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## 5-YEAR ENVIRONMENTAL SUMMARY REVIEW

for

### BEAVER AND MUSKRAT DAMAGE MANAGEMENT in NEBRASKA

#### I. Introduction and Summary

The United States Department of Agriculture (USDA), Animal and Plant Health Inspection Service (APHIS), Wildlife Services (WS) program responds to a variety of requests for assistance from individuals, organizations and agencies experiencing damage and other wildlife-related problems. WS is the federal program authorized by Congress and directed by law to reduce damage caused by wildlife (Act of March 2, 1931, as amended [46 Stat. 1468; 7 U.S.C. 426-426c], and the Rural Development, Agriculture, and Related Agencies Appropriations Act of 1988, as amended [Public Law 100-202, Stat. 1329-1331]). Wildlife damage management is the alleviation of damage or other problems caused by or related to the presence of wildlife, and is recognized as an integral part of wildlife management (The Wildlife Society 1992).

Beaver and muskrats can be an asset or a liability, depending on their compatibility with human interests and activities in a particular situation. Management of beaver and muskrats should not be either absolute protection or total reduction, but a discretionary management action where conflicts are minimized in an environmentally sensitive manner for multiple-use needs.

Beaver and muskrats can cause damage to roads, dams, levees, irrigation ditches, pastures, and cropland. The plugging of culverts and damming of irrigation ditches by beaver impairs agricultural operations. Beaver also cut ornamental trees and shrubs which is costly to homeowners and businesses.

In 2001, the Nebraska WS program completed an Environmental Assessment (EA) (USDA 2001) in consultation with the U.S. Forest Service (Forest Service), Bureau of Land Management (BLM), US Fish and Wildlife Service (USFWS), US Army Corps of Engineers (USACE), Nebraska Game and Parks Commission (NGPC), Nebraska Department of Agriculture (NDA), University of Nebraska Cooperative Extension (UNCE), Nebraska Department of Water Resources (NDWR)<sup>1</sup>, and Nebraska Department of Roads (NDOR)<sup>2</sup>. The EA addressed the need to conduct Beaver and Muskrat Damage Management, as requested, and the potential impacts of various alternatives for responding to beaver and muskrat damage in Nebraska. The EA analyzed beaver and muskrat damage management for the protection of agricultural and natural resources, aquaculture, property, and the protection of public health and safety. The analysis area encompasses the State of Nebraska, including all land types (*i.e.* private, state, federal etc.). The EA identified four Alternatives which were analyzed in detail. Alternative 1, the Proposed Action "Continue the Current Nebraska WS Beaver and Muskrat Damage Management Program" was selected and a Finding of No Significant Impact (FONSI) was issued and a Decision signed April 26, 2001.

Monitoring reports for federal Fiscal Years (FYs) 2000/2001 and 2005, were prepared to review program activities and to determine if the EA was consistent with applicable

<sup>1</sup> In July 2000, the Nebraska Department of Water Resources was merged with the Nebraska Department of Natural Resources and goes by the latter name.

<sup>2</sup> USDA (2001) was prepared to facilitate planning, interagency coordination and the streamlining of program management, and to clearly communicate with the public the analysis of cumulative impacts of WS beaver and muskrat damage management on all lands in Nebraska.



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environmental regulations and the impact analysis. Based on those reviews, there continues to be no indications that Nebraska WS' beaver and muskrat activities are having a significant impact, individually or cumulatively, on the quality of the human environment in the EA analysis area.

Copies of USDA (2001), the FONSI, Decision and monitoring reports are available from the Nebraska WS State Office, USDA, APHIS, Wildlife Services, P.O. Box 81866 Lincoln, NE 68501-1866.

## II. Purpose of this Review

The species and area evaluated within the scope of USDA (2001) were beaver and muskrats and the associated damage caused by beaver and muskrats in Nebraska. Nebraska has a total area of about 77,358 mi<sup>2</sup> (49,509,120 acres) (Nebraska Blue Book 1998-1999) and damage problems can occur throughout the State, resulting in requests for WS assistance. During this analysis period, Nebraska WS had agreements to conduct beaver or muskrat damage management on about 150,000 acres annually or about 0.3% of the land area of Nebraska (Management Information System (MIS) 2004, 2005, 2006, 2007, 2008).

The purpose of this 5-year review is to: 1) review the results of WS' beaver and muskrat activities conducted in Nebraska during FY 2004 through 2008 and evaluate the accuracy of the EA analysis, 2) review standard operating procedures designed to minimize or avoid potential adverse environmental effects (Appendix A), and 3) provide an opportunity for public review.

## III. BEAVER and MUSKRAT DAMAGE BETWEEN FY 2004 AND FY 2008

Many beaver or muskrat damage problems are dealt with directly by the affected property owners, without WS personnel being contacted. However from FY 2004 through 2008, WS signed agreements with 180 cooperators for beaver damage and 6 for muskrat damage. To assist in resolving the damage complaints, WS provided 64 technical assistance projects, or conducted operational damage management to reduce or prevent additional damage. Requests from the public or agencies to address beaver or muskrat damage problems ranged from flooding pastures and field crops; damaging roadbeds; burrowing into earthen structures; damming streams, culverts and irrigation systems; consuming field crops; girdling and cutting trees; and various other nuisances.

Beaver and muskrat damage reported to WS from FY 2004 through 2008 totaled \$414,044. Beaver and muskrat cause damage and various resources in Nebraska, with monetary verified losses totaling \$553,876 in FY2004-2008 (Table 1). These reported losses likely represent only a portion of the total actual losses, and serve more as an indicator of the types of damage rather than an indicator of the total magnitude of damage. The majority of reported damage was to "Property" with estimated damages assessed at \$236,906, while damage to "Agriculture" ranked second with estimated losses at \$169,438.

The majority of verified damage was to "Agriculture" with an estimated damages assessed at \$447,723 while damage to "Property" ranked second highest with estimated damages assessed at \$74,472 (MIS 2004, 2005, 2006, 2007, 2008).

Category	Subcategory	Beaver	Muskrat
Agriculture	Commercial Forestry and Nursery	\$243,006	
	Field Crops	\$368,365	
	Livestock	\$200	
	Range/Pasture	\$5,590	
Natural Resources	Forestry- trees	\$35,730	
	Natural Areas	\$2,401	
Property	Landscape/Turf/Grass	\$251,593	
	Other	\$300	\$1,000
	Structure	\$59,485	\$250

#### IV. ALTERNATIVES CONSIDERED IN USDA (2001)

This section reviews the alternatives considered and analyzed in detail including the Proposed Action (Alternative 1) and the alternatives considered, but eliminated from detailed analysis. Alternatives in USDA (2001) were developed for consideration using the WS Decision Model (Slate et al. 1992), “*Methods of Control*” (USDA 1997 Appendix J) and the “*Risk Assessment of Wildlife Damage Control Methods Used by the USDA Animal Damage Control Program*” (USDA 1997, Appendix P). Four alternatives were recognized, developed, and analyzed in detail by the Multi-agency Team (WS, Forest Service, BLM, USFWS, USACE, NDOR, NDA, NGPC, UNCE, NDWR, NDOR); four alternatives were considered but not analyzed in detail

##### The four alternatives analyzed in detail were:

- 1) Alternative 1 - Continue the Current Nebraska WS Program: (Proposed, No Action). This alternative would continue beaver and muskrat damage management based on the needs of multiple resources (agricultural and natural resources, roadways and bridges, railroad beds, property, and public health and safety). Damage management programs would be implemented following consultations with the NGPC, federal agencies, or tribes as appropriate. This alternative would allow for a program to protect multiple resources as requested on lands owned or managed by the federal or state management agencies, privately owned lands and tribal lands if a Cooperative Agreement, Agreement for Control, MOU, or other comparable document with Nebraska WS are in place.
- 2) Alternative 2 - No Federal Nebraska WS Program. This alternative would terminate the federal beaver and muskrat damage management program in Nebraska.
- 3) Alternative 3 - Technical Assistance Only. Under this alternative, Nebraska WS would not conduct operational beaver or muskrat damage management in Nebraska. The entire program would consist of only technical assistance.
- 4) Alternative 4 - Non-lethal Beaver and Muskrat Damage Management Only. Under this alternative, Nebraska WS would only utilize non-lethal methods for the management of beaver or muskrat damage in Nebraska.

##### The alternatives not considered in detail were:

- Compensation for Wildlife Damage Losses
- Eradication and Suppression
- Bounties
- Non-lethal Required Before Lethal Control
- Beaver Damage Should be Managed by Hunters and Trappers

#### V. Major Issues Analyzed in Detail

Primary issues analyzed in the EA include those issues of concern from the public and/or professional communities about potential environmental impacts that may occur from WS’ proposed beaver and muskrat damage management program. These issues were considered in detail, as required by the National Environmental Policy Act (NEPA). Issues relating to the reduction of wildlife damage were raised during the scoping process in preparing USDA (1997) and during the interdisciplinary approach used for preparing the EA. These issues were consolidated into the following primary issues that were considered in detail:

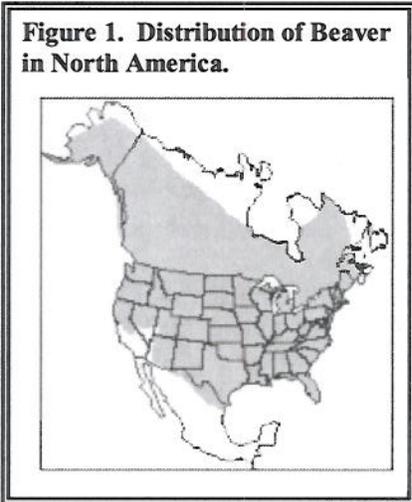
- Concerns for the Nebraska WS' kill of beaver and muskrat to cause population declines, when added to other mortality.
- Concerns about the selectivity and effectiveness of beaver and muskrat damage management.
- Concerns about the effects of Nebraska WS' beaver and muskrat damage management on public health and safety.

***Concerns for the Nebraska WS' kill of beaver and muskrat to cause population declines, when added to other mortality.***

A primary issue analyzed in the EA was the impact of WS beaver and muskrat removal on the viability of target and non-target wildlife populations. Beaver damage continues to be the most important aquatic problem in Nebraska and more beaver were removed than muskrats (Table 2).

**Beaver 5-Year Analysis**

Beaver are the sole representative of the family *Castoridae* in North America and occupy a wide range of habitats (Figure 1), but water is the most important feature in their daily lives. Ideal beaver habitats are ponds, small lakes with muddy bottoms, and meandering streams although they occupy artificial ponds, reservoirs and drainage ditches if food is available; the distribution of beaver is determined by food and water availability. Home range is greatly affected by the water system where beaver live. Small ponds and potholes may contain only one family; home ranges on streams have been reported to be about 0.5 mi of stream (Busher et al. 1983, Bergerud and Miller 1977). The beaver's existence depends on permanent water and a supply of woody vegetation; if food is present, parts of Nebraska provide excellent beaver habitat except during periods of drought when beaver populations decline as water tables drop and wetlands dry up.



Beaver occur mostly in family groups that consist of two adult parents, offspring from the current breeding season and yearlings from the previous breeding season, totaling 2-6 individuals (Novak 1987). Each family's breeding female produces one litter per year (Novak 1977, Wigley et al. 1983). Average litter size in North America is three or four offspring, however litter size can vary because of various factors (Longley and Moyle 1963, Huey 1956, Gunson 1970, Rutherford 1964, Harper 1968, Wigley et al. 1983, Gunson 1970, Henry and Bookhout 1969, Gunson, 1970, Payne 1984a). Gunson (1970) and Payne (1984a) concluded that beaver fecundity was also density-dependent.

The total number of beaver in an area depends on the number of families (colonies) found there and the average number of individuals per family. 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 0.3 to 1.5 families per kilometer of stream, or 0.5 - 2.4 families per mile of stream. Densities reported in terms of families per square kilometer have been reported to range from 0.2 to 3.9, or 0.2 to 6.3 per square mile (Novak 1987).

Nebraska WS removed 139, 157, 128, 116 and 160 beaver in FYs 2004 through 2008, respectively (MIS 2004, 2005, 2006, 2007, 2008). Yeager and Rutherford (1957) determined various harvest rates depending on habitat conditions and management objectives. Annual harvest quotas in Ontario, after many years of study, are set at 30% of the population regardless of habitat type (Novak 1977). USDA

(1997) determined that 30% of the beaver population could be removed and a stable population of beaver be maintained if water and forage conditions remained favorable.

The average annual take of beaver by Nebraska WS between 2004 and 2008 was 140 beaver or about 1.0% of the estimated other take. The FY 2008 Nebraska WS Program beaver take was the highest removed at about 1.3% of the estimated other take during this summary period.

Based on this information and NGPC data, WS' impact on Nebraska beaver, even with possible "Other Take" under-reporting, WS take over the last 5- years has been insignificant to the overall populations of beaver and is not adversely affect beaver in Nebraska (S. Wilson, NGPC, Nongame mammal/Furbearer Program Manager, pers. comm. 2009). In addition, WS had agreements to resolve beaver complaints on only about 0.3% of the total area of Nebraska. Thus, based on WS' take and NGPC beaver data (Table 2), and the research studies cited above, the cumulative impact on the Nebraska beaver population is of a low magnitude.

**Table 2. Beaver/Muskrat Population Harvest Data for Nebraska (MIS FY04-08 and NGPC Fur Harvest Surveys).**

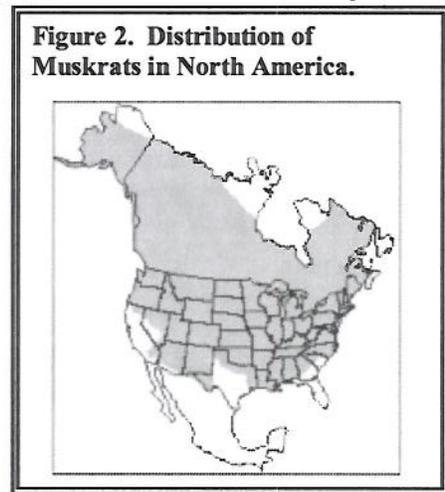
Population Statistics	Beaver*					Muskrat*				
Estimated Population (NGPC)	N/A**					N/A**				
WS Fiscal Year	04	05	06	07	08	04	05	06	07	08
WS Kill	139	157	128	116	160	25	40	0	6	5
Estimated Annual Other Take (NGPC)**	14,507	16,074	16,048	12,353	11,862	14,608	23,696	22,732	30,186	14,627
% WS take of Other Take	0.95	0.97	0.79	0.93	1.33	0.17	0.17	0	0.02	0.03

\* The NGPC Fur Harvest Survey 2006/2007 estimated the average 5-year (2001-2005) beaver sport harvest take at 15,616 and the muskrat 5-year average at 17,117 (<http://www.ngpc.state.ne.us/hunting/guides/furbearer/pdfs/FurHarvest0607.pdf>).

\*\* NGPC does not create population estimate for furbearers, but tracks trends through harvest data (S. Wilson, NGPC Nongame Mammal/Furbearer Program Manager, pers comm. 2009).

### Muskrat 5-Year Analysis

The muskrat is also distributed throughout North America (Figure 2) and is one of the most heavily harvested furbearers (Boutin and Birkenholz 1987). They live in diverse habitats; they can be found in freshwater and brackish marshes, ponds, sloughs, lakes, ditches, streams, and rivers (Boutin and Birkenholz 1987), but must have a source of permanent water and a protected site for shelter and the rearing of young. Muskrats are considered the most prolific of the exploited North American furbearers (Smith et al. 1981). Breeding generally occurs when ponds and streams become ice-free (Olsen 1959). The gestation period is 28 to 30 days, and females can remate immediately after giving birth (Wilson 1955). Thus muskrats have the potential to produce a litter every month, but the number of litters per female in any breeding season is generally about 3-4 (Wade and Ramsey 1986). Average litter size varies from three to nine (Danell 1978). These characteristics help make muskrats relatively immune to over-harvest<sup>3</sup> (Boutin and Birkenholz 1987). Sustainable harvest rates of from three to eight muskrats per acre have been reported (Boutin and Birkenholz 1987).



Smith et al. (1981), using a population model, estimated that muskrats could sustain an annual harvest of 74% of the population. Clark (1987) estimated a 64% maximum sustainable harvest rate for muskrat

<sup>3</sup> Errington (1963) stressed the density-dependent nature of muskrat population dynamics, but observed two external factors that regulated pronounced changes in muskrat numbers. These are drought and disease. O'Neil (1949) proposed that muskrats were regulated by food supply.

populations on the upper Mississippi River. The Nebraska WS muskrat take from 2004 to 2008 was only 0.17% (25 animals) 0.17% (40 animals) 0.0% (0 animals) 0.02% (6 animals) and 0.03% (5 animals), respectively of the NGPC regulated muskrat harvest. Based on this information and NGPC data, WS' impact on Nebraska muskrats, even with possible "Other Take" under-reporting, WS take over the last 5-years has been insignificant to the overall populations of muskrats and is not adversely affect muskrats in Nebraska (S. Wilson, NGPC, Nongame mammal/Furbearer Program Manager, pers. comm. 2009). In addition, WS had agreements to resolve muskrat complaints on only about 0.012% of the total area of Nebraska. Thus, based on WS' take and NGPC muskrat data, and the research studies cited above, the cumulative impact on the Nebraska muskrat population is of a low magnitude.

Non-target animal take reported during FY2004-2008 in Nebraska was eight (Table 3). No threatened or endangered species were killed or harmed by WS in Nebraska during FY2004-2008.

***Concerns about the selectivity and effectiveness of beaver and muskrat damage management.***

Under the current program, all methods are used as selectively and effectively as possible, in conformance with the WS Decision Model (Slate et al 1992) and WS Program Directives. The selectivity of each method is based, in part, on the application of the method and the skill of the WS employee, and the direction provided by WS Directives. The humaneness of each method is based, in part, on the perception of the pain or anxiety caused by the method. WS personnel are trained in the proficient use of each method and are certified by the NDA as pesticide applicators for each pesticide that may be used during damage management activities<sup>4</sup>. WS did not use or employ any method that was not discussed or analyzed in USDA (1997, 2001).

Several methods (cage traps, body-gripping traps, and snares) were more than 97% selective for target species. Leg-hold traps, shooting and hand catching proved 100% selective (Table 3).

Effectiveness of the various methods may vary widely depending on local circumstances at the time of application. Some methods may be more or less effective or applicable depending on weather conditions, time of year, biological and economic considerations, legal and administrative restrictions, or other factors. Because these various factors may at times preclude use of certain methods, it is important to maintain the widest possible selection of management tools to most effectively resolve wildlife damage problems.

**Table 3. Selectivity of Six Selected Techniques Utilized by the Nebraska WS Program, FY2004-2008.**

Take	Leg-hold Traps	Body grip Traps	Cage Traps	Shooting	Snares	Hand Caught
<u>Target</u>						
Beaver	13	434	37	120	96	0
Muskrat	0	24	0	47	0	5
Total FY 2004-2008	13	458	37	167	96	5
<u>Non-targets</u>						
Raccoon	0	2	1	0	1	0
Turtles	0	4	0	0	0	0
Otter	0	0	0	0	0	0
Beaver	0	0	0	0	0	0
Muskrat	0	0	0	0	0	0
Total	0	6	1	0	1	0
% Selectivity	100%	98.7%	97.4%	100%	99%	100%

***Concerns about the effects of Nebraska WS' beaver and muskrat damage management on public health and safety.***

<sup>4</sup> During this analysis period, WS personnel did not use any pesticides for beaver or muskrat damage management.

Effects on public health and safety include potential benefits from Nebraska WS fostering a safer environment and the potential negative effects that might result from the exposure of the public to damage management methods. The potential benefits from the Nebraska WS Program include increased public health and safety on roadways, railroad beds, property, and protection of agricultural and natural resources. During the 5-year review period, 776 beaver and muskrats were targeted and killed by WS. There were no known incidents of domestic pets being harmed or killed, or reports received of risks or injuries to the public resulting from WS' methods. This would indicate that the overall risk posed to public health and safety was extremely low.

#### **VI. Beaver Dam Breaching and Wetland Wildlife Habitat Areas**

WS breached 79 beaver dams during the 5-year review period (Table 4). Thirty-seven dams were removed by binary explosives and 42 by hand method (hand shovel). All beaver dams breached were on private property. When WS is requested to breach a beaver dam, it is typically because the dams has caused flooding of roads, crops, timber, pasture and/or other types of property or resource

FY	Dams Blown	Dams Dug	TOTAL
2004	4	0	4
2005	3	14	17
2006	2	10	12
2007	9	9	18
2008	19	9	28

All WS Explosive Specialists are required to attend 30 hours of extensive explosive safety training and spend time with a certified Explosive Specialist in the field prior to obtaining certification. Once certified, re-certification is required every 2-years and Explosives Specialists must pass competency evaluations/exams administered by WS' Explosives Training Officers. Nebraska's most primary Explosive Specialist has 5-years of explosives experience and has been certified since FY 2004. Explosive handling and use procedures follow the rules and guidelines set forth by the Institute of Makers of Explosives, the safety arm of the commercial explosive industry in the United States and Canada. WS also adheres to Federal and State transportation and storage regulations, such as the Occupational Safety and Health Administration; Bureau of Alcohol, Tobacco and Firearms; and Nebraska Department of Roads.

All beaver dams were breached in accordance with exemptions from permit requirements established by regulation or as allowed under a Nationwide Permit granted under Section 404 of the Clean Water Act and U. S. Army Corps of Engineers Branch Guidelines established in 1996 (USACE 1996). A review of the Section 7 Consultation and Letters of Concurrence from the USFWS, and a review of the NGPC consultation determined that the dams were breached in accordance with established procedures, protocols and environmental concerns.

#### **VII. Public Involvement.**

Issues related to the proposed action were initially developed using an interdisciplinary approach where personnel (WS, Forest Service, BLM, USFWS, USACE, NGPC, NDA, NDOR, HHS, NDWR, and UNCE) refined the issues, prepared objectives and identified alternatives. Nebraska WS also included an invitation for public comment of USDA (2001). An invitation for public comment letter containing issues, objectives, preliminary alternatives, and a summary of the need for action, was sent to 166 individuals or organizations who had identified an interest in Nebraska WS beaver and muskrat management program. Notice of the proposed action and invitation for public involvement for the development of USDA (2001) were placed in 5 newspapers with circulation throughout Nebraska. Public comments were documented from numerous letters or written comments on review of USDA (2001). All comments were analyzed to identify new issues, alternatives, or to redirect the objectives of the program.

All responses are maintained in the administrative file at the Nebraska WS State Office, P.O. Box 81866, Lincoln, Nebraska 68501-1866.

As part of this summary review process, the Summary Report is being made available to the public for a 30-day public comment period and noticed through the APHIS website and a Notice of Availability (NOA) published for 3 consecutive days in the Lincoln Journal Star, Lincoln, NE, and NOAs mailed to those that responded to USDA (2001). The NOA stated that WS was accepting comments for a 30-day period and copies of the USDA (2001), the FONSI and Decision, and the Summary Report may be obtained from the USDA-APHIS-WS website or WS State Office in Lincoln. The WS State Office mailing address and phone number were provided.

### **Compliance and Monitoring**

Nebraska WS' beaver and muskrat damage management activities have been conducted in a manner consistent with all applicable environmental laws and regulations, including the ESA and NEPA. Substantial changes in the scope of work or changes in relevant guidance documents or environmental regulations may trigger the need for further analysis.

### **RESULTS OF THE 5-YEAR REVIEW**

The WS program described in the 2001 EA continued during FY 2004 through 2008 and based on a 5-year review of Nebraska WS beaver and muskrat damage management activities, the effects of implementing the program have been consistent with the analysis in the EA and are not having a significant impact, individually or cumulatively, on the quality of the human environment, and that the affected environment remains essentially unchanged. Therefore, revision of the EA is not deemed necessary and the April 26, 2001 Decision remains appropriate.

  
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Jeffrey S. Green  
Western Regional Director  
USDA-APHIS-WS Program

3/30/09  
Date

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## APPENDIX A

### Nebraska WS Nebraska Beaver and Muskrat Damage Management EA Quality Assurance Checklist<sup>5</sup>

#### Effects on Target Species Populations

- ✓ Beaver and muskrat damage management actions were directed toward localized populations or groups and/or individual offending animals, depending on the species and magnitude of the problem.
- ✓ WS generally conducts activities on “anthropogenic abundant species.”

#### Effects on Non-target Species Populations

- ✓ Non-target animals captured were released at the capture site unless the Animal and Plant Health Inspection Service (APHIS), Wildlife Services (WS) Specialist determined that they would not survive.
- ✓ Impact of beaver and muskrat damage management on non-target animals is negligible.
- ✓ WS personnel are experienced and trained to select the most appropriate method for taking targeted rodents and excluding non-target animals.

#### Protecting human safety

- ✓ Conspicuous, bilingual warning signs alerting people to the presence of damage management devices were placed at major access points when such devices were set in the field.
- ✓ No injuries or illnesses to members of the public occurred as a result of WS activities.
- ✓ Binary explosives storage site was inspected weekly to ensure security and public safety.

#### Historic Preservation

- ✓ APHIS, WS determined this program’s actions are not the kind of actions with potential to affect historic resources.
- ✓ APHIS, WS consulted with the State Historic Preservation Office and has determined that the program is not likely to affect historic properties or archeological sites.

#### Humaneness

- ✓ Beaver and muskrats captured in cage traps were humanely euthanized with CO<sub>2</sub> gas, gunshot to the brain, etc.
- ✓ Cage traps that were left unattended for more than 48 hours were maintained with food and water.

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<sup>5</sup> Checklist of Standard Operating Procedures to minimize or avoid adverse environmental effects.

- ✓ Research on selectivity and humaneness of management practices would be monitored and adopted as appropriate.
- ✓ The use of trapping devices and snares conform to current laws and regulations administered by the Nebraska Game and Parks Commission and Nebraska WS policy.

#### **Threatened and Endangered (T/E) and Sensitive Species**

- ✓ No T/E species, critical habitat or essential fish habitat were adversely affected by WS beaver and muskrat activities.
- ✓ WS has consulted with the U.S. Fish and Wildlife Service (USFWS) regarding the nation-wide program and would continue to implement all applicable measures identified by the USFWS to ensure protection of T/E species.
- ✓ WS employees did not set any bait at beaver trap sets that could be attractive to bald eagles.

#### **Native American Cultural Issues**

- ✓ No activities were conducted on Native American tribal lands and actions would only be conducted on tribal lands at the request of the tribe.

#### **Federal, State, County, City and other Public Land Management Issues/Conflicts**

- ✓ Beaver and muskrat activities on Federal, State, county, city and other public lands were conducted in accordance with work plans or signed Cooperative Agreements or Agreement for Control.
- ✓ Vehicle access was limited to existing roads or trails unless otherwise authorized by the land agency.
- ✓ No conflicts with the public occurred during the reporting period.

#### **Additional Measures to Minimize Impacts**

- ✓ The WS Decision Model (Slate et al. 1992) was used to identify the most appropriate wildlife damage management strategies and their impacts.
- ✓ Preference is given to nonlethal damage management when practical and effective.
- ✓ Lethal control was implemented only after a request for assistance was received from the resource owner/manager when a beaver or muskrat problem could not effectively be resolved through nonlethal damage management and where Agreements for Control or other comparable documents provide for operational damage management.