

PREDECISION

ENVIRONMENTAL ASSESSMENT

AQUATIC RODENT DAMAGE MANAGEMENT IN OKLAHOMA

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ANIMAL AND PLANT HEALTH INSPECTION SERVICE
WILDLIFE SERVICES

In Cooperation With:



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CHAPTER 1: PURPOSE AND NEED FOR ACTION

1.1 INTRODUCTION

Across the United States, wildlife habitat has substantially changed as human populations have expanded and land has been transformed to meet varying human needs. These changes often compete with wildlife and have inherently increased the potential for conflicts between wildlife and people. Some species of wildlife have adapted to and thrive in the presence of humans and the changes that have been made. These species, in particular, are often responsible for the majority of conflicting activities between humans and wildlife. The U.S. Department of Agriculture (USDA), Animal and Plant Health Inspection Service (APHIS), Animal Damage Control (ADC) Final Environmental Impact Statement (FEIS) summarizes the relationship in American culture of wildlife values and wildlife damage in this way (USDA 1994):

"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, sociocultural, and economic considerations as well."

USDA is authorized to protect American agriculture and other resources from damage associated with wildlife. This function is carried out by the USDA, APHIS, Wildlife Services¹ (WS) program. The primary authorities for the WS program come from the Animal Damage Control Act of March 2, 1931, as amended (46 Stat. 1468; 7 U.S.C. 426-426b and 426c) and the Rural Development, Agriculture and Related Agencies Appropriations Act of 1988 (Public Law 100-202). WS activities are conducted in cooperation with other federal, state, and local agencies, as well as private organizations and individuals. This Environmental Assessment (EA) evaluates a portion of this responsibility, specifically, management of aquatic rodents including beaver (*Castor canadensis*), muskrat (*Ondatra zibethicus*), and nutria (*Myocastor coypus*) to resolve conflicts in Oklahoma.

Wildlife damage management (WDM), or control, is defined as the alleviation of damage or other problems caused by wildlife (Leopold 1933, The Wildlife Society 1990, Berryman 1991). WS uses an Integrated WDM (IWDM) approach (sometimes referred to as "Integrated Pest Management") and is described in Volume 4, Chapter 1, pages 1-7 of the WS FEIS (USDA 1994). This includes nonlethal strategies such as the modification of habitat or the offending animal(s) behavior, and lethal control of the offending animal(s) or local population of the offending species. IWDM is not based on punishing animals, but provides a means of reducing future losses or damage.

The FEIS contains detailed discussions of potential environmental impacts from methods that are used for WDM in Oklahoma (USDA 1994). The Council on Environmental Quality (CEQ) regulations for implementing the National Environmental Policy Act (NEPA) authorize agencies to eliminate repetitive discussions of issues addressed in programmatic Environmental Impact Statements (EIS) by tiering to the broader documents (CFR 1500.4(I); 1502.20). Thus, this EA is tiered to the FEIS and incorporates relevant

¹ Wildlife Services was previously known as the Animal Damage Control program. The name change became effective in 1997. Throughout this document, the acronyms "ADC" and "WS" refer to the same federally authorized program.

discussions and analysis from the FEIS. The FEIS may be obtained by contacting the USDA, APHIS, WS Operational Support Staff at 4700 River Road, Unit 87, Riverdale, MD 20737-1234.

WS's mission, developed through a strategic planning process, is to “*provide leadership in wildlife damage management for the protection of America's agricultural, industrial and natural resources, and to safeguard public health and safety*” (USDA 1989). This is accomplished through:

- ▶ training of wildlife damage management professionals;
- ▶ development and improvement of strategies to reduce economic losses and threats to humans from wildlife;
- ▶ the collection, evaluation, and dissemination of management information;
- ▶ cooperative wildlife damage management programs;
- ▶ informing and educating the public on how to reduce wildlife damage; and
- ▶ providing technical advice and a source for limited-use management materials and equipment such as pesticides, cage traps, and pyrotechnics.

WS's Policy Manual² reflects this mission and provides guidance for engaging in wildlife damage control activities. Before wildlife damage management is conducted, *Agreements for Control* or *WS Annual Work Plans* must be signed by WS and the land owner/administrator/agency representative. WS cooperates with land and wildlife management agencies, when appropriate and as requested, to combine efforts to effectively and efficiently resolve wildlife damage problems in compliance with all applicable federal, state, and local laws and Memorandums of Understanding (MOUs) between WS and other agencies.

1.1.1 The Oklahoma WS Program. WS responds to aquatic rodent damage throughout Oklahoma. Oklahoma encompasses about 45 million acres divided into 77 counties as shown in Figure 1. WS currently has about 9.8 million acres of properties under agreement to conduct aquatic rodent damage management (ARDM) in Oklahoma. However, not all properties are worked in any given year. For example, ARDM was conducted on properties totaling only 3.9 million acres in FY 97 (Federal fiscal year 1997= October 1, 1996-September 30, 1997) or about 9% of the area in Oklahoma (MIS³ 1997). Aquatic rodents, though, only inhabit the waterways and wetlands within the properties under agreement which reduces considerably the area on such properties that are actually worked for ARDM. The acreage of water worked in Oklahoma for ARDM is unknown, but properties under agreement probably have a higher percentage of area in streams or ponds than the average since work conducted for these species is associated with water. Oklahoma has about 783,000 acres of surface water in reservoirs, rivers, and streams and an additional 500,000 acres of farm ponds which represents about 3% of the total area of the State. Therefore, the total water surface acreage actually worked for ARDM in FY 97 by WS was probably greater than 117,000 acres of surface water (9% of the acreage

2 **WS Policy Manual** - Provides guidance for WS personnel to conduct wildlife damage management activities through Directives. WS Directives referenced in this EA can be found in the manual but will not be referenced in the Literature Cited Section.

3 **MIS** - Computer-based Management Information System used by WS for tracking Program activities. WS in Oklahoma has had the current MIS system operational since FY 93, and an older version was in place since the early 80s. Throughout the text, MIS will be noted along with the year, ie. 1996, when the data was entered. MIS reports though will not be referenced in the Literature Cited Section since most reports from the MIS are not kept on file. A database is kept that allows queries to be made to retrieve the information needed.

of water in Oklahoma). The acreage of water worked could be as much as 2 to 3 times higher than the average of 117,000 acres depending on the ratio of water to land on the properties under agreement.

WS conducts ARDM in cooperation with several other agencies in Oklahoma. [REDACTED]

[REDACTED] is a primary cooperator with WS for aquatic rodents because they have management authority over these species. WS and [REDACTED] have an MOU which lists responsibilities and requirements for aquatic rodent control. Under the MOU, WS has the responsibility of responding to all damage requests regarding these species. [REDACTED] also has a nuisance beaver control program for land owners and private trappers; many of the private trappers will respond to damage complaints for [REDACTED] and charge the landowners a fee for their services.

Figure 1. Counties cooperating (unshaded) with the Oklahoma WS program in ARDM during FY 98 (Oct. 1997- Sept. 1998).

WS is a cooperatively funded, service-oriented Program. Cooperators range from private citizens to other agency personnel. A primary cooperator of the Oklahoma WS Program by legislation is the [REDACTED]. Their mission and support is primarily focused on the development and protection of Oklahoma agriculture, animal husbandry, forestry, wildlife, and human health and safety. The relationship and responsibilities between WS and [REDACTED] are defined in an MOU. WS also cooperates with most counties in Oklahoma (Figure 1) where most ARDM efforts are conducted. WS also conducts some work in noncooperating counties, but the effort is much less than in cooperating counties.

1.2 PURPOSE

This EA analyzes ARDM for the protection of agriculture, property, natural resources, and human health and safety. These problems are resolved on a case-by-case basis. Normally, according to the APHIS procedures for implementing NEPA, individual wildlife damage management actions are categorically excluded (7 CFR 372.5(c), 60 Fed. Reg. 6,000-6,003, 1995). We have decided to prepare this EA to facilitate planning, interagency coordination, and the streamlining of program management, and to clearly communicate with the public the analysis of cumulative impacts.

ARDM is conducted on private, federal, state, tribal, county, and municipal lands in Oklahoma. As of February 1998, WS had agreements to conduct ARDM on properties totaling about 9.84 million acres or about 22% of the total acreage in Oklahoma. The proportion of this total in each type of land class as of February 1998 was 60.4% private, 30.1% County/city, 2.8% U.S. Forest Service (USFS), 2.0% State, 0.7% Native American, and 4.0% other Federal (mostly [REDACTED] lands). However, as stated

previously, the acreage of aquatic areas worked during FY 97 (Oct. 1, 1996-Sept. 30, 1997), was only about 1% of the total land under agreement.

1.3 NEED FOR ACTION

The need for action is based on the necessity for a program to protect resources from damage by aquatic rodents. Comprehensive surveys of damage by aquatic rodents in Oklahoma have not been conducted. However, WS obtains estimates of the type and value of damage from property and resource owners or managers who request WS assistance, or WS personnel that respond to such requests. Damage data thus obtained are summarized for FY 97 in Table 1. These data represent only a portion of the total damage caused by aquatic rodents because not all people who experience such damage request assistance from WS. Of the 3 species of aquatic rodents found in Oklahoma, beaver are responsible for almost all of the damage reported to or verified by WS (99.8%) and for almost all requests for assistance WS receives. Resource owners and government agencies have used a variety of techniques to reduce aquatic rodent damage. However, all lethal and nonlethal methods developed to date have limitations based on costs, logistics, or effectiveness. The cost effectiveness of the Oklahoma ARDM program has not been determined. However, such a determination has been made in at least one other program based on comparing estimates of the amount of damage prevented from occurring with the cost of conducting ARDM. WS in North Carolina (J. Heisterberg, WS, pers. comm. 1998) was able to document a 5.8:1 ratio of resource savings per dollar spent for ARDM. This indicates that ARDM as a management tool is highly cost effective for the protection of resources.

Table 1. Value of damage caused by aquatic mammals in Oklahoma as reported to or verified by Wildlife Services in FY 97 (October 1, 1996- September 30, 1997). The damage reported in this table is only a fraction of the actual damage caused by aquatic rodents in Oklahoma.

AQUATIC RODENT DAMAGE IN OKLAHOMA REPORTED BY WS IN FY 97				
CATEGORY	SUBCATEGORY	BEAVER	NUTRIA	MUSKRAT
Agriculture	Commercial Forestry & Nursery	\$46,395	-	-
	Field Crops	\$69,625	-	-
	Fruits & Nuts	\$37,750	-	-
	Range/pasture	\$157,775	\$500	-
Human Health & Safety	Human Health & Safety	\$0	-	-
Natural Resources	Forestry	\$128,627	-	-
	Other Natural Resources	\$1,286	-	-
Property	Equipment	\$2,500	-	-
	Landscaping	\$8,650	-	-
	Structures	\$641,409	\$50	\$1,250
	Other Property	\$12,060	-	-
TOTAL AQUATIC RODENT DAMAGE FOR FY 97		\$1,095,548	\$550	\$1,250

To conduct ARDM, it is important to have knowledge about each species. Full accounts of the life histories for these species can be found in mammal reference books. Some background information is given below for each species, especially the information pertaining to their range in Oklahoma.

Beaver. Beaver are a part of the wildlife heritage in Oklahoma. Prior to the 20th century, their numbers were probably relatively few. Beaver were thought to be extirpated from the State by the 1920s from fur trapping pressure. In the early 1950s, beavers began to reappear and the population was estimated at 1,245 individuals (Hoagland 1993). During this time, several beaver were relocated in the State from locations where they were

thriving. Since that time, the population has grown exponentially throughout Oklahoma. Beaver now can be found almost statewide, excluding much of the panhandle; their greatest numbers, though, are in the eastern half of the State. WS received a few requests for assistance regarding beaver damage prior to the 1970s, but, since that time, requests for WS assistance have increased substantially.

The greatest factor in the beaver's current success is the available habitat (Hoagland 1993). Since the late 1800s, streams and rivers in Oklahoma have been impounded and channelized which has inherently increased the surface water and shorelines in Oklahoma available to beaver. About 70 major reservoirs covering 600,000 acres and 500,000 acres of farm ponds exist today. These permanent water sources have allowed many streams to become perennial whereas they would have normally dried up during the late summer months earlier in the century. Currently, 23,000 miles of streams and rivers cross Oklahoma lands adding an additional 200,000 surface acres of water to the State. The year-round water supply has allowed beavers to colonize many areas that they previously could not. It has also changed the vegetation associated with the watercourses from typical oak species to cottonwoods and willows which are favored foods for beavers.

Beaver activities can be beneficial or detrimental depending on their activities and location. Habitat modifications from beaver, a result of dam building and tree cutting, can be beneficial to other species of wildlife and, often, the watershed. However, these modifications can conflict with human land or resource management objectives and can suppress different species of plants and animals including threatened and endangered (T&E) species. Such conflicts, which are viewed as "damage", result in adverse impacts that often outweigh benefits. Most of the damage caused by beavers is a result of dam building, bank burrowing, tree cutting, or flooding. The value of beaver damage is perhaps greater than that of any other single wildlife species in the United States -- economic damage was estimated to have exceeded \$4 billion in the southeastern U.S. over a 40-year period (Arner and Dubose 1979). Annual damage from beaver in Oklahoma has increased significantly along with their population. WS has documented over \$500,000 of damage annually since 1984 (Figure 2), increasing to over \$1,000,000 annually today (Table 1) (MIS 1997).

Beaver are responsible for a variety of damage (Wade and Ramsey 1986, Miller and Yarrow 1994, Willging and Sramek 1989, and Loven 1985) and the vast majority of wildlife damage documented by WS in Oklahoma (MIS 1997). The primary way beavers conflict with human interests is through their dam building activities. Types of damage that result include: (1) flooding of crop fields and livestock pastures rendering them unusable; (2) flooding of bottomland forests which can kill trees intended for timber harvest; and (3) flooding of roads or railways and areas adjacent to them that results in erosion of road and railway beds. In flat terrain, a relatively small beaver dam may cause hundreds of acres to be flooded. Beavers damage and kill ornamental and shade trees by gnawing, girdling and cutting. They sometimes burrow into man-made dams and levees and obstruct overflow structures and spillways which can cause such water

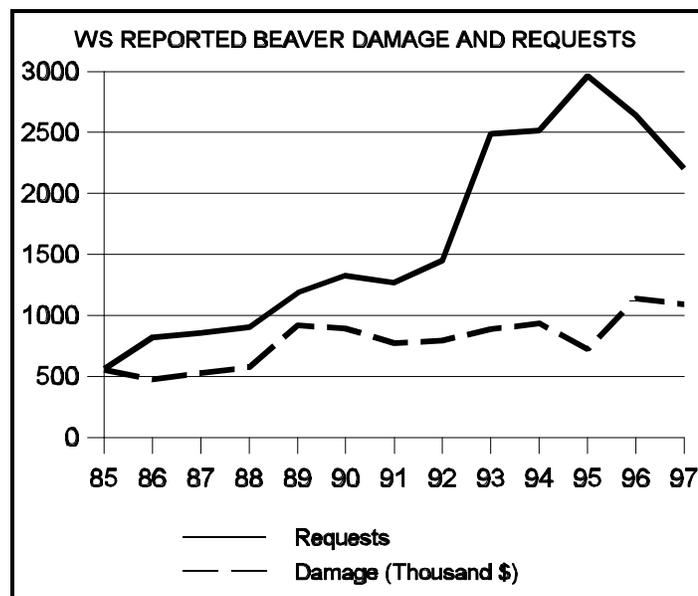


Figure 2. This graph represents the number of beaver requests received by WS Specialists throughout Oklahoma and the damage associated with these requests (MIS 1997). Both requests and damage have increased significantly over the last 10 years.

control structures to fail. Beavers are known to gnaw on or burrow into Styrofoam and wood supports under boat houses and docks which requires expensive repairs. Beavers are also known carriers of the intestinal parasite *Giardia lamblia* and can contaminate surface waters used for human consumption and recreation (Beach and McCulloch 1985).

Beaver damage and requests in Oklahoma have increased significantly over the last 15 years (Figure 2) . WS data provide only a fraction of the damage because much damage is not reported to WS (Loven 1985). Concerns about increased damage problems prompted the ██████████ to provide additional funding for WS in July of 1997 and 1998 to increase the level of assistance the program could provide to resolve beaver damage problems in eastern Oklahoma where damage has been substantial.

Muskrat. The muskrat is a native North American aquatic rodent. Muskrats are most abundant in northeast Oklahoma, but they are found lightly scattered in suitable habitat statewide. They inhabit creeks, rivers, lakes, ponds, and drainage ditches with a steady water level feeding primarily on cattails, bullrushes, and aquatic grasses. It has historically been the most heavily exploited furbearer in North America with 6-20 million harvested annually since about 1935 (Boutin and Birkenholz 1987). Boutin and Birkenholz (1987) provide a comprehensive review of muskrat natural history and population dynamics.

Damage by muskrats is usually not a major problem, but can be significant locally in particular situations (Wade and Ramsey 1986). Damage by this species in Oklahoma was reported at \$1,250 to WS (Table 1) for 5 requests (MIS 1997). The types of damage for which assistance could be requested include burrowing in levees or dams used to hold water for aquacultural production such as crayfish and catfish ponds or to control water flow such as flood control structures. The burrows can cause washouts which result in loss of irrigation water or flooding damage depending on the situation, which can then cause the loss of crops and the need to rebuild the dams and levees (Wade and Ramsey 1986).

Nutria. Nutria are native to Central and South America and became established in the United States after releases in the 1930s and 1940s from the promotion and failure of nutria “fur ranching.” In some areas, nutria were also released to control aquatic weeds (Kinler et al. 1987; Wade and Ramsey 1986). Nutria are now found in southeastern Oklahoma, primarily being confined to ██████████ County. Their preferred habitat is swamps, marshes, rivers, and lakes where they feed on mostly aquatic and semiaquatic vegetation such as cattails and reeds. They also venture from these areas into croplands and can cause considerable damage locally.

Nutria cause damage by feeding on agricultural crops such as pasture and corn, tree seedlings, and ornamental shrubs. Perhaps more serious than consumption of crops however, is damage to levees built for water control through their burrowing activities which can result in flooding damage and the need for expensive levee repairs (Wade and Ramsey 1986). ARDM for nutria is typically minimal in Oklahoma (Table 1) and only 2 requests for their control were received in FY 97 (MIS 1997).

1.3.1 Summary of Proposed Action

The proposed action is to continue the current WS ARDM activities in Oklahoma for the protection of agriculture, property, natural resources, and human health and safety. The objective of ARDM as conducted in the proposed action is to minimize loss or the risk of loss to the above resource categories from aquatic rodents by responding to all requests with technical assistance (advice and/or demonstrations) or direct control. WS employees give technical assistance to resource owners on a variety of methods that can be used to resolve problems under certain circumstances and where resource owners can handle the problem themselves or cooperative funds are not available. WS will

also assist resource owners through educational programs on damage identification and prevention. Direct control support is mostly given with methods that are difficult for the public to implement, especially those that involve lethal control measures, and where cooperative funding is available; resource owners that are given direct control assistance are also encouraged to use additional management strategies when and where appropriate to help reduce present and future problems.

Under the proposed action, Integrated Wildlife Damage Management (IWDM) will be implemented which encourages the use of all legal techniques and methods, used singly or in combination, to meet the needs of requesters for resolving conflicts with aquatic rodents. Most wildlife damage situations require professional expertise, an organized control effort, and the use of multiple control methods to sufficiently resolve them; this will be the task of WS personnel who are trained professionals and equipped to handle most damage situations. The resource, species, location and type of damage, and all available biologically sound, cost-efficient and legal methods will be analyzed by WS personnel to determine the action taken to correct each conflict with aquatic rodents.

A wide range of legal methods are available to resource owners and WS personnel. These fall into different categories including habitat modification (ie. beaver pond leveler, dam removal, and exclusion), and population management (ie. traps, shooting, and toxicants). Population management methods are almost always used lethally.

ARDM will be allowed in the State under the proposed action when and where requested and on public and private lands where signed *Agreements for Control* are in place. All ARDM will comply with federal, state, and local laws and current MOUs between WS and the various management agencies. WS personnel will communicate with other agency personnel when appropriate and necessary.

1.4 RELATIONSHIP OF THIS EA TO OTHER ENVIRONMENTAL DOCUMENTS

1.4.1 WS Programmatic EIS. WS has issued a final EIS (USDA 1994) and Record of Decision on the USDA-APHIS-WS nationwide program. This EA is tiered to that EIS.

1.5 DECISION TO BE MADE

Based on agency relationships, MOUs, and legislative authorities, WS is the lead agency for this EA, and therefore responsible for the scope, content, and decisions to be made. [REDACTED], the [REDACTED], and the [REDACTED] have had input during the EA preparation to ensure an interdisciplinary approach in compliance with NEPA, and agency mandates, policies, and regulations.

Based on the scope of this EA, the decisions to be made are:

- ▶ Should ARDM, as currently implemented, be continued (the no action alternative)?
- ▶ If not, how should WS fulfill its legal responsibilities?
- ▶ What mitigation measures should be implemented?
- ▶ Would the proposal have significant impacts requiring an EIS analysis?

1.6 SCOPE OF THIS EA ANALYSIS

1.6.1 Actions Analyzed. This EA evaluates ARDM to protect agricultural and natural resources, property, and human health and safety from aquatic rodents in Oklahoma.

1.6.2 Counties Not Part of the Operational WS ARDM Program. Some counties in Oklahoma

do not have Cooperative Agreements with WS (Figure 1). Because the current program's mission is to provide assistance when requested and where funds are available, this EA analyzes impacts not only at the current program level, but at potential program levels (statewide) should nonparticipating counties, or currently nonparticipating resource owners/managers in cooperating counties, decide to enter the program. Currently, WS does provide limited direct control support in noncooperating counties.

1.6.3 Native American Lands and Tribes. Several Tribes have requested WS to provide assistance with ARDM in Oklahoma for the protection of resources on tribal lands. The methods employed and potential impacts would be the same as for any private land upon which WS could provide service. WS discusses the methods to be used and addresses concerns with tribal representatives at the time the agreement is signed. Therefore, this EA covers such actions as requested and implemented.

1.6.4 Federal Lands. Currently, WS is providing ARDM on federal lands in Oklahoma including [REDACTED], USFS, the [REDACTED], and others. The methods employed and potential impacts would be the same on these lands as they would be on private lands upon which WS provides service. Therefore, if WS were requested to conduct ARDM on federal lands for the protection of resources, this EA would cover such actions implemented. The other federal agencies are actually responsible for NEPA documentation when they request the work to be done.

1.6.5 Period for which this EA is Valid. This EA will remain valid until WS and other appropriate agencies determine that new needs for action, changed conditions, or new alternatives having different environmental effects that must be analyzed. At that time, this EA would be supplemented pursuant to NEPA with the appropriate analyses. Review of the EA will be conducted yearly to ensure that the EA is accurate and sufficient.

1.6.6 Site Specificity. This EA analyzes potential impacts of ARDM and addresses WS ARDM activities on all lands under *Cooperative Agreement* and/or *Agreements For Control* within Oklahoma. It also addresses the impacts of ARDM on areas where additional agreements with WS may be written in the reasonably foreseeable future within Oklahoma. Because the proposed action is to continue the current ARDM program, and because the current program's goal and responsibility is to provide service when requested within the constraints of available funding and manpower, it is conceivable that additional ARDM efforts could occur. Thus, this EA anticipates potential expansion and analyzes the impacts of such expanded efforts as part of the current program. This EA emphasizes significant issues as they relate to specific areas whenever possible; however, the issues that pertain to aquatic rodent damage and resulting management are the same, for the most part, wherever they occur, and are treated as such. The standard WS Decision Model (Slate et al. 1992) and WS Directive 2.105 will be the site-specific procedure for determining methods and strategies to use or recommend for individual actions conducted by WS in Oklahoma (See USDA 1994, Chapter 2 and Appendix N for a more complete description of the WS Decision Model and examples of its application). Decisions made using the model will be in accordance with any mitigation and standard operating procedures (SOPs) described herein and adopted or established as part of the decision.

1.6.7 Interdisciplinary Development of the EA. Comments were solicited from [REDACTED], Oklahoma Conservation Commission (OCC), USFWS, and the [REDACTED]. Comments are maintained in an administrative file located at the Oklahoma WS State Office, 2800 N Lincoln Blvd., Oklahoma City, OK 73105.

1.7 AUTHORITY AND COMPLIANCE

1.7.1 Authority of Federal⁴ and State Agencies to Conduct ARDM

WS Legislative Authority. The primary statutory authority for WS is the Animal Damage Control Act of 1931, as amended (46 Stat.1486; 7 U.S.C. 425-426c), which provides that:

“The Secretary of Agriculture is authorized and directed to conduct such investigations, experiments, and tests as he may deem necessary in order to determine, demonstrate, and promulgate the best methods of eradication, suppression, or bringing under control on national forests and other areas of the public domain as well as on State, Territory or privately owned lands of mountain lions, wolves, coyotes, bobcats, prairie dogs, gophers, ground squirrels, jackrabbits, brown tree snakes and other animals injurious to agriculture, horticulture, forestry, animal husbandry, wild game animals, furbearing animals, and birds, and for the protection of stock and other domestic animals through the suppression of rabies and tularemia in predatory or other wild animals; and to conduct campaigns for the destruction or control of such animals. Provided that in carrying out the provisions of this Section, the Secretary of Agriculture may cooperate with States, individuals, and public and private agencies, organizations, and institutions.”

Since 1931, with the changes in societal values, WS policies and its programs have placed greater emphasis on the part of the Act discussing "bringing (damage) under control," rather than "eradication" and "suppression" of wildlife populations.

In 1988, Congress strengthened the legislative directive of WS with the Rural Development, Agriculture, and Related Agencies Appropriations Act of 1988, Public Law 100-102, Dec. 27, 1987. Stat. 1329-1331(7 U.S.C. 426c). This Act states, in part:

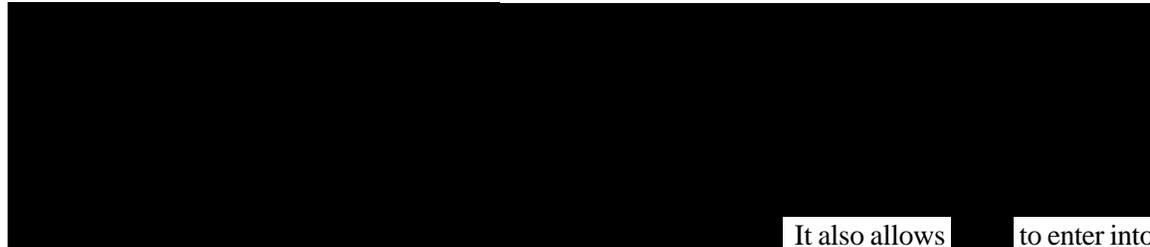
“That hereafter, the Secretary of Agriculture is authorized, except for urban rodent control, to conduct activities and to enter into agreements with States, local jurisdictions, individuals, and public and private agencies, organizations, and institutions in the control of nuisance mammals and birds and those mammal and bird species that are reservoirs for zoonotic diseases, and to deposit any money collected under any such agreement into the appropriation accounts that incur the costs to be available immediately and to remain available until expended for Animal Damage Control activities.”

██ has the responsibility to manage all protected and classified wildlife in Oklahoma, except federally listed T&E species, regardless of the land class on which the animals are found (1995 Oklahoma Revised Statutes (████████████████████)). ██████████ is authorized to cooperate with WS and ██████████ for controlling wildlife including aquatic rodents (████████████████████). ██████████ and WS have an MOU that authorizes WS to control furbearers including beaver, muskrat, and nutria. ██████████ also issues permits to landowners, lawful tenants, and lessees to take aquatic rodents (████████████████████); WS is exempt from this statute under the terms of an MOU.

██████████ does have a nuisance beaver control program whereby private citizens may become certified to use body gripping traps and night shooting to take beaver where they are causing damage and apply

4 Detailed discussions of WS legal responsibilities and key legislation pertinent to wildlife damage management are found in USDA (1994).

for a permit to take them off of said property. Private persons may also use other methods according to the hunting/trapping regulations for beaver, muskrat and nutria. Beaver and nutria can be taken year-round when causing damage with the appropriate licenses and certification. Muskrat can only be taken in December and January, unless a permit is obtained from [REDACTED] allowing their take.



[REDACTED] It also allows [REDACTED] to enter into agreements with other entities to conduct ARDM. [REDACTED] currently has an MOU and Annual Work Plan with WS. These documents establish a cooperative relationship between WS and [REDACTED], outline responsibilities, and set forth annual objectives and goals of each agency for resolving wildlife damage management conflicts in Oklahoma.

[REDACTED] agents to “carry a clip-loaded or magazine-loaded rifle or shotgun in a vehicle, provided the rifle or shotgun is not chamber loaded.” It further states that “*the names of authorized agents by the [REDACTED] to carry said rifle or shotgun shall be furnished to the [REDACTED].*” This letter is written annually to the [REDACTED] with the names of current employees authorized to conduct ARDM within Oklahoma.

The [REDACTED] is responsible for regulating the State Pesticide Law activities including the registration and distribution of pesticides. In addition, they regulate the Oklahoma Pesticide Applicators Law which requires applicators of restricted use pesticides to be properly certified.

Oklahoma Conservation Commission. OCC is responsible for preparing Oklahoma’s Comprehensive Wetlands Conservation Plan (OCC 1996).

Natural Resource Conservation Service (NRCS). NRCS is responsible for certifying wetlands under the Wetland Conservation provisions of the Food Security Act (16 U.S.C. 3821 and 3822). Topographic maps are available through their offices that identify the presence of wetlands.

U.S. Fish and Wildlife Service. USFWS has statutory authority to manage Federally listed T&E species through the Endangered Species Act of 1973 (ESA) (16 U.S.C. 1531-1543, 87 Stat. 884) and migratory birds under the Migratory Bird Treaty Act of 1918 (16 U. S. C. 703-711; 40 Stat. 755), as amended.

U.S. Army Corps of Engineers. The Corps regulates and permits activities regarding waters of the United States including protection and utilization under Section 404 of the Clean Water Act.

U.S. Environmental Protection Agency (EPA). EPA is responsible for implementing and enforcing the Federal Insecticide, Fungicide, and Rodenticide Act (FIFRA) which regulates the registration and use of pesticides. EPA is also responsible for administering and enforcing the Section 404 program of the Clean Water Act with the Corps; this established a permit program for the review and approval of water quality standards that directly impact wetlands.

1.7.2 Compliance with Federal Laws. Several Federal laws regulate WS and ARDM. WS

complies with these laws, and consults and cooperates with other agencies as appropriate.

National Environmental Policy Act (NEPA). This EA for ARDM, with WS as the lead agency, is the first time that all land classes under Cooperative Agreements or Agreements for Control will be analyzed in the analysis area in a comprehensive manner. WS coordinates specific projects and programs with other agencies. The purpose of these contacts is to coordinate any wildlife damage management that may affect resources managed by these agencies or affect other areas of mutual concern. Federal agency requests for WS assistance to protect resources outside the species discussed in this EA would be reviewed, and if necessary, the agency requesting the assistance would be responsible for NEPA compliance.

Migratory Bird Treaty Act of 1918 (16 U. S. C. 703-711; 40 Stat. 755), as amended. The Migratory Bird Treaty Act provides the USFWS regulatory authority to protect species of birds that migrate outside the United States. ARDM does not target migratory birds, but a few are taken as nontargets incidental to ARDM.

Endangered Species Act (ESA). It is WS and Federal policy, under the ESA, that all Federal agencies shall seek to conserve T&E species and shall utilize their authorities in furtherance of the purposes of the Act (Sec.2(c)). WS conducts consultations with the USFWS, as required by Section 7 of the ESA, to utilize the expertise of the USFWS, to ensure that "*any action authorized, funded or carried out by such an agency . . . is not likely to jeopardize the continued existence of any endangered species or threatened species. . .*" (Sec.7(a)(2)). WS has obtained a Biological Opinion from USFWS describing potential effects on T&E species and prescribing reasonable and prudent measures for avoiding jeopardy (USDA 1994, Appendix F). Oklahoma WS has also conducted an informal consultation with USFWS and ODWC for the proposed ARDM program specifically concerning the T&E species in Oklahoma (Appendices B and C).

Clean Water Act (Section 404). Section 404 (33 U.S.C. 1344) of the Clean Water Act prohibits the discharge of dredged or fill material into waters of the United States without a permit from the Corps unless the specific activity is exempted in 33 CFR 323 or covered by a nationwide permit in 33 CFR 330. The removal of most beaver dams are covered by these regulations (33 CFR 323 and 330). However, a recent court decision, the Tulloch Rule Decision, determined that minimal quantities of material released during excavation activities, such as may occur during beaver dam removal, may be considered "incidental fallback" which would not be governed by Section 404 and is allowed (Wayland and Shaeffer 1997).

Food Security Act. The Wetland Conservation provision (Swampbuster) of the 1985 (16 U.S.C. 3801-3862), 1990 (as amended by PL 101-624), and 1996 (as amended by PL 104-127) farm bills require all agricultural producers to protect wetlands on the farms they own. Wetlands converted to farmland prior to December 23, 1985 are not subject to wetland compliance provisions even if wetland conditions return as a result of lack of maintenance or management. If prior converted cropland is not planted to an agricultural commodity (crops, native and improved pastures, rangeland, tree farms, and livestock production) for more than 5 consecutive years and wetland characteristics return, the cropland is considered abandoned and then becomes a wetland subject to regulations under Swampbuster and Section 404 of the Clean Water Act. NRCS is responsible for certifying wetland determinations according to this Act.

Federal Insecticide, Fungicide, and Rodenticide Act. FIFRA requires the registration, classification, and regulation of all pesticides used in the United States. All pesticides used or recommended by the WS program are registered with and regulated by the EPA and ODA. WS uses the chemicals according to labeling procedures and requirements as regulated by the EPA and ODA.

National Historical Preservation Act of 1966 as amended (NHPA). The NHPA and its implementing regulations (CFR 36, 800) require federal agencies to: 1) determine whether proposed activities constitute “undertakings” that can result in changes in the character or use of historic properties and, 2) if so, to evaluate the effects of such undertakings on such historic resources and consult with the State Historic Preservation Office regarding the value and management of specific cultural, archaeological and historic resources; and 3) consult with appropriate American Indian tribes to determine whether they have concerns for traditional cultural properties in areas of these federal undertakings. Activities described under the proposed action do not cause major ground disturbance and are not undertakings as defined by the NHPA. The Oklahoma Historic Preservation Office has indicated no concerns with wildlife damage management actions in the State because construction and earth moving activities are not conducted.

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

Environmental Justice and Executive Order 12898 - Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations. Environmental Justice has been defined as the pursuit of equal justice and equal protection under the law for all environmental statutes and regulations without discrimination based on race, ethnicity, or socioeconomic status. Executive Order 12898 requires Federal agencies to make Environmental Justice part of their mission, and to identify and address disproportionately high and adverse human health and environmental effects of Federal programs, policies and activities on minority and low-income persons or populations. A critical goal of Executive Order 12898 is to improve the scientific basis for decision-making by conducting assessments that identify and prioritize environmental health risks and procedures for risk reduction. Environmental Justice is a priority both within USDA/APHIS and WS. APHIS plans to implement Executive Order 12898 principally through its compliance with the provisions of NEPA.

WS activities are evaluated for their impact on the human environment and compliance with Executive Order 12898 to ensure Environmental Justice. WS personnel use wildlife damage management methods as selectively and environmentally conscientiously as possible. All chemicals used by APHIS-WS are regulated by the EPA through the Federal Insecticide, Fungicide and Rodenticide Act (FIFRA), ODA, by MOUs with Federal land managing agencies, and by ADC Directives. Based on a thorough Risk Assessment, APHIS concluded that when WS program chemicals are used following label directions, they are highly selective to target individuals or populations, and such use has negligible impacts on the environment (USDA 1994, Appendix P). The WS operational program properly disposes of any excess solid or hazardous waste. It is not anticipated that the proposed action would result in any adverse or disproportionate environmental impacts to minority and low-income persons or populations.

1.8 A PREVIEW OF THE REMAINING CHAPTERS IN THIS EA

This EA is composed of 5 chapters and 4 appendices. Chapter 2 discusses and analyzes the issues and affected environment. Chapter 3 contains a description of each alternative, alternatives not considered in detail, and mitigation and SOPs. Chapter 4 analyzes the environmental impacts associated with each alternative considered in detail. Chapter 5 contains the list of preparers of this EA. Appendix A is the literature cited in the EA. Appendix B is the Biological Assessment of ARDM affects on T&E species. Appendix C contains informal consultation letters from USFWS and ODWC regarding the T&E Biological Assessment.

CHAPTER 2: ISSUES

Chapter 2 contains a discussion of the issues, including those that will receive detailed environmental impacts analysis in Chapter 4 (Environmental Consequences), and those that were used to develop mitigation measures and SOPs, and the issues that will not be considered in detail with rationale. Pertinent portions of the affected environment will be included in this chapter in the discussion of issues used to develop mitigation measures. Additional affected environments will be incorporated into the discussion of the environmental impacts in Chapter 4.

Issues are concerns of the public and/or of professional communities about potential environmental problems that might occur from a proposed federal action. Such issues must be considered in the NEPA decision process. Issues relating to the management of wildlife damage were raised during the scoping process in preparing the programmatic WS FEIS (USDA 1994) and were considered in the preparation of this EA. These issues are fully evaluated within the FEIS, which analyzed data specific to the Oklahoma WS Program

2.1 ISSUES CONSIDERED

Following are issues that have been identified as areas of concern requiring consideration in this EA.

- ▶ Effects on Target Aquatic Rodent Species Populations
- ▶ Effects on Nontarget Species Populations, Including T&E Species
- ▶ Humaneness of Control Techniques
- ▶ Effects of Beaver Dam Removal on Wetland Wildlife Habitat
- ▶ Effects of ARDM Methods on Public Safety

Potential environmental impacts of the Proposed Action and Alternatives in relation to these issues are discussed in Chapter 4. All issues except the final two have also been addressed in detail in the FEIS (USDA 1994). As part of this process, and as required by CEQ and APHIS NEPA implementing regulations, this document and its Decision are being made available to the public through “Notices of Availability” (NAS) published in local media and through direct mailings of NAS to parties that have specifically requested to be notified. New issues or alternatives raised after publication of public notices will be fully considered to determine whether the EA and its Decision should be revisited and, if appropriate, revised.

2.2 ISSUES USED TO DEVELOP MITIGATION

2.2.1 Effects on Nontarget Species Populations, Including T&E Species. A common concern among members of the public and wildlife professionals, including WS personnel, is the impact of ARDM control methods and activities on nontarget species, particularly T&E species. WS SOPs include measures intended to mitigate or reduce the effects of ARDM on nontarget species populations and are presented in Chapter 3.

Special efforts are made to avoid jeopardizing T&E species through biological evaluations of potential effects and the establishment of special restrictions or mitigation measures. A description of mitigation measures established to avoid jeopardizing T&E species are presented in Chapter 3. The results of the biological evaluation are given in Chapter 4.

2.2.2 Humaneness of Methods Used by WS. The issue of humaneness, as it relates to the killing or capturing of wildlife is an important but very complex concept that can be interpreted in a variety of ways. Humaneness is a person's perception of harm or pain inflicted on an animal, and people may perceive the humaneness of an action differently. Animal welfare organizations are concerned that some methods used to manage wildlife damage expose animals to unnecessary pain and suffering. Research suggests that with some methods, such as restraint in leghold traps, changes in the blood chemistry of trapped animals indicate "stress." Blood measurements indicated similar changes in foxes that had been chased by dogs for about five minutes as those restrained in traps (USDA 1994). However, such research has not yet progressed to the development of objective, quantitative measurements of pain or stress for use in evaluating humaneness.

The decision-making process involves tradeoffs between managing damage and the aspect of humaneness. The challenge in coping with this issue is how to achieve the least amount of animal suffering with the constraints imposed by current technology, yet provide sufficient ARDM to resolve problems.

WS has improved the selectivity of management devices through research and development such as pan tension devices for traps and breakaway snares. Research is continuing to bring new findings and products into practical use. Until such time as new findings and products are found to be practical, a certain amount of alleged animal suffering will occur if ARDM objectives are to be met in those situations where nonlethal control methods are not practical.

WS personnel in Oklahoma are experienced and professional in their use of management methods so that they are as humane as possible under the constraints of current technology. Mitigation measures and SOPs used to maximize humaneness are listed in Chapter 3.

2.2.3 Effects of Beaver Dam Removal on Wetland Wildlife Habitat. Beavers build dams primarily in smaller riverine wetlands (intermittent and perennial streams and creeks). Their dams obstruct the normal flow of water and typically change the preexisting wetlands' hydrology from flowing or circulating waters to slower, deeper, more expansive waters that accumulate bottom sediment; the depth of the bottom sediment depends on the length of time an area is covered by water, and the amount of suspended sediment in the water. Beaver dams in time can establish new, but different wetlands. The Corps' and EPA's regulatory definition of a wetland (40 CFR 232.2) is:

Those areas that are inundated or saturated by surface or groundwater at a frequency and duration sufficient to support, and that under normal circumstances do support, a prevalence of vegetation typically adapted for life in saturated soil conditions. Wetlands generally include swamps, marshes, bogs, and similar areas.

The preexisting habitat and the altered habitat have different ecological values to the fish and wildlife native to the area. Some species will abound by the addition of a beaver dam, while others will diminish. For example, some species of darters listed as federally endangered require fast moving waters over gravel or cobble beds (see Appendix B) which beaver dams can eliminate, thus reducing the habitat's value for these species. In general, it has been found that wildlife habitat values decline around bottomland beaver impoundments in the Southeast because the hardwoods are killed from flooding and mast production declines (A. Dunaway, WS, pers. comm. 1998). On the other hand,

beaver dams can potentially be beneficial to some species of wildlife such as river otter (*Lutra canadensis*) and waterfowl when it becomes an established wetland. Since a potential exists for ARDM to impact wildlife habitat, this is being considered as an issue.

If a beaver dam is not removed and water is allowed to stand, hydric soils and hydrophytic vegetation eventually form. This process can take anywhere from several months to years depending on preexisting conditions (J. Myers, OCC, pers. comm. 1998). Hydric soils are those soils that are saturated, flooded, or ponded long enough during the growing season to develop anaerobic conditions in the upper part. In general, hydric soils form much easier where wetlands have preexisted (J. Myers, OCC, pers. comm. 1998). Hydrophytic vegetation includes those plants that grow in water or on a substrate that is at least periodically deficient in oxygen as a result of excessive water content (OCC 1996). If these conditions are met, then a wetland has developed that will have different wildlife habitat values than an area that has been more recently impounded by beaver dam activity.

The intent of most dam removal operations is not to drain old established wetlands. With few exceptions, requests from public and private individuals and entities that WS receives involve dam removal to return an area back to its preexisting condition within a few years after the dam was created. If the area does not have hydric soils, it usually takes many years for them to develop and a wetland to become established; this often takes greater than 5 years as recognized by the Swampbuster provisions. Most beaver dam removal by WS is allowed under exemptions stated in 33 CFR parts 323 and 330 of Section 404 of the Clean Water Act or parts 3821 and 3822 of the Food Security Act. However, the removal of some beaver dams can trigger certain portions of Section 404 that require landowners to obtain permits from the Corps. WS personnel determine the proper course of action upon inspecting a beaver dam impoundment. Section 3.2.1 describes the procedures used by WS to assure compliance with the pertinent laws and regulations.

2.2.4 Effects of ARDM Methods on Public Safety. A formal risk assessment of WS methods, including almost all of those used for ARDM in Oklahoma, concluded low risks to humans (USDA 1994, Appendix P). Two specific methods were not addressed in the assessment: the use of explosives to remove beaver dams and the toxicant zinc phosphide for muskrat and nutria control. However, the use of zinc phosphide in Tennessee, Louisiana, and Texas was addressed and it was found to have low potential effects if used according to the label.

2.3 ISSUES NOT CONSIDERED IN DETAIL WITH RATIONALE

2.3.1 WS's Impact on Biodiversity. No WS wildlife management program in Oklahoma is conducted to eradicate a native wildlife population. WS operates in accordance with international, federal, and state laws and regulations enacted to ensure species viability. Any reduction of a local population or group would be temporary because immigration from adjacent areas or reproduction would soon replace the animals removed. The impacts of the current WS Program on biodiversity are not significant nationwide or in Oklahoma (USDA 1994). WS operates on a relatively small percentage of the land area in Oklahoma and WS take is a small proportion of the total population of any species as analyzed in Chapter 4.

2.3.2 Wildlife Damage Should Be an Accepted Loss -- a Threshold of Loss Should Be Reached Before Providing ARDM Services. WS is aware of concerns that federal wildlife damage

management should not be allowed until economic losses become unacceptable. Although some loss of resources to wildlife can be expected and tolerated, WS has the legal direction to respond to requests for wildlife damage management, and it is Program policy to aid each requester to minimize losses. WS uses the Decision Model discussed in Chapter 3 to determine an appropriate strategy.

In a ruling for Southern Utah Wilderness Alliance, et al. vs. Hugh Thompson, Forest Supervisor for the Dixie NF, et al., the United States District Court of Utah denied plaintiffs' motion for preliminary injunction. In part, the court found that a forest supervisor need only show that damage from predators is threatened to establish a need for wildlife damage management (Civil No. 92-C-0052A January 20, 1993). Thus, there is precedent for conducting ARDM when damage has not yet occurred but is only threatened.

2.3.3 No Wildlife Damage Management at Taxpayer Expense, Wildlife Damage Management Should Be Fee Based. WS is aware of concerns that wildlife damage management should not be provided at the expense of the taxpayer or that it should be fee based. WS was established by Congress as the agency responsible for providing wildlife damage management to the people of the United States. Funding for WS ARDM comes from a variety of sources in addition to federal appropriations. Such nonfederal sources include Oklahoma general appropriations, local government funds (county or city), producer associations, and individual private citizens which are all applied toward program operations. Federal, state, and local officials have decided that wildlife damage management needs to be conducted and have allocated funds for these activities. Additionally, wildlife damage management is an appropriate sphere of activity for government programs, since wildlife management is a government responsibility. A commonly voiced argument for publicly funded wildlife damage management is that the public should bear the responsibility for damage to private property caused by “publicly-owned” wildlife.

2.3.4 American Indian and Cultural Resource Concerns. The National Historic Preservation Act of 1966, as amended, requires federal agencies to evaluate the effects of any federal undertaking on cultural resources and to consult with appropriate American Indian Tribes to determine whether they have concerns for cultural properties in areas of these federal undertakings. The Native American Graves and Repatriation Act of 1990 provides protection of American Indian burials and establishes procedures for notifying Tribes of any new discoveries. Senate Bill 61, signed in 1992, sets similar requirements for burial protection and Tribal notification with respect to American Indian burials discovered on state and private lands.

Wildlife damage management has little potential to cause adverse effects to sensitive historical and cultural resources. ARDM activities, specifically, will have no adverse effects on historical and cultural resources.

In consideration of Native American cultural and archeological interests, the WS Program requested a list of the Tribes in Oklahoma from the Bureau of Indian Affairs (BIA). Each Tribe will be solicited for comments regarding the EA and ARDM activities in Oklahoma. ARDM actions on American Indian Tribal property would only occur if requested or as agreed by Tribal officials, assuring that Tribes can decide that such actions will not occur if there are overriding cultural resource concerns.

CHAPTER 3: ALTERNATIVES INCLUDING THE PROPOSED ACTION

3.1 ALTERNATIVES ANALYZED IN DETAIL

3.1.1 **Alternative 1 - Continue the Current Federal ARDM Program (the Proposed Action).**

This is the Proposed Action as described in Chapter 1 and is the “No Action” alternative as defined by CEQ for ongoing Programs.

3.1.2 Alternative 2 - No Federal WS ARDM. This alternative consists of no federal ARDM. Affected resource owners would be left to their own accord to stop damage created by aquatic rodents.

3.1.3 Alternative 3 - Technical Assistance Only. Under this alternative, WS would not conduct any direct operational ARDM activities in Oklahoma. If requested, affected resource owners would be provided with technical assistance information only.

3.1.4 Alternative 4 - Nonlethal Required Before Lethal Control. This alternative would not allow lethal control by WS until nonlethal methods had been tried and found to be inadequate in each damage situation.

3.2 DESCRIPTION OF THE ALTERNATIVES

3.2.1 Alternative 1 - Continue the Current Federal ARDM Program. A succinct description of the proposed action was presented in Chapter 1. The discussion that follows contains further information intended to foster understanding of WS’s rationale for constructing the proposed action.

Integrated Wildlife Damage Management (IWDM). For more than 70 years, WS has considered, developed, and used numerous methods of managing wildlife damage problems (USDA 1994, P. 2-15). The efforts have involved research and development of new methods and the implementation of effective strategies to resolve wildlife damage.

The most effective approach to resolving wildlife damage is to integrate the use of several methods simultaneously or sequentially. IWDM is the implementation and application of safe and practical methods for the prevention and control of damage caused by wildlife based on local problem analyses and the informed judgement of trained personnel. The WS Program applies IWDM, commonly known as Integrated Pest Management (IPM) (WS Directive 2.105), to reduce damage through the WS Decision Model (Slate et. al. 1992) described in the FEIS (USDA 1994).

The philosophy behind IWDM is to implement effective management techniques in a cost effective manner while minimizing the potentially harmful effects on humans, target and nontarget species, and the environment. IWDM draws from the largest possible array of options to create a combination of techniques appropriate for the specific circumstances. IWDM may incorporate cultural practices (i.e. animal husbandry), habitat modification, animal behavior (i.e. scaring), local population reduction, or any combination of these, depending on the characteristics of the specific damage problems. In selecting management techniques for specific damage situations consideration is given to the:

- ▶ Species responsible;
- ▶ Magnitude and geographic extent of damage;
- ▶ Duration and frequency of the damage;
- ▶ Prevention of future damage (lethal and nonlethal techniques); and
- ▶ Environmental concerns such as T&E species in the same area.

The cost of IWDM may be secondary because of overriding environmental, legal, human health and safety, animal welfare, or other concerns.

The IWDM Strategies That WS Employs. WS employs different strategies to resolve wildlife damage problems. In certain situations, WS may provide cooperators with the information necessary to resolve the problem themselves (technical assistance). In others, WS may directly resolve the problem (direct assistance). However, the most common strategy to resolve wildlife damage is to use a combination of these approaches.

Technical Assistance Recommendations (implementation is the responsibility of the requestor). WS personnel provide information, demonstrations, and advice on many of the available IWDM techniques. Technical assistance includes demonstrations on the proper use of management devices (pond-levelers, cage traps, etc.) and information and advice on animal husbandry practices, habitat management, and animal behavior modification devices. Technical assistance is generally provided following an on-site visit or verbal consultation with the requestor. Generally, several management strategies are described to the requestor for short and long-term solutions to damage problems; these strategies are based on the level of risk, the abilities of the requestor, need, and practical application. Technical assistance may require substantial effort by WS personnel in the decision making process, but the actual management is primarily the responsibility of the requestor.

Direct Control Assistance (activities conducted or supervised by WS personnel). Direct control assistance is implemented when the problem cannot effectively be resolved through technical assistance and when *Cooperative Agreements* provide for WS direct control assistance. The initial investigation defines the nature and history of the problem, extent of damage, and the species responsible for the damage. Professional skills of WS personnel are often required to effectively resolve problems, especially if restricted-use pesticides are proposed, or the problem is complex requiring the direct supervision of a wildlife professional. WS considers the biology and behavior of the damaging species and other factors using the WS Decision Model (Slate et al. 1992). The recommended strategy (ies) may include any combination of preventive and corrective actions that could be implemented by the requestor, WS, or other agency, as appropriate. Two strategies are used by WS, preventive and corrective management.

Preventive Damage Management. Preventive damage management is applying wildlife damage management strategies before damage occurs, based on historical damage problems. As requested and appropriate, WS personnel provide information, conduct demonstrations and/or take action to prevent these historical problems from recurring. For example, in areas where substantial damage by flooding has occurred

historically and beaver have been removed, WS may provide information about effective exclusion, pond levelers or other nonlethal techniques, or be requested to conduct operational ARDM after new activity is noticed prior to new damage. However, preventive management is not frequently used in ARDM.

Corrective Damage Management. Corrective damage management is applying ARDM to stop or reduce current losses. As requested and appropriate, WS personnel provide information and conduct demonstrations or, with the appropriate signed agreement, take action to prevent additional losses from recurring. For example, in areas where roads have been flooded, WS may provide information about exclusion methods or pond levelers, and conduct operational ARDM to stop the losses.

ARDM Methods. This section summarizes the best technology for resolving aquatic rodent damage that has evolved from continued development and refinement by research and the experience of professional wildlife biologists. Several ARDM methods are available for use. Resource owner practices consist primarily of nonlethal preventive methods such as exclusion and habitat modifications and are implemented by the resource owner. Resource owners are encouraged to use these methods, based on the level of risk, need, and professional judgement on their effectiveness and practicality (USDA 1992). WS employs several lethal control methods selectively to remove aquatic rodents causing damage where nonlethal techniques would not adequately address the damage situation. WS conducts direct control operations with any of the following methods on a property only where signed *Agreements For Control On Private Property* are in place, or, on federal, state, county or other local government lands, *Agreements For Control On Nonprivate Property* or *Work Plans* are in place that cover the intended target species and methods to be used.

Most ARDM methods have strengths and weaknesses in each specific damage situation, and can range from being very effective at reducing damage to being of virtually no value. WS personnel using the WS Decision Model can determine for each ARDM situation the method or combination of methods that is most appropriate and effective. ARDM methods available for WS Specialists to choose from include the following:

Exclusion. This pertains to preventing access to resources through fencing or other barriers. Fencing of small critical areas such as around culverts and drain pipes can sometimes prevent beavers from plugging them. Fencing, especially if it is installed with an underground skirt, can prevent access to areas for beaver, nutria, and muskrat such as yards or hay meadows with minimal access to water. Hardware cloth or other metal barriers can sometimes be practical to prevent girdling and gnawing of valuable trees. Construction of concrete spillways may reduce or prevent damage to dams by burrowing aquatic rodent species. Riprap can also be used on dams or levies at times, especially to deter muskrat burrowing. Electrical water barriers have proven effective in limited situations for beaver; an electrical field through the water in a ditch or other narrow channel, or hot-wire suspended just above the water level in areas protected from public access, have been effective at keeping beaver out. The effectiveness of an electrical barrier is extended when used in conjunction with an odor or taste cue that is emitted because beaver will avoid the area even if the electrical field

is discontinued (Kolz and Johnson 1997).

Cultural Methods and Habitat Management. Most methods thought of as cultural have little effect on beavers because of their ability to modify their habitat. Some of these methods are more effective for muskrat and nutria. The removal of vegetation near water and damage prone areas reduces cover and eliminates food sources and might discourage the presence of beavers, nutria, and muskrats. Continual destruction of beaver dams and removal of dam construction materials on a daily basis will sometimes cause beavers to move to other locations although this strategy can be far more expensive than removing beavers in conjunction with dam removal. Water control devices such as the three-log drain (Roblee 1983), the T-culvert guard (Roblee 1987), wire mesh culvert (Roblee 1983), and the Clemson beaver pond leveler (Miller and Yarrow 1994) can sometimes be used to control the water in beaver ponds to desirable levels that do not cause damage. Lowering water levels for winter and fluctuating water levels can encourage muskrat and nutria to leave farm ponds.

Repellents. There are no chemical repellents registered for aquatic rodents. Thus, none are legal for use and will not be considered further by WS. However, recent preliminary tests by WS's National Wildlife Research Center suggest that paint mixed with sand may be an effective barrier against beavers gnawing and cutting trees and other objects. If the method is found to be effective and practical, and if it is classified as a "repellent" requiring registration under the Federal Insecticide, Fungicide, and Rodenticide Act and state pesticide control laws, then the program could consider and use or recommend that type of repellent method once it is registered.

Toxicants. The only toxicant registered in Oklahoma for use in ARDM is zinc phosphide for muskrat and nutria control, although some anticoagulants are available in other States for nutria control. No toxicants are registered for use on beavers. The use of zinc phosphide on various types of fruit or vegetable baits (apples, carrots, sweet potatoes) on floating rafts to kill muskrats and nutrias has proven to be quite effective at suppressing a local population. All chemicals used by WS are registered under FIFRA and administered by EPA and ODA. WS personnel that use chemical methods are certified as pesticide applicators by ODA and are required to adhere to all certification requirements set forth in FIFRA and the Oklahoma State pesticide control laws and regulations. Trainees or personnel under direct supervision (supervisor able to be reached by phone call or radio) can use chemicals under Oklahoma Laws without certification (ORS 2, §3-81). No chemicals are used on federal or private lands without authorization from the land management agency or property owner/manager. A quantitative risk assessment evaluating potential impacts of WS's use of chemical methods when used according to the label concluded that no adverse effects are expected from the above (USDA 1994, Appendix P).

Live Trapping and Relocation. Cage traps, snares, and leg-hold traps can be used to capture aquatic rodents alive for relocation. This method is rarely, if ever, used to solve problems caused by beaver, muskrat, or nutria in Oklahoma because these species are abundant; in addition, moving damage-causing individuals to other locations can typically result in damage at the new location, or the translocated individuals can move from the relocation site to areas where they are unwanted. The American Veterinary Medical

Association, the National Association of State Public Health Veterinarians, and the Council of State and Territorial Epidemiologists all oppose the relocation of mammals because of the risk of disease transmission, particularly for small mammals such as raccoons or skunks (Center for Disease Control 1990). Although relocation is not necessarily precluded in all cases, it would in many cases be logistically impractical and biologically unwise in Oklahoma.

Lethal Trapping. Traps that can be used for lethal removal include leghold, cage-type traps, and Conibear (body-gripping) traps, foot snares, and neck/body snares. For a description of these methods the reader is referred to the FEIS, Appendix J (USDA 1994). These techniques are usually implemented by WS personnel because of the technical training required to use such devices. [REDACTED] does provide a training and certification course for the use of Conibears to take beaver. A formal risk assessment of all mechanical devices used by the WS ARDM program in Oklahoma is in the FEIS, Appendix P (USDA 1994).

Shooting. Shooting is an effective method to remove small numbers of individuals in damage situations, especially where trapping is not feasible. Shooting is mostly conducted at night with the aid of spotlights or night-vision equipment. WS personnel receive firearms safety training to use firearms while performing their duties. [REDACTED] also provides certification to individuals for night shooting beaver through their [REDACTED].

Removal of Beaver Dams That Cause Flooding Damage. Beaver dam removal is generally conducted to maintain existing stream channels and drainage patterns, and reduce flood waters that have affected established silviculture, agriculture, and ranching activities or drainage structures such as culverts. Beaver dams are made from natural debris such as logs, sticks, and mud that beaver take from the immediate area. It is this portion that is dislodged during a beaver dam removal operation. The impoundments that WS removes are normally from recent beaver activity and have not been in place long enough to take on the qualities of a true wetland (ie. hydric soils, aquatic vegetation, preexisting function). Unwanted beaver dams can be removed by hand with a rake or power tools (e.g., a winch), or with explosives. Explosives are used only by WS personnel specially trained and certified to conduct such activities, and only binary explosives are used (i.e., they are comprised of two parts that must be mixed at the site before they can be detonated as an explosive material). Beaver dam removal by hand or with binary explosives does not affect the substrate or the natural course of the stream and returns the area back to its preexisting condition with similar flows and circulations. Because beaver dams involve waters of the United States, removal is regulated under Section 404 of the Clean Water Act.

Wetlands are recognized by 3 characteristics: hydric soils, hydrophytic vegetation, and general hydrology. Hydric soils are either composed of, or have a thick surface layer of, decomposed plant materials (muck); sandy soils have dark stains or streaks from organic material in the upper layer where plant material has attached to soil particles. In addition, hydric soils may be bluish gray or gray below the surface or brownish black to black and have the smell of rotten eggs. Wetlands also have hydrophytic vegetation present such as cattails, bulrushes, willows, sedges, and water plantains. The final indicator is general hydrology which includes standing and flowing water or waterlogged soils during the growing season; high water marks are present on trees and drift lines of small piles of debris are usually present. Beaver dams usually will develop a layer of organic material at the surface because siltation can occur

rapidly, but aquatic vegetation and high water marks (a new high water mark is created by the beaver dam) are usually not present. However, cattails and willows can show up rapidly if they are in the vicinity, but most hydrophytic vegetation takes time to establish.

When a dam is removed, debris is discharged into the water. The debris that ends up in the water is considered “incidental fallback” or discharge fill. The Tulloch Rule Decision (Court Case No. 93cv01754) determined that “incidental fallback” did not trigger Section 404 permit requirements. It was not determined if beaver dams fit this category, but EPA and the Corps issued guidance to their regulatory offices that beaver dam removal may not require permits under Section 404 (Wayland and Shaeffer 1997). These agencies stated that they would give their field offices further guidance at a later date. However, in most beaver dam removal operations, the material that is displaced, if considered to be discharge, is exempt from permit requirements under 33 CFR 323 or 330. A permit would be required if the impoundment caused by a beaver dam was considered a true wetland. WS personnel survey the beaver dam site and impoundment and determine whether conditions exist suggesting that the area may be a wetland as defined above. If such conditions exist, the landowner is asked the age of the dam or how long he/she has known of its presence to determine whether Swampbuster, Section 404 permit exemptions or NWP's allow removal of the dam. If not, the landowner is required to obtain a section 404 permit before the dam will be removed by WS personnel.

The following information explains Section 404 exemptions and conditions that pertain to the removal of beaver dams.

33 CFR 323 - Permits For Discharges of Dredged or Fill Material into Waters of the United States. This regulation provides guidance to determine whether certain activities require permits under Section 404.

Part 323.4 Discharges not requiring permits. This section establishes exemptions for discharging certain types of fill into waters of the United States without a permit. Certain minor drainage activities connected with normal farming, ranching, and silviculture activities where they have been established do not require a permit as long as these drainages do not include the immediate or gradual conversion of a wetland (ie. beaver ponds greater than 5 years old) to a non-wetland.. Specifically part (a)(1)(iii)(C)(i) states, “...*fill material incidental to connecting upland drainage facilities [e.g., drainage ditches] to waters of the United States, adequate to effect the removal of excess soil moisture from upland croplands...*”. This indicates that beaver dams that block ditches, canals, or other structures designed to drain water from upland crop fields can be removed without a permit.

Moreover, (a)(1)(iii)(C)(iv) states the following types of activities do not require a permit “*The discharges of dredged or fill materials incidental to the emergency removal of sandbars, gravel bars, or other similar blockages which are formed during flood flows or other events, where such blockages close or constrict previously existing drainageways and, if not*

promptly removed, would result in damage to or loss of existing crops or would impair or prevent the plowing, seeding, harvesting or cultivating of crops on land in established use for crop production. Such removal does not include enlarging or extending the dimensions of, or changing the bottom elevations of, the affected drainageway as it existed prior to the formation of the blockage. Removal must be accomplished within one year of discovery of such blockages in order to be eligible for exemption.”; this allows the removal of beaver dams in natural streams to restore drainage of agricultural lands within one year of discovery.

Part 323.4 (a) (2) allows “*Maintenance, including emergency reconstruction of recently damaged parts, of currently serviceable structures such as dikes, dams, levees, groins, riprap, breakwaters, causeways, bridge abutments or approaches, and transportation structures. Maintenance does not include any modification that changes the character, scope, or size of the original fill design. Emergency reconstruction must occur within a reasonable period of time after damage occurs in order to qualify for this exemption.*”; this allows beaver dams to be removed without a permit where they have resulted in damage to roads, culverts, bridges, or levees if it is done in a reasonable amount of time.

33 CFR 330 - Nationwide Permit (NWP) Program. The Corps Chief of Engineers is authorized to grant certain dredge and fill activities on a nationwide basis if they have minimal impact on the environment. The NWPs are listed in Appendix A of 33 CFR 330 and permittees must satisfy all terms and conditions established in order to qualify for their use. Individual beaver dam removal activities by WS may be covered by any of the following NWPs if not already exempted from permit requirements by the regulations discussed above. WS complies with all conditions and restrictions placed on NWPs for any instance of beaver dam removal done under a specific NWP.

Nationwide permits can be used **except** in any component of the National Wild and Scenic River System such as the headwaters of the Illinois River, any waterway listed as an “Outstanding Water Resource” in Appendix A of the Oklahoma Water Quality Standards, or any waterbody which is part of an area designated for “Recreational or Ecological Significance” in Appendix B of the Oklahoma Water Quality Standards. In addition, the Corps is in the process of developing regional conditions in accordance with national changes to the NWPs. As proposed, these regional conditions include the above restrictions and may also exclude “Rare Aquatic Resources” listed by the Oklahoma Natural Heritage Inventory and waters providing potential habitat for State listed T&E species from coverage under a NWP. This regional condition process is expected to be finalized by March 1999. These new conditions will automatically be recognized by WS in determining where and when beaver dam removal is authorized under an NWP if they are adopted.

NWP 3 authorizes the rehabilitation of those structures, such as culverts, homes, and bridges, destroyed by floods and “discrete events” such as beaver dams provided that the activity is commenced within 2 years of the date when the beaver dam was established.

NWP 18 allows minor discharges of dredged and fill material, including the removal of beaver dams, into all waters of the United States provided that the quantity of discharge and the volume of excavated area does not exceed 10 cubic yards below the plane of the ordinary high water mark (this is normally well below the level of the beaver dam) or is in a “special aquatic site” (wetlands, mudflats, vegetated shallows, riffle and pool complexes, sanctuaries, and refuges). The District Engineer must be “notified” (general conditions for notification apply), if the discharge is between 10-25 cubic yards for a single project or the project is in a special aquatic site and less than 1/10 of an acre is expected to be lost. If the values are greater than those given, a permit is required. Beaver dams rarely would exceed 2 or 3 cubic yards of backfill into the waters and probably no more than 5 cubic yards would ever be exceeded. Therefore, this stipulation is not restrictive. Beaver dams periodically may be removed in a special aquatic area, but normally the aquatic site will be returned to normal. However, if a true wetland exists, and beaver dam removal is not allowed under another permit, then a permit must be obtained from the District Engineer.

NWP 27 provides for the discharge of dredge and fill for activities associated with the restoration of wetland and riparian areas with certain restrictions. On non-federal public and private lands, the owner must have: a binding agreement with USFWS or NRCS to conduct restoration; a voluntary wetland restoration project documented by NRCS; or notified the District Engineer according to “notification” procedures. On Federal lands, including Corps and USFWS, wetland restoration can take place without any contract or notification. This NWP “...applies to restoration projects that serve the purpose of restoring “natural” wetland hydrology, vegetation, and function to altered and degraded non-tidal wetlands and “natural” functions of riparian areas. This NWP does not authorize the conversion of natural wetlands to another aquatic use...” If operating under this permit, the removal of a beaver dam would be allowed as long as it was not a true wetland (i.e., 5 or more years old), and for non-federal public and private lands the appropriate agreement, project documentation, or notification is in place.

A quick response without delays resulting from permitting requirements can be critical to the success of minimizing or preventing damage. Exemptions contained in the above regulations or NWPs provide for the removal of the majority of beaver dams that WS in Oklahoma encounters. The primary determination that must be made by WS personnel is whether a beaver impounded area has become a true wetland or is just a flooded area. The flexibility allowed by these exemptions and NWPs is important for the efficient and effective resolution of many beaver damage problems because damage escalates rapidly in many cases the longer an area remains flooded.

3.2.2 Alternative 2 - No Federal WS ARDM. This alternative would consist of no federal involvement for ARDM in Oklahoma. Neither direct operational management nor technical assistance would be provided from WS. Information on future developments in nonlethal and lethal management techniques that culminate from WS's research branch would not be available to producers or resource owners. It would be left up to the resource owners to conduct ARDM under this option. It is probable that many ARDM methods would be used unsafely and improperly such as the illegal use of pesticides and traps simply out of frustration by resource owners over the inability to reduce damage losses to a tolerable level. As an illustration, in 1997 a man was killed when he and another man set fire to a lodge and quickly were overcome with smoke; the man suffered a heart attack while trying to escape. In addition, it is likely that inexperienced people using many of the ARDM methods could harm the environment, including the increased take of nontarget species.

3.2.3 Alternative 3 - Technical Assistance Only. This alternative would not allow WS to conduct operational ARDM in Oklahoma. WS would only provide technical assistance and make recommendations when requested. However, producers, state agency personnel, or others could conduct ARDM activities including the use of traps, snares, shooting, and any nonlethal methods they deem effective. Methods and control devices could be applied by persons with little or no training and experience. This in turn could require more effort and cost to achieve the same level of problem resolution; and if resource owners become frustrated they are likely to resort to unconventional methods that could cause harm to the environment or result in greater take of nontarget animals.

3.2.4 Alternative 4 - Nonlethal Required Before Lethal Control. This alternative would not allow the use of lethal methods by WS as described under the proposed action until nonlethal methods had been attempted to relieve damage caused by aquatic rodents and found to be ineffective or inadequate. Resource owners or managers would still have the option of implementing nonlethal and lethal control measures and WS would continue to recommend them where appropriate, but no preventive lethal control by WS would be allowed. However, personnel experienced in ARDM generally know when and where nonlethal control techniques would work; this alternative could result in the use of methods that are known to be ineffective in particular situations.

3.3 ALTERNATIVES CONSIDERED BUT NOT ANALYZED IN DETAIL WITH RATIONALE

Several alternatives were considered but not analyzed in detail. These were not considered because of problems associated with their implementation.

3.3.1 Compensation for Aquatic Rodent Damage Losses. Compensation would require the establishment of a system to reimburse resource owners for damages. This alternative was eliminated from further analysis because no federal or state laws currently exist to authorize such action. Under such an alternative, WS would not provide any direct control or technical assistance. Aside from lack of legal authority, analysis of this alternative in the FEIS indicates that the concept has many drawbacks (USDA 1994).

- ▶ It would require larger expenditures of money and manpower to investigate and validate all losses, and to determine and administer appropriate compensation.
- ▶ It would be difficult, if not impossible, to assess and confirm losses in a timely manner for all requests, and, therefore, many losses could not be verified and uncompensated. Additionally,

compensation would most likely be below full market value of the resource.

- ▶ Compensation would give little incentive to resource owners to limit damage with ARDM strategies such as improved barriers.
- ▶ Not all resource owners would rely completely on a compensation program and ARDM activities including lethal control would likely continue as permitted by state law.

Based on data for damage prevented from other programs, compensation could be expected to cost 5-6 times as much as the current program (J. Heisterberg, WS, pers. comm. 1998)

3.3.2 Bounties. Payment of funds for killing aquatic rodents (bounties) suspected of causing economic losses has not been supported by Oklahoma State agencies such as ██████████ as well as most wildlife professionals for many years (Latham 1960, Hoagland 1993). WS concurs with these agencies and wildlife professionals because of several inherent drawbacks and inadequacies in the payment of bounties, including:

- ▶ Bounties are generally ineffective at controlling damage, especially over a wide area such as Oklahoma.
- ▶ Circumstances surrounding the take of animals are typically arbitrary and completely unregulated.
- ▶ It is difficult or impossible to assure animals claimed for bounty were not taken from outside the damage management area.
- ▶ WS does not have the authority to establish a bounty program.

3.3.3 Eradication and Long Term Population Suppression. An eradication alternative would direct all WS Program efforts toward total long term elimination of aquatic rodents in entire cooperating counties or larger defined areas in Oklahoma.

In Oklahoma, the eradication of beaver and muskrat is not a desired goal of state agencies, although these species may be taken liberally by the general public with the appropriate permits in areas where they are causing damage. Eradication of nutria, a nonnative species, might be preferred, but is highly unlikely to achieve because they have successfully been established in southeast Oklahoma. Some landowners would prefer that some species such as beaver be eradicated. However, eradication as a general objective for ARDM will not be considered by WS in detail because:

- ▶ WS opposes eradication of any native wildlife species;
- ▶ ODWC, ODA, and OCC oppose eradication of any native Oklahoma wildlife species;
- ▶ The eradication of a native species or local population would be extremely difficult, if not impossible to accomplish, and cost-prohibitive in most situations; and

- ▶ Eradication is not acceptable to most members of the public.

Suppression would direct WS Program efforts toward managed reduction of certain problem populations or groups. When a large number of requests for wildlife damage management are generated from a localized area, WS would consider suppression of the local population or groups of the offending species, if appropriate. However, it is not realistic, practical, or allowable under present WS policy to consider large-scale population suppression as the basis of the WS Program. Typically, WS activities in Oklahoma are conducted on a small portion of the area inhabited by aquatic rodents.

3.3.4 Reproduction Control. A review of research evaluating chemically induced and surgically induced reproductive inhibition as a method for controlling nuisance beaver populations is contained in Novak (1987). Although these methods were found to be effective in reducing beaver reproduction by up to 50%, the methods were not found to be practical or were too expensive for large-scale application. At present, no chemical reproductive inhibitors are legal for use for any of the species covered by this EA. For these reasons, this method will not be considered further by WS.

3.3.5 Biological Control. The only biological control that has been tried for managing aquatic rodents is the introduction of alligators (Wade and Ramsey 1986). Although alligators can and do sometimes prey on aquatic rodents, they cannot be relied on to reduce numbers to the point that damage no longer occurs. Introducing alligators in some situations could also present hazards to people and pets. For these reasons, this method will not be considered further by WS.

3.4 MITIGATION AND SOPs FOR WILDLIFE DAMAGE MANAGEMENT TECHNIQUES

3.4.1 Mitigation in SOPs. Mitigation measures are any features of an action that serve to prevent, reduce, or compensate for impacts that otherwise might result from that action. The current WS Program, nationwide and in Oklahoma, uses many such mitigation measures and these are discussed in detail in Chapter 5 of the FEIS (USDA 1994). Some key mitigating measures pertinent to the proposed action and alternatives that are incorporated into WS's SOPs include the following.

- ▶ The WS Decision Model, which is designed to identify effective wildlife damage management strategies and their impacts, is consistently used.
- ▶ Nontarget animals captured in leghold traps or snares are released unless it is determined by WS Specialists that they will not survive and it can be done safely.
- ▶ Conspicuous, bilingual warning signs alerting people to the presence of traps and snares are placed at major access points to areas where they are set in the field.
- ▶ Reasonable and prudent alternatives and measures are established through consultation with USFWS and implemented to avoid adverse impacts to T&E species.
- ▶ EPA-approved label directions are followed for all pesticide use.

Some additional mitigating factors specific to the current program include the following.

- ▶ All WS Specialists who use restricted-use chemicals are trained and certified by WS personnel

or others who are experts in the safe and effective use of these materials or are supervised by such persons according to ODA's definition (ORS 2, §3-81).

- ▶ Management actions are directed toward localized populations or groups of target aquatic rodent species or individual offending members of those species. Generalized population suppression across Oklahoma will not be conducted.
- ▶ Although hazards to the public from ARDM devices and activities are low according to a formal risk assessment (USDA 1994, Appendix P), hazards to the public and their pets are even further reduced by the fact that ARDM activities are primarily conducted on private or other properties in Oklahoma where public access is highly restricted or denied.

3.4.2 Additional Mitigation Specific to the Issues. The following is a summary of additional mitigation measures that are specific to the issues listed in Chapter 2 of this document.

3.4.2.1 Effect on Target Aquatic Rodent Species Populations.

- ▶ ARDM activities to resolve damage problems are directed at taking action against individual problem animals, or local populations or groups, and not by attempting to eradicate populations in the entire area or region.
- ▶ WS kill is monitored to maintain the magnitude within levels desired or authorized by the State agencies that represent the State's interests in terms of managing or controlling affected species (See Chapter 4).

3.4.2.2 Effects on Nontarget Species Populations Including T&E Species.

- ▶ WS personnel are highly experienced and trained to select the most appropriate method(s) for taking problem animals with little impact to nontarget animals.
- ▶ Conibear traps in Oklahoma used in the primary range of the river otter will be fitted with "otter-safe" triggers (Species Specific Traps and Exclusion Devices LLC, Tension Triggers®) that have been recently developed. These have been found to reduce otter take by 97% (Gault and Strojny 1997). In addition, it was also found that other smaller animals such as turtles and mink are less likely to be caught because of the trigger tension.
- ▶ WS has an MOU in place with ██████ to mitigate impacts on otter populations by implementing a strategy for reducing the number of nontarget otter taken. Briefly, the MOU states that WS will modify ARDM methods in areas where fresh otter sign is observed or if two or more otter have been captured in recent history. The ARDM modifications include using non-lethal snare and leghold trap sets (checked daily), spotlight/shooting, electronic scare devices, or other alternative methods that are non-lethal to river otters. For dams, explosives may be used to reduce the water level followed immediately by spotlighting/shooting; a river otter sign survey will then be conducted and if no sign is found, all traps can again be used (if sign is found then

modifications to trapping will remain in effect. These modifications are implemented from January-March when the majority of nontarget otter are taken.

- ▶ The nationwide WS program engaged in formal consultation with the USFWS pursuant to Section 7 the Endangered Species Act and received a Biological Opinion in 1992 (see USDA 1994, Appendix F and P). That opinion is incorporated herein by reference. The 1992 Biological Opinion covered WS's use of all methods of take used in ARDM with the exception of the toxicant zinc phosphide for muskrat and nutria control in Oklahoma (use of Zn Phos. was addressed for Texas, Louisiana, and Tennessee). It also did not cover the potential effects of beaver dam removal on listed species. To address these other concerns, WS prepared and submitted a Biological Assessment of the potential impacts of ARDM activities on T&E species in Oklahoma to the USFWS and ODWC (Appendix B). WS abides by the reasonable and prudent alternatives and measures established as a result of these consultations. For the full context of the 1992 Biological Opinion, see the WS FEIS, Appendix F (USDA 1994); otherwise see Appendices B and C.

WS determined that the T&E species that could potentially be negatively impacted by ARDM, as discussed in the formal consultation of 1992 (USDA 1994), in Oklahoma are the bald eagle and whooping crane. However, it was determined by the USFWS that the whooping crane would not be adversely affected by current WS ARDM activities. The Reasonable and Prudent Alternatives and mitigation measures and their terms and conditions from the 1992 Biological Opinion (USDA 1994, Appendix F) for bald eagles as related to the proposed action and alternatives described in this EA are as follows.

- ▶ WS personnel will contact either the local ODWC office or the appropriate USFWS regional or field office to determine nest and roost locations for bald eagles.
- ▶ The appropriate USFWS office shall be notified within five days of the finding of any dead or injured bald eagle. Cause of death, injury, or illness, if known, would be provided to those offices.
- ▶ If a bald eagle is incidentally taken from the Southwest population, use of the control method will be halted immediately, and WS will reinitiate consultation.
- ▶ When bald eagles are in the immediate vicinity of a proposed wildlife damage management program, WS personnel will conduct daily checks for carcasses or trapped individuals.

Potential impacts on other T&E species in Oklahoma have been assessed (Appendix B) and no adverse impacts are likely to occur from WS actions. USFWS and ODWC

have concurred that WS ARDM activities are not likely to adversely affect T&E species in Oklahoma (Appendix C).

3.4.2.3 Humaneness of Methods Used by WS.

- ▶ WS personnel attempt to kill captured target animals that are slated for lethal removal as quickly and humanely as possible. In most field situations, a shot to the brain with a small caliber firearm is performed which causes rapid unconsciousness followed by cessation of heart function and respiration. This is in concert with the American Veterinary Medical Association's definition of euthanasia.
- ▶ Research continues with the goal of improving the selectivity and humaneness of management devices.
- ▶ WS specialists recommend the use of various nonlethal methods such as exclusion and pond levelers where these are applicable.
- ▶ WS specialists use trap lures and set traps in locations that are conducive to capturing the target animal, but minimize potential impact to nontarget species.

3.4.2.4 Effects of Beaver Dam Removal on Wetland Wildlife Habitat.

- ▶ WS specialists remove beaver dams in accordance with federal and state laws and regulations for environmental protection. Beaver dam removal would be conducted to restore drainage or the stream channel for an area or if an area has an established silvicultural, agricultural, or ranching activity and where such an area has not become an established wetland.
- ▶ Property owners will be required to obtain dam removal permits from the Corps for areas determined to be wetlands, for dams that have more than 10 cubic yards of fill associated with them, or if the project would alter the waters into a use it was previously not subject, where the flow or circulation of waters would be impaired or the reach of the waters reduced.

3.4.2.5 Effects of ARDM Methods on Public Safety.

- ▶ WS specialists will be trained and supervised in the use of ARDM methods, including firearms, watercraft, explosives, traps, and vertebrate pesticides to ensure that they are used properly and according to policy.
- ▶ WS specialists using restricted-use vertebrate pesticides will be certified according to EPA and Oklahoma State laws.
- ▶ WS specialists using binary explosives in ARDM will be certified to use them.

- ▶ WS specialists using firearms will routinely receive firearms safety training according to WS policy.

CHAPTER 4: ENVIRONMENTAL CONSEQUENCES

Chapter 4 provides the information needed for making informed decisions in selecting the appropriate alternative for meeting the purpose of the proposed action. This chapter analyzes the environmental consequences of each alternative in relation to the issues identified for detailed analysis in Chapter 2.

4.1 ENVIRONMENTAL CONSEQUENCES

This section analyzes the environmental consequences of each alternative in comparison with the proposed action to determine if the real or potential impacts are greater, lesser or the same.

- 4.1.1 Cumulative and Unavoidable Impacts.** Cumulative and unavoidable impacts will be discussed in relationship to each of the potentially affected species analyzed in this chapter.
- 4.1.2 Nonsignificant Impacts.** The following resource values within Oklahoma are not expected to be significantly impacted by any of the alternatives analyzed: soils, geology, minerals, floodplains, visual resources, air quality, or prime and unique farmlands. These resources will not be analyzed further.
- 4.1.3 Irreversible and Irretrievable Commitments of Resources.** No irreversible or irretrievable commitments of resources are expected, other than minor uses of fuels for motor vehicles and other similar materials. These will not be discussed further.

4.2 ISSUES ANALYZED IN DETAIL

4.2.1 Effects on Target Aquatic Rodent Populations. NEPA requires federal agencies to determine whether their actions have a “significant impact on the quality of the human environment.” A declining population of a resident wildlife species does not necessarily equate to a “significant impact” as defined by NEPA if the decline is collectively condoned or desired by the people that live in the affected human population. It is reasonable and proper to rely on the representative form of government within a state as the established mechanism for determining the “collective” desires or endorsements of the people of a state. WS abides by this philosophy and defers to the collective desires of the people of the State of Oklahoma by complying with State laws and regulations that govern the take or removal of resident wildlife. Although the analysis herein indicates aquatic mammal populations are not being impacted to the point of causing a decline, if at some point in the future they are, then such a decline would not constitute a “significant” impact as defined by NEPA so long as the actions that cause the decline are in accordance with state law, and concomitantly, with the collective desires of the people of the State.

4.2.1.1 Alternative 1 - Continue the Current Federal ARDM Program. To adequately determine the impacts that this alternative would have on aquatic rodents, their populations need to be analyzed. The authority for management of resident wildlife species has traditionally been a responsibility left to the states. ODWC is the state agency with management responsibility over animals classified by state law as protected furbearers. ODWC provided statistics on population trends and take, but was unable to provide any

definitive estimates of population sizes for purposes of the following analyses on impacts to the population. Therefore, WS used the best available information to produce reasonable estimates. ODWC provided trend information for these species, though, and commented on the validity of the estimates.

Beaver Population Impact Analysis. To discuss the impacts of various environmental constraints and external factors on beaver population and density, it is essential to understand the basic mechanisms that play a role in the beaver's response to constraints and actions. This wildlife species is often characterized by biologists and managers as having the unique ability to modify its environment to create habitat to meet its own needs. As mentioned, beavers are the major damage-causing species as documented by WS in Oklahoma and caused more than \$1,000,000 in reported and/or verified damage to property and agriculture annually since FY 95. Beaver damage management is therefore the major focus of WS ARDM efforts in Oklahoma.

Beavers occur mostly in family groups that are comprised of 2 adult parents with 2-6 offspring from the current or previous breeding season (Novak 1987). Average family group size has been documented as ranging from 3.0 to 9.2 (Novak 1987). Beaver abundance has been reported in terms of families per kilometer of stream or per square kilometer of habitat. Novak (1987) summarized reported beaver family abundance as ranging from 0.31 to 1.5 families per kilometer of stream, which converts to 0.5 - 2.4 families per mile of stream. Densities reported in terms of families per square kilometer have been reported to range from 0.15 to 3.9 (Novak 1987) which is the same as 0.24 to 6.3 per square mile. However, the density figures for beaver per km² surface water that Novak (1987) summarized are probably much lower than what is actually found in Oklahoma because reservoirs in Oklahoma, all manmade, have many fingers which result in extensive shoreline lengths (J. Hoagland, ODWC, pers. comm. 1998). Oklahoma reservoirs of 100 acres or more have over 7,000 miles of shoreline (Oklahoma Water Resources Board 1997) which is very high in comparison to other states because most reservoirs are rounder in shape. The density studies for beaver have been conducted in areas with comparatively short shoreline lengths. If shoreline and stream lengths had similar beaver densities, Oklahoma reservoirs could have beaver densities 10 times as high as Novak (1987) reported.

The professional opinion of wildlife biologists at ODWC (R. Hatcher, J. Hoagland, M. Shaw pers. comm. 1998) and WS suggests that the present beaver population in Oklahoma, especially in the eastern half of the State, is closer to, if not greater than, the upper limits found by Novak (1987). The beaver population in Oklahoma is therefore probably closer to the high end of the range of densities given above. However, to be conservative, this analysis assumes actual densities in Oklahoma are at the midpoint of the ranges given by Novak (1987) or an average of 6 beavers per family and about 1.5 families per mile of stream/river and 3.3 families per square mile of lakes, reservoirs, and ponds. Oklahoma has 23,000 miles of streams and 1,100,000 surface acres (1,718 mi.²) of water in reservoirs, lakes, and ponds. (Okla. Dept. Libraries 1995). Under the above assumptions of family group size and abundance, a reasonable minimum estimate of the beaver population in Oklahoma is 240,000. This estimate is conservative because ODWC biologists consider the beaver population to be

much higher (J. Hoagland, ODWC, pers. comm. 1998), which means numbers could actually be as high as about 600,000, determined from the highest densities and family group sizes found by Novak (1987).

Table 2 summarizes the analysis of WS and cumulative impacts on the beaver population. WS killed 7,144 beavers in FY 97. This number was the second highest number ever taken in one year by the program (7,305 were taken in FY 96 by WS, but private take was only 1,006 (ODWC 1997a) for a total of 8,311). Private harvest of beaver as reported by the ODWC during the 1996-97 season was 2,574. The ADC FEIS (USDA 1994) determined that beaver populations can withstand harvest rates of up to 30% without

declining (this is probably a conservative figure as ODWC (Hoagland 1993) determined the harvest rate could be 70%). Cumulatively, the total kill of beavers during 1997 was nearly 10,000 which is only 4% of the minimum population estimate of 240,000 beavers shown above, and less than 2% of the more probable true population of 600,000. Thus, cumulative take appears to be far beneath the level that would begin to cause a decline in the population. The cumulative impact on the beaver population is therefore considered to be of extremely low magnitude. ████████ biologists have concurred with this conclusion (██████████ pers. comm. 1998).

Table 2. Cumulative Beaver Take in Oklahoma Including Take by the WS Program for FY 97.

	Using Conservative Beaver Population Estimate	Using High Beaver Population Estimate
Est. Population	240,000	600,000
WS Kill FY 97	7,144	7,144
Private Take (ODWC data)	2,574	2,574
Total Kill	9718	9718
WS Kill - % of Population	3.0%	1.2%
Other Kill - % of Population	1.1%	0.4%
Total Kill - % of Population	4.0%	1.6%

Muskrat Population Information and Impact Analysis. Muskrats are considered abundant in the northeast quarter of Oklahoma and scattered in suitable habitat over the remainder of the State. They can be found in marshes, ponds, sloughs, lakes, ditches, streams, and rivers (Boutin and Birkenholz 1987). Muskrats do not cause substantial damage problems in Oklahoma and WS only killed 21 for depredation purposes in FY 97. In addition, 14 were taken as nontargets in beaver control operations. It is highly unlikely that the program would kill more than 1,000 muskrats in the entire state in any one year under the proposed action which would be a substantial increase in ARDM activity for muskrats. Private harvest as reported by ODWC during the 1996-97 season was 236. ODWC does not estimate muskrat populations in the State, but considers the population to be stable.

Muskrats are highly prolific and produce 3-4 litters per year that average 5-8 young per litter (Wade and Ramsey 1986) which makes them relatively immune to overharvest (Boutin and Birkenholz 1987). Harvest rates of from 3 to 8 per acre have been reported to be sustainable in muskrat populations (Boutin and Birkenholz 1987). Assuming that muskrats occupy only 1% of the 1.2 million acres of wetlands in the state, a harvest totaling more than 36,000 per year would be sustainable. Clearly, any mortality as a result of fur harvest or damage control would have a virtually imperceptible impact on the population. ODWC concurs with this conclusion (R. Hatcher, J. Hoagland, M. Shaw pers. comm. 1998).

Nutria Information and Impact Analysis. Nutria are distributed in surface water streams, rivers, reservoirs and wetlands of the southeastern part of Oklahoma, primarily in ██████████ County. WS took 7 in damage control projects during FY 97. Private harvesters did not report any take during the 1996-1997 fur season (ODWC 1997a). Thus, the cumulative impact was 7 known nutria taken. Kinler et al. (1987) summarized density estimates from different reports and these ranged from 0.6 up to 138 per hectare (0.3 to 56 per acre). ██████████ County is over ██████████ square miles in size and has many different types of wetlands covering a much higher percentage of the land than in other counties. However, for the purpose of this analysis, if nutria were found in only 1% of the total area in ██████████ County (much less than the available habitat), there would be a conservatively estimated population of 3,500 nutria. The take by WS would represent less than 1% of the total population which is insignificant. It is likely that the actual nutria numbers in Oklahoma exceed this estimate many fold. In addition, take of nutria by WS is considered to be of no significant impact on the human environment since nutria are not an indigenous component of ecosystems in Oklahoma. ODWC concurs with this conclusion (R. Hatcher, J. Hoagland, M. Shaw pers. comm. 1998).

4.2.1.2 Alternative 2 - No Federal WS ARDM. Under this alternative, WS would have no impact on target aquatic rodent species populations in Oklahoma. However, ██████████ or ██████████ would probably still provide some level of direct control assistance with ARDM but without federal supervision. Also, private efforts to reduce or prevent damage might increase which could result in impacts on target species populations. Impacts on target species under this alternative could be the same, less, or more than those of the proposed action depending on the level of effort expended by ██████████, ██████████, and by private persons. For the same reasons shown in the population impacts analysis in section 4.2.1.1 it is highly unlikely that aquatic rodent populations would be impacted significantly by implementation of this alternative. However, it is hypothetically possible that frustration caused by the inability to reduce losses could lead to illegal use of chemical toxicants which could lead to unknown impacts on aquatic species populations in general in the area.

4.2.1.3 Alternative 3 - Technical Assistance Only. Under this alternative, WS would have no impact on target aquatic rodent populations directly. Hypothetical risks would be the same as under alternative 2, except that technical assistance given by WS would help in the proper use of tools. ██████████ or ██████████ would probably provide some level of direct control assistance with ARDM but without federal supervision, and private efforts to reduce or prevent damage could increase which would result in impacts on those populations. For the same reasons

shown in the population impacts analysis in section 4.2.1.1, it is highly unlikely that aquatic rodent populations would be impacted significantly by implementation of this alternative. Impacts and hypothetical risks of illegal chemical toxicant use under this alternative would probably be about the same as those under Alternative 2.

4.2.1.4 Alternative 4 - Nonlethal Required Before Lethal Control. Under this alternative, WS take of target aquatic rodent species would probably be less than that of the proposed action because lethal actions by WS would be restricted to situations where nonlethal controls had been tried, in most cases by the requestor, but also by WS, without success. No preventive lethal control actions would be taken by WS. For many individual damage situations, this alternative would be similar to the current program because many producers have tried one or more nonlethal methods such as dam removal or barriers without success or have considered them and found them to be impractical in their particular situations prior to requesting WS's assistance. Without WS conducting control activities prior to implementation of nonlethal methods, damage could be expected to rise significantly before nonlethal means failed or could take effect. Therefore, it is likely that private efforts at control would increase, leading to potentially similar cumulative impacts as those of Alternative 2. For the same reasons shown in the population impacts analysis in section 4.2.1.1, it is highly unlikely that Statewide beaver, muskrat, or nutria populations would be impacted significantly by implementation of this alternative. Impacts and hypothetical risks of illegal chemical toxicant use under this alternative would probably be similar as those under Alternatives 2 and 3, but to a lesser degree.

4.2.2 Effects on Nontarget Species Populations, Including T&E Species.

4.2.2.1 Alternative 1 - Continue the Current Federal WS ARDM Program. Nontarget species taken in Oklahoma are recorded as Target - Unintentional (i.e., they were listed on the agreement as target species but were taken unintentionally during efforts to take other target species) or Nontarget (i.e., they were not listed as target species on the agreement and were taken unintentionally during efforts to take target species). With this type of data recording, some species were targets in some situations and nontargets in others. Nontarget animals killed by WS during ARDM activities in Oklahoma in FY 97 included 1 double-crested cormorant (*Phalacrocorax auritus*), 1 lesser scaup (*Aythya affinis*), 1 belted kingfisher (*Ceryle alcyon*), 2 mink (*Mustela vison*), 14 muskrat, 29 river otter, 5 raccoons, and 317 turtles. In addition, nutria, armadillos (*Dasypus novemcinctus*), pied-billed grebes (*Podilymbus podiceps*), and other ducks have been taken as nontargets during ARDM activities in the last ten fiscal years; no more than just a few of these species were taken and impacts to these species would be considered light.

River Otter Population Impact Analysis. River otters are known to occur primarily in eastern Oklahoma. Population densities appear greatest in east-central to southeastern counties in areas where lowland marshes and swamps interconnect with meandering streams and small lakes. Figure 3 shows the distribution of otter in the State based on nontarget captures by WS. ODWC suggests that the range is expanding as their population increases and would also include several of the adjacent counties where WS has not taken otter (J. Hoagland, ODWC, pers. comm. 1998).

WS took 29 river otter as nontargets during ARDM in FY 97 and an average of 32 per year from July 1996 to June 1998. Numbers of otter taken have steadily increased over the past several years. ODWC did not report any other harvest during the 1996-97 or 1997-98 fur seasons because the season in Oklahoma has been closed (M. Shaw, ODWC, pers. comm. 1998). Therefore, total known take averaged 32 in the last 2 years.

ODWC does not estimate river otter populations. The best information available on otter population trends is based on the professional opinion of biologists at ODWC who believe the otter population is increasing (M. Shaw, J. Hoagland pers. comm. 1998). Melquist and Dronkert (1987) summarized studies that estimated river otter densities which showed that densities were about 1 per 175-262 acres in Texas coastal marshes, and ranged from 1/1.8 to 1/3.6 miles of waterway (stream or river).

WS has taken otter in 14 counties of Oklahoma over the last 2 years (Figure 3). The area encompassed by these 14 counties is 13,350 square miles. If it is assumed that 3% (the statewide average) of these lands are covered by water (these 14 counties probably average much more water than the remainder of the State so 3% would be conservative) and that Oklahoma has a conservative average of 1 otter per 300 surface acres of water (lower than Texas Coastal marshes, streams, and rivers), the otter population would be estimated at 850. Hence, WS took conservatively an estimated 4% of the population over the last 2 years. This is somewhat insignificant relative to the population. USDA (1994) did not give an allowable harvest level for otter, but the otter is a CITES species and no more than 10% can be harvested in States that have a fur season on them (J. Hoagland, ODWC, pers. comm. 1998). [REDACTED] has determined that the population is increasing and expanding and, therefore, cumulative take must be below that which is sustainable by the population. Therefore, it appears that cumulative impacts on the otter population from WS ARDM activities are low, and this is supported by ODWC biologist professional opinions (R. Hatcher, M. Shaw, J. Hoagland pers. comm. 1998) that the range, distribution, and population have increased substantially despite cumulative take. The fact that WS only conducts ARDM on about 9% of the available aquatic habitat in the State supports a conclusion that WS ARDM potentially affects only a small portion of the otter population.

[REDACTED] and WS have an MOU that outlines mitigation measures to reduce the number of otter taken, summarized in section 3.4.2.2. In addition, WS has obtained "otter-safe" tension triggers for Conibears that should further reduce the take of otters, also discussed in section 3.4.2.2.

Turtle Populations Impact Analyses Turtles comprise the highest nontarget take by WS in ARDM activities. WS took 317 turtles statewide in FY 97. This is very low in comparison to the 56,390 turtles taken by commercial turtle trappers in 1996 (ODWC 1997b). The most common species taken by WS and commercial harvesters are red-eared turtles (*Trachemys scripta*), smooth (*Apalone mutica*) and spiny softshell turtles (*A. spinifera*), and common snapping turtles (*Chelydra serpentina*). Turtle species of concern in Oklahoma that have closed seasons are the alligator snapping turtle (*Macroclmys temminckii*) of eastern

Oklahoma, map turtle (*Graptemys geographica*) of ██████ County, and the Western chicken turtle (*Kinosternon subrubrum*) of central and southeastern Oklahoma. It is unknown how many of each of these species WS takes because records are not kept for turtles by species. However, the alligator snapping turtle has a sedentary hunting behavior and is found in deeper waters, and, therefore, WS will probably take them infrequently; map turtles inhabit deeper lakes and rivers and, therefore, are probably not taken by WS except on occasion; chicken turtles may be taken by WS in low numbers because of their limited range, but they do inhabit areas where ARDM activity is likely to occur. The level of take by WS in Oklahoma, though, is insignificant in terms of the overall populations of these and all other turtles in Oklahoma. Therefore, WS impacts to turtle populations are considered insignificant in terms of the overall population and this is in concurrence with ODWC (J. Hoagland pers. comm. 1998).

Other Nontarget Populations Impact Analyses. Nontarget take was included in the population impacts analysis under 4.2.1.1 for muskrat and nutria; analysis of cumulative take of raccoons and mink is conducted annually by Oklahoma WS in other NEPA documentation; it has been concluded that cumulative impacts to these populations, including the take of nontargets, was not significant (USDA 1996a, 1996b). No detailed analyses of potential impacts on cormorant, kingfisher, lesser scaup, other ducks, or armadillo populations was deemed necessary because these species are common and abundant in Oklahoma and nontarget take by WS ARDM is low enough to be intuitively insignificant to populations.

Threatened and Endangered Species. Mitigation measures that serve to avoid adverse impacts on T&E species were described in Chapter 3 (section 3.4.2.2). Those measures should assure that the proposed action would not adversely impact T&E species. USFWS and ODWC have concurred with WS that WS ARDM activities will either not affect or are not likely to adversely affect any federal or state listed T&E species in Oklahoma (Appendix C).

4.2.2.2 Alternative 2 - No Federal WS ARDM. Alternative 2 would not allow any WS ARDM in Oklahoma. There would be no impact on nontarget or T&E species by WS activities from this alternative. However, private efforts to reduce or prevent depredations could increase which could result in less experienced persons implementing control methods and could lead to greater take of nontarget wildlife than the proposed action. ██████ or ██████ would probably still provide some level of direct control assistance with aquatic rodent damage problems but without federal supervision and would continue to take nontargets but probably in lesser numbers proportionate to the decreased direct control efforts. Private individuals may trap aquatic rodents year round with the appropriate permits and would not be restricted to WS's self-imposed mitigation measures. Hazards to otters and other nontargets could therefore be greater under this alternative. It is hypothetically possible that frustration caused by the inability to reduce losses could lead to illegal use of chemical toxicants which could impact local nontarget species populations, including T&E species.

4.2.2.3 Alternative 3 - Technical Assistance Only. Alternative 3 would not allow any WS direct operational ARDM in the area. There would be no impact on nontarget or T&E species

by WS activities from this alternative. Technical assistance or self-help information would be provided at the request of resource owners and others. ■■■■ or ■■■■ would probably still provide some level of direct control assistance with aquatic rodent damage problems but without federal supervision and would continue to take nontargets but probably in lesser numbers proportionate to the decreased direct control. Although technical support might lead to more selective use of control methods by private parties than that which could occur under Alternative 2, private efforts to reduce or prevent damage could result in less experienced persons implementing control methods, including the hypothetical illegal use of toxicants, leading to greater take of nontarget wildlife and T&E species, similar to Alternative 2.

4.2.2.4 Alternative 4 - Nonlethal Required Before Lethal Control. Under this alternative, WS take of nontarget animals would probably be less than that of the proposed action because no preventive lethal control actions would be taken by WS. In addition, aquatic mammals could relocate during the time that it would take to implement control techniques. Mitigation measures to avoid T&E impacts were described in Chapter 3. Those measures should assure that adverse impacts are not likely to occur to T&E species by implementing Alternative 4. However, if cooperators were not satisfied by corrective control operations by WS, private efforts to reduce or prevent depredations could increase, similar to Alternative 2. This could result in less experienced persons implementing control methods including the hypothetical use of illegal toxicants and could lead to greater take of nontarget wildlife than the proposed action.

4.2.3 Humaneness of Control Techniques

4.2.3.1 Alternative 1 - Continue the Current Federal WS ARDM Program. Under this alternative, methods viewed by some persons as inhumane would be employed. Despite SOPs designed to maximize humaneness as described in sections 3.4.2.4 and 2.2.3, the perceived stress and trauma associated with being held in leghold traps or snares until the WS specialist arrives at the trap or snare site to dispatch the animal, or, as in the case of an unharmed nontarget, to release it, is unacceptable to some persons. In addition, these methods are used in “drown sets” where the animal drowns shortly after being caught which is also considered inhumane by some persons. Other ARDM methods used to take target animals including shooting and body-gripping traps (i.e., Conibears) result in a relatively humane death because the animals die instantly or within seconds to a few minutes; 87% of the aquatic rodents taken in Oklahoma by WS were with these methods in FY 97.

4.2.3.2 Alternative 2 - No Federal WS ARDM. Under this alternative, leghold and quick-kill traps, snares, and shooting would not be used by WS. Use of such methods by private individuals and state agencies would probably increase. This could result in less experienced persons implementing use of traps and snares without modifications such as underpan tension devices which exclude smaller nontarget animals from leghold traps. Greater take and suffering of nontarget wildlife could result. It is hypothetically possible that frustration caused by the inability to reduce losses could lead to illegal use of chemical toxicants which might result in increased animal suffering.

4.2.3.3 Alternative 3 - Technical Assistance Only. Impacts regarding the issue of humaneness under this alternative would likely be similar to those under Alternative 2, except that technical assistance would lead to better training for the general public on the appropriate procedures for using different methods.

4.2.3.4 Alternative 4 - Nonlethal Required Before Lethal Control. The amount of suffering by target and nontarget wildlife under this alternative would likely be less than under the proposed action since preventive control activity by WS would not be allowed. However, use of leghold traps and shooting by private individuals would probably increase if depredation was not satisfactorily reduced. This could result in similar impacts as Alternative 2, although they would likely be less severe. The hypothetical risk of frustration leading to illegal pesticide use and its associated animal suffering is probably less than under Alternatives 2 and 3 but more than under the proposed action.

4.2.4 Effects of Beaver Dam Removal on Wetland Wildlife Habitat.

4.2.4.1 Alternative 1 - Continue the Current Federal WS ARDM Program. Under this alternative, beaver impounded areas would be removed by hand or with explosives for the purpose of returning streams, channels, dikes, culverts, and irrigation canals to their original function. WS removes most beaver impoundments because they have flooded areas such as roads, crops, merchantable timber, pastures, and other types of property or resources that were not previously flooded. In FY 97, a total of 724 dams were removed by hand and 164 were removed with binary explosives in Oklahoma (MIS 1997). Most dams removed were created as a result of recent beaver activity because WS personnel receive most requests soon after affected resource owners discover damage and become aware of the WS program. Dams are removed in accordance with exemptions from permit requirements established by regulation or as allowed under NWP's granted under Section 404 of the Clean Water Act (see Sections 2.2.3 and 3.2.1). The majority of impoundments that WS removes have been in existence but a few months or years. These are not considered true wetland habitat and, therefore, do not possess the same wildlife habitat values that established wetlands have. Thus, significant impacts on established wetland wildlife habitat are avoided.

4.2.4.2 Alternative 2 - No Federal WS ARDM. Under this alternative, needs for beaver dam removal would be met by private, state, or local government entities. Some beaver impounded areas that WS would advise against draining might be drained under private or local government management, which could have adverse impacts on wetland habitats in limited circumstances.

4.2.4.3 Alternative 3 - Technical Assistance Only. Reduced effectiveness would cause many local governments or individuals to discontinue federally supervised ARDM programs. ARDM needs would then be met by private individuals and local governments, and adverse impacts on wetland habitat areas would be similar to Alternative 2, although probably to a lesser degree since many individuals might act in accordance with advice given by WS.

4.2.4.4 Alternative 4 - Nonlethal Required Before Lethal Control. Reduced effectiveness might cause local governments and individuals to drop out of federally supervised ARDM programs, but this would be less likely than under Alternatives 2 and 3. There would be an increase in ARDM and dam removal by state agencies and by less trained and less experienced private individuals. The potential for adverse impacts to wetlands would be slightly more than the current program but less than under Alternatives 2 and 3.

4.2.5 Effects of ARDM Methods on Public Safety.

4.2.5.1 Alternative 1 - Continue the Current Federal WS ARDM Program. Some ARDM methods could pose risks where they are not used by professionals. Methods used in ARDM that could present risks are the use of explosives, chemicals, firearms and Conibear traps. However, no accidents resulting in harm to any persons have occurred under the current program.

WS uses binary explosives to remove beaver dams. WS Specialists that use explosives are certified through in-depth training and must be able to demonstrate competence and safety in their use of explosives. They adhere to WS policies as well as regulations with regards to explosives use, storage, and transportation from the Bureau of Alcohol, Tobacco and Firearms, the Occupational Safety and Health Administration, and the Department of Transportation. Binary explosives require two components to be mixed before they can be actuated which virtually eliminates the hazard of accidental detonation during storage and transportation. Storage and transportation of mixed binary explosives is not allowed. When explosives are used, signs are placed to stop public entry. Where dams are near roads, police or other road officials are used to stop traffic and public entry, much like Road Department crews when they use explosives, to ensure public safety. Therefore, no adverse impacts to public safety are expected from the use of explosives by WS in Oklahoma.

The use of toxicants by WS, which under the alternatives proposed in this EA include technical grade zinc phosphide treated baits for muskrat and nutria, is regulated by EPA under FIFRA, Oklahoma Pesticide Control Laws, and WS Directives. Based on a thorough Risk Assessment, APHIS concluded that, when WS Program chemical methods, including those referenced above, are used in accordance with label directions, they are highly selective to target individuals or populations, and such use has negligible impacts on the environment (USDA 1994). The use of zinc phosphide baits for muskrat and nutria was analyzed in the FEIS, Appendix P (USDA 1994) for use in Louisiana, Texas, and Tennessee where it was deemed to be of no threat to the public or environment including T&E species. The Oklahoma WS program did not use zinc phosphide in FY 97, but did have the product registered through ODA. Use is expected to be very minimal in Oklahoma because few requests for muskrat and nutria damage control projects are received. Poisoned baits are placed on floating rafts where the potential for nontarget take is minimized; beavers and raccoons (*Procyon lotor*) are the only species normally considered to potentially be affected as nontargets. Therefore, it is expected that use of this product would have negligible impacts on public safety and the environment.

WS uses firearms to shoot aquatic rodents and euthanize animals caught in traps. WS personnel are trained and given refresher courses to maintain awareness of firearm safety and handling as prescribed by WS policy. Therefore, no adverse impacts to public safety are expected from the use of firearms by WS in Oklahoma.

WS uses body-gripping traps (e.g. Conibear) to take target aquatic rodents. Traps are strategically placed to minimize nontarget take and minimize exposure to the public. Signs are used to post properties where traps are set to alert the public of their presence. In addition, body-gripping traps are restricted to water sets according to WS policy, which further reduces threats to public safety and nontarget take.

Under this alternative, the risk of adverse impacts to the public from ARDM methods would continue to be low as discussed. Risk to members of the public from use of explosives to remove beaver dams and chemicals, firearms, and body-gripping traps to take aquatic rodents would remain low due to adherence to WS policies, required safety precautions, and training.

4.2.5.2 Alternative 2 - No Federal WS ARDM. There would be no potential for adverse impacts to humans from federal use of ARDM methods. However, state agency and private use of ARDM methods would probably rise which would increase risks to human safety because of lack of training and knowledge of the proper use of ARDM methods. Body-gripping traps can cause injuries to persons who try to use them without proper training. In 1997, an Oklahoma man died after he and a landowner set fire to a beaver lodge and it burned out of control. Similarly in 1998, an Oklahoma landowner narrowly escaped being killed by flames after he set a beaver lodge on fire. A surrounding pasture inadvertently caught fire and had to be extinguished. These were acts of desperation to rid a property of beaver and the persons involved were unaware of the WS program. Private persons who use explosives to remove beaver dams are far less likely to be adequately trained in safety or to be held accountable for safe practices. In addition, the potential exists for illegal activities to occur such as the misuse of poisons, especially from frustrated resource owners that cannot manage damage situations. Public safety risks under this alternative would, therefore, likely increase.

4.2.5.3 Alternative 3 - Technical Assistance Only. The effects of implementing this alternative on public safety would be similar to, but somewhat less than, Alternative 2. Although there would be no potential for adverse impacts to humans from federal use of ARDM methods, risks would likely increase because of increased use of ARDM methods by untrained and less experienced persons. However, the increased risks under this Alternative would be somewhat less than under Alternative 2 since many individuals might receive technical assistance from WS and act in accordance with the safety advice given.

4.2.5.4 Alternative 4 - Nonlethal Required Before Lethal Control. Reduced effectiveness might cause local governments and individuals to drop out of federally supervised ARDM programs and result in similar impacts as described under Alternative 2. However, this would be less likely than under Alternatives 2 and 3 because some ARDM needs would be met by WS. Risk of adverse impacts to the public from the use of ARDM methods would be greater than the current program, but probably less than Alternatives 2 and 3.

4.3 ALTERNATIVE IMPACTS

Each of the 4 analyzed Alternatives would have varying impacts in the 5 issue areas. Alternative 1 would probably have the overall lowest impacts on the environment (Table 3). Alternative 2, followed closely by Alternative 3 would probably have the highest impacts to the environment.

Table 3. Alternative Impacts on Issues Compared.

Issues	Alternative 1	Alternative 2	Alternative 3	Alternative 4
Target Species Populations	Low	Low to Moderate	Low to Moderate	Low to Moderate
Nontarget Species Populations	Low	Low to High	Low to High	Low to Moderate
T&E Species	Low	Low to Moderate	Low to Moderate	Low to Moderate
Humaneness	Low	Low to High	Low to High	Low to Moderate
Wetland Wildlife Habitat	Low	Moderate	Moderate	Low to Moderate
Public Safety	Low	Moderate	Moderate	Low to Moderate

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APPENDIX A

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**Biological Assessment for the
Management of Damage by Aquatic Rodents
in Oklahoma**

**ANALYSIS OF POTENTIAL IMPACTS
ON THREATENED AND ENDANGERED SPECIES**

**U.S. Department of Agriculture (USDA)
Animal and Plant Health Inspection Service (APHIS)
Wildlife Services (WS)
Oklahoma City, OK**

INTRODUCTION

Section 7 of the Endangered Species Act of 1973, as amended ((ESA) 16 USC 1531-1543) requires each Federal agency to ensure that its actions will not jeopardize the continued existence of listed species or destroy or modify such species' critical habitat. If one or more protected species are found within the area of a proposed action, then the agency must determine whether and how the action will affect such species. If a "may affect" determination is made, the agency must consult with the U.S. Fish and Wildlife Service (USFWS) to determine whether the action is likely to adversely affect or jeopardize the continued existence of the species and, if so, to avoid or mitigate the action to avoid or minimize adverse impacts.

DESCRIPTION OF PROPOSED ACTION

The proposed action is to continue an ongoing management program for the protection of agriculture and other resources from damage caused by beaver, nutria, and muskrat. Among resources being protected are crops, pastures, timber, roads, drainage systems, human health and safety, personal property, natural resources, and aquaculture. The proposed action is part of the ongoing nationwide WS program, which has been previously reviewed under a formal consultation between WS and USFWS (USDA 1994, Appendix F). The Biological Opinion provided by the USFWS in 1992 as a result of that consultation evaluated the impacts of methods of taking aquatic rodents including the use of body-gripping (e.g., Conibear) and leghold traps. That consultation did not evaluate any "may affect" determinations for habitat management methods, which are addressed in this evaluation.

WS presently uses an Integrated Wildlife Damage Management (IWDM) approach, utilizing a variety of methods for managing aquatic rodent damage. This allows WS personnel greater flexibility and more opportunity to tailor an effective damage management strategy for each specific problem that is encountered. In selecting control techniques, consideration is given to the type, magnitude, duration, frequency, and location of damage. Consideration is also given to the status of potential nontarget species. The decision-making steps taken by WS personnel when addressing aquatic rodent damage are described in the "ADC Decision Model" which is discussed in great detail in the ADC Final Environmental Impact Statement (EIS) (USDA 1994).

Requests for assistance may be handled through technical assistance or direct control. Technical assistance may include providing advice, information, recommendations, and materials to others for use in resolving beaver-caused damage. Most WS direct control efforts for beaver damage management utilize site-specific lethal control measures. Lethal control is achieved through the use of traps (leghold, body grip, and snares) and shooting. A risk assessment in the EIS addressed the use of these tools and the associated risks. In situations where nonlethal control is determined to be effective, WS utilizes physical exclusion via barriers, baffles, and shields; water level management devices; and beaver dam removal, either by hand or with binary explosives.

Traps are set to maximize beaver catches and minimize catches of nontarget animals. This is accomplished through the selection of specific trap types and trap placement. Exclusion including barriers and shields is usually used to prevent gnawing damage. Water levelers and beaver baffles are used to protect water flow through culverts or to maintain water levels in beaver ponds at a certain flow through small ditches and natural drainages. Explosives are used to remove dams; only the portion of the dam blocking the drainage is breached. In general, dam removal is usually conducted concurrently with beaver trapping, as part of a comprehensive beaver management program.

Some nonlethal tools are not used by WS because they are biologically unsound, legally questionable, or ineffective (e.g., translocation and frightening). Others are more appropriately used by the person experiencing an aquatic rodent problem rather than by WS.

ANALYSIS OF POTENTIAL IMPACTS ON THREATENED AND ENDANGERED SPECIES

Of the species and subspecies currently listed as threatened or endangered (T&E) under provisions of the ESA, 17 are Federally listed as T&E within the State of Oklahoma (USFWS 1998a). These species are automatically included on the State T&E list (Okla. Statutes, Title 29, § 2-109). Oklahoma also lists 5 species as T&E within the State (Okla. Admin. Codes 800:25-19) that are not included on the Federal list. In addition, this biological assessment includes 4 species currently listed as Federal candidates for the T&E species list that may likely be listed in the future (USFWS 1998b). Combining information from these 3 sources resulted in a list of 4 mammals, 10 birds, no reptiles and amphibians, 7 fish, 4 invertebrates, and 1 plant.

Mammals. Three species of mammals are Federally listed as threatened or endangered in Oklahoma. A fourth species is a candidate for the Federal T&E list.

Bat, gray	<i>Myotis grisescens</i>	Federal endangered
Bat, Indiana	<i>Myotis sodalis</i>	Federal endangered
Bat, Ozark big-eared	<i>Corynorhinus townsendii ingens</i>	Federal endangered
Fox, swift	<i>Vulpes velox</i>	Federal candidate

Gray Bat. This species is found in four counties of northeastern Oklahoma during summer months prior to migration to wintering habitats in eastern and southern States. This bat prefers caves or cave-like places within a kilometer of a large river, stream or reservoir. This species would not be affected by any aspect of WS ARDM activities as concluded in the 1992 opinion.

Indiana Bat. This species can be found in four eastern counties of Oklahoma but are considered to be extremely rare. They occupy the cool temperate zone of eastern U.S. The bat prefers wintering in limestone caves. Summer foraging by females and juveniles is limited to riparian and flood plain areas. They prefer streams lined with large, overhanging trees. Creeks are apparently not used if riparian trees have been removed. This species would not be adversely affected by any aspect of WS ARDM activities as concluded in the 1992 opinion. WS ARDM activities could have a positive effect by protecting forage habitat.

Ozark Big-eared Bat. This species is found in the four northeastern counties of Oklahoma. They require limestone caves in oak-hickory forests of the Ozark Plateau region with specific temperature and humidity ranges for hibernation, roosting and maternity purposes. This species would not be affected by any aspect of WS ARDM activities as concluded in the 1992 opinion.

Swift Fox. This species is found in the panhandle and far northwestern counties; their range coincides with the area that has the least ARDM activity. Its preferred habitat is mixed and short grass prairies. This species would not be affected by any aspect of WS ARDM activities because of habitat preference.

Birds. Oklahoma currently has 8 Federally listed T&E bird species and 2 candidates.

Crane, whooping	<i>Grus americana</i>	Federal endangered
Curlew, Eskimo	<i>Numenius borealis</i>	Federal endangered
Eagle, bald	<i>Haliaeetus leucocephalus</i>	Federal endangered
Falcon, American peregrine	<i>Falco peregrinus anatum</i>	Federal endangered
Plover, piping	<i>Charadrius melodus</i>	Federal endangered
Tern, Interior least	<i>Sterna antillarum athalassos</i>	Federal endangered
Vireo, black-capped	<i>Vireo atricapillus</i>	Federal endangered
Woodpecker, red-cockaded	<i>Picoides borealis</i>	Federal endangered
Chicken, lesser prairie	<i>Tympanuchus pallidicinctus</i>	Federal candidate
Plover, mountain	<i>Charadrius montanus</i>	Federal candidate

Whooping Crane. This species breeds in northern Canada and winters in Texas. In Oklahoma, they are only found during migration in October-November and March-April. They associate with large open wetlands, croplands, and pastures. Two ARDM methods, body gripping traps and the use of zinc phosphide, were considered to have potential negative impacts on the whooping crane in the USFWS 1992 B.O. However, quick-kill traps used to take beaver were also determined to have a positive impact. The use of zinc phosphide grain baits for field rodents was identified to have the most significant potential impact, but zinc phosphide for aquatic rodents on carrots or other vegetables on floating rafts was not discussed. Under the current WS ARDM program in Oklahoma (no baits have been use in the past several years) and considering the pesticide labeling, the use of zinc phosphide for muskrat and nutria control would not impact whooping cranes. The USFWS 1992 B.O. concluded that no aspect of the WS program would adversely affect this species, including any methods used by WS to take aquatic rodents (USDA 1994, Appendix F). In conjunction with the B.O., the USFWS issued an incidental take statement which indicated the USFWS did not anticipate the WS program would result in any take of this species. Therefore, no aspect of WS ARDM should result in any adverse impacts to whooping cranes, including the use of explosives to remove beaver dams.

Eskimo Curlew. This is an extremely rare bird that winters on natural grasslands, prairies, pastures, plowed land, and intertidal zones. It has not been seen in Oklahoma since 1948. It primarily traveled through central and western Oklahoma during migration. The USFWS 1992 B.O. concluded that no aspect of the WS program would adversely affect this species, including any methods used by WS to take aquatic rodents (USDA 1994, Appendix F). ARDM should have no impact on this species.

Bald Eagle. Bald eagles generally occur in riparian habitat associated with coasts, rivers, and lakes and usually nest near bodies of water where they feed on fish. ARDM generally is conducted only in small drainages unlikely to be used by eagles. The USFWS 1992 B.O. stated there is no evidence that WS trapping activities are having significant adverse impacts on bald eagles (USDA 1994, Appendix F). Because there is at least a slight risk of take from use of traps and trapping devices, WS received an incidental take statement from the USFWS in 1992 which covers all WS use of ARDM methods of take. However, such methods are extremely unlikely to result in any adverse impacts on bald eagles.

American Peregrine Falcon. This species is an active predator that feeds primarily on small birds usually over open areas and adjacent to wooded edges. The USFWS 1992 B.O. concluded that no aspect of the WS program would adversely affect this species, including any methods used by WS to take aquatic rodents (USDA 1994, Appendix F). WS ARDM activities in Oklahoma would not affect this species.

Piping Plover. Piping plovers migrate through much of eastern Oklahoma in the spring and fall. They can be found along lake and river mudflats, sandy beaches, and sandbars during migration. Although this species is associated with wetlands, they would not be affected by ARDM in Oklahoma because of habitat preference. The USFWS 1992 B.O. concluded that no aspect of the WS program would adversely affect this species, including any methods used by WS to take aquatic rodents (USDA 1994, Appendix F).

Interior Least Tern. This species of tern prefers sandy shorelines and sand bars along lakes and rivers. Its habitat preferences make it unlikely that it would be impacted by WS ARDM activities. The USFWS 1992 B.O. concluded that no aspect of the WS program would adversely affect this species, including any methods used by WS to take aquatic rodents (USDA 1994, Appendix F).

Black-capped Vireo. This species is primarily found in upland areas that have open grasslands with scattered clumps of shrubs. It nests in low growing shrubs such as shin oak and sumac. It is found in the southwest-central portion of Oklahoma. This species is not associated with riparian and wetland areas where WS ARDM activities are primarily conducted and should not be affected by such activities. The USFWS 1992 B.O. concluded the same.

Red-cockaded Woodpecker. This species roosts and nests in cavities of live pine trees. Cavities are built only in large, old pines. Its primary habitat is open pine forests with large, widely-spaced older trees in extreme southeastern Oklahoma. This species is not normally associated with riparian and wetland areas where WS ARDM activities are conducted. Such activities should have no effect on this species. The USFWS 1992 B.O. concluded the same except that it was said that beaver control with shooting, snares, and quick-kill and leghold traps would have a positive impact on the species because it would limit the flooding of forests and tree cutting that could impact them.

Lesser Prairie Chicken. This species is found in shinnery oak-sandsage bluestem grasslands in far northwestern counties and the panhandle of Oklahoma. Because of habitat preference and location, this species would not be affected by ARDM activities.

Mountain Plover. This species breeds in the far panhandle counties and is usually associated with dry upland prairies and plains. Because of habitat preference and location, this species would not be effected by ARDM activities.

Fish. Oklahoma has 3 Federal and 3 State listed T&E species of fish. In addition, 1 fish is a Federal T&E candidate.

Cavefish, Ozark	<i>Amblyopsis rosae</i>	Federal threatened
Darter, leopard	<i>Percina pantherina</i>	Federal threatened
Madtom, Neosho	<i>Noturus placidus</i>	Federal threatened
Darter, longnose	<i>Percina nasuta</i>	State endangered
Darter, blackside	<i>Percina maculata</i>	State threatened
Shiner, Arkansas River	<i>Notropis girardi</i>	State threatened & Fed. proposed endangered
Darter, Arkansas	<i>Etheostoma cragini</i>	Federal candidate

Ozark Cavefish. This species occurs in 3 counties of northeastern Oklahoma. It is a true cave dweller and highly adapted to a subterranean cave existence. Ozark Cavefish require clear-flowing waters from large perennial streams in permanently dark, rubble-bottom caves. WS ARDM activities will have no effect on this species because it occur only in caves where ARDM activities are not conducted.

Leopard Darter. This species occurs in extreme southeastern Oklahoma. Leopard darters inhabit streams with moderately swift riffles in pools 1 to 3 feet of depth over rubble and boulder beds. Most streams where they have been found have been over 40 feet wide. The leopard darter does not occur in upper headwaters and is considered more of a riverine species. ARDM activity would have no adverse effect on this species. The removal of beaver dams may have a positive effect by restoring stream flow velocities and preventing siltation which would reduce suitable habitat for this species.

Neosho Madtom. This species is limited in distribution to the [REDACTED] drainage system in far northeastern Oklahoma. They live in riffle areas of moderate sized, clear-flowing streams where they hide in crevices and spaces under loose rocks. ARDM activity would have no adverse effect on this species. The removal of beaver dams may have a positive effect by restoring stream flow velocities and preventing siltation

which would reduce suitable habitat for this species.

Longnose Darter. This species historically inhabited 2 counties in far [REDACTED] Oklahoma. Currently, it is only known to occur in [REDACTED] of [REDACTED] County. During most of the year, it prefers deep quiet clear waters with gravel runs until spring when it migrates into shallower gravel riffles. ARDM activities would have no adverse effect on this species.

Blackside Darter. This species is one of the most widespread darters nationwide. It inhabits clear gravel-bottomed streams and river tributaries of far eastern Oklahoma. Distribution and abundance are not known but loss of stream habitat through damming and infrequent collection are the primary reasons for its listing in Oklahoma. ARDM activities would have no adverse effect on this species, including the use of binary explosives for removing beaver dams which in some cases could be beneficial by reducing silting in critical habitat.

Arkansas River Shiner. In Oklahoma, this species occurs in significant numbers only in the [REDACTED] above [REDACTED]. These shiners prefer to live in unshaded, braided, main channels of major streams and rivers with sandy bottoms rather than mud or rock bottoms. ARDM activities would have no effect on this species, including the use of binary explosives for removing beaver dams because beaver dams do not generally occur in the broad main channels of major streams and rivers. Should the species occur in smaller streams subject to beaver damming activities, then beaver dam removal could have a positive effect by protecting preferred sandy bottoms from siltation.

Arkansas Darter. In Oklahoma, this species' range is primarily restricted to suitable habitat in tributaries of the [REDACTED] system in far northeastern Oklahoma and sporadically in suitable habitat in the [REDACTED] in the Oklahoma [REDACTED]. Arkansas darters prefer to live in springs, pools along spring-fed tributary streams, and seeps partially overgrown with watercress or aquatic vegetation which are generally floored with soft organic sediment. Pond construction in seep areas and springs can destroy their habitat. Removal of forest cover along stream banks can increase water temperatures and be detrimental to this species reproduction. ARDM activities would not have an adverse effect on this species with the exception of beaver dam removal. Removal of beaver dams could have positive or negative impacts depending on the location and timing. Under most circumstances, beaver pond removal would have a positive effect because beaver ponds could destroy the character of the springs and seeps they inhabit. However, the use of explosives to remove beaver dams could potentially have a negative impact on this species by directly killing a few individuals. The benefits of dam removal probably greatly outweigh the potential negative impacts. If WS is requested to do dam removal where known populations exist and this species is listed, WS will consult with USFWS prior to any actions.

Invertebrates. Two invertebrate species are Federally listed T&E species in Oklahoma. In addition, 2 species are listed on the State T&E list.

Beetle, American burying	<i>Nicrophorus americanus</i>	Federal endangered
Rock-pocketbook, Ouachita	<i>Arkansia wheeleri</i>	Federal endangered
Crayfish, cave	<i>Cambarus tartarus</i>	State endangered
Mucket, Neosho	<i>Lampsilis rafinesqueana</i>	State endangered

American Burying Beetle. This species was once found in much of the eastern U.S. Oklahoma is one of only four States where it can be found. Habitat requirements are largely unknown. Collection of specimens in Oklahoma have been from level areas with relatively loose, well-drained soils, and a well-formed litter layer of previous year's vegetation. The beetle has been collected from oak-pine and oak-hickory forests, grasslands and open fields, and along forest edges. ARDM activities would not occur in the upland areas where this

species has been found. Therefore, ARDM activities would have no effect on this species.

Ouachita Rock-pocketbook. This is a species of freshwater mussel, also known as Wheeler's Pearly Mussel, and found only in the [REDACTED] of southeastern Oklahoma. Its range has been reduced because of dam building and decreased water quality. They prefer streams with cobble-gravel bottoms or, sometimes, sand. ARDM activities would have no effect on this species with the exception of beaver dam removal which could have a positive effect on the species by preventing siltation of preferred habitat.

Cave Crayfish. This species is known to occur in only one cave system of the Ozark Plateau in [REDACTED] County. The crayfish inhabits subterranean perennial streams and pools that are devoid of sunlight. They depend upon detritus and other organic material that is either brought into caves or washed in with the underground streams. WS ARDM activity will have no effect on this species because it occurs only in caves where ARDM activities are not conducted.

Neosho Mucket. This freshwater mussel historically occurred in the rivers systems of northeastern Oklahoma. Recent surveys indicate the mucket now only occurs in the [REDACTED] above [REDACTED]. They primarily inhabit silty backwater areas of rivers and streams and, to a lesser extent, swift water among rock and gravel beds. Since, the Illinois River is a State Scenic River and classified as an Outstanding Resource Water under the States water quality standards, a permit would be required. ARDM activities would have no effect on this species except that beaver dam removal could have a potential impact.

Plants. Only one species of plant is Federally listed as a T&E species in Oklahoma.

Orchid, Western Prairie fringed *Platanthera praeclara* Federal threatened

Western Prairie Fringed Orchid. This species has been found in 2 counties of far [REDACTED] Oklahoma. However, none have been found in Oklahoma since the 1970s. The plants are mainly in areas with moist to wet loamy soils of tallgrass prairies and pastures. ARDM activities with the exception of dam removal would not affect this species should it be present. Dam removal, either by hand or with explosives, could have a positive or negative impact on this species depending on the timing. If dam removal were associated with restoring pre-existing flows prior to an area becoming an established wetland (about 3-5 years), removal of a dam could be positive because a new dam may flood critical habitat for the orchid. However, if the dam were removed after an area became an established wetland, it may dry out adjacent soils of the area and, therefore, dry up the orchid's habitat; however, dam removal at this stage would require a Section 404 permit under the Clean Water Act from the Army Corps of Engineers. Currently, WS requires landowners to obtain a permit for established wetlands prior to WS conducting dam removal. WS removes only beaver dams that are "relatively new" (usually less than 5 years old) and have not yet become an established wetland. In addition, the streams, drainage ditches or other waterway is returned to its original function and flow rate. Therefore, current ARDM practices by WS including dam removal would not affect this species.

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FINDING OF NO SIGNIFICANT IMPACT

For

The Environmental Assessment Aquatic Rodent Damage Management in Oklahoma

Based on the foregoing, I have determined that there will not be a significant impact, individually or cumulatively, on the quality of the human environment because of WS's activities for managing aquatic mammal damage in the State of Oklahoma, and that the actions do not constitute a major federal action.

Individual activities for controlling damage by aquatic rodents are normally categorically excluded, and I have found nothing in the present circumstances to warrant an exception to that classification. The effects of aquatic rodent control activities contemplated in this document, when added to the other past, present, and reasonably foreseeable future actions, will not significantly affect the quality of the human environment. This determination takes into consideration the following factors:

Based on the analysis documented in the environmental assessment for the proposed actions to be conducted in Oklahoma, the impacts of the aquatic rodent management program will not have significant effects on the human environment.

The proposed action's effects on public health and safety would be minimal. No human accident associated with APHIS-WS aquatic rodent damage management is known to have occurred in the State.

There are no unique characteristics such as park lands, prime farm lands, wetlands, wild and scenic areas, or ecologically critical areas that would be significantly affected.

Mitigation measures adopted as part of the proposed action combined with SOPs of WS minimize risks to the public, and would prevent adverse effects on the human environment and reduce uncertainty and risks.

The number of animals taken (both target and nontarget) by APHIS-WS annually in Oklahoma is small in comparison to the area's total estimated population. Effects on wildlife or wildlife habitats would be minimal.

There would not be significant cumulative effects from this project and other actions implemented or planned within the area.

The evaluation that assessed the effects of the proposal upon T&E species determined that no significant adverse effects are likely to occur on these species. Consultation with the U.S. Fish and Wildlife Service has taken place concerning T&E species for which there is a potential for adverse impacts and mitigation measures to avoid adverse impacts will be implemented.

This action would be in compliance with federal, state, and local laws or requirements for wildlife damage control and environmental protection.

DECISION

I have carefully considered this matter. Individual aquatic rodent control actions that may take place in Oklahoma are normally categorically excluded from the need to prepare NEPA documentation. I have determined that taking action consistent with the first alternative provides the best chance of minimizing losses of resources to be protected in the area and of allowing the program to meet its responsibilities, while not significantly affecting the quality of the human environment. By this decision, I am directing the Oklahoma WS program to implement Alternative 1 and to abide by the mitigation measures established as standard operating procedures in the WS Directives.

The decision to implement Alternative 1 will become effective 30 days after publication of legal notice in the Daily Oklahoman, the statewide newspaper.

/s/

3/3/99

Michael V. Worthen
Western Regional Director
USDA-APHIS-WS

Date

**DECISION
AND
FINDING OF NO SIGNIFICANT IMPACT**

Aquatic Rodent Damage Management in Oklahoma

The U.S. Department of Agriculture, Animal and Plant Health Inspection Service (USDA-APHIS), Wildlife Services (WS) program responds to requests for assistance from individuals, organizations and agencies experiencing damage caused by wildlife in Oklahoma. WS has prepared an environmental assessment (EA) that analyzes alternatives for managing damage caused by aquatic rodents (beaver, nutria, and muskrat) in the state of Oklahoma. Ordinarily, according to APHIS procedures implementing the National Environmental Policy Act (NEPA), individual wildlife damage management actions are categorically excluded (7 CFR 372.5(c), 60 Fed. Reg. 6000-6003, 1995). An EA was prepared in this case to facilitate planning, interagency coordination, and the streamlining of program management, and to clearly communicate with the public the analysis of cumulative impacts. The predecisional EA released by WS in November 1998 documented the need for aquatic rodent damage management (ARDM) in Oklahoma and assessed potential impacts of various alternatives for responding to aquatic rodent damage problems. The EA is tied to the programmatic Environmental Impact Statement (EIS) for the Wildlife Services Program⁵ (USDA 1994).

WS's proposed action was to continue the current program of ARDM which allows for the use of all methods, both nonlethal and lethal, to protect agriculture, property, natural resources, and human health and safety from damage caused by aquatic rodents. Based on the analysis in the EA, I have determined that there will not be a significant impact, individually or cumulatively, on the quality of the human environment from implementing the proposed action of continuing the program as proposed, and that the action does not constitute a major federal action.

Public Involvement

Following interagency review of a preliminary draft of the EA, a predecisional EA was prepared and released to the public for a 30-day comment period. The predecision EA was sent to all American Indian Tribes in Oklahoma, to consulted state and federal agencies, and to other interested organizations. Twenty-five copies were sent to the Oklahoma Department of Libraries to be available for public review. Notice of availability of the predecisional EA was also published in 2 major newspapers in the State on November 17, 18, and 19, 1998. One comment letter was received in response to the predecisional EA. Some of the comments indicated areas that warranted additional clarification or treatment. These are:

1. The "Nonlethal Required Before Lethal" alternative should be a mandate.

As stated in the EA, personnel experienced in ARDM can generally determine when and where nonlethal control techniques would work, and this alternative could result in the use of methods that are known to be ineffective, or would have little chance of being effective, in certain situations. **Rick W. will put in a statement re Refer to IWDM approach as described in EIS.** WS believes that requiring nonlethal alternatives that are unacceptable to property owners because of high cost or because they have little chance of success would only encourage such persons to avoid seeking professional assistance and to possibly resort to unsound remedies that could have serious environmental consequences. Also, this alternative would be similar to the current program in many situations because many property owners have tried nonlethal alternatives such as dam removal or wire barriers prior to contacting WS. Thus, WS believes mandating nonlethal methods before implementing lethal methods could actually be counterproductive in many situations.

2. Leghold traps, snares, and body-gripping traps are inhumane.

The EA addressed humaneness of control techniques at length in section 2.2.2 and in Chapter 4 for each alternative. WS recognizes that the above methods are viewed as inhumane by some people. However, they remain essential components of the means of resolving those damage situations in which the only feasible remedy is to remove the problem animals. Other means of removal such as shooting or using cage-type traps are much more labor intensive and costly in most situations or, in the case of shooting, may not be allowed because of human safety considerations, and requiring their use in lieu of the above capture methods would

⁵ USDA (U.S. Department of Agriculture), Animal and Plant Health Inspection Service (APHIS), Animal Damage Control (ADC). 1994. Animal Damage Control Program, Final Environmental Impact Statement. Anim. Plant Health Inspection Serv., Anim. Damage Control. Hyattsville, MD. Volume 1, 2 & 3.

reduce the damage situations in which WS could provide assistance. Such a reduction could lead to property owners becoming frustrated and resorting to home remedies that might be less environmentally sound as discussed in the EA. Thus, discontinuing the use of the above capture devices could actually lead to greater environmental harm and greater impacts on nontarget wildlife. WS believes that, until other cost-effective methods that are perceived as being more humane are developed, the above capture devices should remain available for use as part of an integrated approach to resolving aquatic rodent damage.

This commenter also expressed concern that relying on drowning as a means of killing trapped aquatic rodents is inhumane. The commenter cited Gilbert and Gofton (1982) who concluded that body-gripping (e.g., Conibear) traps were more humane for taking beaver than drowning sets using leghold traps. Although leghold traps are occasionally used by WS to capture beaver, body-gripping quick-kill type traps are used far more often. In FY 1998, 86 percent of beaver were taken by body-gripping traps or shooting, and only 0.5% were taken by leghold traps. Thus, the method perceived by the commenter as being more inhumane is used by WS to an extremely minor degree. In general, leghold traps are used in situations where the beaver appear to be wise to other capture methods, and are not a primary method of choice for capturing beaver in the OK WS program. The WS program continues to participate in the research and development of alternative wildlife capture methods in the hope that methods that are both effective and more acceptable to persons such as this commenter can be developed and brought into use.

3. Zinc phosphide for control of muskrats and nutria is inhumane.

WS acknowledges that some persons consider this chemical to be inhumane. However, it is the only chemical registered by the EPA and state pesticide agencies for control of muskrat and nutria. In those situations where a reduction in a local population of one of these species is necessary, other alternatives such as shooting or trapping are much more labor intensive and costly and may not be as successful as use of zinc phosphide baits. This method has not been used by the OK WS program in recent years, and it is expected that the need for its use will remain exceedingly low in the State. Also, the baiting strategy used with this method relies on prebaiting with nontoxic bait to assure it is being accepted by the target species and on the use of floating rafts which limits access to the bait to aquatic rodent species. Thus, concerns about the humaneness of this method and concerns about nontarget animals being affected are already mitigated to a great degree. Nevertheless, this method may be used by WS to reduce local populations of these two species under the current program alternative, and persons with similar attitudes as this commenter would continue to view its use as inhumane.

No substantive changes to the predecision EA are deemed necessary. Therefore, the predecision EA is hereby designated as the final EA for this proposal.

Major Issues

Several major issues were deemed relevant to the scope of this EA. These issues were consolidated into the following 5 primary issues to be considered in detail:

1. Effects on Target Aquatic Rodent Species Populations
2. Effects on Nontarget Species Populations, Including T&E Species
3. Humaneness of Control Techniques
4. Effects of Beaver Dam Removal on Wetland Wildlife Habitat
5. Effects of ARDM Methods on Public Safety

Alternatives Analyzed in Detail

Six potential alternatives were developed to address the issues identified above. Seven additional alternatives were considered but not analyzed in detail. A detailed discussion of the anticipated effects of the alternatives on the objectives and issues is described in Chapter 4 of the EA. The following summary provides a brief description of each alternative and its anticipated impacts.

Alternative 1. Continuation of Current Program (No Action). Consideration of the No Action alternative is required under 40 CFR 1502.14(d), and provides a baseline for comparing the potential effects of all the other alternatives. This alternative allows for WS to use all currently authorized management methods in an integrated approach to resolve aquatic rodent damage problems in the State.

Alternative 2. No Federal WS ARDM. This alternative would consist of no federal involvement in ARDM in the State -- neither direct operational management assistance nor technical assistance to provide information on nonlethal and/or lethal management techniques would be available from WS. A portion of the formerly federal ARDM responsibility would probably be born by the remaining state agency programs. Private individuals would increase their efforts which would mean more ARDM would probably be conducted by persons with less experience and training, and with little oversight or supervision. Effectiveness and selectivity would probably be lower than Alternative 1. Risks to the public and to nontarget and T&E species would probably be greater than Alternative 1. Persons who perceive capture methods used by WS as inhumane would probably view this alternative as more acceptable than Alternative 1; however, animal suffering could actually be greater because lethal methods would be used by less experienced individuals in many cases, and more persons would likely resort to illegal methods such as unregistered toxicants that could potentially cause more overall suffering of target and nontarget animals. Risks to established wetland wildlife habitat would probably be slightly greater than Alternative 1.

Alternative 3. Technical Assistance Only. Under this alternative, WS would not provide any direct control assistance to persons experiencing aquatic rodent problems, but would instead provide only advice, recommendations, and, in some cases, limited technical supplies or equipment. ARDM would likely be conducted by persons with little or no experience and training, and with little oversight or supervision. Risks to the public and to nontarget and T&E species would probably be somewhat more than Alternative 1 but slightly less than or about the same as Alternative 2, and effectiveness and selectivity would probably be lower. Persons who perceive capture methods used by WS as inhumane would probably view this alternative as more acceptable than Alternative 1, but less than or perhaps equal to Alternative 2; however, actual effects on animal suffering could be greater than Alternative 1 and less than Alternative 2 for reasons similar to those presented in the previous paragraph. Risks to established wetland wildlife habitat would probably be slightly greater than Alternative 1, but less than Alternative 2.

Alternative 4. Nonlethal Control Required Before Lethal. This alternative would allow no use of lethal methods by WS as described under the proposed action until nonlethal methods have been employed in a given damage situation and found to be ineffective or inadequate. Property owners and state agencies would still have the option of implementing lethal control measures without a requirement that nonlethal methods be conducted first. Risks to the public and to nontarget and T&E species would probably be somewhat more than Alternative 1, somewhat less than or about the same as Alternative 2, and about the same as or more than Alternative 3. Persons who perceive capture methods used by WS as inhumane would probably view this alternative as more acceptable than Alternative 1, less than or perhaps equal in acceptability to Alternative 2, and less acceptable than alternative 3. However, actual effects on animal suffering could be greater than Alternative 1, less than Alternative 2, and greater than or about the same as Alternative 3 for reasons similar to those presented in the previous two paragraphs. Risks to established wetland wildlife habitat would probably be slightly greater than Alternative 1, less than Alternative 2, and less than Alternative 3.

Alternatives considered but not analyzed in detail were:

Compensation for Aquatic Rodent Damage Losses. This alternative would require the establishment of a system to reimburse resource owners for damage caused by aquatic rodents. This alternative was eliminated from further analysis because no federal or state laws currently exist to authorize such action and because of other drawbacks discussed in the EA and the WS FEIS.

Bounties. Bounties are the payment of funds for killing animals of certain species that cause or are suspected of causing economic losses. This alternative was eliminated from further analysis because it is not supported by Oklahoma State agencies such as ODWC and ODA nor is it supported by WS because of problems discussed in the EA.

Eradication and Long Term Population Suppression. An eradication alternative would direct all WS program efforts toward total long term elimination of beaver, muskrat, and/or nutria within large defined areas or across the entire State. This alternative was eliminated from further analysis because WS, ODWC and ODA oppose eradication of any native wildlife species, and because it is generally impossible to achieve for native and well established nonnative species such as nutria. Long term population suppression is not a desired goal of state agencies or of WS for the State as a whole but could be implemented for localized areas prone to aquatic rodent damage under the current program alternative. The impacts of localized population suppression are analyzed in the EA.

Reproduction Control. This alternative would have involved controlling populations of aquatic rodents by

chemical or surgical means. It was rejected for detailed analysis because currently available methods are not practical or are too expensive for large-scale field application, the animals that are currently causing damage in a given situation remain to continue causing damage even after being sterilized, and no chemical reproductive inhibitors are legal for use for any of the aquatic rodent species.

Biological Control. This alternative would have called for the introduction of predators or other biological agents to control populations of aquatic rodents. It was rejected for detailed analysis because introduced predators have not been effective in the past, because certain species of reintroduced predators could pose a hazard to people and pets (e.g., alligators), and because no other biological agents have been researched or approved for controlling aquatic rodent species.

The effects of implementing the proposed action, when added to the other past, present, and reasonably foreseeable future actions, will not significantly affect the quality of the human environment. This determination takes into consideration the following factors:

1. Aquatic Rodent Damage Management, as conducted by WS in the State of Oklahoma, is not regional or national in scope.
2. Based on the analysis documented in the EA, the impacts of the ARDM program will not significantly affect the human environment.
3. The proposed action will not have a significant impact on unique characteristics such as park lands, prime farm lands, wetlands, wild and scenic areas, or ecologically critical areas. Built-in mitigation measures that are part of WS's standard operating procedures and adherence to laws and regulations that govern impacts on wetlands will assure that significant adverse impacts on established wetland areas are avoided.
4. The proposed action will not significantly affect public health and safety. Concern for the effects of WS ARDM methods on public safety was addressed in the EA. Risks to the public from WS methods were determined to be low in a formal risk assessment (USDA 1994, Appendix P).
5. The effects on the quality of the human environment are not highly controversial. Although there is opposition to ARDM, this action is not controversial in relation to size, nature, or effects. Based on consultations with other resource professionals, the proposed action is not likely to cause a controversial disagreement among the appropriate resource professionals.
6. Mitigation measures adopted and/or described as "part of the proposed action" minimize risks to the public, prevent adverse effects on the human environment, and reduce uncertainty and risks. Effects of ARDM methods and activities, as proposed, are known and do not involve uncertain or unique risks.
7. The proposed action does not establish a precedent for future actions. This action would not set a precedent for future aquatic rodent management that may be implemented or planned within the State. Effects of the proposed action are minor and short-term in nature and similar actions have occurred previously in the State without significant effects.
8. The number of animals taken (both target and nontarget) by WS annually is small in comparison to total populations. Adverse effects on wildlife or established wetland wildlife habitats would be minimal.
9. The EA discussed cumulative effects of WS ARDM on target and nontarget species populations and concluded that such impacts were not significant for this or other anticipated actions to be implemented or planned within the State.
10. The taking of target species in the State is not an irretrievable or irreversible loss of a resource. The environmental consequences chapter of the EA discusses the effects of the proposed action and concludes that WS take of target species is insignificant to overall populations.
11. Potential effects on T&E species were analyzed and discussed under each alternative. WS has taken no T&E species in the State. WS has consulted with the U.S. Fish and Wildlife Service and abides by and will abide by Reasonable and Prudent Alternatives and/or Mitigation Measures that have resulted from or will result from such consultation to avoid significant adverse impacts to T&E species. Mitigation developed as part of that consultation, or appropriate mitigation that may be established as the result of further consultations, will

be implemented to avoid jeopardy or significant adverse impacts.

12. The proposed action is consistent with state and federal laws that provide for or restrict WS ARDM. Therefore, WS concludes that this project is in compliance with Federal, State and local laws for environmental protection.

DECISION

I have carefully reviewed the Environmental Assessment (EA) prepared for this proposal, and it is my determination that the proposed action does not constitute a major Federal action and will not significantly affect the quality of the human environment. As such, an environmental impact statement will not be prepared. Therefore, it is my decision to implement the proposed action as described in the EA.

As stated previously herein, no substantive changes to the analysis in the predecision EA were deemed necessary based on public comments received, and the predecision EA is hereby designated as the final EA for this proposal. Additional copies of the EA are available upon request from USDA, APHIS, WS, 2800 N. Lincoln Blvd., Oklahoma City, OK 73105.

Michael V. Worthen
Western Regional Director
USDA-APHIS-WS

Date