain a viable population. (USDA 2015c, p. 53)

Using significance criteria by Pitt et al. (2001) to determine the magnitude of total harvest impacts on the population, a cumulative harvest of less than 60% of the population of coyotes

results in a determination of “low magnitude.” Thus, a “low magnitude” impact rating is determined for North District total annual harvest, and is expected to remain well below this level. Private coyote harvest and Wildlife Services take would have to increase far beyond the greatest expected levels before the cumulative impact would exceed the level sustainable by the population. (USDA 2015c, p. 53.)

The Shasta County coyote population estimated by CDFW (2004) ranges from 9,818 to 49,088. Population densities of coyotes vary throughout the County and are reflected in high and low estimates. The low density (conservative) estimates were used in determining program impacts, thus presenting a worst case scenario to err on the side of caution. Under the proposed IWDM Program, the number of coyotes removed in the County would likely be similar to the number taken during the last several recorded years.

Wildlife Services in Shasta County removed an annual average of 68 coyotes over a four-year period spanning FY 2011-2014. This level of take is 0.69% of the lowest estimated Shasta County population. (USDA 2015 j, USDA 2015 k, UDSA 2015 l, USDA 2015 m.)

The Shasta County cumulative take [Wildlife Services take (USDA 2015i, USDA 2015j, USDA 2015k, USDA 2015l, USDA 2015m) + other take (hunting and trapping) in the County (CDFW 2010d, CDFW 2011d, Souza 2012, Meshriy 2013b) (CDFW 2006, CDFW 2007, CDFW 2008b, CDFW 2010c)] represents 15.87% of the estimated Shasta County low population. This rate of take is not expected to have a significant impact on the Shasta County coyote population. (USDA 2015c.)

The California cumulative take [(Wildlife Services take (USDA 2015i, USDA 2015j, USDA 2015k, USDA 2015l, USDA 2015m) + other take (hunting and trapping) (CDFW 2010a. 2011a, 2012a, CDFW 2013a) (CDFW 2006, CDFW 2007, CDFW 2008b, CDFW 2010c)] represents 15.89% of the estimated California low population. This rate of take is not expected to have a significant impact on the California coyote population. The 15.87% cumulative take for Shasta County is essentially equal to the 15.89% statewide average. (USDA 2015c, USDA 2015j, USDA 2015 k, UDSA 2015 l, USDA 2015 m.)

Feral Swine

Feral swine are a game animal in California (Sec. 3950 Fish & G. code). They were introduced into California by the early European explorers and settlers as a food source. As pigs escaped or were freed from domestication, they spread throughout California’s coastal range. Swine populations spread inland to the Central Valley area and into most counties in California. Feral swine can now be found in 56 of the 58 counties. (Waithman et al. 1999.) Wildlife Services responds to requests from resource owners having damage problems caused by feral swine. Most damage requests are for feral swine rooting pastures, rangeland, lawns, crops, riparian areas, sensitive plant species and erosion issues. Other damage caused by feral swine include predation on young lambs, goats and calves, and consuming crops such as, grapes, grain, corn, truck gardens. Another problem with feral swine is their ability to push through predator proof fencing, creating holes where other predators can access farm animals. (USDA 2015c.)

Feral swine are not native species but they are known to adversely affect native species and habitats. Calls for assistance to reduce feral swine damage from farmers, property owners, ranchers and natural space managers to California Wildlife services have been on a steady increase, from about 5,300 in 2009 to about 6,600 in 2013. (USDA 2014c, pp. 8, 43; USDA 2015c.)

CDFW has not conducted any studies on feral swine density or population growth since 1996 when the population was estimated at 133,000 individuals. The CDFW 2003 Wild Pig Hunting document acknowledges feral swine populations have steadily increased since 1950. Feral swine have the highest reproductive rate of any ungulate species. (Read et al. 1989.) (USDA 2014c, pp. 8, 43.) Population estimates of feral swine in California range from 106,485 (low) to 159,727(high) while Shasta County estimates of feral pigs ranges from 1,832 (low) to 3,663 (high). (Waithman 1999.) Feral swine can sustain viable populations at harvest levels of 70%. (Dzieciolowski 1992.)

Population densities of feral swine vary throughout the County and are reflected in high and low estimates. The low density (conservative) estimates were used in determining program impacts, thus presenting a worst case scenario to err on the side of caution. Under the proposed IWDM Program, the number of feral swine removed in the County would likely be similar to the number taken during the last several recorded years. (USDA 2015c)

Wildlife Services has removed an average of 937 feral swine annually in California since 2009. All California Wildlife Services feral swine removal is under individual depredation permits issued to landowners. When California Wildlife Services take is compared to wild pigs recorded as legally harvested for sport hunting, Wildlife Services feral swine take is about 4.5% of the total estimated hunter harvest of feral swine taken each year. Wildlife Services feral swine take would have to exceed 2,000 annually to make up greater than 10% of the reported hunter harvest. Even assuming dramatic increases in total take, assuming the cumulative take estimate was 44,000 individuals removed annually, when compared to the last comprehensive population estimate of 133,000 in 1996, the statewide feral swine take by all methods would only be 33% of a conservative statewide population estimate. Since feral swine populations have been shown to be expanding since 1996 and can endure/rebound from population reduction efforts in excess of 70%, it is likely that even increased effort responding to feral swine damage management requests in California will not contribute to a decline in the statewide population. (USDA 2014c, pp. 43-4.) After analyzing the effect of feral swine damage management statewide, Wildlife Services concluded that while localized population reduction is expected to occur on properties receiving damage assistance, the sustainability of the statewide feral swine population will not be affected by Wildlife Services action, even if the management actions were to expand. Taking into account the legal status of feral swine being non-native species, the ability of feral swine to withstand cumulative mortality levels greater than expected and conformance with state-issued individual depredation permits, Wildlife Services concluded the statewide program would not cause a significant adverse effect on the feral swine population. (USDA 2014c, pp. 44, 45.)

The Shasta County Wildlife Services program removed an annual average of only 1 feral swine over a four-year period spanning FY 2011-2014. This level of take is 0.05% of the lowest estimated Shasta County population. (USDA 2015j, USDA 2015k, UDSA 2015l, USDA 2015m.)

Shasta County cumulative take [Wildlife Services take (USDA 2015i, USDA 2015j, USDA 2015k, USDA 2015l, USDA 2015m) + other take (sport hunting) from returned pig tags (4 year average) (CDFW 2008a, 2009a, 2009c, 2010a)] in the County represents 21.84% of the estimated Shasta County low population. This rate of take is well below harvest thresholds and not expected to have a significant impact on the County feral swine population.

Statewide cumulative take [(Wildlife Service take (USDA 2015i, USDA 2015j, USDA 2015k, USDA 2015l, USDA 2015m) + County take (sport hunting) (CDFW 2008a, 2009a, 2009c, 2010a) (CDFW 2006, CDFW 2007, CDFW 2008b, CDFW 2010c) represents 22.64% of the estimated California low population estimate (Waithman 1999). This rate of take is not expected

to have a significant impact on the California feral swine population. Shasta County cumulative take of 21.84% is essentially equal to the statewide cumulative take average of 22.64%.

Bobcat

The bobcat is widespread in North America and is most abundant in brushy stages of low and mid-elevation conifer, oak, riparian and pine-juniper forests and all stages of chaparral. (Zeiner et al. 1990.) Most bobcat damage is to pets, especially house cats. Other damage associated with bobcats is to poultry or exotic fowl. A permit from CDFW is required to take bobcats for depredation reasons. Wildlife Services occasionally responds to requests in the District to resolve bobcat depredation on lambs, kid goats, poultry and pets. (USDA 2015c, p. 61.)

The District bobcat population estimated from CDFW ranges from 35,333 to 37,260. District personnel removed an annual average of 12 bobcats over a 4-year period spanning 2010-2013. This level of take is 0.034% (actual take) and 0.045% (inflated 33%) of the lowest estimated District population. The District cumulative take and hunting and trapping take represents 2.84% of the estimated District low population. This rate of take is not expected to have a significant impact on the District bobcat population. (USDA 2015c, p. 61.)

The Shasta County bobcat population estimated from CDFW parameters (CDFW 2004) ranges from 3,323 to 3,504. Population densities of bobcats vary throughout the County and are reflected in high and low estimates. The low density (conservative) estimates were used in determining program impacts, thus presenting a worst case scenario to err on the side of caution. Under the current program, the number of bobcats removed in the County would likely be similar to the number taken during the last recorded years. (USDA 2015e.)

The Wildlife Services Shasta County program removed an annual average of 2 bobcats over a four-year period spanning FY 2011-2014. This level of take is 0.06% of the lowest estimated Shasta County population. (USDA 2015j, USDA 2015k, UDSA 2015l, USDA 2015m.)

Shasta County cumulative take [Wildlife Services take (USDA 2015i, USDA 2015j, USDA 2015k, USDA 2015l, USDA 2015m) + other take (hunting and trapping) in the County (CDFW 2010d, CDFW 2011d, Souza 2012, Meshriy 2013) (CDFW 2006, CDFW 2007, CDFW 2008b, CDFW 2010c) (Garcia 2010, 2011) (Meshriy 2012, 2013)] represents 6.08% of the estimated Shasta County low population. This rate of take is not expected to have a significant impact on the County bobcat population.

Statewide cumulative take [Wildlife Services take (USDA 2015i, USDA 2015j, USDA 2015k, USDA 2015l, USDA 2015m) + other take (hunting and trapping) (Garcia 2010, Garcia 2011, Meshriy 2012, Meshriy 2013a, Garcia et al. 2014) (CDFW 2006, CDFW 2007, CDFW 2008b, CDFW 2010c)] represents 1.27% of the estimated California low population estimate. This rate of take is not expected to have a significant impact on the California bobcat population. Shasta County cumulative take of 6.08% is above the statewide Cumulative take average of 1.27%.

The most conservative adult bobcat population estimate for California ranges between 120,441 to 127, 010 or between 0.55 and 0.58 per square mile (CDFW 2004). These data were used to estimate harvest analysis in the California Department of Fish and Wildlife's 2004 Draft Environmental Document for Furbearing and Nongame Mammal Hunting and Trapping.

USFWS Office of Scientific Authority (OSA) approved CDFW estimate of 72,000 adult bobcats (pre-breeding) and harvest quota of 14,400. The bobcat population sustainable harvest of 14,400 bobcats would represent 20% of the population. (CDFW 2004.) Private bobcat harvest

and Wildlife Services take would have to increase far beyond the expected levels before the cumulative impact would exceed the level sustainable by the population. The impact of Wildlife Services' wildlife damage management actions on the status quo for bobcat populations in the state is negligible. CDFW (2004) concluded that the Wildlife Services program is not expected to have a significant impact on the bobcat population in California. (USDA 2015c, p. 61.)

Black Bear

The black bear is a game mammal in California (Sec. 3950 Fish & G. code) and is found in most habitat types. Wildlife Services responds to requests to resolve conflicts when bears kill or injure livestock (including bees), pets and hobby animals, become a safety threat to humans, damage/destroy property or crops and when they become injured or wounded. Before a bear can be taken for causing damage, the CDFW must issue a depredation permit to the resource owner. When CDFW declares a bear a public safety threat, it has attacked someone or had been acting aggressive towards people, has been injured by a vehicle collision or has been shot and wounded, a permit is not needed and only authorization by CDFW is needed to take the bear. (CDFW 2011a.)

A conservative estimate puts the state bear population between 25,000 to 30,000 animals (CDFW 2011a, CDFW 2011c), and some estimates at nearly 40,000 bears. According to the CDFW Bear Hunting Environmental Document (2011a) the black bear population could withstand a legal harvest of 3,100 bears and still maintain a viable bear population. The sport hunter take quota for black bears in California is set at 1,700 bears or roughly half the take threshold. The maximum-sustained yield level of black bear harvest according CDFW Bear Hunting Environmental Document (2011a) is 14.2%. (CDFW 2011a.)

Shasta County has an estimated range of 3,522 (low) to 8,805 black bears. Population densities of black bear vary throughout the County and are reflected in high and low estimates. The low density (conservative) estimates were used in determining program impacts, thus presenting a worst case scenario to err on the side of caution. Under the proposed IWDM Program, the number of black bear removed in the County would likely be similar to the number taken during the last recorded years. (USDA 2015c.)

The Shasta County Wildlife Services program removed an annual average of 18 black bears over a four-year period spanning FY 2011-1014. This level of take is 0.50% of the lowest estimated Shasta County population. (USDA 2015j, USDA 2015k, UDSA 2015l, USDA 2015m.)

Shasta County cumulative take [Wildlife Services take (USDA 2015i, USDA 2015j, USDA 2015k, USDA 2015l, USDA 2015m) + other take (sport hunting) (CDFW 2009b, CDFW 2010b, CDFW 2011c, Kenyon 2012, Kenyon 2013) in the County represents 7.35% of the estimated Shasta County low population. This rate of take is well below harvest thresholds and not expected to have a significant impact on the County black bear population.

Statewide cumulative take [(Wildlife Services take (USDA 2015i, USDA 2015j, USDA 2015k, USDA 2015l, USDA 2015m) + County take (sport hunting) (CDFW 2009b, CDFW 2010b, CDFW 2011c, Kenyon 2012, Kenyon 2013) (depredation) (CDFW 2006, CDFW 2007, CDFW 2008b, CDFW 2010c) represents 20.22% of the estimated California low population estimate. This rate of take is high because of adding both hunter harvested bear tag numbers and hunter take survey numbers, many of which may be duplicates or inflated. Also, many of the Wildlife Service take numbers and statewide depredation numbers are duplicates.

Mountain Lion

In response to the passage of Proposition 117 in 1990, the classification of the mountain lion in California was changed from game mammal to a "specially protected species" and as a result of that change lions can now only be killed:

1) If a depredation permit has been issued to take a specific lion killing livestock or pets;[6]

2) To preserve public safety; or

3) To protect listed bighorn sheep.

Wildlife Services personnel in Shasta County respond to requests for assistance when mountain lions are suspected of killing or injuring livestock/pets or threatening public safety. Individual lions that are confirmed to have killed or injured livestock or pets are only removed if the legally required DFW depredation permit has been issued to the resource owner. Lions deemed to be a public safety threat are removed if authorized by CDFW. (CDFW 2015d.)

According to the CDFW website's "Commonly Asked Questions about Mountain Lions" any statewide estimate of the CA mountain lion population is going to be just a "guesstimate." The website states that density estimates of from zero to 10 lions per 100 square miles come from individual studies conducted over the last 30 years that looked at densities in certain habitat types and simply expanded those based on the total amount of each habitat type available statewide. This method provides a crude estimate of between 4,000 and 6,000 mountain lions statewide. This same website states that approximately half of California is considered mountain lion habitat. (77,000 sq. miles if you assume the state land mass is 155,959 sq. mi.) Use of these figures gives an estimated low lion population of 5.2 per 100 sq. mi and a high of 7.8 per 100 sq. mi. In 1988 CDFW, in response to CEQA requirements, prepared a Draft Environmental Document on Mountain Lions. This document analyzed the potential impacts of a mountain lion hunting season to be proposed in the 1988/89 Mammal Hunting and Trapping regulations. The new regulations would have allowed the sport hunting of lions in four areas of California. In summary, the Department felt the local population could withstand up to 18% removal rate without significant impacts. The density figures mentioned above are consistent with densities in other states that range from a low of about 1 per 100 square miles to a high of 24 per 100 square miles for all age classes (Johnson et al. 1992). An average density estimate for the western states was 7.5 per 100 sq. miles (Johnson et al. 1992). The California Mountain Lion Foundation website states that it believes the State has an average lion population density of 1.7 lions per 100 sq. km, or 4.4 per 100 sq. mi., of habitat. The estimated population in Shasta County is 155(low) to 317(high). (USDA 2015c.)

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[6] Revocable permits may be issued by the department after receiving a report, from any owner or tenant or agent for them, of property being damaged or destroyed by mountain lion. The department shall conduct and complete an investigation within 48 hours of receiving such a report. Any mountain lion that is encountered in the act of inflicting injury to, molesting or killing livestock or domestic animals may be taken immediately if the taking is reported within 72 hours to the department and the carcass is made available to the department. Whenever immediate action will assist in the pursuit of the particular mountain lion believed to be responsible for damage to livestock or domestic animals, the department may orally authorize the pursuit and take of a mountain lion. The department shall investigate such incidents and, upon a finding that the requirements of this regulation have been met, issue a free permit for depredation purposes, and carcass tag to the person taking such mountain lion. (Title 14, C.C.R. 402.)

As was mentioned above, California has not legalized hunting mountain lions so the only lions removed are those killed to protect livestock and pets, human safety and listed bighorn sheep. Mountain lion populations are resilient to removal due to their high reproductive potential. In addition, mountain lion populations have demonstrated the ability for rapid growth and recovery from reduction. Robinette et al. (1961) reported a total annual mortality of 32% of the population in Utah, while Ashman et al. (1983) noted a sustained total annual mortality of at least 30% in Nevada. Ashman et al. (1983) believed under "moderate to heavy exploitation (30%-50% removal)" cougar populations on their Nevada study areas had the "recruitment capability of rapidly replacing annual losses." Anderson et al. (2005) concluded cougar populations would be stable or increasing as long as adult female harvest was ≤ 25% of the harvest, and with an annual harvest of more than 25% of the total cougar population. Anderson et al. (2005) found after a 66% population reduction by hunting in Wyoming, the cougar population recovered in numbers within 3 years with about 18% of the cougar population harvested annually. Ross et al. (1992) documented a population increase of approximately 40% in an Alberta cougar population from 1984 – 1989, following a decline in hunter harvest. Logan et al. (2001) found a peak annual growth rate of 28% for adult cougars following removal of 58% of the independent cougars (adults and sub adults) and the population recovered in 31 months. In Oregon, the cougar population recovered from near extinction in 1961 to an estimate of nearly 3,000 by 1992 (Keister et al. 2002). (Oregon Dept. of Fish and Wildlife 2006.)

The Shasta County Wildlife Services program removed an average of 9 mountain lions per year during the four year period 2011-2014. This level of take is 5.81% of the lowest estimated Shasta County population. (USDA 2015j, USDA 2015k, UDSA 2015l, USDA 2015m.)

Shasta County cumulative take [Wildlife Services take (USDA 2015i, USDA 2015j, USDA 2015k, USDA 2015l, USDA 2015m) + other take (depredation and public safety)(CDFW 2010d, CDFW 2011d, Souza 2012, Meshriy 2013)] in the county represents up to 7.74% of the estimated Shasta County low population. This rate of take is well below published harvest thresholds and not expected to have a significant impact on the counties mountain lion population.

Statewide cumulative take (Wildlife Services take (USDA 2015i, USDA 2015j, USDA 2015k, USDA 2015l, USDA 2015m) + other take (depredation and public safety) (CDFW 2010d, CDFW 2011d, Souza 2012, Meshriy 2013) represents 4.65% of the estimated California low population estimate. This rate of take is not expected to have a significant impact on the California lion population. Shasta County has historically been near the top of counties within the State in the number of depredation lions taken. This could account for the higher cumulative take in Shasta County from the statewide cumulative take number.

Gray Fox

The gray fox is classified by CDFW as a furbearer that may be taken by hunting or trapping. Wildlife Services responds to requests to resolve conflicts with gray fox when they prey on small animals such as pets or hobby animals. Wildlife Services also removes any sick foxes that pose a potential human, health, and safety threat. (USDA 2015c, p. 63.) Gray fox conflicts often occur in residential areas, especially in semi-urban areas. (USDA 2015c.)

The District gray fox population estimated by CDFW ranges from approximately 100,000 to 300,000. District wide, an annual average of 33 gray foxes were removed over a four year period spanning 2010-2013. This level of take is 0.033% (actual take) and 0.044% (inflated 33%) of the lowest estimated District population. The California cumulative take and California hunting and trapping take represent 1.04% of the estimated California population estimate.

(CDFW 2010c, CDFW 2013.) The most conservative adult gray fox population estimate for California ranges from approximately 330,000 to 980,000. CDFW concluded that the District Wildlife Services program would not have a significant impact on the gray fox population in California. (USDA 2015c, p. 63.)

The Shasta County gray fox population estimated by CDFW (CDFW 2004) ranges from 9,792 to 28,873. Population densities of gray fox vary throughout the County and are reflected in high and low estimates (Table 3). The low density (conservative) estimates were used in determining program impacts, thus presenting a worst case scenario to err on the side of caution. (USDA 2015e.)

The Shasta County Wildlife Services program removed an annual average of 2 gray foxes over a four-year period spanning FY 2011-1014. This level of take is 0.02% of the lowest estimated Shasta County population. (USDA 2015j, USDA 2015k, UDSA 2015l, USDA 2015m.)

Shasta County cumulative take [Wildlife Services take (USDA 2015i, USDA 2015j, USDA 2015k, USDA 2015l, USDA 2015m) + other take (hunting and trapping) (CDFW 2010d, CDFW 2011d, Souza 2012, Meshriy 2013) (CDFW 2006, CDFW 2007, CDFW 2008b, CDFW 2010c)] in the County represents 2.24% of the estimated Shasta County low population. This rate of take is not expected to have a significant impact on the County gray fox population. (USDA 2015e.)

Statewide cumulative take [(Wildlife Services take (USDA 2015i, USDA 2015j, USDA 2015k, USDA 2015l, USDA 2015m) + other County take (hunting and trapping) (CDFW 2010d, CDFW 2011d, Souza 2012, Meshriy 2013) (CDFW 2006, CDFW 2007, CDFW 2008b, CDFW 2010c) represents 0.78% of the estimated California low population estimate. This rate of take is not expected to have a significant impact on the California gray fox population. Shasta County cumulative take of 2.24% is higher than the statewide Cumulative take average of 0.78%. (USDA 2015.)

The most conservative adult gray fox population estimate for California ranges from 332,769 to 981,216, or between 1.0 and 3.04 per square mile. (CDFW 2004.) These data were used to estimate harvest analysis in the California Department of Fish and Wildlife's 2004 Draft Environmental Document for Furbearing and Nongame Mammal Hunting and Trapping. Gray fox allowable harvest level is 25%. (CDFW 2004.)

Private gray fox harvest and Wildlife Services take would have to increase far beyond the expected levels before the cumulative impact would exceed the level sustainable by the population. The impact of Wildlife Services' wildlife damage management actions on the status for gray fox populations in the state is negligible. CDFW (2004) concluded that the Wildlife Services program is not expected to have a significant impact on the gray fox population in California.

Raccoon

The raccoon is a widespread permanent resident throughout the District and County. It is most abundant in riparian and wetland areas, and some suburban areas. (Zeiner et al. 1990.) Wildlife Services responds to requests to resolve conflicts when raccoons threaten to kill livestock, pets and hobby animals, threaten humans and damage property or crops or create a disease threat.

In addition, Wildlife Services occasionally responds to requests to resolve raccoon depredation on aquaculture facilities and damage to structures. (USDA 2015c, p. 55e.)

The District raccoon population estimated by CDFW ranges from approximately 22,000 to 64,000. District wide, an annual average of 426 raccoons were removed over a four year period spanning 2010-2013. This level of take is 1.94% (actual) and 2.58% (inflated 33%) of the lowest estimated District population. The California cumulative take and California hunting and trapping take represent 19.3% of the estimated California population estimate. (CDFW 2013.) The sustainable harvest level for raccoons is 49%. CDFW concluded that the District Wildlife Services program would not have a significant impact on the raccoon population in California. (USDA 2015c, p. 55.)

The Shasta County raccoon population estimated by CDFW (CDFW 2004) ranges from 2,067 to 6,027. Population densities of raccoons vary throughout the District and are reflected in high and low estimates. The low density (conservative) estimates were used in determining program impacts, thus presenting a worst case scenario to err on the side of caution. (USDA 2015c.)

Wildlife Services in Shasta County removed an annual average of 3 raccoons over a four-year period spanning FY 2011-2014. This level of take is 0.16% of the lowest estimated Shasta County population. (USDA 2015j, USDA 2015k, UDSA 2015l, USDA 2015m.)

Shasta County cumulative take [Wildlife Services take (from (USDA 2015i, USDA 2015j, USDA 2015k, USDA 2015l, USDA 2015m) + other take (hunting and trapping) (CDFW 2010d, CDFW 2011d, Souza 2012, Meshriy 2013) (CDFW 2006, CDFW 2007, CDFW 2008b, CDFW 2010c)] represents 4.90% of the estimated Shasta County low population. This rate of take is not expected to have a significant impact on the County raccoon population. (USDA 2015c.)

Statewide cumulative take [(Wildlife Services (USDA 2015i, 2015j, 2015k, 2015l, 2015m) + other take in the County (hunting and trapping) (CDFW 2010d, CDFW 2011d, Souza 2012, Meshriy 2013) (CDFW 2006, CDFW 2007, CDFW 2008b, CDFW 2010c) represent 13.60% of the estimated California low population estimate. This rate of take is not expected to have a significant impact on the California raccoon population. Shasta County cumulative take of 4.90% is well below the statewide average of 13.60%.

The sustainable harvest level for raccoons is 49% (CDFW 2004) and total mortality is not expected to have a significant impact on the raccoon population, particularly since the population estimate is considered to be well below the true population size. (CDFW 2004.) CDFW (2004) concluded that the Wildlife Services program is not expected to have a significant impact on the raccoon population in California. (USDA 2015c.)

Striped skunk

The striped skunk is a common resident in California, found in nearly all habitats, except for dry areas of the high Sierra in the Mojave and Colorado deserts. (Zeiner et al. 1990.) Wildlife Services responds to requests to resolve conflicts with striped skunks when skunks create nuisance odor problems, damage property, or prey on small animals such as pets, rabbits, and poultry. In addition, Wildlife Services removes skunks that are a potential human, health, and safety threat. (USDA 2015c, p. 57.) Wildlife accounts for about 92% of reported animal rabies cases nationwide, and rabies is well-established in skunk populations in California. (Krebs et al. 2003.) Skunk conflicts often occur in residential areas, especially in semi-urban areas. (USDA 2015c.)

The District striped skunk population estimated by CDFW ranges from approximately 149,000 to 710,000. District wide, an annual average of 891 striped skunk were removed over a four year period spanning 2010-2013. This level of take is 0.60% (actual) and 0.84% (inflated 33%) of the lowest estimated District population. (USDA 2015c, p. 57.)

The Shasta County striped skunk population estimated from CDFW parameters (CDFW 2004) ranges from 14,014 to 66,837. Population densities of striped skunks vary throughout the County and are reflected in high and low estimates. The low density (conservative) estimates were used in determining program impacts, thus presenting a worst case scenario to err on the side of caution. (USDA 2015c.)

Wildlife Services in Shasta County removed an average of 14 striped skunks over a four-year period spanning FY 2011-2014. This level of take is 0.10% of the lowest estimated Shasta County population. Under the proposed IWDM Program, the number of striped skunks removed in the County would likely be similar to the number taken during the last recorded years. (USDA 2015j, USDA 2015k, UDSA 2015l, USDA 2015m.)

Shasta County cumulative take, [Wildlife Services take (USDA 2015i, USDA 2015j, USDA 2015k, USDA 2015l, USDA 2015m) + other take (hunting and trapping) (CDFW 2010d, CDFW 2011d, Souza 2012, Meshriy 2013)] represents 0.14% of the estimated Shasta County population. This rate of take is not expected to have a significant impact on the Shasta County striped skunk population. It should be noted that only trapping data (CDFW 2010d, CDFW 2011d, Souza 2012, Meshriy 2013) is available for this analysis, as there is no County sport hunting harvest data available for striped skunks. Private striped skunk harvest and Wildlife Services take would have to increase far beyond the expected levels before the cumulative impact would exceed the level sustainable by the population. (USDA 2015c.)

Statewide cumulative take [(Wildlife Services take (USDA 2015i, USDA 2015j, USDA 2015k, USDA 2015l, USDA 2015m) + other take (hunting and trapping) (CDFW 2010d, CDFW 2011d, Souza 2012, Meshriy 2013)] represents 1.16% of the estimated California low population estimate. This rate of take is not expected to have a significant impact on the California striped skunk population. Cumulative take of 0.14% for Shasta County is below 1.16% for statewide cumulative take.

The most conservative adult striped skunk population estimate for California ranges between 318,195 to 1,517,548, or between 1.3 and 6.2 per square mile. (CDFW 2004.) These data were used to estimate harvest analysis in the California Department of Fish and Game's 2004 Draft Environmental Document for Furbearing and Nongame Mammal Hunting and Trapping.

The impact of Wildlife Services' wildlife damage management actions on the status quo for skunk populations in the state is negligible. CDFW (2004) concluded that the Wildlife Services program is not expected to have a significant impact on the striped skunk population in California. (USDA 2015c.)

Feral or Free Ranging Dogs

Wildlife Services took an annual average of 1 feral or free-ranging dog in Shasta County over a four-year period spanning FY 2011-2014 for the protection of resources discussed in this document. Feral or free ranging dogs accounted for $1,571 in livestock losses in 2013-2014 (USDA 2015f). Dogs are captured when they harass or kill pets, hobby animals or livestock, or pose a threat to human safety on property held in public ownership. Most often, Wildlife Services delivers offending dogs to local animal control officials or to the landowners.

Landowners then attempt to locate the owners of the dogs (to recover losses), call the local animal control office to remove the dog, or kill the dog. Feral dogs are classified as nongame mammals by CDFW and may be taken at any time using approved methods. (USDA 2015c.)

Other Animals

Wildlife Services in Shasta County over the four previous years (2011-2014) did take other animal species in low numbers relative to their populations statewide. Because the take numbers were so low as compared to the statewide population, impacts to the species population in the state would be very minimal and were not analyzed. (USDA 2015c.)

- Blackbirds. Wildlife Services responded to requests from several local wild rice growers who were having their crops destroyed by birds, determined to be a mix of species, including mostly red-winged blackbirds with yellow-headed blackbirds, Brewer's blackbirds, and brown-headed cowbirds. Damage to the crop was estimated at over $100,000. (USDA 2015f) Hazing and harassment methods were initially used to disperse in excess of 986,000 birds. An average of 5,648 blackbirds were removed per year from 2010/2011 through 2013-2014, which represents a take of 0.04% of the statewide population. (USDA 2015j, 2015k, 2015l, 2015m)
- Muskrats. Wildlife Services in Shasta County responded to 14 separate requests for consultation for damage associated with muskrats in 2013-2014. In that single fiscal year, the damage totaled $54,776 to field crops, pasture, dikes and other natural resources. A total of 95 muskrats were removed in the reporting period of October 1, 2013 through September 30, 2014. (USDA 2015f)
- Beavers. Wildlife Services responded to seven consultation requests for damage associated with beaver. The total damage reported and verified by beavers in Shasta County for 2013-2014 was $53,441. Three beaver were removed by Wildlife Services in the October 1, 2013 through September 30, 2014 reporting period. (USDA 2015f)

Alternatives to the Proposed IWDM Program

<u>No IWDM Program</u>

In the event that the IWDM Program is eliminated in the County, it is probable that some resource owners/managers would try to use damage management methods in an unsafe and improper manner, such as the illegal use of pesticides. Without any IWDM program, lack of expertise in method-use to reduce wildlife damage could result in substantially more injury or death to target and non-target wildlife than under the Program. When persons experiencing wildlife damage find no or inadequate assistance available to reduce damages, people have resorted to using toxicants that are illegal for use on the intended target species. The illegal use of methods often results in loss of both target and non-target wildlife. (White 1989; Allen 1996; USFWS 2001; FDA 2003; USDA 2015c, p. 86.)

In the absence of a program, or where restrictions prohibit the delivery of an effective program, it is most likely that damage management would be conducted by the State and other entities such as private individuals. Private damage management activities are more likely to have higher risks to non-target species because private activities may include the unwise or illegal

use of IWDM methods. For example, Great-tailed grackles were illegally poisoned in Texas with dicrotophos (Mitchell et al. 1984); on a Georgia quail plantation, predatory birds were being killed with eggs that had been injected with carbofuran (Federal Wildlife Officer 2000); in Oklahoma, Federal agents charged 31 individuals with illegally trapping and killing hawks and owls to protect fighting chickens. (USDA 2014c, p. 55.) All of these examples represent ill-advised or illegal uses of methods to protect resources that could have impacted non-target species. County Staff believe that it is in the best interest of the public, pets, and the environment that a professional IWDM Program be available because private resource owners could elect to conduct their own control rather than use government services and simply out of frustration resort to inadvisable techniques. (Treves et al. 2005; USDA 2014c, p. 54.)

Adaptability of the Wildlife Services Program

The Wildlife Services program is a *by request* service provided to resource owners dealing with wildlife issues throughout the County. While the description above covers current program activities, resource use and possible wildlife conflicts are constantly changing. The Wildlife Services program is designed to be flexible and address the evolving needs of the County's constituents within the framework of state and federal wildlife and environmental regulations.

Effects on Non-Target Species, Including Threatened and Endangered (T&E) Species

A common concern among members of the public and wildlife professionals is the possible impact of damage management methods and activities on non-target species, including pets and threatened and endangered species. In the course of protecting agriculture, property, human health and safety or natural resources from wildlife damages, there may be some potential for affecting protected species. The primary potential for impacts to any non-target animal would be associated with accidental injury or death occurring due to efforts to reduce predation on livestock and during efforts to reduce other damage caused by wildlife.

On a state-wide level, California Wildlife Services has consulted with USFWS, Ecological Services, and CDFW concerning the District program's potential to affect federally and state listed threatened and endangered species, and also species that are proposed for federal listing. The species that occur in the North District include, but are not limited to: northern spotted owl, western snowy plover, gray wolf, Point Arena mountain beaver, giant garter snake, green sea turtle, California red-legged frog, California coast Coho, Northern California steelhead, valley elderberry longhorn beetle, Whitebark pine. (See USDA 2015c, pp. 70-71 for full listing of species.)

California Wildlife Services determined the District program would have no effect on any listed fish, invertebrate, marine animal or plant species because it does not affect habitat or does not work in the range of the species. In addition, the District program would have no effect on the marbled murrelet, western snowy plover, yellow-billed Cuckoo, greater sage-grouse and short tailed albatross because program activities would not occur within the range of these species. The program would not affect amphibian species due to adherence to US EPA labels. (USDA 2015c, p. 72.)

On a federal level, California Wildlife Services consulted with USFWS to determine program effects and received USFWS concurrence that the program is not likely to affect the following species: Giant garter snake (May 8, 2007 letter from USFWS to Wildlife Services), Gray wolf

(April 15, 2014 letter from USFWS to Wildlife Services finding the use of gas cartridges, leg-hold traps, neck and foot snares, and shooting are not likely to adversely affect the gray wolf).

APHIS consulted with CDFW regarding effects of the District program on state listed threatened and endangered species (October 29, 2014) and concurred with Wildlife Services' findings that the District program would have no effect, or would not be likely to adversely affect, the following state-listed species: Gray wolf, Southern rubber boa, Bald eagle, Swainson's hawk, California black rail, Greater sandhill crane, Marbled murrelet, Western yellow-billed cuckoo, Willow flycatcher, Bank swallow, Sierra Nevada red fox, North American wolverine, Siskiyou Mountains salamander, Shasta salamander, Southern mountain yellow-legged frog, California tiger salamander. Moreover, CDFW indicated there have been no reported or documented adverse effects on state listed species from Wildlife Services. (USDA 2015c, pp. 74-75, USDA 2015c, Appendix D.)

Both USFWS and CDFW concurred with California Wildlife Services' determination that the District program is not likely to adversely affect federal or state listed threatened and endangered species. No non-targeted listed threatened or endangered species have been taken by the ongoing District program. (USDA 2015c, p. 75.)

Statewide, the number of non-target animals killed and/or caught and released unharmed in the District under the Wildlife Services program in 2013 represented less than 1% of the total California Wildlife Services take. The number of non-target animals killed is extremely low (18 freed and one raccoon and one skunk killed.) With emphasis on cage trapping in urban areas, many captured non-target animals can be released unharmed. Cage trapped target animals are euthanized by shooting, carbon dioxide gas or lethal injection. Because euthanasia is administered in such a target-specific manner, no non-target effects are expected. (USDA 2015c, p. 76.)

Similarly, under the statewide feral swine damage management program, California Wildlife Services did not lethally take any non-target species between 2006 and 2012. These low numbers are expected to remain into the future, because of the selectivity of the methods used by Wildlife Services. (USDA 2014c, pp. 47-48.) In addition, as part of an informal Section 7 consultation in 2007 and updated in 2014, the USFWS has concurred with Wildlife Services' determination that the statewide feral swine program is not likely to adversely affect federally listed threatened and endangered species, the California condor, gray wolf and desert tortoise, or any state listed threatened and endangered species. (USDA 2014c, p. 48; see also USDA 2004a, pp. 73-76, concluding the Wildlife Services activities in California would not result in adverse impacts on threatened and endangered species.)

<u>Effects on Biodiversity</u>

Public concern has been raised regarding the potential for wildlife damage management actions to eradicate native or indigenous wildlife populations, or exotic (introduced) species. Specifically, the County knows there is public concern that the proposed IWDM Program will result in mesopredator release and/or trophic cascade, each of which are discussed in more detail below.

Mesopredator Release

The removal of larger predators (e.g. coyote) resulting in an increase in populations of smaller predators (e.g. fox or skunk) is a theory termed mesopredator release and has been

documented in the absence of larger predators. Implementation of the IWDM Program would not result in an elimination of larger predators. Lethal removals, when necessary, are highly specific to individual damage situations. For example, Wildlife Services removes only a minor portion of a coyote population during specific times when livestock are most vulnerable to predation, or Wildlife Services removes individual animals in response to damage that is occurring to property or other resources. Studies show that coyotes are highly prolific and capable of rapid repopulation from areas following localized damage management and from sport (hunter) harvest. (Gese 1998; Blejwas et al. 2002; Williams et al. 2003.) While removing animals from small areas at the appropriate time can protect vulnerable resources (such as birthing and young livestock), immigration of coyotes from the surrounding area quickly replaces the animals removed and maintains biodiversity. (Stoddart 1984.) Predator populations are not adversely affected, and in fact cumulative mortality would have to far exceed the greatest expected levels before sustainability would be affected. Therefore, there is no evidence that coyote damage management actions would lead to indirect increases in mesopredators (*e.g.,* skunk, raccoon, fox), or result in other indirect effects on biodiversity. (USDA 2015c, pp. 29-30.)

Trophic Cascade

A trophic cascade is an indirect ecological effect that occurs when one trophic level is modified to an extent that it affects other trophic levels in a food chain or web. In a simple example, predators, their herbivore prey, and plants that provide food for the herbivores are three trophic levels that interact in a food chain. The goal of Wildlife Services is to provide management only when and where it is needed, most often only on a temporary or short-term basis, and in relatively small or isolated geographic areas compared with population levels. As discussed above, effects on target animals' populations are minor and temporary. Wildlife Services does not strive to eliminate or remove predators from any area on a long term basis, no predators or prey would be extirpated, and none would be introduced into an ecosystem. (USDA 2015c, p. 30.)

Some groups have expressed concerns the IWDM Program would cause trophic cascades, citing studies to back up their claims. (Project Coyote 2015.) The County has reviewed these studies and has determined they are not relevant to the extent they were largely focused on areas where predators were intensively and continually controlled over large geographic areas, or were reintroduced after being extirpated. (See e.g., Ripple 2011.) Changes at lower trophic levels resulted from the absence and then reintroduction of large predators. In the case of Shasta County and California, no predator is being extirpated or reintroduced.

Wildlife Services' actions are directed at resolving individual human-wildlife conflicts (*e.g.,* on a single property experiencing damage), not broad scale removal of predators in the ecosystem. Wildlife Services removes only a minor portion of any wildlife population during programs to reduce predation on livestock. Coyotes are highly prolific and capable of rapid repopulation from areas following localized damage management and from sport (hunter) harvest (Gese 1998; Blejwas et al. 2002.) Research indicates that although coyote population control may result in a short-term void in the local ecosystem, that void is quickly filled by immigrant coyotes from surrounding areas. (UC 2007.) This does not mean that coyote removal is ineffective. Immigrant coyotes may have different travel patterns and prey preferences, thus reducing conflicts with humans, pets, or livestock. (UC 2007.) Recent studies, in conjunction with decades of practical field experience has shown that removal of dominant coyote pairs at the outset of the breeding season may greatly reduce predation on livestock up to one year. (UC 2007.) Moreover, coyote populations are largely regulated by resource availability (e.g., food and water) over time. Following termination of predator reduction programs, coyote population densities return to pre-

removal levels. (Henke 1995 [Coyote control studies demonstrate that coyote population densities return to pre-removal levels within three months after removal levels ceased].)

Humane Treatment of Animals

Humaneness is, in part, a person's perception of harm or pain inflicted on an animal because people may perceive the humaneness of an action differently. One major factor influencing a person's value system is the degree of dependence on land and natural resources as indicated by rural residency, property ownership and agriculture or resource dependent occupations. Socioeconomic status also influences wildlife values with a higher occurrence of naturalist and ecologistic values among college educated and higher income North Americans. (Kellert 1994; USDA 2015c, p. 78.) The public is generally concerned about animal welfare and minimizing animal suffering as much as possible, or eliminating unnecessary suffering. Humaneness as perceived by livestock and pet owners requires that domestic animals be protected from wildlife that may inflict harm to their livestock or pets because humans have bred the natural defense capabilities out of domestic animals. Predators frequently do not kill larger prey animals quickly, and will often begin feeding on them while they are still alive and conscious. (USDA 2014c, p. 60.)

Determining whether an animal is experiencing pain or suffering is difficult. Despite this difficulty, manifestations of pain are shared by many animal species. The intensity of pain perceived by animals could be judged by the same criteria that apply to its recognition in human beings. If a condition causes physical pain in humans, it probably causes pain in other animals. Suffering may be defined as a highly unpleasant response usually associated with pain and distress. Suffering is not a modality, such as pain or temperature. Thus, suffering can occur without pain; and pain can occur without suffering. The degree of pain experienced by an animal that is shot probably ranges from little to no pain, to significant pain depending on the nature of the shot and time until death. Since the connotation of suffering carries with it the association of time, it would seem that there is little or no suffering where death comes immediately. (USDA 2015c, p. 76; USDA 2014c, p. 60.)

When implementing the IWDM Program, Wildlife Services specialists evaluate all potential tools for their humaneness, effectiveness, ability to target specific individuals as well as species, and potential impacts on human safety. The American Veterinary Medical Association (AVMA) (2013) recognizes that "*for wild and feral animals, many recommended means of euthanasia for captive animals are not feasible. The panel recognized there are situations involving free-ranging wildlife when euthanasia is not possible from the animal or human safety standpoint, and killing may be necessary."* AVMA states that in these cases, the only practical means of animal collection may be gunshot and lethal trapping, and that personnel should be proficient, and use the proper firearm and ammunition. Wildlife Services policy and Standard Operating Procedures are in compliance with these guidelines, and the County program recognizes the importance of careful decision-making regarding use of methods. (USDA 2015c, p. 77; USDA 2014c, p. 61.)

Wildlife Services supports the most humane, selective, and effective damage management techniques, and would continue to incorporate advances into IWDM Program activities. Wildlife Services specialists are highly experienced professionals, skilled in the use of management methods and committed to minimizing pain and suffering. Wildlife Services has numerous policies giving direction toward the achievement of the most humane wildlife damage management program possible (USDA 2004b USDA 2009a, USDA 2014d). Wildlife Services and the National Wildlife Research Center (NWRC) in Fort Collins, Colorado are striving to bring additional nonlethal damage management devices into practical use. Research continues to

improve the selectivity and humaneness of management devices. Until new findings and products are found practical, a certain amount of animal suffering could occur when some methods are used when current methods are not practical or effective. Wildlife Services personnel are trained to place shots that result in quick death and minimize pain and suffering. Daily trap checks, the use of CO_2 when practicable, and incorporation of Association of Fish and Wildlife Agencies Best Management Practices (AFWA 2006) help to ensure that the IWDM program minimizes pain and suffering of individual target animals. In addition, all Wildlife Services specialists are trained in techniques to minimize the risk of capturing non-target wildlife. Because the methods used are highly target specific, very few non-target animals are harmed. Most often, non-target animals that are caught can be easily released unharmed. (USDA 2015c, p. 77; USDA 2014c p. 61.)

The primary management tool used to remove small mammals in urban areas is the cage trap. Raccoons, skunks, and opossums are live trapped with a baited cage trap, and euthanized by AVMA (2013) approved methods. Wildlife Services personnel consider the humane treatment of the individual animal by placing traps in the shade whenever feasible, and by checking traps daily. In addition, Wildlife Services uses and recommends nonlethal methods whenever they are deemed to be practical and effective. The current District and County programs rely heavily on technical assistance to resolve wildlife damage complaints, and the Wildlife Services specialists respond to numerous requests for assistance through telephone consultations and make recommendations to the requesting public on ways to avoid attracting unwanted animals onto their property. Technical assistance is also provided to property owners or managers during operational assistance where the Wildlife Services specialist is at a damage site. In many instances, technical assistance is sufficient to effectively resolve the damage problem. (USDA 2015c, p. 77.)

Wildlife Services gives preference to non-lethal methods where practical and effective (Directive 2.101), and as a result, non-lethal methods are recommended with higher frequency over lethal methods under the current IWDM Program. In urban situations technical assistance provided to a resident may remove the attractant that is causing a nuisance problem, such as raccoons being attracted to pet food left outside. (USDA 2015c, p. 88.) However, most non-lethal methods have limited efficacy. For example, although non-lethal methods can be used to protect limited areas such as individual farms, feral swine are still free to damage natural resources. The adverse impacts of feral swine on natural resources are serious enough that allowing the swine to remain at large is undesirable Consequently, in most situations Wildlife Services recommendations will include a combination of non-lethal and lethal-methods. (USDA 2014c, p. 29.)

Staff Recommendation

Staff recommends that the Board 1) find that the IWDM Program, as operated in Shasta County, is exempt from CEQA pursuant to the Common Sense exemption (Guidelines § 15061(b)(3)), and pursuant to the Class 7 and 8 categorical exemptions (Guidelines §§ 15307 and 15308), and 2) renew the 2016-2021 Cooperative Agreement and 2016-2017 Annual Financial and Work Plan implementing the Wildlife Services IWDM.

This recommendation is based upon the operational protocols of the IWDM Program and the limited “take” numbers relative to the statewide and county populations for the Program, which are well within the sustainable limits for the species being controlled. While the Program is involved in managing a biological resource, the overall impacts are nominal and no significant impact on individual species populations has been documented. As relevant to CEQA, the

IWDM Program would not result in any impact to threatened, endangered or fully protected species.

Additionally, with predator control having existed on and off for 50 years in Shasta County and the current iteration of the Wildlife Services IWDM Program having been in operation continuously for the last 16 years, no trophic cascade or significant population shift or extinction resulting from the program has been intimated or documented.

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