

**ENVIRONMENTAL ASSESSMENT**

**for**

**REDUCING AQUATIC**

**MAMMAL DAMAGE**

**in**

**WASHINGTON STATE**

Prepared By:

United State Department of Agriculture  
Animal and Plant Health Inspection Services  
Wildlife Services

In Consultation With:

Washington Department of Fish and Wildlife

U.S. Fish and Wildlife Service

National Marine Fisheries Service

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## Executive Summary

The United States Department of Agriculture (USDA), Animal and Plant Health Inspection Service (APHIS), Wildlife Services (WS) proposes to continue administering a beaver (*Castor canadensis*), nutria (*Myocastor coypus*), muskrat (*Ondatra zibethica*), mink (*Mustela vison*), and river otter (*Lutra canadensis*) adaptive damage management program in the State of Washington, using legally available methods to protect property, agricultural and natural resources, and human health and safety. WS damage management would only be conducted on property in Washington when the resource owner (property owner) or manager requests assistance from WS<sup>1</sup>. Some the damage that resource owners seek to alleviate from beaver, nutria, and muskrat are: flooding of agricultural land and roads, prevention of road and railroad bed failure due to impounded water, protection of ornamental trees from cutting, protection of commercial trees and tree plantations from cutting and flooding, structural degradation of storm water ditches, and protection of levees from burrowing. The types of damage that resource owners seek to alleviate from otter and mink are damages to fish in fish farms and hatcheries as well as to private docks.

WS would use or recommend damage management strategies that encompass the use of practical and effective methods to prevent or reduce damage while minimizing any harmful effects of damage management methods on humans, other species, and the environment. Under this action, WS could provide technical assistance<sup>2</sup> (TA) (recommendations) and operational damage management as requested, including non-lethal and lethal management after applying the WS Decision Model (Slate et al. 1992). The requester of services is responsible for obtaining permits prior to WS conducting management activities. When appropriate, physical exclusion or localized habitat modification would be recommended and/or utilized to reduce damage. In situations requiring the removal of animals, the most practical and humane methods would be used (*i.e.* cage traps, body-gripping traps, padded-foothold traps, or shooting). For muskrats and nutria, zinc phosphide baits may be used. In determining the damage management strategy, preference would be given to practical and effective non-lethal methods. However, non-lethal methods may not always be applied as a first response to each damage situation. The most appropriate response could be a combination of non-lethal and lethal methods, or there could be instances where lethal methods alone would be the most appropriate strategy (*e.g.*, human health and safety).

State and federal authorities have provisions permitting the removal of all or part of beaver dams. In most cases, WDFW issues a Hydraulic Project Approval (HPA) allowing the removal of beaver dams under certain criteria to protect the environment. These approvals are issued to local municipalities, state agencies, or private individuals who may request assistance from WS or any contractor. For irrigation districts in the Columbia Basin Project (CBP) where beaver dams cause flooding or impede irrigation water, WS may use binary explosives to remove beaver dams in irrigation and drainage structures under existing authorities (Appendix A).

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<sup>1</sup> WS is only partially federally funded. Funding for work done for specific cooperators is provided by those cooperators, or in some cases, larger programs paid for by local municipalities or private entities.

<sup>2</sup> TA is provided in situations where the damage situation may be resolved safely and legally by the landowner. Some examples of TA are: 1) demonstration of equipment use, 2) explanation of habitat modification, and 3) referral to more appropriate resource or regulatory agency. WS employees are aware of regulations governing aquatic mammal damage management and will refer requesters to permitting and consulting agencies when appropriate. While WS makes every effort to guide requesters with TA, it is the responsibility of the requester to follow all rules and regulations. Recommendations from TA are categorically excluded through WS' Programmatic NEPA implementation regulations and guidance. While recommendations may be discussed in this document, only operational damage management will be analyzed [7 CFR §372.5(c)].

## ACRONYMS

APHIS	Animal and Plant Health Inspection Service
AVMA	American Veterinary Medical Association
BLM	Bureau of Land Management
BOR	Bureau of Reclamation
CBP	Columbia Basin Project
CDC	Center for Disease Control
CDFG	California Department of Fish and Game
CE	Categorical Exclusion
CEQ	Council on Environmental Quality
CFR	Code of Federal Regulations
CWA	Clean Water Act
DEA	Drug Enforcement Agency
DOE	Department of Ecology, State of Washington
DSHS	Department of Social and Health Services, Washington State
EA	Environmental Assessment
EIS	Environmental Impact Statement
EO	Executive Order
EPA	U.S. Environmental Protection Agency
ESA	Endangered Species Act
FDA	Food and Drug Administration
FIFRA	Federal Insecticide, Fungicide, and Rodenticide Act
FY	Fiscal Year
HPA	Hydraulic Project Approval
IWDM	Integrated Wildlife Damage Management
JARPA	Joint Aquatic Resource Permits Application
MIS	Management Information System
MOU	Memorandum of Understanding
NEPA	National Environmental Policy Act
NF	National Forest
NHPA	National Historical Preservation Act
NMFS	National Marine Fisheries Service
NRCS	Natural Resource & Conservation Service
NWP	Nationwide Permit
NWRC	National Wildlife Research Center
PCC	Previously Converted Cropland
RCW	Revised Code of Washington
SOP	Standard Operating Procedure
TA	Technical Assistance
T&E	Threatened and Endangered
TWS	The Wildlife Society
USACE	U.S. Army Corps of Engineers
USDA	U.S. Department of Agriculture
USFS	U.S. Forest Service
USFWS	U.S. Fish and Wildlife Service
WDA	Washington Department of Agriculture
WDFW	Washington Department of Fish and Wildlife
WDNR	Washington Department of Natural Resources
WDPH	Washington Department of Public Health
WNV	West Nile Virus
WS	Wildlife Services

## CHAPTER 1: PURPOSE AND NEED FOR ACTION

### 1.1 INTRODUCTION

Across the United States, wildlife habitat changes as human populations expand and land is transformed to meet varying human needs. These changes often compete with wildlife and inherently increase the potential for conflicts between wildlife and people. Some species adapt and thrive in the presence of humans and the changes being 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), Wildlife Services' (WS) Final Environmental Impact Statement (EIS) (USDA 1997<sup>3</sup>) summarizes American values toward wildlife values and wildlife damage:

*"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."*

With this said, the wildlife acceptance capacity and biological carrying capacity factors must be applied when resolving wildlife damage management problems. The wildlife acceptance capacity, or cultural carrying capacity, is the limit of human tolerance for wildlife or the maximum number of a given species that can coexist with local human populations. Biological carrying capacity is the land or habitat's ability to support healthy populations of wildlife without degradation to the species' health or their environment over an extended period of time (Decker and Purdy 1988). These phenomena are especially important because they define the sensitivity of a community to a wildlife species. For any given damage situation, there are varying thresholds of tolerance by people directly and indirectly affected by wildlife and any associated damage. This damage threshold is a factor in determining the wildlife acceptance capacity. While Washington may have a biological carrying capacity to support more beaver (*Castor canadensis*), nutria (*Myocastor coypus*), muskrat (*Ondatra zibethica*), mink, (*Mustela vison*), and river otter (*Lutra canadensis*), in many cases the wildlife acceptance capacity is lower or has been met. Once the wildlife acceptance capacity is met or exceeded, people begin to implement damage reduction methods, including lethal methods, to alleviate damage and human health or safety threats.

The USDA Secretary is authorized by Congress to protect American agricultural and other resources and interests from damage associated with wildlife. That authority includes, if

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<sup>3</sup> USDA (1997) may be obtained by contacting the USDA, APHIS, WS Operational Support Staff at 4700 River Road, Unit 87, Riverdale, MD 20737-1234.

requested, protection of threatened and endangered (T&E) wildlife and resolving conflicts between wildlife and human health and safety pursuant to the Act of March 2, 1931, as amended (7 U.S.C. 426-426b<sup>4</sup>) and the Act of December 22, 1987 (7 U.S.C. 426c).

Wildlife damage management is a specialized field within the wildlife management profession. The mission of the Wildlife Damage Management Working Group of The Wildlife Society (TWS) is *to promote better understanding of the challenges of managing human-wildlife conflicts and to provide a forum for TWS members to advance their skills and knowledge of wildlife damage management practices*. During the last 130 years, with settlers migrating west, the introduction of domestic livestock, water development, urbanization, and other modern agricultural and cultural practices, wildlife management has changed. It is generally recognized that responsible management, not passive preservation, is necessary when managing agricultural and natural resources or protecting property and human health and safety.

Wildlife damage management is the alleviation of damage or other problems caused by, or related to, the habits of wildlife and is recognized as an integral component of wildlife management (The Wildlife Society 1992). The authorities imparted to the Secretary of Agriculture by the Act of March 2, 1931, as amended, and the Act of December 22, 1987, have been delegated to APHIS, a USDA agency. Within APHIS, these authorities have been delegated to the WS program. Accordingly, WS' authorities support and authorize its mission of providing federal leadership and expertise to reduce problems caused by injurious and/or nuisance wildlife to agricultural and other natural resources, including other wildlife; minimizing potential wildlife harm or threats to human health and safety (*e.g.*, zoonotic diseases from wildlife<sup>5</sup>). WS' Policy Manual<sup>6</sup> reflects this mission and provides guidance for engaging in wildlife damage management. Before WS conducts wildlife damage management activities, *Agreements for Control* or *WS Work Plans*, or other or other comparable documents, must be executed between WS and the requester of services or land owner/administrator/agency representative (WS Directive 2.210). WS cooperates with land and wildlife management agencies, when requested and as appropriate, to combine efforts to effectively and efficiently resolve wildlife damage problems in compliance with applicable federal, state, and local laws and Memoranda of Understanding (MOUs) between WS and other agencies. These documents establish the need for the requested work, legal authorities allowing the requested work, and the responsibilities of WS and its cooperators.

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<sup>4</sup> Section 426 as amended on October 28, 2000, authorizes the Secretary of Agriculture to "... conduct a program of wildlife services with respect to injurious animal species and take any action the Secretary considers necessary in conducting the program. The Secretary shall administer the program in a manner consistent with all of the wildlife services authorities in effect on the day before October 28, 2000."

<sup>5</sup> See [www.aphis.usda.gov/ws/mission.html](http://www.aphis.usda.gov/ws/mission.html). Examples of APHIS-WS activities include: training of wildlife damage management professionals; development and improvement of strategies to reduce losses and threats to humans from wildlife; 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 data and a source for limited-use management materials and equipment, including pesticides.

<sup>6</sup> WS Policy Manual - Provides guidance for WS personnel to conduct wildlife damage management through Directives. WS Directives referenced in this EA can be found in the manual but will not be referenced in the Appendix A.



WS' authority cited above, plus other statutory authorities<sup>7</sup>, authorize WS to enter into cooperative agreements with federal agencies, states, local jurisdictions, individuals, and public and private agencies, organizations, and institutions to reduce the risks of injurious animal species and/or nuisance mammals and birds and those mammal and bird species that are reservoirs for zoonotic diseases. WS activities and assistance are contingent upon cooperative funding from those cooperating and/or requesting WS' services, including federal, state, local, private or public associations or organizations, or individuals, and/or upon appropriations and/or specifically delineated authorization or direction from Congress. WS uses an adaptive, Integrated Wildlife Damage Management (IWDM) approach, commonly known as Integrated Pest Management, where a combination of methods may be used or recommended to reduce wildlife damage. IWDM is the application of safe and practical methods for the prevention and reduction of damage caused by wildlife based on a local problem analysis and the informed judgment of trained personnel. IWDM includes localized habitat and behavioral modification, removal of the offending animal(s), or local populations or groups through lethal methods. Wildlife damage management is not based on punishing offending animals but is a means of reducing future damage and implemented using the WS' Decision Model<sup>8</sup> (Slate et al. 1992). The imminent threat of damage or loss of resources is often sufficient for individual actions to be initiated and the need for damage management is derived from the specific threats to resources.

WS' wildlife damage management program is a cooperatively-funded, service-oriented program that provides assistance to requesting public and private entities and governmental agencies<sup>9</sup>. WS' mission and support is focused on the development and protection of Washington resources. WS responds to requests for assistance when valued resources are damaged or threatened by wildlife. Responses can be in the form of technical assistance (TA) or operational damage management, depending on the complexity of the wildlife problem and the funding available.

This Environmental Assessment (EA) documents the analysis of the potential environmental effects of WS' proposed beaver, nutria, mink, muskrat, and otter damage management program (hereafter referred to as aquatic mammal damage management). This analysis relies on existing data contained in published documents and other information (See Literature Cited), and WS' Environmental Impact Statement (EIS) (USDA 1997). The Council on Environmental Quality (CEQ) regulations for implementing NEPA authorize agencies to eliminate repetitive discussions of issues addressed in USDA (1997) and Code of Federal Regulations (CFR) 1500.4(I); 1502.20. Thus, pertinent analyses in USDA (1997) are incorporated by reference by integrating relevant discussions and analysis.

### **1.1.1 Washington WS Program.** WS responds to aquatic mammal damage throughout Washington when and where a need exists and a request is received. Washington encompasses about 71,303 square miles (mi<sup>2</sup>), making it the 18th largest of the 50 states

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<sup>7</sup> Section 713 of the Agriculture, and Related Agencies Appropriations Act of 2003.

<sup>8</sup> The WS Decision Model is not a written process but rather a mental problem solving process similar to other professions to determine appropriate management actions to take.

<sup>9</sup> The State of Washington has the primary responsibility for wildlife management and could conduct wildlife management related activities without WS assistance (RSW §§ 77.36.005). This aquatic mammal damage management effort would be facilitated by WS providing assistance to ensure more timely response to damaging wildlife and complaints.

with 66,544 mi<sup>2</sup> of land area. Washington has approximately 68,668 miles of permanent streams and 945.6 mi<sup>2</sup> (605,212 acres) of permanent surface water in lakes, ponds, and reservoirs, which represents about 1.3% of the total area of the State. Washington WS generally only conducts aquatic mammal damage management on a small portion of the properties under Agreement in any one year. Aquatic mammals only inhabit the aquatic portions within the properties under agreement. Therefore, the actual area in which WS conducts aquatic mammal damage management is much smaller lower than the 1.3% of the state.

WS conducts aquatic mammal damage management in cooperation with several other agencies in Washington. The Washington Department of Fish and Wildlife (WDFW) is a cooperator with WS because they have management authority over wildlife (See Appendix A). WDFW has management authority for non-agricultural property or when these species are considered nuisance animals. WDFW issues nuisance control and recreational harvest permits to remove aquatic mammals to regulate recreational harvest. WS acts as an agent for entities requesting assistance with agricultural depredations or to reduce damage to private property or threats to human health and safety by confirming damage, species identification, or providing recommendations for further action. WS may act as an agent for these entities for management actions after consultations are completed and/or the proper permits are secured.

**1.1.2 Summary of Proposed Action.** WS proposes to continue an adaptive integrated aquatic mammal damage management program in Washington for the protection of agriculture, property, natural resources, and human health and safety. The objective of WS' proposed program is to minimize loss or the risk of loss to the above resource categories by responding to requests with TA (recommendations and/or demonstrations) or operational damage management. WS employees provide TA to resource owners on a variety of methods, including localized habitat modification and exclusion (Appendix B). These methods can be used to resolve problems under certain circumstances and where resource owners can handle the problem themselves and/or where funding is not available. WS also assists resource owners through educational programs on damage identification and prevention.

Operational damage management assistance is generally provided for situations where professional expertise is needed (*e.g.*, trapping and lethal management). Resource owners requesting operational damage management assistance are also encouraged to use non-lethal management strategies when and where appropriate to help reduce present and future damage (WS Directive 2.101).

Under the proposed action, WS will encourage the use of practical and legal methods, used alone or in combination, to meet the needs of requesters for resolving conflicts. Most wildlife damage situations require professional expertise, an organized damage management effort, and the use of multiple damage management methods to sufficiently resolve them; this will be the task of WS personnel trained and equipped to handle most damage situations. The resource, species, location and type of damage, and available biologically

sound, cost-efficient, and legal methods will be analyzed by WS personnel (Slate et al. 1992) to determine an action to correct each conflict.

A wide range of legal methods are available for reducing aquatic mammal damage. These fall into two categories: localized habitat modification (e.g., beaver pond leveler, dam removal, exclusion) and population management (e.g., trapping and shooting). Aquatic mammal damage management would be allowed in the state under the proposed action when requested, on public and private lands where signed *Agreements for Control* or an appropriate Work Plan is in place. All aquatic mammal damage management will comply with federal, state, and local laws, permitting processes, and current MOUs between WS and the various management agencies. State and federal authorities have provisions permitting the removal of beaver dams. In most cases, WDFW issues a Hydraulic Project Approval (HPA) allowing the removal of dams under certain mitigation criteria to prevent damage to the environment. For irrigation districts in the Columbia Basin Project (CBP) where beaver dams cause flooding or impede irrigation water, WS may use binary explosives to remove beaver dams under existing authorities (Appendix A).

Waterways in Washington are subject to regulation from federal, state, and local governments. To prevent violating these regulations, requesters would be required to apply for the proper permits using the Joint Aquatic Resource Permit Application (JARPA). Currently, JARPA is being used by the Department of Ecology (DOE), WDFW, Washington Department of Natural Resources (WDNR), U. S. Army Corps of Engineers (USACE), the U.S. Coast Guard, and more than 90 local governments for the following permits:

- Section 404 permit of the Clean Water Act (CWA) -- (USACE)
- Sections 9 & 10 permit of the Rivers and Harbors Act -- U.S. Coast Guard, USACE
- HPA -- WDFW
- 401 Water Quality Certifications -- Department of Ecology, State of Washington (DOE)
- Water Quality Modifications -- DOE
- Shoreline Management Act permits -- Local Government
- Growth Management Act critical area ordinance requirements -- Local Governments
- Flood damage reduction ordinance requirements -- Local Governments
- Aquatic Resource Use Authorization -- WDNR

Washington WS will only work under a permit issued to the requester under the JARPA process, or under consult, when required, with U.S. Fish and Wildlife Service (USFWS) or National Marine Fisheries Service (NMFS), or when other entities possess appropriate authority.

## **1.2 SCOPE AND PURPOSE OF THIS EA**

The scope and purpose of this EA are to evaluate potential impacts from WS' proposed aquatic mammal damage management program for the protection of agricultural and natural resources, property, and human health and safety in Washington. Recommendations from TA are categorically excluded through WS' Programmatic NEPA implementation regulations and guidance. While recommendations may be discussed in this document, only operational damage

management will be analyzed [7 CFR §372.5(c)]. Damage problems can occur throughout the state, resulting in requests to WS for assistance and these problems are addressed on a case-by-case basis. Duda et al. (2002) found that approximately 36% of Washingtonians had experienced problems with wild animals or birds between 2000 and 2001. Of these, more than half the problems were associated with small game mammals, furbearers, and unclassified wildlife (Duda et al. 2002). This accounts for nearly 425,000 negative human-wildlife interactions annually. Under the Proposed Alternative, aquatic mammal damage management could be conducted on private, federal, state, tribal, county, and municipal lands in Washington.

According to APHIS procedures for implementing NEPA, individual aquatic mammal damage management actions considered in this analysis could be afforded a Categorical Exclusion (CE) (7 CFR §372.5(c), 60 FR 6,000, 6,003, 1995). This EA was prepared to facilitate planning, interagency coordination, streamline program management, to evaluate and determine if any potentially significant or cumulative impacts could occur, and to clearly communicate to the public the analysis of cumulative effects of the alternatives. All WS wildlife damage management in Washington would be undertaken according to relevant laws, regulations, policies, orders and procedures, including the Endangered Species Act (ESA) and CWA. Notice of the availability of this document will be published consistent with the agency's NEPA procedures.

### **1.3 AQUATIC MAMMAL DAMAGE AND EFFECTS TO THE ENVIRONMENT AND RESOURCES**

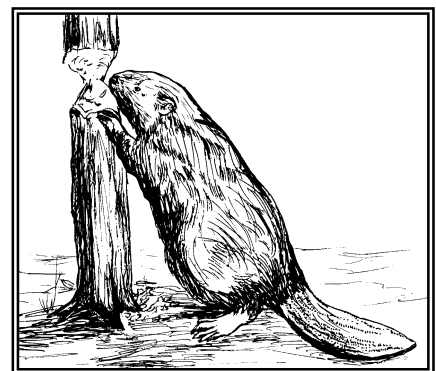
It is important to have knowledge about each species to conduct aquatic mammal damage management. Full accounts of the life histories for these species can be found in mammal reference books. Some background information is given below for each species, especially information pertaining to their ecology.

#### **1.3.1 Beaver**

Beaver (Figure 1-1) are widely distributed, a part of the wildlife heritage in the United States and once played important roles in shaping vegetation patterns in riparian and meadow ecosystems (Knight 1994). They probably once occupied stream valleys and other suitable habitat in Washington at a maximum carrying capacity prior to European settlement. Population fluctuations of beaver in the pre-European era were determined by plant succession and its influence upon the amount and quality of habitat.

Between the years 1800 and 1850, the major explorations beyond civilization were made in part for the purpose of discovering new beaver trapping areas. The low point of beaver populations in the United States occurred between 1890 and 1900 (Seton 1937). As a result of this decline, most western States provided protection to beaver. In 1909, the first laws protecting beaver were passed (Snohomish County, online) in Washington. Since beaver were protected, their populations have experienced a steady growth and their population is currently stable to increasing (D. Martorello, WDFW 2007, pers. comm.).

**Figure 1-1. Beaver**



Populations historically were kept under control by subsistence and commercial hunting and trapping (Hill 1976, Woodward 1983, Novak 1987). However increased trapping regulations and low demands for short-haired fur resulted in decreased beaver harvest. Furthermore, a lack of natural predators and the beavers' ability to modify and create their own escape areas has contributed to increases in populations. In 2000, voters in Washington approved ballot initiative 713, regulating the use of body-gripping traps. WDFW has the authority to grant special permits to allow the use of these traps after non-lethal methods have been tried, for the protection of T&E species, human health and safety, and wildlife research<sup>10</sup>. The absence of an adequate beaver harvest in conjunction with insignificant predation and an abundance of suitable habitat resulted in beaver populations dramatically increasing, resulting in increased beaver complaints (S. Carrell, WDFW, 2007, pers. comm.).

**1.3.1.1 Beaver Activities.** Opinions and attitudes of individuals, communities, and organizations about beaver vary greatly and are primarily influenced and formed by benefits and damage directly experienced (Hill 1982). Property ownership, options for public and private land use, and effects on adjacent property affect public attitudes toward beaver (Hill 1982). Therefore, it is difficult to place a dollar value on beaver activities because they can be beneficial and detrimental depending on the type of activity and location. Woodward et al. (1976) found that 24% of landowners who reported beaver activity on their property indicated benefits to having beaver ponds on their land. Some of these benefits are hunting and trapping, water source for livestock, and the value of beaver ponds in the natural environment. Habitat modification by beaver, primarily dam building and tree cutting, can sometimes benefit wildlife (Jenkins and Busher 1979, Arner and DuBose 1982, Hill 1982, Arner and Hepp 1989, Medin and Clary 1990, Medin and Clary 1991), however, it can also destroy other habitat types (*e.g.*, free-flowing water, riparian areas, and bird roosting and nesting areas) which are important to many species. Beaver cut large trees along rivers, lakes, and reservoirs that are used as roosting/nesting trees by bald eagles (*Haliaeetus leucocephalus*) or other bird species. As a result many landowners desire removal of beaver and assistance with beaver pond management (Hill 1976, Lewis 1979, Woodward et al. 1985).

**1.3.1.2 Benefits of Beaver Activities.** Beaver are generally considered beneficial where their activities do not compete with human use of the land or property (Wade and Ramsey 1986). Positive ecological influences on wetland habitats (Arner 1967, Reese and Hair 1976) and economic gains from fur production (Moore and Martin 1949, Hill 1974, Arner and Dubose 1978a, 1978b) make beaver beneficial animals in the United States. Beaver ponds can create valuable wetlands that provide habitat for many species of fish and wildlife (Hill 1982, Novak 1987, Arner and Hepp 1989). The creation of standing water, edge, and plant diversity in close proximity, results in excellent wildlife habitat (Hill 1982). The resulting wetland habitat may be beneficial to some fish, reptiles, amphibians, waterfowl, shorebirds, and furbearers such as muskrats, river otter, and mink (Arner and DuBose 1982, Naimen et al. 1986, Miller and Yarrow 1994). When

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<sup>10</sup> Even with a permit, the sale of pelts taken through the use of a body-gripping trap is illegal.

the ponds are abandoned, they progress through successional stages which improve feeding conditions for deer (*Odocoileus* spp.) (Arner and DuBose 1982). The USFWS estimates that up to 43% of the T&E species rely directly or indirectly on wetlands for their survival [U.S. Environmental Protection Agency (EPA) 1995].

These wetland ecosystems also filter nutrients and reduce sedimentation, thereby helping maintain the quality of nearby water systems (Arner and Hepp 1989, Wade and Ramsey 1986, Hill 1982). As noted by the EPA, wetlands can provide aesthetic and recreational opportunities for wildlife observation, nature study, hunting, fishing, trapping, wildlife photography, livestock water and environmental education, and added an estimated \$59.5 million to the national economy in 1991 (Woodward 1983, Wade and Ramsey 1986, EPA 1995). Aquatic and early successional plants may become established in the newly deposited sediment allowing conditions to become favorable for the stabilization of a flood plain by more permanent woody vegetation (Hill 1982). The Minnesota Department of Natural Resources computed a cost of \$300 to replace, on average, each acre-foot of flood water storage that wetlands can provide (EPA 1995). Producing wetlands/marsh habitat through beaver management in New York was far less costly than developing either small or large manmade marshes, assuming the quality is equal in each case (Ermer 1984). Beaver ponds are also considered part of the riverine or riparian habitat type (Natural Heritage Program 2003).

Beaver may increase habitat diversity by flooding and opening forest habitats which result in greater interspersion of successional stages and subsequently increases the floral and faunal diversity of a habitat (Hill 1982, Arner and Hepp 1989). Waterfowl use beaver pond habitats extensively (Speake 1955, Arner 1964, Novak 1987, Hill 1982, Arner and Hepp 1989). In particular dabbling ducks benefit from the increased interspersion of cover and food found in beaver ponds (Novak 1987, Arner and Hepp 1989). Also, the attraction of a beaver pond to waterfowl varies with age and vegetation (Arner and DuBose 1982). In Mississippi, beaver ponds older than 3 years were found to have developed plant communities that increase their value as nesting and brood rearing habitat for wood ducks (*Aix sponsa*) (Arner and DuBose 1982). Reese and Hair (1976) found that beaver pond habitats were highly attractive to a large number of birds year-round and the value of the beaver pond habitat to waterfowl was minor when compared to other species of birds (Novak 1987).

Beaver ponds may also improve soil quality and provide improved habitat for some fish and invertebrates. The anaerobic conditions caused by beaver impoundments may result in the accumulation of ammonium, so that soil storage of inorganic nitrogen is nearly tripled by beaver impoundments during a 50 year period (Johnston 1994). Arner et al. (1969) found that the bottom soils of beaver ponds in Mississippi were generally higher in phosphate, potash, and organic matter than the bottom soils of feeder streams. Greater biomass of invertebrates and healthier fish were also found in beaver ponds than in feeder streams in Mississippi (Arner and DuBose 1982).

Beaver-created impoundments are attractive to certain fishes (Hanson and Campbell 1963). In Oregon, threatened coho salmon (*Onchorhynchus kisutch*) depend on still

pools, off-channel ponds, and large woody debris within the stream for the successful rearing of juvenile salmonids; beaver activities, especially the building of dams, help to create these habitat elements. In Washington, several of the state and federally listed T&E fish including chinook salmon (*Oncorhynchus tshawytscha*), chum salmon (*O. keta*), sockeye salmon (*O. nerka*), Lower Columbia River coho salmon (*O. kisutch*), steelhead (*O. mykiss*) and bull trout (*Salvelinus confluentus*) may depend on established beaver ponds, especially during dry seasons and where areas are dewatered by developments. Mitigation may be required for commercial or residential developments that interfere with salmon or other T&E species habitat. At the same time, though, extensive beaver ponds in their areas could be detrimental by limiting movements. The balance is that beaver ponds should provide refuge during low water times, but not impact migration, spawning, and feeding.

**1.3.1.3 Harm Caused by Beaver Activity.** The value of beaver damage is perhaps greater than that of any other single wildlife species in the U.S. (Arner and Dubose 1982). Miller (1983) estimated that annual beaver damage in the U.S. amounted to \$75-\$100 million more than two decades ago. Damage throughout the U.S. and requests for beaver damage management have increased since that time. Such conflicts are viewed as “damage” by resource owners and result in adverse affects. In many cases, the beaver damage exceeds the benefits, resulting in a demand for beaver damage management.

Beaver are responsible for a variety of different kinds of damage (Loven 1985, Wade and Ramsey 1986, Willging and Sramek 1989, Miller and Yarrow 1994). This damage can conflict with human, land, or resource management objectives and can suppress different species of plants and animals, including T&E species. Some of the types of damage that can result include: (1) flooding of crop fields, livestock pastures, residential areas, forested tracts of lands, killing the vegetation, and destroying other property, (2) damage to irrigation structures and blockage of other waterways; (3) flooding of roads, railways, or airports and areas adjacent that results in erosion of road and railway beds and train derailments caused by continued flooding and burrowing; (4) reservoir dams damaged by bank den burrows, and (5) cutting trees for building the dam which have lumber or aesthetic values, and could be important for creek bank stabilization (Hill 1982, Woodward 1983, Wade and Ramsey 1986, Miller and Yarrow 1994). In flat terrain, a relatively small beaver dam may cause hundreds of acres to be flooded.

Beaver often inhabit sites in or adjacent to urban/suburban areas and cut or girdle ornamental vegetation in yards, undermine yards and walkways by burrowing, flood homes and other structures, destroy pond and reservoir dams by burrowing into levees, gnaw on boat houses and docks, and cause other damage to private and public property (Wade and Ramsey 1986).

In a speech to the Natural Resources Leadership Academy in 2003, J. Koenings, Director of WDFW, stated the following:

*“The main problem, however, is that animal-damage complaints have picked up substantially since [Initiative 713]<sup>11</sup> was approved. Flooding caused by beaver damages is a big problem. . . . As a result, a lot of public parks are getting flooded out”* (WDFW 2003, online).

Beaver activity in certain situations can threaten public health and safety (*e.g.*, burrowing into or flooding of roadways and railroad beds can result in serious vehicle accidents) (Miller 1983, Woodward 1983). Increased water levels in urban areas resulting from beaver activity can lead to unsanitary conditions and potential health problems by flooding septic systems and sewage treatment facilities (DeAlmeida 1987, Loeb 1994). Beaver damming activity also creates conditions favorable to mosquitoes (*Aedes spp.*) and can hinder mosquito control efforts or result in undesirable population increases of these insects (Wade and Ramsey 1986).

Beaver have been linked to other human diseases. They are known carriers of tularemia, a bacterial disease that is transmittable to humans through bites by insect vectors or infected animals or by handling animals or carcasses which are infected (Wade and Ramsey 1986); tularemia is also responsible for large-scale beaver die-offs (Addison et al. 1998). On rare occasions, beaver may contract the rabies virus and attack humans. In February 1999, a beaver attacked and wounded a dog and chased children that were playing near a stream in Vienna, Virginia; approximately a week later, a beaver was found dead at the site and tested positive for rabies (E. Hodnett, Fairfax Virginia Animal Control, pers. comm. 2002).

Beaver are also known carriers of the intestinal parasite *Giardia lamblia*, which can contaminate water supplies used for human consumption and recreation (Beach and McCulloch 1985). Giardiasis is an intestinal protozoal disease associated with ingesting fecal material in contaminated water. In a 1982 study of *Giardia* in Washington State, the Department of Social and Health Services, Washington State (DSHS) found that of 656 beaver stools tested, 10.9% were positive for *Giardia*. Of 172 muskrat stools tested, 51.2% were positive for *Giardia* (Frost et. al. 1982).

Beaver damming activity can create conditions favorable for mosquitoes and can result in increased abundance of these insects (Wade and Ramsey 1986). West Nile Virus (WNV), a disease that is carried by birds, but is spread by mosquitoes, was first identified in the United States in 1999 in New York; beaver ponds create habitat for mosquitoes. Beaver activity can also increase water levels in urban areas resulting in unsanitary conditions and potential health problems by flooding septic systems and sewage treatment facilities (DeAlmeida 1987, Loeb 1994). This activity can become a threat to public health and safety when animals burrow into or flood roadways and railroad beds (Miller 1983, Woodward 1983).

Beaver activities can also destroy critical habitat (*e.g.*, free-flowing water, riparian areas, and bird roosting and nesting areas) which are important to many wildlife species,

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<sup>11</sup>Initiative 713 is the “anti-trapping initiative” passed by Washington Voters in 2001.



including certain species of fish and mussels. Patterson (1951) and Avery (1992) reported that the presence of beaver dams can negatively affect fisheries. An example of this happened in Nevada, and was resolved by the WS program. Beaver created extensive dams across the Walker River, a watershed where beaver were not native, which reduced the flow of water below the beaver dams to 10% of the flows from above. Pounded water between the numerous dams evaporated and percolated into the soils. Water below the dam was crucial for Walker Lake as it was lowering, getting precariously to the point that a fish die off could occur in the lake, which had happened during a previous extensive drought. The federally listed threatened Lahontan cutthroat trout (*Onchorhynchus clarki stomias*) became susceptible to rising water temperatures and salinity in the lake as a result of the loss of water. Removing the beaver and their dams from site returned the water flow to 90% of normal.

Beaver impacts on trout habitat have been a major concern of the Wisconsin Department of Natural Resources and the general public since as early as 1950. Patterson (1951) found that beaver impoundments in the Peshtigo River Watershed caused significant negative impacts to trout habitat by raising water temperatures, destroying immediate bank cover, changing water and soil conditions, and silting spawning areas. Studies from other areas also reported negative aspects of beaver impoundments with regard to trout habitat (Sayler 1935, Cook 1940, Sprules 1940, Bailey and Stevens 1951). Evans (1948) suggested a continued increase in beaver populations in Minnesota would result in deterioration of streams for trout. The Wisconsin Department of Natural Resources guidelines for management of trout stream habitat stated that beaver dams are a major source of damage to trout streams (White and Brynildson 1967, Churchill 1980). More recent studies have documented improvements to trout habitat upon removal of beaver dams. Avery (1992) found that wild brook trout (*Salvelinus fontinalis*) populations in tributaries to the north branch of the Pemebonwon River in northeastern Wisconsin improved significantly following the removal of beaver dams. Species abundance, species distribution, and total biomass of non-salmonids also increased following the removal of beaver dams (Avery 1992).

Beaver dams may also adversely affect stream ecosystems by increasing sedimentation in streams, and thereby negatively affect wildlife that depend on clear water such as certain species of fish and mussels. The Louisiana WS program has conducted beaver damage management activities for USFWS to protect the threatened Louisiana pearlshell (*Margaritifera hembeli*), which requires clear, free-flowing water to survive (D. LeBlanc, WS, pers. comm. 2003).

Increased soil moisture within and surrounding beaver flooded areas can also result in reduced timber growth and mast production and a decrease in bank stabilization. These habitat modifications can also conflict with human land or resource management objectives and oppress some plants and animals, including T&E species. For example, WS in Oregon conducted beaver damage management to protect the Nelson's checker-mallow (*Sidalcea nelsoniana*), which was being flooded by water which has been impeded by a beaver dam.

Opinions and attitudes of individuals, communities, and organizations about beaver vary greatly and are primarily influenced and formed by benefits and damage directly experienced (Hill 1982). Property ownership, options for public and private land use and effects on adjacent property affect public attitudes toward beaver (Hill 1982).

### 1.3.2 Nutria

Nutria are large, semi-aquatic, surface feeding rodents (similar to beaver, but with a long, round, scaly, rat-like tail) that were first introduced in the U.S. in 1899 (Willner et al. 1979) (Figure 1-2). Throughout much of their range, nutria prefer a semiaquatic existence in swamps, marshes, and along the shores of rivers and lakes.

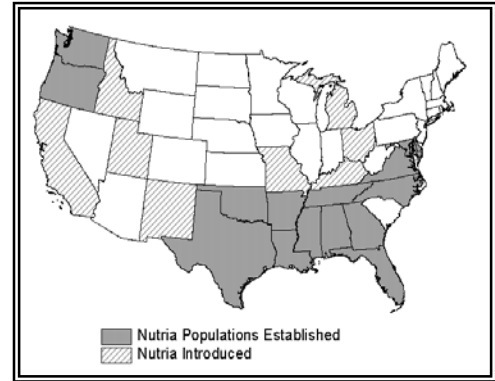
The presence of nutria is most readily revealed by their trails, feces, and cut vegetation left in their trails. They are extensive burrowers, examined burrows were about 10 inches in diameter and extended into the bank more than 3 feet. Nutria burrows often weaken flood control structures that protect low lying areas. This burrowing can also result in the collapse of roadways and levees, uneven settling of building foundations, and erosion of stream banks. Often they are open at both ends, with the entrance toward the waterway, usually above water level. Some of the burrows; are under roots of trees that are exposed along the banks of the waterway. Their nests are made of reeds and sedges built up in large piles somewhat after the fashion of a swan's nest. These are built on land among the marsh vegetation and close to the water's edge.

Their food consists of aquatic and semiaquatic vegetation, but when these animals live along the coast they also feed upon shellfish. Cattails, reeds, and sedges appear to be especially prized food items. When established near gardens, they readily eat cabbage, carrots, and sweet potatoes.

Nutria digging and surface feeding behavior is extremely destructive to wetland and marsh vegetation. Nutria forage directly on the vegetative root mat, leaving the marsh pitted with digging sites and fragmented with deeply cut swimming canals. In the face of rising sea levels, nutria damage is particularly problematic in coastal areas because it accelerates erosion associated with tidal currents and wave action and also facilitates salt water intrusion into marsh interiors. The situation is extremely delicate within the tidal marshes because much of the marsh would be underlain by a layer of "fluid mud" that is easily eroded once the vegetative root mat becomes fragmented. Marshes degraded by nutria do not naturally recover, because this erosion is more rapid than natural soil deposition.

Nutria are extremely prolific, reproducing throughout the year and having two to three litters annually (Brown 1975, Willner et al. 1979). On average, nutria have five young, but may have as many as 13 young per litter (Nowak 1991). At birth, the young are fully furred and their eyes are open. They are able to move about and feed upon green vegetation within a

Figure 1-2. Nutria in the United



few hours. At that time they weigh about ½ lb but mature rapidly, increasing at the rate of about 1 lb per month during the first year. They reach sexual maturity at the age of 4 or 5 months. Females may give birth to their first litter when they are 8 or 9 months old. The maximum life span for nutria kept in captivity is 12 years, but the life span in the wild probably is considerably less. To compound the problem, nutria have no natural predators to help control their populations; therefore, populations have exploded causing significant impacts to native wildlife, fish, shellfish, plants and marsh ecosystems. Adult nutria may weigh up to 18 pounds, which is 5-10 times the size of the native muskrat.

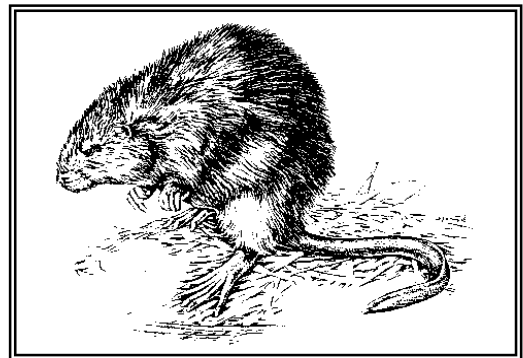
Nutria are especially troublesome because their high reproductive capacity results in rapid overpopulation. The animals move into places where they are not wanted and destroy vegetation that is valuable for native wildlife such as waterfowl and muskrats.

In addition, the signing of the Invasive Species Executive Order 13112 (Appendix A) by President Clinton illustrates the national concern about the negative impact non-native, invasive species, in this case nutria, have on the nation's natural resources.

### 1.3.3 Muskrat

Figure 1-3. Muskrat

The muskrat (Figure 1-3) is a native aquatic rodent found throughout Washington and is abundant in suitable habitat. They inhabit creeks, rivers, lakes, ponds, and drainage ditches with a steady water level, and feed primarily on cattails, bulrushes, and aquatic grasses. Historically, they were the most heavily harvested furbearer in North America, with 6-20 million harvested annually (Boyce and Birkenholz 1987). Boyce and Birkenholz (1987) provide a comprehensive review of muskrat natural history and population dynamics.



In inland areas, shallow, freshwater marshes with clumps of cattails interspersed among bulrushes, sedges, and other marsh vegetation support the heaviest populations. In coastal areas, brackish marshes that support good stands of sedges are most attractive. Such marshes with a stabilized water depth of 6-24 inches seem to offer optimum living conditions.

In marshes, muskrats live in dome-shaped houses or lodges constructed of marsh vegetation. Access to the inner chamber usually is gained by means of two or more underwater openings. Such houses are usually 24 inches or more in diameter at water level, and project 20-24 inches above the water. They seem to be of two types: (1) those used for feeding only, in which case the floor may be submerged in water, and (2) those used for dens or resting places. Frequently, several animals, usually members of one family, occupy one lodge. Conspicuous travel-ways radiate from the houses and lead to the forage areas. In canals, creeks, rivers, and so forth, muskrats burrow into the banks and live below ground. Entrance to such burrows is usually by means of underwater openings. Dens are commonly

4 inches in diameter and 80-120 inches in length, and usually terminate in an enlarged nest chamber.

Where available, the tender basal parts of cattails and rushes are their preferred forage. Normally, the animals have well-established feeding stations at the edges of travel lanes or feeding lodges to which food is brought to be consumed at leisure. Muskrats are active throughout the year and store no food for winter use. When nutritious food is scarce or made unavailable by freezing weather, muskrats will eat almost anything, including parts of their lodges and nests, dead fish, frogs, wood, and so forth, or they may turn cannibalistic.

Breeding females produce two or more litters a year, ranging in size from one to 11 young and averaging six young. The gestation period is from 22 to 30 days. At birth, the young are helpless, blind, almost furless, and weigh about 0.7 ounces. The pelage develops rapidly and by the end of the first week the young are covered with a good coat of gray-brown fur. Their eyes are open in 14-16 days, at which time they can dive and swim with ease. Sexual maturity is reached in 10-12 months, at which time they have attained the size and characteristics of adults. Muskrats are the victims of many predators. Raptors, raccoons (*Procyon lotor*), fox (*Vulpes* spp.), mink, water snakes (Colubridae), and large turtles are known to prey on them. Mink and raccoon predate muskrats by tunneling directly into their houses.

Environmental factors can adversely affect muskrat populations severely. Drought and flooding often kill large numbers of muskrat within small areas. Diseases of muskrats include internal and external parasites such as worms, fleas and ticks, and viral and bacterial illnesses.

Muskrats were an economically important furbearing mammal in Washington, but this is no longer true. The decline in importance of the muskrat as a furbearing mammal is a reflection of a loss of habitat as a result of marsh deterioration and resultant population decline and variations in market demand.

Large-scale damage by muskrats is usually not a major problem, but can be locally significant in particular situations (Wade and Ramsey 1986). They typically do not cause as much damage as beaver, but can impact several resources. For example, muskrats burrow into levees or dams causing washouts which result in the loss of irrigation water or other water supplies, and flooding damage where the water drains. Muskrats also damage crops, wetlands, landscaping, and other resources where these are adjacent to muskrat habitat (Wade and Ramsey 1986).

On the other hand, in many areas, muskrats are considered beneficial and provide opportunities for recreation and satisfaction to people that like to observe wildlife in a natural setting. In the prairie pothole region of the U.S. and Canada, as well as in Washington, muskrats clear or open small areas through feeding and house building in otherwise dense cattail marshes. The small openings create nesting and brood rearing habitat for nesting waterfowl (Wade and Ramsey 1986).

### 1.3.4 River Otter

River otter are largely aquatic and frequent lakes and larger streams. They are expert swimmers and divers and can remain underwater for several minutes. They are not bound to water and they do not hesitate to travel overland from one body of water to another.

Otter are notorious wanderers in their chosen habitat and may range over several miles of a waterway and for this reason, they are rarely abundant in any locality. They are ordinarily shy, unobtrusive creatures that are seldom seen even though they are active throughout the year.

Dens vary with the locality and availability of sites. Most otter locate their dens in excavations close to water under tree roots, rock piles, logs, or thickets. Occasionally, they will take over beaver lodges or muskrat dens after killing the occupants. A typical den consists of a hole leading into a bank, with the entrance below water level. Otter may occupy two dens; a temporary resting den and a permanent nesting den.

Otter are not specific in their food habits. Their main diet consists of fish, crustaceans, mollusks, amphibians, reptiles, invertebrates, birds, and mammals. One of their preferred prey is crayfish, and where abundant, an otter will consume a tremendous number annually. The fish they eat are primarily rough fish; however, when otter invade a fish hatchery or other rearing facility, they can eat and injure a large number of hatchery fish.

They generally breed in late winter to early spring, but males do not generally mate until they are 3 to 4 years of age, and females rarely breed before 2 years. Males typically engage in fierce combat during the mating season, and they are believed to be solitary except when accompanying estrous females. Delayed implantation results in the gestation period extending to as much as 380 days. Litter size varies from one to five. Young females may mate again as soon as 20 days following birth, which means that otters may remain almost continuously pregnant once they reach sexual maturity. Newborns are about 11 inches in length and weigh about  $\frac{1}{4}$  lb. They are fully furred, but the eyes are closed and none of the teeth are erupted. Their eyes open at 22-35 days and they are weaned at 18 weeks.

### 1.3.5 Mink

Mink are a semiaquatic mustelid and are associated with semipermanent and permanent wetlands, streams, and rivers. Mink are distributed throughout North America, except the desert southwest where stream flows are irregular (Jones et al. 1985).

Mink are opportunistic predators that feed primarily on mammals and birds including waterfowl, grebes (*Podicipedidae*), blackbirds (*Icteridae*), gulls (*Laridae*), partridges (*Perdix* spp.), ground squirrels (*Sciuridae*), and muskrats (Sargeant et al. 1973, Yeager 1943). They have also been found to prey on tiger salamanders (*Ambystoma tigrinum*) (Sargeant et al. 1973), crayfish, and fish.

During spring, territorial males occupy large areas and females occupy small areas (Gerell 1970, Whitman 1981, Eagle and Whitman 1987, Eagle 1989). Female mink with kits restrict their activities to an average of one wetland (Eberhardt and Sargeant 1977, Eagle 1989), while in the prairie pothole region, male mink tend to occupy circular habitats that may encompass many wetlands (Sargeant et al. 1993). In a study by Arnold (1986), home ranges of adult male mink during May through July in pothole habitats in Manitoba averaged 2.5 mi<sup>2</sup> (range = 1.2-6.3 mi<sup>2</sup>) and included all or parts of 285 wetlands.

Mink lead a precarious existence in prairie habitats because annual fluctuations in water levels affect abundance of food and availability of shelter. Eberhardt (1974) stated that the frequent widespread and local droughts characteristic of the prairie pothole region lowered reproductive performance by mink. However, Sargeant et al. (1993) found that mink were common in two study areas in southeastern Nebraska during the drought years of the mid to late 1980s.

#### **1.4 NEED FOR ACTION**

The need for action is based on the necessity for a program to protect resources (*e.g.*, agricultural and natural resources, property, and human health and safety) from damage caused by aquatic mammals and to respond to requests for assistance from property owners/managers.

Aquatic mammal damage in Washington threatens a number of different resources. During FY07, WS recorded losses to 11 different kinds of resources due to beaver activity, totaling \$1,428,730<sup>12</sup>. Those include, but are not limited to, flooding of buildings, digging and burrowing in irrigation ditches and structures, flooding pastures and roads, chewing on trees in orchards and standing timber, and threatening human health and safety by degrading structures. Losses due to nutria damage totaled \$25,400 and included damaging wetlands by burrowing, damage irrigation ditches and structures, destruction of general property, and damage to human food items. River otter damage totaled \$6,000 and consisted of damage to structures and property (*e.g.*, destruction of floatation material), defecation on marine structures (including docks and marinas), and predation on commercial fish operations. These numbers do not include estimates of damage prevented by WS actions, nor do they include all dollar amounts; not all losses are reported to WS.

Comprehensive surveys of damage from aquatic mammals in Washington 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. Damage data obtained are summarized for FY98 through FY07 (Table 1-1). These data, however, only represent a portion of the total damage caused by aquatic mammals, as not all people who experience damage contact WS. WDFW also documents requests for permits to trap offending wildlife. Since 2001, there has been a steady increase in the number of permits requested. Annual requests from 2001 - 2006 were: 337, 482, 624, 646, 762, and 776, respectively. Of those requests, 50-60% was for nuisance beaver, 6-9% was for otter, and 3-4% was for nutria. Trends for permit requests to trap

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<sup>12</sup> This figure is higher than previous years due to the high costs of repairing bridges flooded by beaver dams in that year.

aquatic mammals rose with the increased abundance trend (S. Carrell, WDFW, pers. comm. 2007).

Resource owners and government agencies have used a variety of techniques to reduce aquatic mammal damage. However, lethal and nonlethal methods developed to date have limitations based on costs, logistics, or effectiveness. The cost effectiveness of the Washington WS aquatic mammal damage management program has not been determined. Although cost efficiency is not an essential factor, such a determination has been made in at least one other WS program based on comparing estimates of damage prevented against the cost of conducting aquatic mammal damage management. WS (2004 ) documented a 1:5.86 cost:benefit ratio for beaver damage management in 13 states, using the more conservative models. Using the less conservative model, damage could have been two to three times higher. This indicates that aquatic mammal damage management is cost effective for the protection of resources. Of the aquatic mammals found in Washington, beaver are responsible for most of the damage reported to or verified by WS and for most of the requests for assistance.

**Table 1-1. Aquatic Mammal Damage in Dollars (\$) Verified and Reported to WS by Fiscal Year (FY) in Dollars (\$).**

FY	Species			
	Beaver	Nutria	Muskrat	Otter/ Mink
98	101,610	100	675	20,000
99	66,990	0	1,900	3,000
00	528,120	5,450	0	6,600
01	98,250	6,100	0	22,500
02	100,450	916,400	11,100	9,500
03	355,000	3,000	0	4,100
04	123,350	398,655	0	1,825
05	136,850	355,705	0	1,500
06	132,291	25,400	0	6,000
07	1,428,730	87,850	0	35,788

This EA analyzes alternative ways to reduce aquatic mammal damage. Aquatic mammal damage reduction can be accomplished through an adaptive IWDM program and this need for action, in part, is derived from threats to resources, human health and safety, and is, in part, supported by President Clinton’s Invasive Species Executive Order 13112 for nutria (see Appendix A).

## **1.5 RELATIONSHIP OF THIS EA TO OTHER ENVIRONMENTAL DOCUMENTS**

### **1.5.1 WS Programmatic EIS**

WS issued a final EIS (USDA 1997) and Record of Decision on the USDA-APHIS-WS nationwide program. The final EIS (USDA 1997) discussed aquatic mammal damage management at the nationwide level and concluded that the nationwide WS program did not impact aquatic mammal populations. Pertinent portions of the EIS are incorporated by reference in this EA.

### **1.5.2 Washington Game Management Plan 2003-2009**

WDFW adopted the 6-year game management plan in December 2002. This plan underwent an EIS review, completed in November 2002, allowing public review and input as to how WDFW should meet its duties to “preserve, protect, perpetuate, and manage” wildlife through the year 2009.

## **1.6 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. WDFW and NMFS have had input during the preparation of this EA to facilitate an interdisciplinary approach in compliance with NEPA, agency mandates, policies, and regulations.

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

1. Should aquatic mammal damage management, as currently implemented, be continued (the no action alternative)?
2. If not, how should WS fulfill its legal responsibilities?
3. Are the current minimization measures appropriate?
4. Would the proposal have significant impacts requiring an EIS analysis?

## **1.7 SCOPE OF THIS EA ANALYSIS**

### **1.7.1 Actions Analyzed**

This EA evaluates planned aquatic mammal damage management to protect: 1) agricultural resources, 2) natural resources, 3) property, and 4) human health and safety in Washington. Protection of other resources or other program activities will be addressed in other NEPA analysis, as appropriate. This analysis is limited to the methods and species towards which Washington WS would conduct or reasonably expect to conduct operational damage management.

### **1.7.2 Wildlife Species Potentially Protected by Washington WS**

Washington WS assistance, such as removing beaver dams to re-establish stream flow, could conceivably be requested by WDFW, USFWS or NMFS to achieve management objectives for salmonids or other fish species, including T&E species. If other needs are identified, the determination for additional NEPA analysis would be made on a case-by-case basis.

### **1.7.3 Resources Not Currently Protected by WS Aquatic Mammal Damage Management**

The current program operates on a small percentage of the area of Washington (see Section 1.1.1) and provides assistance when requested and a need is identified. This EA analyzes effects not only at the current program level, but at increased program levels should individuals or agencies request assistance. Any increase is anticipated to be minimal.



#### **1.7.4 American Indian Lands and Tribes**

If tribes request WS assistance the methods employed and potential effects 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.

Currently, Washington WS has no MOUs with American Indian Tribes. If WS enters into an agreement with a tribe for aquatic mammal damage management, this EA would be reviewed and, if appropriate, supplemented to insure compliance with NEPA. MOUs, agreements and NEPA compliance would be conducted, as appropriate, before conducting any aquatic mammal damage management on Tribal lands.

#### **1.7.5 Public Lands**

WS may provide aquatic mammal damage management on public lands in Washington as requested by the USFWS, United States Forest Service (USFS), Bureau of Land Management (BLM), Bureau of Reclamation (BOR), USACE, WDFW and others. The methods employed would be the same on these lands as they would be on other lands upon which WS provides service. If WS were requested to conduct aquatic mammal damage management on public lands for the protection of resources, this EA would cover such actions.

#### **1.7.6 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 must be analyzed. At that time, this EA would be supplemented or reissued pursuant to NEPA with the appropriate analyses. Review of the EA will be conducted annually to ensure that the EA analysis is accurate and sufficient.

#### **1.7.7 Site Specificity**

This EA analyzes potential impacts of WS' aquatic mammal damage management and addresses those activities on all lands under *Cooperative Agreement* or *Agreements For Control* within Washington, or those written in the foreseeable future. Because the proposed action is to implement an adaptive, integrated aquatic mammal damage management program, and because the program's goals and responsibility are to provide service when requested within the constraints of available funding and workforce, it is conceivable that additional damage management efforts could occur. Thus, this EA anticipates and analyzes the affects of additional efforts as part of the proposed program. This EA emphasizes significant issues as they relate to specific areas whenever possible; however, the issues that pertain to aquatic mammal 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 Washington. Decisions made using the model will be in accordance with any minimization measures and standard operating procedures (SOPs) described herein and adopted or established as part of the decision.

### **1.7.8 Interdisciplinary Development of the EA**

WDFW, BOR, USFWS and NMFS had input and contributed toward the development of this EA to help ensure an interdisciplinary process. Comments shall be maintained in an administrative file located at the Washington WS State Office in Olympia, Washington.

## **1.8 AUTHORITY AND COMPLIANCE WITH STATUTES**

See Appendix A for a more detailed discussion.

### ***Wildlife Services:***

WS' activities are conducted at the request of and in cooperation with other federal, state, and local agencies, private organizations, and individuals. WS is directed by the U.S. Congress to protect American agriculture, property, natural resources and human health and safety from damage associated with wildlife (Act of March 2, 1931, as amended (46 Stat. 1486; 7 USC. 426-426c). "Wildlife damage management" is defined as, *the reduction or alleviation of damage or other problems caused by, or related to, the presence of wildlife*<sup>13</sup>, and it is an integral component of wildlife management (Leopold 1933, The Wildlife Society 1992, Berryman 1992, Conover 2002).

### ***Consulting Agencies:***

**WDFW:** WDFW's authority for managing wildlife in the State of Washington is based on Title 77 of the Revised Code of Washington (RCW).

**USFWS:** On 26 May 2008, WS received concurrence of a "*may affect, not likely to adversely affect*", from USFWS in response to a Section 7 consultation (letter from K. Berg, USFWS to R. Woodruff, WS).

**NMFS:** On 9 May 2008 WS received concurrence of a "*may affect, not likely to adversely affect*", from NMFS in response to a Section 7 consultation (letter from D. Lohn, NMFS to R. Woodruff, WS).

### ***Compliance with Statutes:***

Several federal laws regulate WS' wildlife damage management. WS complies with these laws and regulations, consults with, reports to, and cooperates with other agencies as appropriate.

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<sup>13</sup> WS' mission is to reduce wildlife damage.

**National Environmental Policy Act.** Environmental documents pursuant to NEPA must be completed before a NEPA decision can be implemented. 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 areas of mutual concern.

**Endangered Species Act.** It is federal policy, under the ESA, that all federal agencies shall seek to conserve endangered and threatened species and shall utilize their authorities in furtherance of the purposes of the Act (Sec. 2(c)). WS conducts Section 7 consultations with the USFWS and NMFS to use the expertise of these agencies to ensure that “any action authorized, funded or carried out by such an agency . . . is not likely to jeopardize the continued existence of any endangered or threatened species . . . Each agency shall use the best scientific and commercial data available” (Sec. 7(a)(2)). In accordance with the ESA, WS also assists in recovery efforts of ESA-listed species.

**Federal Insecticide, Fungicide, and Rodenticide Act (FIFRA).** FIFRA requires the registration, classification, and regulation of all pesticides used in the U.S. The EPA is responsible for implementing and enforcing FIFRA.

**National Historic Preservation Act (NHPA).** The NHPA of 1966 and its implementing regulations (36 CFR 800) require federal agencies to: 1) determine whether activities they propose constitute “undertakings” that can result in changes in the character or use of historic properties and, if so, 2) 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<sup>14</sup> to determine whether they have concerns for traditional cultural properties in areas of these federal undertakings.

**Executive Order (EO) 12898 Environmental Justice.** EO-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. WS concludes that it would not create an adverse environmental health or safety risk to minority and low-income persons or populations from implementing this proposed action.

**EO 13045 - Protection of Children from Environmental Health and Safety Risks.** Children may suffer disproportionately from environmental health and safety risks for many reasons, including their development physical and mental status. WS makes it a high priority to identify and assess environmental health and safety risks that may disproportionately affect children, and WS has considered the impacts that the current/proposed program might have on children. The current/proposed aquatic mammal damage management would occur by using only legally

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<sup>14</sup> WS’ damage management would only be conducted on tribal lands at the Tribes request and only after appropriate documents had been signed by WS and the respective Tribe.

available and approved damage management methods where it is highly unlikely that children would be adversely affected.

**Joint Aquatic Resource Permits Application.** - JARPA provides a streamlined process to obtain a number of permits for work involving “waters of the state”, including by not limited to Section 404 permits from USACE, 401 permits from DOE, and HPA from WDFW. Property owners will be responsible for obtaining appropriate permits before work is conducted.

## **CHAPTER 2: ISSUES**

Issues are concerns of the public or professional communities about potential environmental problems that might occur from a proposed 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 when preparing USDA (1997) and were considered in the preparation of this EA. These issues are fully evaluated in USDA (1997) which analyzed issues related to WS and wildlife damage management.

Chapter 2 contains a discussion of the issues that will receive detailed environmental impacts analysis in Chapter 4 (Environmental Consequences), and those that were used to develop minimization measures and SOPs. Issues not considered in detail, with rationale, are discussed in Section 2.3. Pertinent portions of the affected environment are included in this chapter in the discussion of issues used to develop minimization measures. Additional information on affected environments is incorporated into the discussion of the environmental impacts in Chapter 4.

### **2.1 ISSUES CONSIDERED**

The following are the issues identified as areas of concern requiring detailed consideration in this EA.

1. Effects on Target Aquatic Mammal Species Abundance
2. Effects on Non-target Species Abundance, Including T&E Species
3. Effects of Aquatic Mammal Damage Management on Public Safety

Potential environmental affects of the Proposed Action and Alternatives in relation to these issues are discussed in Chapter 4 of this EA. As part of this process, and as required by CEQ, and APHIS and NEPA implementing regulations, this document and its Decision are being made available to the public through “Notices of Availability” published in local media, on the APHIS website and through direct mailings 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/or revised.

### **2.2 ISSUES USED TO DEVELOP MINIMIZATION MEASURES**

#### **2.2.1 Effects on Target Aquatic Mammal Species Abundance**

Effects on target species are analyzed in detail in Chapter 4 for each of the alternative. Methods are discussed in detail in Appendix B. WDFW has the responsibility to manage all protected and classified wildlife in Washington, except federally listed T&E species, regardless of the land class on which the animals are found (RCW Title 77). WDFW is authorized to cooperate with WS for controlling nuisance and non-agriculture property damage caused by wildlife and WS closely coordinates aquatic mammal project with the WDFW.

#### **2.2.2 Effects on Non-target Species Abundance, Including T&E Species**

A concern among members of the public and wildlife professionals, including WS personnel, is the effect of aquatic mammal damage management methods and activities on non-target species, particularly T&E species. Special efforts are made to avoid adversely affecting T&E species through biological evaluations of potential effects and the establishment of special restrictions or SOPs where needed. The results of the biological evaluations are provided in Chapter 4. WS SOPs include measures intended to reduce the effects of aquatic mammal damage management on non-target species and are presented in Chapter 3.

### **2.2.3 Effects of Beaver Dam Removal**

Some people are concerned about the effects of the alternatives on the wetland ecosystem and that the removal of beaver or beaver dams will result in the loss of wetland habitat and the plant and animal species associated with those wetlands. Beaver dams, in time, can establish new or different wetlands. The USACE and the EPA 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.*

Therefore, per this definition, a site needs to meet three qualifications to be considered a wetland. First, it must contain soils saturated by surface or ground water during a specific period of the growing season. 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 pre-existed. Secondly, the site must exhibit evidence of wetland hydrology. An area has wetland hydrology if it is inundated or saturated to the surface for at least 5% of the growing season in most years. Finally, the site must be dominated by hydrophytic vegetation which are those species tolerant of and specially adapted to live in saturated soil conditions. 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 (CDOW 2002). If a beaver dam is not removed and water is allowed to stand, hydric soils and hydrophytic vegetation may eventually form.

DOE definition of wetlands mirrors the USACE definition, but goes on to exclude certain features from “wetland status”:

*Wetlands do not include those artificial wetlands intentionally created from nonwetland sites, grass-lined swales, canals, detention facilities, wastewater treatment facilities, farm ponds, and landscape amenities. However, wetlands may include those artificial wetlands intentionally created from nonwetland areas created to mitigate conversion of wetlands, if permitted by the county or city (WAC 365-190-030).*

These exclusions, along with exemptions under Section 404 (33CFR 1341.404f), provide WS with the authority to remove beaver dams in irrigation structures within the designated area under permit from WDFW or other governing agency.

The Wetland Conservation provision of the 1985 and 1990 Farm Bills, more commonly known as Swampbuster, sets forth requirements for the distribution of USDA farm benefits to producers who use convert wetlands to croplands. Previously Converted Croplands (PCCs) are defined as those wetlands converted to agriculture before December 23, 1985 and that meet certain biological criteria. The Swampbuster provisions allow for farmers to fallow PCCs for up to 5 years and restart farming activity without regard to reformation of wetland conditions. Beyond the 5-year period, lands are considered abandoned and become subject to wetland regulations under Swampbuster and the CWA.

The intent of dam removal is not to drain old, established wetlands. Washington WS will only work under a permit issued to the requester under the JARPA process, or under consult, when required, with USFWS or NMFS, or when other entities possess appropriate authority. Requests for assistance by WS from public agencies or private individuals involve dam removal to return an area back to its preexisting condition within a few days to a few months after the dam was created. Beaver dam removal does not alter the natural course or the substrate of the stream and is allowed under exemptions stated in 33 CFR parts 323 and 330, Section 404 of the CWA, or parts 3821 and 3822 of the Food Security Act.

WS personnel determine the proper course of action upon inspecting a beaver dam and WS will only remove beaver dams in accordance with local, state and federal regulations and will only use binary explosives<sup>15</sup> in irrigation structures within the CBP. These activities generally take place in areas such as small roadside drainage ditches, irrigation structures, and other locations that are not delineated as true wetland habitats and can best be described as small projects conducted to restore water flow. Only that portion of the dam blocking the stream or ditch channel is altered or removed. Appendix B describes the procedures used by WS to assure compliance with the pertinent laws and regulations.

In other states, beaver control and dam removal is used to enhance or reclaim riparian or stream fisheries habitat. In Wisconsin, WS partnered with WDNR and USFWS to implement a beaver management program that includes beaver dam removal using binary explosives. Dickerson (1989) reported that beaver dams blocked waterflow, flooded vegetation and increased the food supply behind the blockage. Fish grew larger and required increased food intake, which eventually became unavailable due to decomposing organic matter and silting above the dam. This is not optimal habitat for salmon or trout and dams blocked fish migration. Washington WS does not currently conduct nor is it proposing to conduct beaver control for salmonid enhancement.

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<sup>15</sup> No major disturbances to permanent structures or primary substrates, such as stream banks, adjoining soil composition, natural bottom sediment or bedrock are damaged or removed from WS' use of binary explosives.

Beaver dams removed by WS are typically the result of very recent or current beaver activity because WS receives most requests soon after affected resource owners discover damage or become aware of the WS program. Washington WS will only work under a permit issued to the requester under the JARPA process, or under consult, when required, with USFWS or NMFS, or when other entities possess appropriate authority. The impoundments created by these dams are not considered true wetland habitats and, therefore, do not possess the same wildlife habitat values as established wetlands.

#### **2.2.4 Effects of Beaver Dam Removal in Irrigation Ditches**

Beaver dam removal in irrigation ditches will occur solely within the CBP, established and governed by the BOR. The irrigation structures are maintained by private irrigation districts and BOR maintains water rights through the CBP in perpetuity. The distribution of the water is conducted by the individual irrigation districts, who collect dues from members and repay the BOR for creating the irrigation system. The CBP is comprised of three irrigation districts, South, East, and Quincy. Artificial irrigation and drainage structures are exempt from state HPA (WDFW no date, online). Other responsible agencies would be contacted and consulted as necessary or if a request for dam removal is received for areas outside the specified irrigation districts. Appendix B describes the procedures used by WS to assure compliance with the pertinent laws and regulations.

#### **2.2.5 Effects of Aquatic Mammal Damage Management Methods on Public Safety**

A formal risk assessment of WS methods, including those used for aquatic mammal damage management in Washington, concluded low risks to humans when used properly and according to WS Directives (USDA 1997, Appendix P).

### **2.3 ISSUES NOT CONSIDERED IN DETAIL WITH RATIONALE**

#### **2.3.1 WS' Impact on Biodiversity**

As analyzed in the EA, no WS wildlife damage management is conducted to eradicate native or indigenous wildlife populations.<sup>16</sup> WS Directives, and federal and state laws and statutes are enacted to ensure species viability. In many cases, only a short-term project would be conducted in a specific location to reduce damage. WS is proposing to work on a relatively small percentage of the land area in Washington (See Section 1.1.1) and WS' take is a small proportion of the total population of the species analyzed in Chapter 4. At the relatively low levels of removal occurring, overall biodiversity would not substantially change because of management activities. The impacts of the current WS Program on biodiversity are not significant nationwide or in Washington (USDA 1997). Therefore, there is no evidence to suggest that WS aquatic mammal damage management, as proposed, would have adverse direct, indirect, or cumulative effects on biodiversity.

#### **2.3.2 Wildlife Damage Should Be an Accepted Loss**

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<sup>16</sup> Nutria are nonnative and the proposed program would have a low magnitude of impact on native target species populations.



WS is aware that some people feel that federal aquatic 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 a legal obligation to respond to requests for wildlife damage management, and it is WS policy to aid each requester to minimize losses. WS uses the Decision Model (Slate et al. 1992) 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 National Forest (NF), et al., the United States District Court of Utah upheld the determination that a wildlife damage management program may be established based on threatened damage. In part, the court found that a forest supervisor need only show that damage (from predators) is threatened to establish a need for IWDM (Civil No. 92-C-0052A January 20, 1993). Thus, there is precedent for conducting damage management activities when the threat of damage is present.

### **2.3.3 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. Kellert and Berry (1980), in a survey of American attitudes toward animals, related that 58% of their respondents, “...*care more about the suffering of individual animals...than they do about species population levels.*” Schmidt (1989) indicated that vertebrate pest control for societal benefits could be compatible with animal welfare concerns, if “...*the reduction of pain, suffering, and unnecessary death is incorporated in the decision making process.*”

Suffering has been described as a “...*highly unpleasant emotional response usually associated with pain and distress.*” However, suffering “...*can occur without pain...*,” and “...*pain can occur without suffering...*” (American Veterinary Medical Association (AVMA) 1987).

Because suffering carries with it the implication of a time frame, a case could be made for “...*little or no suffering where death comes immediately...*” [California Department of Fish and Game (CDFG) 1991], such as the WS technique of shooting.

Defining pain as a component of humaneness may be a greater challenge than that of suffering. Pain likely occurs in animals. Altered physiology and behavior can be indicators of pain, and identifying the causes that elicit pain responses in humans would “...*probably be causes for pain in other animals...*” (AVMA 1987). However, pain experienced by individual animals probably ranges from little or no pain to significant pain (CDFG 1991). Some WS damage management methods such as foothold traps, body snares, and even repellents may thus cause varying degrees of pain in different animal species for varying time frames.

Pain and suffering, as they relate to a review of WS aquatic mammal damage management methods to capture animals, have a professional and lay point of arbitration. Wildlife

managers and the public would be better served to recognize the complexity of defining suffering, since “...neither medical or veterinary curricula address suffering or its relief ...” (CDFG 1991).

Thus, the decision-making process involves tradeoffs between the above aspects of pain and humaneness. An objective analysis of this issue must consider not only the welfare of wild animals but also the welfare of pets or humans, if damage management methods were not used. Therefore, humaneness, in part, appears to be a person’s perception of harm or pain inflicted on an animal, and people may perceive the humaneness of an action differently. The challenge in coping with this issue is how to achieve the least amount of suffering with the constraints imposed by current technology and funding.

WS has improved the selectivity of management devices through research and is striving to bring new findings and products into practical use. Until new findings and products are found practical, a certain amount of animal suffering could occur when some methods are used in those situations when nonlethal damage management methods are not practical or effective.

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

#### **2.3.4 American Indian and Cultural Resource Concerns**

The NHPA, 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 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.

Aquatic mammal damage management activities would have no adverse effects on historical and cultural resources. Aquatic mammal damage management actions on tribal property may occur as requested by tribal officials, assuring that tribes can decide what actions occur considering any overriding cultural resource concerns.

#### **2.3.5 Selectivity and Effectiveness of Methods**

Under the current program, all methods used are as selective and effective as practically 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, the skill of the WS Specialist, and the direction provided by WS Directives and the methods employed under that alternative. WS personnel are trained in the use of each method and are certified by the WDA as pesticide applicators for each pesticide that is used

during damage management activities. 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 considerations, 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 damage management tools to most effectively resolve wildlife damage problems.

### **2.3.6 Appropriateness of Preparing an EA**

Federal agencies have the discretion to determine the geographic scope of their NEPA analyses (*Kleppe v Sierra Club*, 427 U.S. 390, 414 (1976)) and Washington WS has determined that preparation of this EA to address aquatic mammal damage management activities in Washington is appropriate (*i.e.*, one set of laws, regulations, and policies direct wildlife management in Washington). If in fact a determination is made through this EA that the proposed action would have a significant environmental impact, then an EIS would be prepared. In terms of considering cumulative impacts, one EA covering the entire State of Washington may provide a better analysis than multiple EA's covering smaller zones. A more detailed and more site-specific level of analysis would not substantially improve the decision-making process, and pursuing a more site-specific and more detailed analysis might even be considered inconsistent with NEPA's emphasis on reducing unnecessary paperwork (Eccleston 1995).

### **2.3.7 Impacts of Aquatic Mammal Removal on the Public's Aesthetic Enjoyment of Aquatic Mammals**

Wildlife is generally regarded as providing economic, recreational, and aesthetic benefits (Decker and Goff 1987), and the mere knowledge that wildlife exists is a positive benefit to many people. Aesthetics is the philosophy dealing with the nature of beauty or the appreciation of beauty. Therefore, aesthetics is truly subjective in nature, dependent on what an observer regards as beautiful.

WS aquatic mammal damage management has occurred on a relatively limited portion of the total area in Washington (See Section 1.1.1), and the portion of various aquatic mammal species' populations removed through WS damage management activities is typically low (see Tables 4-1, 4-2, 4-3, 4-4, 4-5). Most of the species potentially affected by WS damage management are relatively abundant, but are not commonly observed because of their secretive and largely nocturnal behavior (Conover 2002). The likelihood of getting to see or hear an aquatic mammal in some localized areas could be temporarily reduced as a result of WS damage management, but because there is already a low likelihood of seeing an aquatic mammal; this temporary local reduction in public viewing opportunity would not likely be noticeable in most cases. Effects on overall populations would be relatively low under any of the alternatives being considered in this EA, and opportunities to view, hear, or see evidence of aquatic mammals would still be available under any of the alternatives being

considered. The potential minor reduction in local opportunity to view aquatic mammals must be weighed against the potential economic harm suffered by resource/home owners or others affected by aquatic mammal damage, if damage management were not implemented.

### **2.3.8 Direct, Indirect, and Cumulative Effects of Proposed Activities on Soils, Water Quality, Watersheds, Native Vegetation, and Recreation**

Potential adverse effects on soils, water, watersheds, and native vegetation would be expected to be minimal, and are addressed here. The Washington WS program coordinates its damage management with the USFWS, BOR, USACE, WDNR, DOE, and WDFW to help ensure there are no significant direct, indirect, or cumulative affects to any resources managed by these agencies. WS damage management may involve such activities as driving a pickup truck on a road through forests or rangelands, but these activities would not reasonably be expected to have any significant adverse effects on soils, water, watersheds, or native vegetation. If damage management is conducted in situations where local travel may be difficult due to muddy road conditions, WS field employees exercise conservative judgment to minimize any potential damage to roads or roadside vegetation. In some cases this may mean delaying vehicle travel through certain areas until road conditions improve, or using alternate means of transportation such a boat, or ATV. WS employees are also cognizant of the threat of noxious weeds to rangelands and watersheds, and exercise routine preventive measures to reduce the likelihood of spreading noxious weeds (*e.g.*, routinely checking and clearing vehicle bumpers and undercarriage for any weeds or other vegetation).

### **2.3.9 More Time and Money Should be Spent on Education**

Education is an important element of WS' program because wildlife damage management is about finding a "balance" or co-existence between the needs of people and needs of wildlife. This is extremely challenging as nature has no balance, but rather, is in continual flux. In addition to the dissemination of educational materials and recommendations to individuals or organizations sustaining damage, lectures and demonstrations are provided to ranchers, homeowners, and other interested groups. WS frequently cooperates with other agencies in education and public information efforts. Additionally, technical papers are presented at professional meetings and conferences so that WS personnel, other wildlife professionals, and the public are updated on recent developments in damage management technology, laws and regulations, and agency policies.

### **2.3.10 Effects of Washington WS Beaver Dam Removal on Wetlands**

Dams considered for removal are recently constructed and may cause damage to agriculture, property, public safety, or natural resources. These activities generally take place in areas such as small roadside drainage ditches, irrigation structures, and other locations that are not delineated as true wetland habitats and can best be described as small projects conducted to

restore water flow. Therefore, they do not possess the same wildlife habitat quality as established wetlands. WS does not anticipate working in wetland habitats.

If dam removal is deemed necessary, Washington WS will only remove beaver dams under a permit issued to the requester under the JARPA process, or under consult, when required, with USFWS or NMFS, or when other entities possess appropriate authority (*e.g.*, under Section 404 of CWA) (see Habitat Management, Appendix B of this EA). Therefore, it is concluded that WS' actions will have no effect on wetland wildlife habitat.

## **2.4 ADDITIONAL ISSUES NOT CONSIDERED BECAUSE THEY ARE OUTSIDE THE SCOPE OF THIS ANALYSIS**

### **2.4.1 Encourage Bounties, Trapping, and Hunting to Reduce Damage (*e.g.*, recreational harvest)**

The jurisdiction for managing most resident wildlife rests with WDFW (RCW §77.12.020) which has the authority to request other agencies' assistance to achieve management objectives. Currently, WDFW manages beaver, mink, muskrats, and otter as furbearer species under a strategic plan. If deemed necessary, WDFW has the option and authority to reduce or increase restrictions on harvest to provide for more or less harvest for sportsmen. The current strategic plans for these species support the current system of management.

In addition, most private trappers and hunters are not able to provide year-round site-specific damage management activities. That option, however, remains open to entities experiencing damage or the threat of damage.

Payment of funds for killing wildlife (bounties) to reduce damage or economic loss is not generally supported by WDFW because:

- Bounties are not generally effective in reducing damage,
- Circumstances surrounding take of animals are largely unregulated,
- No process exists to prohibit taking animals from outside the damage management area for compensation,
- WS does not have the authority to establish a bounty program

### **2.4.2 Provide Compensation for Wildlife Losses**

This option is not currently available to WS because WS is directed by Congress to protect American agricultural, natural resources, property, and safeguard human health and safety (Act of March 2, 1931, and Rural Development, Agricultural and Related Agencies Appropriation Act 1988). Analysis of this issue shows that it has many drawbacks:

- It would require larger expenditures of money and workforce to investigate and validate all losses to determine and administer appropriate compensation.

- Compensation would most likely be below full market value.
- It is difficult to make timely responses to all requests to assess and confirm losses, and many losses could not be verified.
- Compensation would give little incentive to resource owners to limit damage through improved management strategies.
- Not all claimants would rely completely on a compensation program and unregulated lethal control of aquatic mammals would most likely continue as permitted by State law.
- Congress has not appropriated funds to compensate for predation or other wildlife damage to agricultural products.

## CHAPTER 3: ALTERNATIVES, INCLUDING THE PROPOSED ACTION

### 3.1 INTRODUCTION

This Chapter consists of six sections: 1) introduction, 2) description of Alternatives considered and analyzed in detail, including the Proposed Alternative (Alternative 1), 3) aquatic mammal damage management methodologies and strategies used by Washington WS, 4) a description of alternatives considered, but eliminated from detailed analysis, 5) methodologies considered but deemed impractical, ineffective or unsafe at the present time, and 6) a table that provides minimization measures and SOPs for each alternative.

Alternatives 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 and three alternatives (Section 3.5) were considered but not analyzed in detail with rationale. The four alternatives analyzed in detail are:

#### **3.1.1 Alternative 1 - Continue the Current WS Adaptive Aquatic Mammal Damage Management Program: (No Action/Proposed Alternative)**

This Alternative consists of the current program of TA and operational aquatic mammal damage management by Washington WS personnel on federal, state, county, city, and private lands under Cooperative Agreement and Agreement for Control or other comparable documents are in place. The current program protects agricultural resources, natural resources, property, and human health and safety.

#### **3.1.2 Alternative 2 - Continue the Current WS Aquatic Mammal Damage Management Program, but Non-lethal Required Before Lethal Control**

This Alternative would not allow WS to conduct lethal damage management until all non-lethal methods had been tried and found to be inadequate in each damage management situation.

#### **3.1.3 Alternative 3 - Technical Assistance Aquatic Mammal Damage Management Program Only**

Under this Alternative, Washington WS would not conduct operational aquatic mammal damage management activities in Washington. If requested, affected resource owners would be provided with TA recommendations only.

#### **3.1.4 Alternative 4 - No WS Aquatic Mammal Damage Management Program**

This Alternative would terminate WS' role in aquatic mammal damage management in Washington. Affected resource owners would need to contact the WDFW, other agencies, or be left to their own devices to stop damage created by aquatic mammals.

### **3.2 DESCRIPTION OF THE ALTERNATIVES**

#### **3.2.1 Alternative 1 - Continue the Current WS Adaptive Aquatic Mammal Damage Management Program: (No Action<sup>17</sup>/Proposed Alternative)**

The No Action Alternative (Proposed Alternative) would continue the current Washington WS aquatic mammal damage management program. The current program is a collection of cooperative programs with public agencies, private individuals, and associations. Washington WS conducts TA, operational preventive aquatic mammal damage management, and corrective aquatic mammal damage management (in response to current loss) on private and public lands under Cooperative Agreements, Agreements for Control or other comparable documents and after permits from WDFW have been issued. All damage management is based on interagency relationships, which require close coordination and cooperation because of overlapping authorities and responsibilities.

Before aquatic mammal damage management would be conducted on private lands, *Agreements for Control on Private Property* are signed with the landowner or manager that describe the methods to be used and the species to be managed. For the removal of beaver dams from natural waterways, NMFS will be consulted 10 days prior to removing the dam in an effort to maintain the integrity of the habitat. The removal of beaver dams from irrigation structures within the CBP will be conducted as necessary. For federal, state, county, city, and tribal lands, Washington WS would coordinate damage management with the appropriate management agency. Damage management would be directed toward localized populations or groups and/or individual animals.

#### **3.2.2 Alternative 2 - Continue the Current WS Aquatic Mammal Damage Management Program, but Non-lethal Required Before Lethal Control**

This Alternative would not allow for the use of lethal methods by WS, as described in Appendix. B, until all nonlethal methods had been attempted in a given damage situation and found to be ineffective or inadequate. No preventive lethal damage management would be allowed. Resource owners, however, would still have the option of implementing their own non-lethal and lethal aquatic mammal damage management. Personnel experienced in aquatic mammal damage management often already know when and where practical nonlethal damage management techniques would work. Therefore, this alternative requires the use of methods that are known to be ineffective, potentially leading to prolonged damage and risk to human health and safety.

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<sup>17</sup> The No Action Alternative is a procedural NEPA requirement (40 CFR 1502.14(d)) and is a viable and reasonable Alternative that could be selected and serves as a baseline for comparison with the other Alternatives. The No Action Alternative, as defined here, is consistent with CEQ (1981).



### **3.2.3 Alternative 3 - Technical Assistance Aquatic Mammal Damage Management Program Only**

This Alternative would not allow WS to conduct operational aquatic mammal damage management in Washington. Washington WS personnel would only provide TA when requested. However, private landowners, resource owners, or others could conduct their own aquatic mammal damage management including the use of traps, snares shooting, and any non-lethal methods they choose on federal, state, county, and private lands (if properly permitted). Methods and damage management 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 could resort to unconventional methods that cause harm to the environment or result in greater take of nontarget animals.

The “*TA only*” Alternative would place the immediate burden of operational damage management work on other federal, state or county agencies, and property owners. Individuals experiencing aquatic mammal damage would, independently or with Washington WS recommendations, carry out and fund damage management activities. Individuals or agencies could implement damage management as part of the cost of doing business or assume a more active role in providing operational damage management. If this Alternative were selected, Washington WS could not direct how state or county agencies or property owners would implement damage management. Some agencies or property owners may choose not to take action to resolve damage while other situations may warrant the use of legally available management methods because of public demands.

### **3.2.4 Alternative 4 - No WS Aquatic Mammal Damage Management Program**

This Alternative would eliminate all WS’ aquatic mammal damage management (operational and TA) in Washington. However, aquatic mammal damage management activities would continue to be conducted in Washington because of the need for this type of expertise and service. Federal, state, county and city governments, state and/or county agricultural organizations, private pest control operators and contractors, the public, and possibly other entities would fill the void left by WS and would continue or begin implementing aquatic mammal damage management.

Washington WS would not be available to provide TA. Information on future developments in non-lethal and lethal management techniques that culminate from WS’ research branch (*i.e.* National Wildlife Research Center (NWRC)) may not be recommended by WS and may not be available to resource owners. It is possible that many aquatic mammal damage management methods could be used unsafely and improperly, such as the illegal use of pesticides and traps simply out of frustration by resource owners because of the inability to reduce damage to a tolerable level. In addition, it is likely that inexperienced people using many of the aquatic mammal damage management methods could harm the environment,

themselves, and result in the take of non-target species. Due to interest in this alternative, an analysis has been included. A “*No Program*” Alternative was also evaluated in USDA (1997).

### **3.3 AQUATIC MAMMAL DAMAGE MANAGEMENT METHODS AND STRATEGIES USED BY WASHINGTON WS**

Aquatic mammal damage management methods and strategies vary according to the resource being protected, species involved, location of the damage, time of year, and other factors. A management strategy designed to protect agricultural or natural resources could differ significantly from one designed to protect property or human health and safety. However, WS damage management efforts are site specific and targeted to reduce the specific damage problem.

Some of the strategies and methodologies described in this Chapter are common to Alternatives 1 and 2 based on practical and legal strategies supported by the WS Decision Model (Slate et al. 1992). Under Alternative 3, WS personnel would only provide TA and recommendations to requesters based on practical and legal strategies supported by the WS Decision Model (Slate et al. 1992). Alternative 4 would terminate WS TA and operational aquatic mammal damage management in Washington.

#### **3.3.1 Integrated Wildlife Damage Management**

During more than 90 years of resolving wildlife damage problems, WS has considered, developed, and used numerous methods for reducing damage problems (USDA 1997). WS’ efforts include the research and development of new methods and the implementation of effective strategies to reduce and prevent wildlife damage.

WS employs different strategies to reduce wildlife damage problems. In certain situations, WS may provide requesters with the information necessary to resolve the problem themselves (TA). In others, WS may directly resolve the problem (operational damage management assistance). However, the most common strategy to resolve wildlife damage is to use a combination of these approaches, called IWDM.

IWDM is the implementation and application of safe and practical methods for the prevention and reduction of damage caused by wildlife based on local problem analyses and the informed judgment of trained personnel. The WS Program applies IWDM to reduce damage using the WS Decision Model (Figure 3-1) (Slate et al. 1992).

The philosophy behind IWDM is to implement effective management techniques, in a cost-effective manner while minimizing the potentially harmful effects to humans, target and non-target species, and the environment. IWDM draws from the largest possible array of options to create a combination of techniques for each specific situation. IWDM may incorporate cultural practices, localized habitat and animal behavior modification, removal of individual animals, local population reduction, or any combination of these, depending on the characteristics of the specific damage problem.

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

**3.3.1.2 Operational Damage Management Assistance.** Operational damage management assistance is implemented when the problem cannot effectively be resolved through TA alone and when *Cooperative Agreements* provide for WS operational damage management. WS conducts operational damage management with any of the following methods only when a signed *Agreement For Control On Private Property* is on file, or where *Agreement For Control On Nonprivate Property* or *Work Plans* on federal, state, county or other local government lands are in place that cover the intended target species and methods to be used. The initial investigation defines the nature and history of the problem, extent of damage, and the species responsible for the damage. WS considers the biology and behavior of the damaging species and other factors using the WS Decision Model (Slate et al. 1992). The recommended damage management program may include any combination of preventive and corrective actions that could be implemented by the requester, WS, or other agency, as appropriate. Two strategies are used by WS, preventive and corrective management.

**3.3.1.2.1 Preventive damage management** is applying management strategies before damage occurs, and is based on historical damage problems. As requested and appropriate, WS personnel provide information, conduct demonstrations, 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, other nonlethal techniques, or be requested to conduct operational aquatic mammal damage management after new activity is noticed prior to new damage. However, preventive population management is not frequently used in aquatic mammal damage management.

**3.3.1.2.2 Corrective damage management** is applying aquatic mammal damage management to stop or reduce current losses. For example, in areas where roads are flooded, WS may provide information about exclusion methods or pond levelers and conduct operational aquatic mammal damage management to stop the losses. Corrective damage management is usually the most common aquatic mammal damage management strategy. Most people typically do not want assistance with aquatic mammals until they have damage.

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

**3.3.1.4 Research and Development.** The NWRC functions as the research arm of WS by providing scientific information and development of methods for wildlife damage management that are effective and environmentally responsible. NWRC scientists work closely with wildlife managers, researchers, field specialists, and others to develop and evaluate wildlife damage management techniques. NWRC research is instrumental in the development of non-lethal methods. In addition, NWRC scientists have authored hundreds of scientific publications and reports and are respected world-wide for their expertise in wildlife damage management.

### **3.4 ALTERNATIVES CONSIDERED BUT NOT ANALYZED IN DETAIL WITH RATIONALE**

#### **3.4.1 Eradication and Long Term Population Suppression.**

An eradication alternative would direct all WS Program efforts toward total long-term elimination of aquatic mammals in cooperating counties or larger defined areas in Washington. In Washington, the eradication of beaver, otter, mink, and muskrat is not a desired goal of state agencies. Under certain conditions, these species may be taken by the general public in areas where they are causing damage (RCW 77.36.030). Eradication as a general objective for aquatic mammal damage management will not be considered by WS in detail because:

- WS opposes eradication of any native wildlife species;
- WDFW opposes eradication of any native Washington wildlife species;
- The eradication of a native wildlife species or local population would be extremely difficult, if not impossible to accomplish, and cost-prohibitive in most situations; and
- Eradication of native wildlife species is not acceptable to most members of the public.

Suppression would direct WS program efforts toward managed reduction of aquatic mammals. Considering large-scale population suppression as the basis of the WS program is not realistic, practical, or allowable under present WS policy. In localized areas where damage can be attributed to specific groups of aquatic mammals, WDFW has the authority to permit trapping and increase the permits that are issued. When many requests for aquatic damage management are generated from a localized area, WS after consultation with WDFW, would consider suppression of the local population or groups of the offending species, if appropriate.

However, eradication and suppression are not realistic, practical, or allowable under present WS policy. Typically, WS activities in Washington would be conducted on a small portion of the area inhabited by problem/nuisance species (See Section 1.1.1).

### **3.5 METHODS CONSIDERED BUT DEEMED IMPRACTICAL, INEFFECTIVE OR UNSAFE AT THE PRESENT TIME**

#### **3.5.1 Harassment**

Harassment has generally proven ineffective in resolving aquatic mammal damage problems. Destroying beaver dams and lodges without removing resident beaver rarely resolves damage problems as beaver usually rebuild in the same vicinity in a very short time. Also under field conditions, removal of food supplies to discourage aquatic mammal activity is generally not economically feasible nor ecologically desirable.

#### **3.5.2 Electromagnetic, Ultrasonic Repellents, and Electronic Frightening Devices**

These devices have been researched, developed, and marketed over the past 40 years (Shumake 1997). Electromagnetic repellents are advertised as capable of generating their own magnetic fields or distorting the earth's magnetic fields in such a manner that animal pest species stop eating, drinking, and reproducing. However, there are no efficacy data that exist to support the electromagnetic pest control concept or theory (Shumake 1997) and the EPA (1980) has indicated definitively that such devices have no effect on feeding, drinking, mating, or infestation patterns. Ultrasonic devices operate above the human-hearing frequency range and have been commercially marketed to prevent aquatic mammal invasions, repel aquatic mammals in existing infestations, or used to enhance the effectiveness of conventional methods. Controlled efficacy test protocols have indicated only marginal repellency effects with six commercial ultrasonic devices. Test results indicated that only a 30-50% reduction in aquatic mammal movement activity was recorded with no significant repellency effects beyond 3 to 7 days. Electronic frightening devices (artificial light and auditory tapes) rarely work for more than a few days or at most a week (Koehler et al. 1990, Shumake 1997, Nolte et al. 2003).

#### **3.5.3 Reproduction Control**

At present, no chemical reproductive inhibitors are legal for use for beaver, nutria, otter, mink, or muskrat. For these reasons, this method will not be considered further by WS.

### 3.5.4 Biological Control

There are no known acceptable biological control methods for aquatic mammals.

## 3.6 MINIMIZATION MEASURES AND SOPs FOR AQUATIC MAMMAL DAMAGE MANAGEMENT TECHNIQUES

Minimization measures are any feature of an action that serves to prevent, reduce, or compensate for impacts that otherwise might result from that action. The current WS program, nationwide, uses many minimization measures, and these are discussed in detail in Chapter 5 of USDA (1997). The following measures apply to some or all of the alternatives, as indicated by an “X” in the column on the right side of Table 3-1.

**Table 3-1. Minimization Measures.**

MINIMIZATION MEASURES IMPLEMENTED FOR EACH ALTERNATIVE	ALTERNATIVES			
	1	2	3	4
<i>Animal Welfare and Humaneness of Methods Used by WS</i>				
Research on selectivity and humaneness of management practices would be monitored and adopted as appropriate.	X	X	X	
The WS Decision Model (Slate et al. 1992) is used to identify effective biologically and ecologically sound aquatic mammal damage management strategies and their impacts.	X	X	X	
Captured non-target animals are released unless it is determined by the Washington WS personnel that the animal would not survive.	X	X		
The use of capture equipment conforms to current laws and regulations administered by WDFW and WS Directives.	X	X		
Euthanasia procedures approved by the AVMA (1993) that cause minimal pain are used.	X	X		
Drugs are used according to the Drug Enforcement Agency (DEA) and WS program policies and directives, and procedures that cause minimal pain are followed.	X	X		
WS Specialists would recommend the use of traditional and newly developed, proven nonlethal methods.	X	X	X	
WS personnel are trained and experienced on all capture devices to select the most appropriate method for taking targeted animals while excluding non-target species.	X	X	X	

MINIMIZATION MEASURES IMPLEMENTED FOR EACH ALTERNATIVE	ALTERNATIVES			
	1	2	3	4
WS Specialists would use trap lures and set traps in locations that are conducive to capturing the target animal, while minimizing potential impact to non-target species.	X	X		
WS would use of aquatic mammal damage management capture devices would be consistent with internationally recognized humane trap standards.	X	X		
<b><i>Safety Concerns Regarding WS' Aquatic Mammal Damage Management Methods</i></b>				
All rodenticides are registered with the EPA and WDA.	X	X		
EPA-approved label directions would be followed by WS employees.	X	X		
The WS Decision Model (Slate et al. 1992), designed to identify the most appropriate aquatic mammal damage management strategies and their impacts, would be used to determine management strategies.	X	X	X	
Aquatic mammal damage management conducted on public lands would be coordinated with the management agency.	X	X		
WS employees who use rodenticides are trained to use each material and are certified to use pesticides under EPA and WDA approved certification programs.	X	X		
Rodenticide use, storage and disposal conform to label instructions and other applicable laws and regulations, and Executive Orders 12898 and 13045.	X	X		
Beaver dam removal would be done according to rules, regulations, and permits to protect environment, public, pets, wildlife, and fisheries.	X	X		
Material Safety Data Sheets for rodenticides are provided to all WS personnel involved with specific aquatic mammal damage management activities.	X	X		
<b><i>Concerns about Affects on T&amp;E Species, Species of Special Concern, and Non-target Species</i></b>				
WS consulted with the USFWS and NMFS regarding the nation-wide program and would continue to implement all applicable measures identified by the USFWS and NMFS to ensure protection of T&E species.	X	X	X	
Washington WS' kill is considered with the statewide "Total Harvest" (Washington WS take and fur harvest) when estimating the impact on wildlife species.	X	X		
Management actions would be directed toward localized populations and/or individual offending animals, dependent on the magnitude of the problem.	X	X		
Potential impacts on other T&E species in Washington have been assessed and no adverse affects are likely to occur from WS actions.	X	X		

MINIMIZATION MEASURES IMPLEMENTED FOR EACH ALTERNATIVE	ALTERNATIVES			
	1	2	3	4
WS personnel are trained and experienced to select the most appropriate method for taking targeted animals and excluding non-target species.	X	X		
<b><i>Effects of Beaver Dam Removal to Wetlands</i></b>				
WS aquatic mammal damage management activities do not affect “wetlands” as defined in Swampbuster or the CWA. Some aquatic mammal damage management activities involve removing beaver dams; wetlands would not be affected.	X	X		
Beaver dam removal does not alter the existing drainage system. Use of binary explosives to remove dams would only serve to restore existing drainage to irrigation systems. Dam removal is not necessary or conducted on mainstream rivers.	X	X		
WS would not conduct aquatic mammal damage management activities requiring a Section 404 permit without the necessary permit obtained by the project proponent. A HPA may be required for any habitat modification or construction that will use, divert, obstruct, or change the bed or flow of waters of the state.	X	X		
WS Specialists remove beaver dams in accordance with federal and state laws and regulations for environmental protection.	X	X		
Binary explosives would only be used by WS technicians trained and certified in beaver dam removal. Policies and training emphasize using the minimum amount of explosives necessary to remove the dam. This practice minimizes disturbance to adjacent habitat, prevents fill from relocating off-site, and minimizes stream born particles within the water.	X	X		
<b><i>Effects of Aquatic Mammal Damage Management Methods on Public Safety</i></b>				
WS aquatic mammal damage management methods are implemented by trained professionals. WS policies regarding use of specific methods minimize exposure of these methods to the public. Warning signs are placed where traps or snares are used to further protect public safety.	X	X		
Aquatic mammal damage management is coordinated with the public land management agency to identify areas of concern. Projects which might expose people to safety risks are modified accordingly.	X	X		
Bureau of Alcohol, Tobacco, and Firearms, US Department of Transportation, Occupational Safety Health Administration, and Agency regulations, as well as industry standards, would be followed regarding use and storage of all explosive materials.	X	X		



MINIMIZATION MEASURES IMPLEMENTED FOR EACH ALTERNATIVE	ALTERNATIVES			
	1	2	3	4
Only trained and certified explosive specialists are authorized to transport and store explosive components. WS policies regarding explosives use are mandated. Re-certification occurs every 2 years.	X	X		
Time effectiveness of method allows for timely resolution of public safety hazards posed by standing water on roadways, residential flooding, or other water related hazards.	X			
WS personnel are trained and certified in 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 Washington.	X	X		

## CHAPTER 4: ENVIRONMENTAL CONSEQUENCES

NEPA requires federal agencies to “identify and assess the reasonable alternatives to a proposed action that will avoid or minimize adverse effects of these actions upon the quality of the human environment” (40 CFR 1500.2e). Chapter 4 provides the information needed for making informed decisions for selecting the appropriate alternative for meeting the need for action and purpose of the proposed action. This chapter analyzes the environmental consequences of each alternative analyzed in detail discussed in Chapter 3 in relation to the issues identified for detailed analysis in Chapter 2.

### 4.1 ENVIRONMENTAL CONSEQUENCES

This section identifies the environmental consequences of each alternative in comparison with the proposed action to determine if the real or potential impacts are greater, less than, or the same as other alternatives.

#### 4.1.1 Cumulative and Unavoidable Impacts

Cumulative and unavoidable impacts are discussed in relationship to each of the potentially affected species analyzed in this chapter.

#### 4.1.2 Nonsignificant Impacts

The following resource values within Washington are not expected to be significantly impacted by any of the alternatives analyzed: soils, geology, minerals, flood plains, 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.

#### 4.1.4 Evaluation of Significance

Each major issue is evaluated under each alternative and the direct, indirect, and cumulative impacts were analyzed. NEPA regulations describe the elements that determine whether or not an impact is “*significant*.” Significance is dependent upon the context and intensity of the action. The following factors were used to evaluate the significance of impacts in this EA that relate to context and intensity (adapted from USDA 1997) for this proposal:

**4.1.4.1 Magnitude of the Impact (size, number, or relative amount of impact) (intensity).** Magnitude is defined in USDA (1997) as “. . . a measure of the number of animals killed in relation to their abundance” and may be determined either quantitatively or qualitatively. Quantitative analysis is used whenever possible as it is more rigorous and is based on allowable harvest levels, abundance estimates, and harvest data. Qualitative analysis is based on abundance trends and harvest data or trends and modeling. Allowable harvest levels were determined from research studies cited in USDA (1997, Table 4-2) and from the WDFW data. “*Other Harvest*” includes the known fur harvest, sport harvest, and other information obtained from the WDFW. “*Total Harvest*” is the sum of the Washington WS kill combined with the “*Other Harvest*.”

**4.1.4.2 Duration and Frequency of the Impact.** Duration and frequency of aquatic mammal damage management in Washington is highly variable. Abiotic and biotic factors affecting wildlife behavior affect the duration and frequency of aquatic mammal damage management activities conducted by WS in Washington. Aquatic mammal damage management in specific areas may be long duration projects, but

the frequency of individual operational aquatic mammal damage management projects may be highly variable depending upon spatial, temporal, and biotic factors affecting the behavior of the animals that are causing damage. Aquatic mammal damage management would only be conducted by WS when a request for assistance is received and a demonstrated need is present.

**4.1.4.3 Geographic Extent.** Aquatic mammal damage management could occur anywhere in the State of Washington where damage management has been requested, agreements for such actions are in place, and action is warranted as determined by implementing the WS Decision Model (Slate et al. 1992). Actions would be limited to areas receiving damage from aquatic mammals, areas with historical aquatic mammal damage, or areas where a threat of damage exists.

## 4.2 ISSUES ANALYZED IN DETAIL

### 4.2.1 Effects on Target Aquatic Mammal Populations.

Damage management actions that reduce damage but may also reduce a local wildlife abundance does not necessarily equate to a “significant impact,” as defined by NEPA, if the damage and abundance reduction is collectively condoned or desired by the people that live in the affected human population in accordance with state law. 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 Washington.

There are no formal abundance surveys for furbearers, or unclassified wildlife in Washington. Rather, WDFW examines trends in total harvest and catch per-unit-effort, which are collected annually using a hunter questionnaire or mandatory “Trapper’s Report of Catch” Form<sup>18</sup>. Since 2001, there has been a marked increase in the number of depredation permits requested from WDFW for aquatic species (S. Carrell, WDFW, pers. comm. 2007). Data are also collected when any of these species are in conflict with humans. For bona fide human-wildlife conflicts, the species, location, number of animals, and sex are recorded. These data are used to help assess trends in wildlife abundance and identify species distributions at the local scale and within the state. These animals typically have a high population growth rate and often experience compensatory mortality, therefore, the risk of overexploitation is low (WDFW 2003). Nonetheless, because biological data on individual species abundance are limited, harvest levels are generally managed conservatively. The analysis herein indicates aquatic mammal populations are not being adversely affected to the point of causing an abundance decline.

Commercial trapping seasons for furbearers are generally through the winter months, but action to resolve human-wildlife conflicts may occur year round. Commercial trapping pressure has been greatly reduced in recent years. Comparing 1999 (pre-trap ban) to 2005 (recent post-trap ban), there has been a 65% decrease in the number of trappers actively trapping (WDFW Online 2007). The same data sets also show a decrease in the numbers of furbearing mammals taken in 2005 by 75% when compared to 1999 data.

**4.2.1.1 Alternative 1 - Continue the Current WS Adaptive Aquatic Mammal Damage Management Program.** To adequately determine the impacts that this alternative would have on aquatic mammals, their abundance or abundance trends need to be examined. WDFW is the state agency with management responsibility for animals classified by state law as protected furbearers (RCW Title 77) and they provided statistics on abundance trends and take. Thus, WS used the best available information to analyze effects on species potentially taken by the aquatic mammal management program.

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<sup>18</sup> All trappers of fur-bearing animals are required to complete and return a trapper report of catch. Harvest is calculated directly from the reports and not expanded to include trappers that did not return a completed report ([www.wdfw.gov/huntcorn.htm](http://www.wdfw.gov/huntcorn.htm)).

**Beaver Population Impact Analysis.** Beaver abundance has been reported in terms of families per mile (mi) of stream or per square mile (mi<sup>2</sup>) of surface area for water bodies. Novak (1987) summarized North American beaver family abundance as ranging from 0.4 to 12.0 families/mi<sup>2</sup> of impoundments (lakes, ponds, and reservoirs) and between 0.50 and 2.02 families per mile of stream. Densities reported in terms of families for water bodies have been reported to range from 3.2 to 9.2 individuals/family (Novak 1987).

The range of beaver per family used for population estimates will be the low-point and highpoint as stated by Novak (1987). Using the estimated beaver density for impoundments, the beaver population would range between 1.28 and 110.4 individuals/mi<sup>2</sup> surface area of impoundments [(families/mi<sup>2</sup> x #/family), 0.40 x 3.20 = 1.28 and 12.0 x 9.2 = 110.4, respectively]. Using the estimated beaver density for streams, the beaver population would range between 1.60 and 18.58 individuals per mile of stream [(families/stream mile x #/family), 0.50 x 3.20 = 1.6 and 2.02 x 9.2 = 18.58, respectively].

Washington has 4,756 mi<sup>2</sup> surface acres of water, ranking 11<sup>th</sup> among the 50 states (<http://www.infoplease.com/ipa/A0108355.html>). A GIS database maintained by the Pacific States Marine Fisheries Commission shows that at the 1:100,000 scale level, Washington has a total of about 68,668 stream miles and 945.6 mi<sup>2</sup> (605,212 acres) of surface water in lakes, ponds and reservoirs<sup>19</sup> (V. Hare, Pacific States Marine Fisheries Commission, pers. comm. 2006 based on StreamNet's Lambert Conformal Conic projection, <http://www.streamnet.org/online-data/GISData.html>). Though much of this area provides beaver habitat, it is recognized that some of it does not and conservative calculations were used to estimate populations. With these assumptions and the above formula, the beaver population is estimated to range from 111,079 to 1,380,520<sup>20</sup>. However, to be conservative, the low population estimate will be used for this analysis.

There have been few studies of adult beaver mortality factors, but those factors that have been identified are trapping (Henry and Bookout 1969, Novak 1977, Boyce and Birkenholz 1987, Payne 1984), severe winter weather (Lyons 1979), under ice starvation and malnutrition (Aleksiuk 1968, Bergerud and Miller 1977, Payne 1984b), water fluctuations and floods (Kennelly and Lyons 1983), and falling trees (Ellarson and Hickey 1952, Hitchcock 1954). Seven to eighteen percent of the beaver found by Payne (1984) had shotgun wounds. Estimates of trapping mortality on various beaver populations were 25-70% (Henry 1966), 13-19% (Henry and Bookout 1969), 43% (Novak 1977), 20% (Boyce and Birkenholz 1987) and 13-25% (Payne 1984). The effect of predators on beaver populations is variable and dependent on the species of predator and alternate prey bases.

Yeager and Rutherford (1957) gave 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 beaver abundance can withstand harvest rates of up to 30% without declining. An allowable harvest based on the conservative estimate would be more than 31,100 beaver annually. WDFW believes that beaver populations are stable and probably increasing throughout Washington (D. Martorello, WDFW, pers. comm. 2007). Included in Table 4-1 is WS' take and the Statewide harvest, which includes sportsman and private harvest. The number of beaver taken in FY04 was the highest in any one year by the Washington WS Program. Cumulative take appears to be well below the level that would cause a decline in the overall abundance and WS' take and other take of beaver is considered to be of a low magnitude (D. Martorello, WDFW, pers. comm. 2007).

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<sup>19</sup> Note, the reservoirs along the mainstem of the Columbia River are included in the above area calculation.

<sup>20</sup> The following formula was used to determine the range of the beaver population in Washington:

(beavers/family \* # beaver families/mile of stream \* miles of streams in WA) + (beavers/family \* # beaver families/mi<sup>2</sup> of impoundments \* surface mi<sup>2</sup> in WA). Using the low (3.2 beavers/family; 1.6 families/mi stream and 0.4 families/mi<sup>2</sup> surface water) and high ranges (9.2 beavers/family; 2.02 families/mi stream and 12.0 families/mi<sup>2</sup> surface water) from Novak (1987).

**Nutria Population Information and Impact Analysis.** Nutria are non-native, invasive species that compete with native species and cause extensive vegetation damage to ecologically fragile wetlands. Section 2 of Federal Agency Duties of EO 13112 stipulates that: (a) each federal agency whose actions may affect the status of invasive species shall, to the extent practicable and permitted by law,

**Table 4-1. Analysis of Cumulative Beaver Take in Washington for FY01 – FY07.**

	FY01	FY02	FY03	FY04	FY05	FY06	FY07
<b>WS Take</b>	68	152	165	370	363	293	319
<b>Trapper Take<sup>1</sup></b>	1,150	1,470	1,414	1,715	1,505	2,626	n/a
<b>Permit Take<sup>2</sup></b>	696	1,127	1,981	1,313	1,660	1,407	1,355
<b>Impact</b>	Low	Low	Low	Low	Low	Low	Low

<sup>1</sup> Trapper take as reported by the WDFW for the 2000-2001 trapping season.

<sup>2</sup> Take is based on a calendar year basis and represents numbers taken under WDFW depredation permits.

1) identify such actions;  
 2) subject to the availability of appropriations, and within

Administration budgetary limits, use relevant programs and authorities to: (i) prevent the introduction of invasive species; (ii) detect and respond rapidly to and control populations of such species in a cost-effective and environmentally sound manner; (iii) monitor invasive species populations accurately and reliably; (iv) provide for restoration of native species and habitat conditions in ecosystems that have been invaded; (v) conduct research on invasive species and develop technologies to prevent introduction and provide for environmentally sound control of invasive species; and (vi) promote public education on invasive species and the means to address them;

3) not authorize, fund, or carry out actions that it believes are likely to cause or promote the introduction or spread of invasive species in the United States or elsewhere unless, pursuant to guidelines that it has prescribed, the agency has determined and made public its determination that the benefits of such actions clearly outweigh the potential harm caused by invasive species; and that all feasible and prudent measures to minimize risk of harm will be taken in conjunction with the actions; and

4) Federal agencies shall pursue the duties set forth in this section in consultation with the Invasive Species Council, consistent with the Invasive Species Management Plan and in cooperation with stakeholders, as appropriate, and, as approved by the Department of State, when Federal agencies are working with international organizations and foreign nations.

Table 4-2 summarizes the analysis of WS and cumulative affects on nutria. However, nutria damage management, even to the point of complete eradication, would comply with direction provided by EO 13112 and these actions would be consistent with WAC 220-12-090.

**Table 4-2. Analysis of Cumulative Nutria Take in Washington for FY01 – FY07.**

	FY01	FY02	FY03	FY04	FY05	FY06	FY07
<b>WS Take</b>	31	1	0	0	91	8	52
<b>Trapper Take</b>	687	239	351	744	n/a	n/a	n/a
<b>Permit Take<sup>1</sup></b>	534	525	539	545	485	559	380
<b>Impact</b>	Low	Low	Low	Low	Low	Low	Low

<sup>1</sup> Take is based on a calendar year and basis, represents numbers taken under WDFW depredation permits.

**Muskrat Population Information and Impact Analysis.** WDFW muskrat abundance estimates and data indicate populations are stable or increasing (D. Martorello, WDFW, pers. comm. 2007). Further, WDFW does not believe that removal of nuisance individuals will have any adverse effect on abundance. Muskrat abundance is probably much higher than the beaver population in Washington and could withstand larger harvest rates.

Smith et al. (1981) determined that muskrats could sustain an annual harvest of 74% of the fall abundance. The average annual of harvest is well within the level of take muskrat could withstand (Table 4-3) and therefore, WS concludes that it has not adversely affected muskrat abundance in Washington. WS will likely continue with about the same take rate in the foreseeable future and would not take more than a relatively few muskrats per year. However, if WS increased its take a hundred-fold under the proposed action as a result of unanticipated future projects, the overall muskrat take in Washington would still have a low magnitude of impact.

**Table 4-3. Analysis of Cumulative Muskrat Take in Washington for FY01 – FY07**

	FY01	FY02	FY03	FY04	FY05	FY06	FY07
<b>WS Take</b>	0	2	15	5	2	190	78
<b>Trapper Take<sup>1</sup></b>	453	683	452	566	527	1,111	n/a
<b>Permit Take<sup>2</sup></b>	128	47	45	70	39	70	496
<b>Impact</b>	Low	Low	Low	Low	Low	Low	Low

<sup>1</sup> Trapper take as reported by the WDFW for the 2000-2006 trapping season. 2007 data not available.  
<sup>2</sup> Take is based on a calendar year basis, represent numbers taken under WDFW depredation pe

**River Otter Population Information and Impact Analysis.**

Damage by river otters is not a major problem in Washington, but they occasionally cause serious losses by preying on fish in hatcheries or commercially produced aquaculture products.

The best information available with regard to otter abundance trends is based on WDFW biologists who believe that otter are stable or increasing in Washington (D. Martorello, WDFW, pers. comm. 2007). Melquist and Dronkert (1998) summarized studies that estimated river otter densities at about 1 per 175-262 acres in coastal marshes, and ranged from 1/1.8 to 1/3.6 miles of waterway (stream or river). WS killed between one and five river otter per year between FY00 and FY07 (Table 4-4). Private trapper harvest varied between 138 and 438 river otter from 2001-2006 fur harvest seasons according to WDFW fur harvest reports. WDFW also reported that between 12 and 60 river otter were taken under permits issued by the WDFW for depredation complaints during the same time frame (S. Carrell, WDFW, 2006 pers. comm.). Therefore, total known take was 151, 340, 392, 450, and 276 from 2001 to 2005, respectively (Table 4-4). WS take is not expected to exceed 20 individuals per year, which is less than 6% of the average sport harvest between 2003 and 2006. Therefore, based on the best information available there has been no cumulative adverse effect on Washington’s river otter abundance from WS damage management activities and WS’ actions have a low magnitude of impact.

**Table 4-4. Analysis of Cumulative River Otter Take in Washington for FY01 – FY07**

	FY01	FY02	FY03	FY04	FY05	FY06	FY07
<b>WS Take</b>	3	4	1	5	4	1	1
<b>Trapper Harvest<sup>1</sup></b>	138	315	331	438	231	366	n/a
<b>Permit Take<sup>2</sup></b>	12	21	60	17	41	78	32
<b>Impact</b>	Low	Low	Low	Low	Low	Low	Low

<sup>1</sup> Trapper take as reported by the WDFW for the 2000-2006 trapping season. 2007 data not available.  
<sup>2</sup> Take is based on a calendar year basis, represents numbers taken under WDFW depredation permits.

## Mink Population Information and Impact Analysis.

WDFW estimates abundance trends for mink as stable or increasing across the state (S. Carrell, WDFW, pers. comm. 2007). Only two mink were taken by Washington WS from FY01 through FY07, while fur harvesters reported taking between 33 and 101 (Table 4-5) during the same time period. Although Washington WS only took two mink between FY01 and FY07, a need for increased take could arise. Any potential take would likely be less than 10 damaging individuals annually; therefore the magnitude of WS' impact is determined to be low.

### 4.2.1.2 Alternative 2- Continue the Current WS Aquatic Mammal Damage Management Program,

	FY01	FY02	FY03	FY04	FY05	FY06	FY07
<b>WS Take</b>	0	0	1	1	0	0	0
<b>Trapper Take<sup>1</sup></b>	33	62	45	64	47	78	n/a
<b>Permit Take<sup>2</sup></b>	0	0	0	0	0	1	0
<b>Impact</b>	Low	Low	Low	Low	Low	Low	Low

<sup>1</sup> Trapper take as reported by the WDFW for the 2000-2006 trapping season. 2007 data not available.  
<sup>2</sup> Take is based on a calendar year basis, represents numbers taken under WDFW depredation permits.

**but Non-lethal Required Before Lethal Control.** Under this alternative, WS' impact on target aquatic mammals would probably be equal to or less than the proposed action. If nonlethal methods do not adequately resolve damages in a timely manner, requesters may take actions themselves or allow the problem to continue. This could result in less take of damaging wildlife, but could also delay WS being able to take the most appropriate action based on implementation of the WS Decision Model (Slate et al. 1992). If abundance increases because of lack of effectiveness, recruitment, or reproduction, resolving damage situations may ultimately result in taking more animals, increased costs, time, and effort. Lethal actions by WS would be restricted to situations where nonlethal management had been tried, in most cases by the requester, but also by WS, without success. For many individual damage situations, this alternative would be similar to the current program because many requesters would have tried one or more nonlethal methods, such as barriers, without success, or would have considered them and found them to be impractical for their particular situations prior to requesting WS' assistance. Therefore, it is likely that private efforts at aquatic mammal damage management would increase, leading to potentially similar cumulative impacts as analyzed in Alternative 4. For the same reasons shown in the population impacts analysis in section 4.2.1.1, it is highly unlikely that statewide aquatic mammal populations would be adversely affected by implementation of this alternative. Impacts and hypothetical risks of illegal chemical toxicant use under this alternative would be less than Alternative 3 and 4, but probably more than under Alternative 1.

### 4.2.1.3 Alternative 3 - Technical Assistance Aquatic Mammal Damage Management Program Only.

Under this alternative, WS would have no direct adverse effect on target aquatic mammal abundance. However, WDFW or another entity might provide some level of direct management assistance. Without federal supervision, private efforts to reduce or prevent damage could increase, resulting in adverse impacts to those populations if non-professionally trained individuals conduct aquatic mammal damage management. Effects and hypothetical risks of illegal control measures used under this alternative could be greater than those under Alternatives 1 and 2, but less than Alternative 4.

**4.2.1.4 Alternative 4 - No WS Aquatic Mammal Damage Management Program.** Under this alternative, WS would have no impact on target aquatic mammal species abundance in Washington. However, WDFW or another entity might provide some level of direct management assistance, but without federal supervision. Private efforts to reduce or prevent damage might increase, which could result in greater impacts on target populations. Impacts on target species under this alternative could vary relative to the proposed action, depending on the level of effort expended by WDFW and the entities

controlling damage. It is possible that frustration caused by the inability to reduce losses could lead to illegal use of methods and toxicants which could lead to greater impacts on aquatic mammals, but these would only likely affect the species in localized areas. It is possible that aquatic mammal abundance

be

**Table 4-6. Summary of Non-Target Take by WS Using Aquatic Mammal Damage Management Methods between FY98 – FY07.**

Year	FY 98	FY 99	FY 00	FY 01	FY 02	FY 03	FY 04	FY 05	FY06	FY07
Species <sup>1</sup>										
Muskrat	2	0	0	0	0	0	0	0	1	0
Beaver	0	0	0	0	0	0	0	0	4	0
Raccoon	0	0	0	0	0	0	0	0	0	3
River Otter	0	0	3	3	4	1	5	4	3	1

would more

adversely affected by implementation of this alternative.

#### 4.2.2 Effects on Non-target Species Populations, Including T&E Species

**4.2.2.1 Alternative 1 - Continue the Current WS Adaptive Aquatic Mammal Damage Management Program.** WS personnel minimize the take of non-target species<sup>21</sup> by using trapping techniques conducive to excluding non-target species (Table 4-6). No other known effects to non-target animals would occur as a result of Washington WS’ aquatic mammal damage management activities. The take of non-target species is very minimal and would have no adverse affect on the species abundance (D. Martorello, WDFW, pers. comm. 2007).

WS proposes to work in areas where there is a small possibility that the following T&E species may be adversely affected<sup>22</sup>: bull trout, chinook, sockeye, chum, and steelhead salmon. The only methods that could potentially adversely affect fish are body-gripping traps and binary explosives. Washington WS has no record of any fish being caught during aquatic mammal management. Body-gripping traps would only adversely affect adult fish (D. Bambrick, NMFS, 2007 pers. comm.) but the probability of take is low and NMFS believes that risk of direct injury or death from exposure to a trap is discountable (Letter from R. Lohn, NMFS to R. Woodruff, WS, 9 May 2008). By limiting the use of binary explosives to irrigation canals in the CBP, the possibility of encountering listed fish is greatly reduced and almost nonexistent due to the many deliberate physical barriers that exclude fish from the irrigation structures. WS consulted with USFWS and NMFS regarding the use of binary explosives and other aquatic mammal damage management activities. The USFWS and NMFS concurred that WS actions “*may effect, not likely to adversely affect*” any federal or state listed T&E species in Washington (Letter from R. Lohn, NMFS to R. Woodruff, WS, 9 May 2008 and letter from K. Berg, USFWS to R. Woodruff, WS, 26 May 2008). Washington WS will only work under a permit issued to the requester under the JARPA process, or under consult, when required, with USFWS or NMFS, or when other entities possess appropriate authority.

WS reviewed the State T&E species list and distribution on 19 June 2008 and determined that there will be “no effect” on any state T&E species.

**4.2.2.2 Alternative 2 - Continue the Current WS Aquatic Mammal Damage Management Program, but Non-lethal Required Before Lethal Control.** Under this alternative, WS’ take of non-target or T&E

<sup>21</sup> Those species listed as target species may be considered non-target take where they are not being actively targeted.

<sup>22</sup> Minimizing measures that serve to avoid adverse affects 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 affect T&E species.



species may be equal to or less than the proposed action. If nonlethal methods do not adequately resolve damages in a timely manner, requesters may take actions themselves or allow the problem to continue. This could result in less take of listed species, but could also delay WS being able to take the most appropriate action based on implementation of the WS Decision Model (Slate et al. 1992). If abundance of target species increased because of recruitment, reproduction, or lack of effectiveness, resolving damage situations may ultimately result in increased costs, time, and effort. Increases in management effort could result in greater risk to non-target or T&E species. Lethal actions by WS would be restricted to situations where nonlethal management had been tried, in most cases by the requester, but also by WS, without success. For many individual damage situations, this alternative would be similar to the current program because many requesters tried one or more nonlethal methods without success, or would have considered them and found them to be impractical for their situations prior to requesting WS' assistance. Therefore, it is likely that private efforts at aquatic mammal damage management would increase, leading to potentially similar cumulative impacts as analyzed in Alternative 4. For the same reasons shown in the population impacts analysis in section 4.2.1.1, it is highly unlikely that statewide aquatic mammal populations would be adversely affected by implementation of this alternative. Impacts and hypothetical risks of illegal chemical toxicant use under this alternative would be less than Alternative 3 and 4, but probably more than under Alternative 1.

#### **4.2.2.3 Alternative 3 - Technical Assistance Aquatic Mammal Damage Management Program Only.**

Under this alternative, WS would have no effect on non-target or T&E species. However, WDFW or another entity might provide some level of direct management assistance with aquatic mammal damage management. Without federal supervision, private efforts to reduce or prevent damage could increase, resulting in greater adverse impacts to those populations if non-professionally trained individuals conduct aquatic mammal damage management. Effects and hypothetical risks of illegal control measures used under this alternative could be greater than those under Alternatives 1 and 2, but less than Alternative 4.

#### **4.2.2.4 Alternative 4 - No WS Aquatic Mammal Damage Management Program.**

Under this alternative, WS would have no effect on non-target or T&E species. However, WDFW or another entity might provide some level of direct management assistance with aquatic mammal damage management. Without federal supervision, private efforts to reduce or prevent damage could increase, resulting in greater adverse impacts to those populations if non-professionally trained individuals conduct aquatic mammal damage management. Impacts to non-target or T&E species under this alternative could vary relative to the proposed action, depending on the level of effort expended by WDFW and the entities controlling damage. It is possible that frustration caused by the inability to reduce losses could lead to illegal use of methods and toxicants which could lead to greater risks to non-target and T&E species than the other alternatives analyzed.

### **4.2.3 Effects of Aquatic Mammal Damage Management on Public Safety**

#### **4.2.3.1 Alternative 1 Continue the Current WS Adaptive Aquatic Mammal Damage Management Program.**

Some aquatic mammal damage management methods could pose greater risks when they are not used by professionals. These include, explosives, firearms, traps, and registered pesticides.

WS Specialists who use explosives must be certified and demonstrate competence and safety in their use. They adhere to WS Directives as well as Bureau of Alcohol, Tobacco and Firearms, the Occupational Safety and Health Administration, and the U.S. Department of Transportation regulations with regards to explosives use, storage, and transportation (Appendix B). Binary explosives require two components to be mixed before they can be actuated, which eliminates the hazard of accidental detonation during storage and transportation. WS does not allow the storage or transportation of mixed binary explosives. When explosives are used, signs are placed to deter public entry. In addition to signs, WS personnel post observers to ensure no people, pets, livestock, or vehicles are present in the vicinity when explosives are

used. Where dams are near roads, police or other officials may be asked to stop traffic and public entry. Risks to employees are minimized through safety training and certification.

WS uses firearms to shoot aquatic mammals and dispatch animals captured in traps. WS personnel are certified in firearm safety and handling (WS Directive 2.615).

WS uses traps (*e.g.*, body-gripping and foothold) to capture target aquatic mammals under permits from WDFW. Traps are strategically placed to minimize exposure to the public. Signs are posted to alert the public of their presence (WS Directive 2.450).

Washington WS' aquatic damage management program would positively affect public safety by removing flood water from airports, roads, railways, utilities, homes, and commercial buildings.

Under this Alternative, Washington WS will have no adverse effect on, though may positively affect public safety (USDA 1997, Appendix P).

**4.2.3.2 Alternative 2 - Continue the Current WS Aquatic Mammal Damage Management Program, but Non-lethal Required Before Lethal Control.** Some aquatic mammal damage management methods could pose greater risks when they are not used by professionals. These include, explosives, firearms, traps, and registered pesticides.

WS Specialists who use explosives must be certified and demonstrate competence and safety in their use. They adhere to WS Directives as well as Bureau of Alcohol, Tobacco and Firearms, the Occupational Safety and Health Administration, and the U.S. Department of Transportation regulations with regards to explosives use, storage, and transportation (Appendix B). Binary explosives require two components to be mixed before they can be actuated, which eliminates the hazard of accidental detonation during storage and transportation. WS does not allow the storage or transportation of mixed binary explosives. When explosives are used, signs are placed to deter public entry. In addition to signs, WS personnel post observers to ensure no people, pets, livestock, or vehicles are present in the vicinity when explosives are used. Where dams are near roads, police or other officials may be asked to stop traffic and public entry. Risks to employees are minimized through safety training and certification.

WS uses firearms to shoot aquatic mammals and dispatch animals captured in traps. WS personnel are certified in firearm safety and handling (WS Directive 2.615).

WS uses traps (*e.g.*, body-gripping and foothold) to capture target aquatic mammals under permits from WDFW. Traps are strategically placed to minimize exposure to the public. Signs are posted to alert the public of their presence (WS Directive 2.450).

Washington WS' aquatic damage management program would positively affect public safety by removing flood water from airports, roads, railways, utilities, homes, and commercial buildings.

This Alternative would require WS to implement nonlethal methods first, which may or may not effectively resolve the problem, increasing risks to public safety. This Alternative may adversely affect public safety.

**4.2.3.3 Alternative 3 - Technical Assistance Aquatic Mammal Damage Management Program Only.** WS would have no effect on public safety under this Alternative. Risks to the public would likely increase if untrained and less experienced persons attempted complex control measures (*e.g.*, traps, toxicants, etc.). The increased risks under this Alternative would be greater than Alternatives 1 and 2, but somewhat less than under Alternative 4 because some individuals might receive TA from WS and act in accordance with safety advice given.

**4.2.3.4 Alternative 4 - No WS Aquatic Mammal Damage Management Program.** WS would have no effect on public safety under this Alternative. However, state agency and private use of aquatic mammal damage management methods could increase, which would increase risks to human safety because of lack of training and knowledge regarding the proper use of aquatic mammal damage management methods. Private trappers are not required to post signage warning the public about the presence of traps. Inadequate signage could lead to pets being captured in live and kill traps. Body-gripping traps can cause injuries to persons who try to use them without proper training. 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 adequately manage damage situations. Failure to appropriately address the situation (*e.g.*, remove dams), could result in a continued or escalated threat to public safety due to flooding, damage to structural integrity of infrastructure, or other created hazard. Public safety risks under this Alternative would likely be higher than Alternatives 1, 2, and 3.

### 4.3 ALTERNATIVE IMPACTS

Cumulative impacts are impacts to the environment that result from the incremental impact of the action when added to other past, present, and reasonably foreseeable future actions, regardless of what agency (federal or non-federal) or person undertakes such other actions (40 CFR 1508.7). Cumulative impacts may result from individually minor, but collectively significant, actions taking place over time.

Under Alternatives 1, 2 and 3, WS would, to varying extents, address damage associated with aquatic mammals throughout Washington. WS' aquatic mammal damage management program would be the primary federal program with aquatic mammal damage management responsibilities; however, some State and local government agencies may conduct aquatic mammal damage management activities. Through ongoing coordination with these agencies, WS is aware of such damage management activities and may provide TA in such efforts. WS does not normally conduct operational damage management activities concurrently with other entities in the same area, but may conduct management activities at adjacent sites within the same time frame. However, multiple commercial pest control companies may conduct aquatic mammal damage management activities in the same area. WDFW keeps records of all animals taken by WS under state trapping permits and this information is presented in the cumulative impact analysis section of this EA. Potential cumulative impacts could occur either as a result of WS' aquatic mammal damage management activities, or as a result of effects of other agencies and individuals.

#### **Cumulative Impacts on Aquatic Mammal Abundance**

As shown in Section 4.2, aquatic mammal damage management methods used or recommended by Washington WS will have no cumulative adverse effects on target, non-target, or T&E wildlife populations (Table 4-7).

#### **SUMMARY**

No significant cumulative environmental impacts were identified or are expected from implementation of the four alternatives (Table 4-7). Under the Proposed Action, the removal of aquatic mammals by WS would not have significant impacts on target species abundance in Washington, but some short-term localized reductions could occur. No risk to public safety is expected when WS' assistance is provided to requesting individuals under Alternative 1 since only trained and experienced wildlife biologists/specialists would conduct and recommend aquatic mammal damage management activities. There is a slight increased risk to public safety, potential for increased take of target species, and risk to T&E species under Alternative 2 because of delays in implementing effective lethal control methods. There is a slight increased risk to public safety when persons who reject WS TA in Alternative 3 and conduct their own damage management activities, and when no WS assistance is provided as per Alternative 4. Although some persons could be opposed to WS' participation in aquatic mammal damage

management activities in Washington, the analysis in this EA indicates that WS' adaptive IWDM program will not result in significant cumulative adverse impacts on the quality of the human environment.

<b>Table 4-7. Summary of Impacts of the Alternatives in Relation to the Issues analyzed in Detail.</b>				
	<b>Current Program</b>	<b>Nonlethal before Lethal</b>	<b>Technical Assistance</b>	<b>No Program</b>
<b>Effects on Target Aquatic Mammals</b>	Lowest of the Alternative Analyzed	Higher than alternative 1, but lower than Alternatives 3 and 4	Higher than Alternatives 1 and 2, but lower than alternative 4.	Highest of the Alternatives analyzed
<b>Effects on non-target and T&amp;E Species</b>	Lowest of the Alternative Analyzed	Impacts under this alternative would be less than Alternatives 3 and 4, but more than under Alternative 1.	Impacts under this alternative could be greater than Alternatives 1 and 2, but less than Alternative 4.	Impacts could to greater risks to non-target and T&E species than the other Alternatives analyzed.
<b>Effects on Public safety</b>	Under Alternative 1 no adverse effect but positively effect public safety by removing flood water from airports, roads, railways, utilities, homes, and commercial buildings.	This Alternative may not effectively resolve the problem, increasing risks to public safety; this Alternative may adversely affect public safety.	The increased risks under this Alternative would be greater than Alternatives 1 and 2, but somewhat less than under Alternative 4.	Public safety risks under this Alternative would likely be higher than Alternatives 1, 2, and 3.

## **CHAPTER 5:LIST OF PREPARERS AND PERSONS CONSULTED**

### **5.1 List of Preparers and Reviewers**

Bob Barnard, WDFW, Olympia, Washington  
Ken Gruver, USDA-APHIS-WS, Olympia, Washington  
David Hayes, USDA-APHIS-WS, Billings, Montana  
Donny Martorello, WDFW, Olympia, Washington  
Erica McDonald, USDA-APHIS-WS, Olympia, Washington  
Laurence Schafer, USDA-APHIS-WS, Olympia, Washington  
Roger Woodruff, USDA-APHIS-WS, Olympia, Washington

### **5.2 List of Persons and Agencies Consulted**

Dale Bambrick, NMFS, Ellensburg, Washington  
Ken Berg, USFWS, Lacey, Washington  
Sean Carrell, WDFW, Olympia, Washington  
Donna Postma, BOR, Ephrata, Washington

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## APPENDIX A AUTHORITY AND COMPLIANCE

Authority of Federal<sup>23</sup> and State Agencies to Conduct Aquatic Mammal Damage Management

**WS Legislative Authority.** USDA is directed by law and by Congress to protect American agriculture and other resources from damage associated with wildlife. The primary statutory authority for USDA is the Act of March 2, 1931 (7 U.S.C. 426-426c; 46 Stat. 1468), as amended, which provides that:

*“The Secretary of Agriculture may conduct a program of wildlife services with respect to injurious animal species and take any action the Secretary considers necessary in conducting the program. The Secretary shall administer the program in a manner consistent with all of the wildlife services authorities in effect on the day before the date of the enactment of the Agriculture, Rural Development, Food and Drug Administration, and Related Agencies Appropriations Act, 2001.”*

In 1988, Congress passed the Rural Development, Agriculture, and Related Agencies Appropriations Act which strengthened the Act of March 2, 1931 at that time (the amended Act of March 2, 1931 in 2001 superseded this Act). 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.”*

### **Washington Department of Natural Resources:**

The WDNR’s authority is based on the Forest Practices Board Rules [Washington Administrative Code (WAC) Title 222] and Revised Code of Washington (RCW) 76.09, 76.13, 77.85.

**Washington Department of Fish and Wildlife.** WDFW has the responsibility to manage all protected and classified wildlife in Washington, except federally listed T&E species, regardless of the land class on which the animals are found (RCW Title 77). WDFW is authorized to cooperate with WS for controlling nuisance and non-agriculture property damage caused by wildlife. Landowners, lessees or any other person may obtain a permit to take any wildlife species causing excessive damage to property in Washington (RCW § 77.36.030 RCW).

Furbearers and unclassified wildlife management goals are:

1) Preserve, protect, perpetuate, and manage species and their habitats to ensure healthy, productive populations, 2) Manage wildlife species for a variety of recreational, educational, and aesthetic purposes including hunting, trapping, scientific study, cultural and ceremonial uses by Native Americans, wildlife viewing, and photography, and 3) Manage statewide populations for a sustained yield.

The Washington trap ban (Voter Initiative 713) prohibits or severely restricts the use of foothold traps, body-gripping traps, snares, and poisons to manage take wildlife in the State of Washington. Exceptions include: (1) use by municipal departments of health for the purpose of protecting human health or safety; (2) use to control wild or domestic rodents, except beaver or muskrat; (3) use of nonlethal traps and snares for research, falconry, relocation, or for medical treatment; and (4) use on private property used for agricultural production by private landowners, lessees, or their employees for no more than a 30-day period and so long as the owner can present on-site evidence that ongoing damage to livestock or crops has not been alleviated by the use of nonlethal control methods which have not been prohibited.

**Washington Department of Transportation.** Authorized by RCW §47.01.011, WSDOT is authorized to administer programs “relating to the safety of the state’s transportation system” (RCW §47.01.012).

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<sup>23</sup> Detailed discussions of WS legal responsibilities and key legislation pertinent to wildlife damage management are found in USDA (1997).

**Washington Department of Agriculture.** RCW §17.34 discusses WDA’s responsibilities regarding depredating pests and rodent control. RCW §16.36.100 authorizes WDA to enter into agreements with WS for the purpose of cooperating in the management of damage caused by coyotes, wolves, mountain lions, bobcats, and other depredating animals. It also allows WDA to enter into agreements with other entities to conduct aquatic mammal damage management. This document establishes a cooperative relationship between WS and WDA, outlines responsibilities, and sets forth objectives and goals of each agency to for resolving wildlife damage in Washington. RCW 17.21 outlines the procedure used by WDA for licensing individuals to apply registered pesticides in the State of Washington.

**Washington Department of Public Health (WDPH).** Under Washington Voter Initiative 713, WDPH can issue a permits to use restricted methods to for the protection of human health and safety, including methods for issues involving aquatic rodents.

**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 (16 U.S.C. 1531-1543, 87 Stat. 884).

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

**U.S. Bureau of Reclamation.** Under 33CFR 208.10 (b), the BOR is mandated to “exterminate burrowing animals” for the protection of levee integrity and “repair of damage caused by erosion or other forces”.

**U.S. Environmental Protection Agency (EPA).** EPA is responsible for administering and enforcing the Section 404 program of the Clean Water Act with the USACE; Section 404 established a permit program for the review and approval of water quality standards that affect wetlands.

**1.7.2 Compliance with Federal Laws.** Several federal laws regulate WS and aquatic mammal damage management. WS complies with these laws, and consults and cooperates with other agencies as appropriate.

**National Environmental Policy Act (NEPA).** All federal actions are subject to NEPA (Public Law 91-190, 42 U.S.C. 4321 et seq.). NEPA sets forth the requirement for all major federal actions to be evaluated in terms of their potential significant impact on the quality of the human and natural environment for the purpose of avoiding or, where possible, minimizing significant adverse impacts. NEPA established the CEQ to oversee the federal government’s responsibilities. Federal activities affecting the physical and biological environment are regulated in part by CEQ through regulations in Title 40 CFR, Parts 1500-1508. Each agency, such as APHIS, develops its own guidelines to comply with NEPA requirements. In accordance with CEQ and USDA regulations, APHIS Guidelines Concerning Implementation of NEPA Procedures, as published in the Federal Register (44CFR 50381-50384) provide guidance to APHIS and WS regarding the NEPA process. WS follows the CEQ regulations implementing NEPA (40 CFR 1500 et seq.), USDA (7 CFR 1b), and the APHIS Implementing Guidelines (7 CFR 372) as a part of the decision-making process. These laws, regulations, and guidelines generally outline five broad types of activities that need to be accomplished as part of any project: scoping, analysis, documentation, implementation, and monitoring.

This EA for aquatic mammal damage management, with WS as the lead agency, is the first time that all land classes in Washington under *Cooperative Agreements* or *Agreements for Control* will be analyzed in Washington 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 willould be reviewed, and if necessary, further analysis will be conducted to comply with NEPAthe agency requesting the assistance would be responsible for NEPA compliance.

**Endangered Species Act (ESA).** It is WS and federal policy, under ESA, that all federal agencies shall seek to conserve T&E species and shall utilize their authorities in furtherance of the purposes of the ESA (Sec.2(c)). WS conducts

consultations with the USFWS and NMFS, 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 and NMFS describing potential effects on T&E species and prescribing reasonable and prudent measures to avoid jeopardy (USDA 1997, Appendix F). Washington WS has conducted an informal consultation with USFWS and NMFS for the proposed aquatic mammal damage management program specifically concerning the T&E species in Washington (Appendices C). Both agencies concurred with WS' species determinations made in the Biological Assessment submitted to the agencies (Letters from K. Berg and D. Lohn dated March 26 and May 9, 2008, respectively).

**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 USACE unless the specific activity is exempted in 33 CFR 323 or covered by a NWP in 33 CFR 330. The removal of most beaver dams are covered by these regulations (33 CFR 323 and 330). However, a 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 Public Law 101-624), and 1996 (as amended by Public Law 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. The NRCS is responsible for certifying wetland determinations according to this Act.

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

**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.

**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.

## **Executive Orders (EO)**

**Invasive Species EO 13112** - Authorized by President Clinton, EO 13112 establishes guidance to federal agencies to prevent the introduction of invasive species and provide for their control and to minimize the economic, ecological, and human health impacts that invasive species cause. The EO, in part, states that each federal agency whose actions may affect the status of invasive species shall, to the extent practicable and permitted by law; 1) reduce invasion of exotic species and the associated damages, 2) monitor invasive species populations, provide for restoration of native species and habitats, 3) conduct research on invasive species and develop technologies to prevent introduction, and 4) provide for environmentally sound control, promote public education on invasive species.

Nutria are non-native, invasive species that compete with native species. Section 2 of the EO states federal agency duties are: (a) Each federal agency whose actions may affect the status of invasive species shall, to the extent practicable and permitted by law,

- 1) *identify such actions;*
- 2) *subject to the availability of appropriations, and within Administration budgetary limits, use relevant programs and authorities to: (i) prevent the introduction of invasive species; (ii) detect and respond rapidly to and control populations of such species in a cost-effective and environmentally sound manner; (iii) monitor invasive species populations accurately and reliably; (iv) provide for restoration of native species and habitat conditions in ecosystems that have been invaded; (v) conduct research on invasive species and develop technologies to prevent introduction and provide for environmentally sound control of invasive species; and (vi) promote public education on invasive species and the means to address them;*
- 3) *not authorize, fund, or carry out actions that it believes are likely to cause or promote the introduction or spread of invasive species in the United States or elsewhere unless, pursuant to guidelines that it has prescribed, the agency has determined and made public its determination that the benefits of such actions clearly outweigh the potential harm caused by invasive species; and that all feasible and prudent measures to minimize risk of harm will be taken in conjunction with the actions.*
- 4) *Federal agencies shall pursue the duties set forth in this section in consultation with the Invasive Species Council, consistent with the Invasive Species Management Plan and in cooperation with stakeholders, as appropriate, and, as approved by the Department of State, when federal agencies are working with international organizations and foreign nations.*

In addition, relocation would be illegal under Washington statute because nutria are classified as a prohibited aquatic animal species (WAC §232-12-064 and 220-12-090). Any decisions to relocate of nutria would be coordinated with WDFW officials.

The EO also established an Invasive Species Council (Council) whose members include the Secretary of State, the Secretary of the Treasury, the Secretary of Defense, the Secretary of the Interior, the Secretary of Agriculture, the Secretary of Commerce, the Secretary of Transportation, and the Administrator of the EPA. The Council shall be Co-Chaired by the Secretary of the Interior, the Secretary of Agriculture, and the Secretary of Commerce. The Council oversees: 1) the implementation of this order, 2) that federal agencies activities concerning invasive species are coordinated, complementary, cost-efficient, and effective, 3) the development of recommendations for international cooperation in addressing invasive species, 4) develop, in consultation with the CEQ, guidance to federal agencies, 5) facilitate development of a coordinated network among federal agencies to document, evaluate, and monitor impacts from invasive species on the economy, the environment, and human health, 6) facilitate establishment of a coordinated, up-to-date information-sharing system that utilizes, and 7) prepare and issue a national Invasive Species Management Plan.

**Environmental Justice and EO 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. EO 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 EO 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 EO 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), WDA, by MOUs with federal land managing agencies, and by WS 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 1997, 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.

**Protection of Children from Environmental Health and Safety Risks (EO 13045).** Children may suffer disproportionately from environmental health and safety risks for many reasons, including their development, and physical

and mental status. Because WS makes it a high priority to identify and assess environmental health and safety risks that may disproportionately affect children, WS has considered the impacts that this proposal might have on children. The proposed aquatic mammal damage management program would occur by using only legally available and approved methods where it is highly unlikely that children would be adversely affected. For these reasons, WS concludes that it would not create an environmental health or safety risk to children from implementing this proposed action.



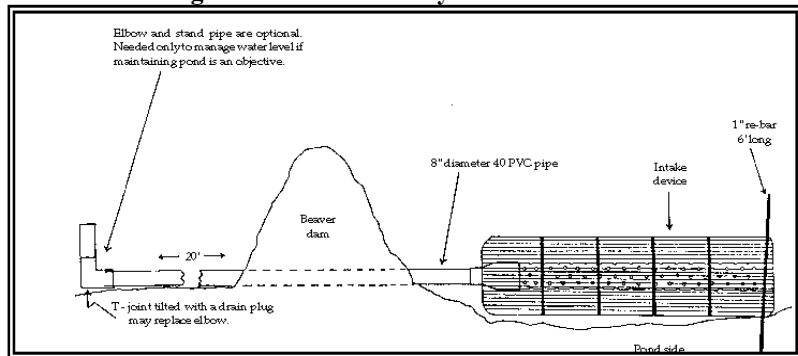
## APPENDIX B

### Methods used or recommended by Washington WS for

#### Aquatic Mammal Damage Management

Resource owners and government agencies used a variety of methods/techniques to reduce wildlife damage (USDA 1997, Appendix P). However, all non-lethal and methods developed to date have limitations on costs, logistics, selectivity and effectiveness. Below is a discussion of aquatic mammal damage management methods which could be recommended or by the Washington WS Program. The methods/techniques are grouped in two major categories: 1) Mechanical Methods, and 2) Chemical Methods. Each category is then subdivided in to two groups: 1) Non-lethal and 2) Lethal Methods.

Figure B-1. Clemson Pond Leveler used to Control Water Level and Prevent Flooding from Beaver Activity.



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### MECHANICAL METHODS

#### NON-LETHAL

**Habitat Management** for the reduction of damage refers to vegetation and/or environmental manipulation to reduce the carrying capacity or attraction.

**Beaver.** Habitat alteration through forest type conversion might be the most effective long-term method of reducing beaver density in some areas (Payne 1989). Forest management practices that discourage the establishment of aspen and promote long-lived hardwoods and conifers within 200-400 feet of streams may reduce beaver abundance on those streams. However, Payne (1989) suggested that reduced food availability might force beaver colonies to move more often, possibly increasing nuisance complaints.

Physical factors may have a greater impact on beaver habitat use than food availability, and habitat alteration may however have little effect on beaver populations (Beier and Barrett 1987). Habitat management to reduce or stabilize beaver abundance have been a component of beaver management recommendations. Habitat management may also involve manipulating beaver impoundment water levels to reduce damage or conflict caused by flooding. Impoundments can be completely drained by removing dams with binary explosives. Water levels may sometimes also be lowered by use of a drain tube or pond leveler placed in the dam. However, application of this strategy has been virtually non-existent. Habitat management to reduce beaver populations has the greatest potential for application on federal, state, and county forest lands. At present, there appears to be no large-scale and consistent programs dealing with this beaver damage management strategy.

**Pond Levelers** have been used for many years in many different states, with varying degrees of success. Various types of beaver pond levelers have been described (Arner 1964, Laramie and Knowles 1985, Roblee 1984) and installation of beaver pond levelers can be effective in reducing flooding in certain situations (MDNR 1994, Miller and Yarrow 1994). 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) (Figure B-1) can sometimes be used to regulate water levels in beaver ponds. Installation of flow control devices generally requires an HPA permit from WDFW.

**Muskrat.** The best ways to reduce habitat for muskrats are to eliminate aquatic or other suitable foods eaten by muskrats, and where possible, to construct pond dams which prevent muskrats from burrowing into the dams by drawing the water down in winter or using and filling the burrows with rip-rap. Habitat alterations to reduce cattail wetlands could reduce the density of muskrats. This type of management practice would be conducted by entities other than WS.

**Exclusion** involves physically preventing animals from gaining access to protected resources by constructing a fence or

erecting other barriers. Exclusion has been used to prevent beaver from plugging road culverts when a metal screen, grate, or fencing is secured in front of the opening. Construction of concrete spillways may reduce or prevent damage to dams caused by burrowing aquatic mammal species. Rip-rap (small to medium sized rocks) can also be used on dams or levies at times, especially to deter rodent burrowing. Electrical barriers have proven effective in limited situations for rodents; 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 animals beaver will avoid the area even if the electrical field is discontinued (Kolz and Johnson 1997).

Protecting ornamental, landscape, or fruit trees or other plants from rodent damage can sometimes be accomplished by using hardware cloth, similar screening, chicken wire, chain link fencing (or other materials) or grit paint. These methods are used most frequently by property and home owners. They are rarely, if ever, used to prevent large-scale timber or forest damage due to the high material cost and labor required to wrap hundreds or thousands of trees in a managed forest. A variety of road culvert screens or fences have been used by county and local highway departments. In most cases the screens do not solve a damage problem, as workforce is still required to remove beaver dam materials from the screen or fence itself. The main benefit of this technique is to prevent beaver dam materials from being deposited inside the culvert.

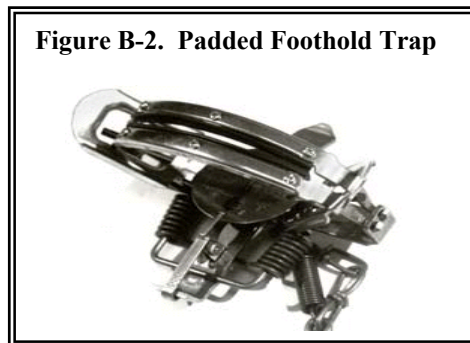
**Abrasives** are materials that discourage, reduce or prevent gnawing behavior. Abrasives produce an unpalatable surface which irritates the teeth and mouth when the animal attempts to gnaw or chew on the surface. Flexible materials, such as sandpaper, grinder pads and fine-mesh stainless steel screening can be placed on or over objects (electrical wiring, plastic piping, fruit trees, etc) that are susceptible to gnawing. Fine sand can be mixed with paint, glue or other suitable liquid adherents to formulate a paste or heavy mixture that can be brushed-on or applied to a surface to discourage gnawing. This method has had limited success when applied or painted to tree trunks to discourage beaver from cutting down trees. Results of applying a textural repellent (sand mixed in paint) by WS' NWRC (Nolte et al. 2003) suggests that this method may be more applicable for large diameter trees. However, additional research is needed to fully evaluate the efficacy and practicality of abrasives.

**Cultural Practices** are similar to habitat/environmental manipulation, but differ in that the manipulation is directed towards domestic plants/crops and stored foods/grains. Selecting and planting crops that are less susceptible to damage or modifying planting schedules during low populations can sometimes help lessen potential damage. Establishing food plots exclusively or providing supplemental food, mineral, or nutritional needs may help individual growers who suffer significant damage. However cultural practices are sometimes expensive, require considerable time and planning to implement, and may attract other unwanted species to the area. Cultural practices are normally implemented by the requester through recommendations from WS.

**Traps** can be used as a non-lethal or lethal capture device, the style or manufacturer of the device, placement, how is set adjustments. Commonly used devices include foothold (Figure type traps, and snares. These devices are usually implemented personnel because of the technical training and skill required to devices. A formal risk assessment of all trap and snare devices program in Washington can be found in USDA (1997,

**Cage Traps** can be used to capture animals alive for relocation. rarely, if ever, used to solve problems caused by animals in because these species are abundant; in addition, moving damage-causing individuals to other locations would typically just result in damage at the new location or the translocated individuals moving from the relocation site to areas where they were 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 small mammals (CDC 1990). Although relocation is not necessarily precluded in all cases, it would in many cases be logistically impractical and biologically unwise in Washington.

**Hancock Traps** are designed to live-capture beaver for relocation or later disposition. The trap is constructed of a metal frame that is hinged with springs attached and covered with chain-link fence. The trap's appearance is similar to a large clam when closed. When set, the trap is opened to allow an animal to enter the *clam shells*, when tripped the *clam shells* close around the animal. One advantage of using the Hancock trap is the ease of release of target or non-target animals.



**Figure B-2. Padded Foothold Trap**

depending on and mechanical B-2) and cage-by WS use such used by the WS Appendix P).

This method is Washington

Disadvantages are that the trap weighs about 25 pounds and is relatively bulky to carry and maneuver. It also presents more risk to the user than snares or foothold traps.

**Foothold Traps** (Figure B-2) can be effectively used to capture a variety of mammals. Despite the numerous damage management methods developed, trapping remains one of the most effective methods of removing beaver (Hill 1976, Hill et al. 1977, Wigley 1981) nutria, otter and muskrats from specific damage areas. Intensive trapping can eliminate or greatly reduce the populations in limited areas (Hill 1976, Forbus and Allen 1981).

Foothold traps are typically placed next to, or in some situations, in travel ways or trails being actively used by the target species. Placement of traps is contingent upon the habits of the respective target species, habitat conditions, and presence of non-target animals. Effective trap placement and use of appropriate lures and placement by trained WS personnel also contributes greatly to the Foothold trap's selectivity. Foothold traps can be set in a manner that produces death to the captured animal by incorporating a drowning rig to a trap or by purposely catching a small rodent by the body, head or neck. The use of Foothold traps requires more workforce than some methods, but they are indispensable in resolving many damage problems.

**Beaver Dam Removal** involves the removal of debris deposited by beaver that impedes the flow of water and 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. The impoundments that WS removes are generally from recent beaver activity that have not had enough time to take on the qualities of a true wetland (*i.e.*, hydric soils, aquatic vegetation, preexisting function). Unwanted beaver dams can be removed in many ways. Explosives are used only by WS personnel specially trained and certified to conduct such activities, and only binary explosives (see CHEMICAL METHODS) 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). Because beaver dams involve waters of the United States, removal is regulated under Section 404 of the CWA. The use of binary explosives, in situations outside of irrigation ditches, may trigger JARPA requirements and require the landowner/manager to get a permit. Irrigation ditches in the CBP are artificial waterways and therefore not "waters of the state". However, several activities are covered under NWP which will be discussed below.

Beaver dam removal 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. 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. The Tulloch Rule Decision (Court Case No. 93cv01754) determined that incidental fallback did not trigger Section 404. It was not determined if beaver dams fit into this category, but the EPA and the USACE issued guidance to their regulatory offices that beaver dam removal may not require permits under Section 404 (Wayland and Shaeffer 1997). However, most beaver dam removal operations in Washington, if considered discharge, are covered under 33 CFR 323 or 330 and USACE (1996) and do not require a permit. A permit would be required if the beaver dam was considered a true wetland. WS personnel survey the site and determine the apparent age of the dam by conditions such as aquatic plants. If the area has been flooded for more than 5 years or appears to be a wetland, the landowner is required to obtain a Section 404 and possibly an HPA permit before removing any dams and releasing water.

In areas outside of the CBP, beaver dams may be removed by hand where HPA permits are in place for such activity. Land owners requesting assistance that do not already have an HPA permit for work in waterways will be referred to the JARPA permitting process before WS conducts any damage management actions.

**USACE Guidelines for Washington WS.** In addition to the above CFRs and exemptions, Washington WS consulted with the USACE, Walla Walla District Office, Regulatory Branch to request written guidelines for removal of beaver dams in Washington. The below Guidance was provided by the USACE, Chief, of the Regulatory Branch on September 16, 1996 (USACE 1996).

1. The following guidance applies only to the regulation for the removal of beaver dams in the State of Washington by the Walla Walla District, USACE under the authority of Section 404 of the Clean Water Act.
2. In the August 25, 1993 Federal Register, the USACE amended permit regulations defining discharges of dredged material. Under these amendments, commonly referred to as the "Excavation Rule," the definition of the phrase "discharge of dredged material" was revised to include mechanized land clearing, ditching, channelization, or other excavation

activities which destroy or degrade waters of the United States.

3. The removal of beaver dams normally involves the incidental discharge of dredged material. Soil and debris imbedded in the dam to seal and solidify the structure are released downstream into the waterway. In addition, organic matter and soil which has accumulated in the pond upstream of the dam are released downstream. Furthermore, aquatic habitats including wetlands upstream of the dam are dewatered and lost.
4. The removal of beaver dams is normally considered to be an excavation activity which will destroy or degrade waters of the United States. Therefore, this activity is normally subject to regulation under Section 404 of the Clean Water Act and requires a Department of the Army permit.
5. Under the following circumstances, the removal of beaver dams will normally be considered to be an excavation activity which will not destroy or degrade waters of the United States. Therefore, under these circumstances, this activity will normally not be regulated and does not require a Department of the Army permit. However, we reserve the right to require a Department of the Army permit for the removal of a beaver dam on a case- by- case basis if we determine that the activity will destroy or degrade waters of the United States.
  - a. Recently constructed beaver dams (less than 1 year old). The removal of recently constructed beaver dams is normally considered to be an excavation activity which does not destroy or degrade waters of the United States and is not normally regulated. This is based on the observation that recently constructed beaver dams have not had sufficient time to trap much soil in the structure, to accumulate organic matter and soil in the pond, nor to develop important and valuable aquatic habitats upstream of the dam.
  - b. Beaver dams located on man-made irrigation delivery and return canals constructed in uplands. These waterways are not considered to be waters of the United States if constructed in uplands. A permit is not required to remove beaver dams located in these waterways. This does not include waterways which have been modified and/or relocated to carry both natural streamflows and irrigation water.
  - c. Beaver dams located on natural waterways in the immediate vicinity (generally within 100 feet) of an authorized irrigation diversion structure which are adversely affecting the operation of that structure. This activity is considered exempt from permit regulations under 33 CFR 323.4(a) (3) as the maintenance of structures appurtenant and functionally related to irrigation ditches.

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 NWP's provide for the removal of the majority of beaver dams that Washington WS 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 NWP's is important for the efficient and effective resolution of many beaver damage problems because damage can escalate rapidly the longer an area remains flooded.

NWP are allowed except in any component of the National Wild and Scenic River System such as the headwaters of the Snake River. Beaver dam removal by WS otherwise complies with all other conditions and restrictions placed on NWP.

## **LETHAL METHODS**

These methods involve damage management activities specifically designed to lethally remove certain aquatic mammals to a level that stabilizes, reduces, or eliminates damage. The level of management necessary to achieve a reduction of damage varies according to the resource protected, habitat, abundance, the effectiveness of other damage management strategies, and other ecological factors. Specific methods of lethal population reduction involve removing aquatic mammals with conibear traps, and traps, neck snares, and shooting. These specific methods are further described in USDA (1997, Appendix J).

**Shooting** is selective for target species and may involve the use of spotlights and either a shotgun or rifle. Shooting is an effective method to remove small numbers of individuals in damage situations, especially where trapping is not feasible. Removal of specific animals in the problem area can sometimes provide immediate relief from a problem. Shooting may be utilized as one of the first lethal damage management options because it offers the potential of solving a problem more

quickly and selectively than some other methods, but it does not always work. Shooting may sometimes be one of the only damage management options available if other factors preclude setting of damage management equipment. WS personnel receive firearms safety training to use firearms while performing their duties (WS Directive 2.615). To ensure safe use and awareness, WS employees who use firearms to conduct official duties are required to attend an approved firearms safety and use training program within 3 months of their appointment and a refresher course every 2 years afterwards (WS Directive 2.615). WS personnel, carry firearms as a condition of employment, are required to sign a form certifying that they meet the criteria as stated in the *Lautenberg Amendment* which prohibits firearm possession by anyone who has been convicted of a misdemeanor crime of domestic violence.

**Sport Hunting and Trapping** is sometimes recommended by WS as a viable damage management method when the target species can be legally hunted or harvested if it can be conducted safely for its fur value. valid hunting or trapping license, or other licenses or permits may be required by the WDFW. Permission from the property-owner/manager to trespass on private property may also be required. This method provides sport and sometimes food for hunters and a valuable fur resource that can be marketed by trappers. This method requires no cost to the landowner. Sport harvest is occasionally recommended if it can be conducted safely.

**Snares** are capture devices comprised of a  $\frac{3}{64}$ th to  $\frac{3}{32}$ nd inch diameter cable formed in a loop with an attached locking device that are placed in the travel ways of aquatic mammals and can be used as non-lethal or lethal capture devices, depending on the placement and how it is set (USDA 1997, Appendix P). Smaller diameter cable is used for muskrats whereas beavers, nutria and otter require larger diameter cable. Most snares are equipped with a swivel to minimize cable twisting and breakage. Snares are set in a manner that produces death to the captured animal by 1) incorporating a drowning rig to the snare, 2) placing a “kill pole” near the set a snare, or 3) purposely catching the animal by the neck or thoracic cavity. They are easier than foothold traps to keep operational during periods of inclement weather.

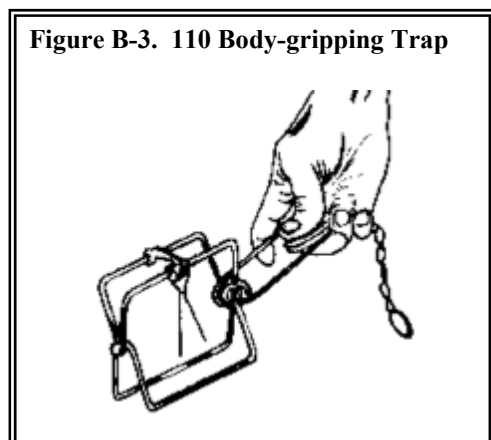
**Body-gripping/Quick-kill Traps** and other kill-style traps are designed to cause the quick death of the animal that activates the trap. When set in water they can be placed either submerged, partly submerged, or above water. Placement is in travel ways or at lodge or burrow entrances created or used by the target species with the animal captured as it travels through the trap and activates the triggering mechanism. Use pattern data indicate that the conibear is used throughout the year, but greatest use is during the spring, summer and fall months. Safety hazards and risks to humans are usually related to setting, placing, checking, or removing the traps. Conibear traps (Figure B-3.) represent a minor risk to non-target animals because of the placement in aquatic habitats and below the water surface.

## **CHEMICAL METHODS**

All chemicals used by Washington WS are used in accordance with their registrations and WS policy. All WS field personnel in Washington who apply restricted-use rodenticides are certified as restricted-use pesticide applicators by the WDA. No chemicals are used on public or private lands without authorization from the land management agency or property owner/manager. A quantitative risk assessment evaluating potential impacts of WS’ use of chemical methods when used according to the label concluded that no adverse effects are expected from the above (USDA 1997, Appendix P). The chemical methods used and/or currently authorized for use in Washington are:

## **NON-LETHAL**

**Repellents** are non-lethal chemical formulations used to discourage or disrupt particular behaviors. There are three main types of chemical repellents: olfactory, taste, and tactile. Olfactory repellents must be inhaled to be effective. These are normally liquids, gases or granules, and require application to areas or surfaces needing protecting. Taste repellents are compounds (liquids, dusts, granules) that are normally applied to trees, shrubs and other materials that are likely to be ingested or gnawed by the target species. Tactile repellents are normally thick, liquid-based substances which are applied to areas or surfaces to discourage travel by irritating the feet or making the area undesirable for travel. Most repellents are ineffective or are short-lived in reducing or eliminating damage caused by aquatic mammals, therefore, are not used very often by WS.



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**Binary Explosives** are defined as any chemical mixture, compound or device which serves as blasting agents and detonators. WS uses binary explosives to remove beaver dams after beaver have been removed or moved from a damage situation. The binary explosives consist of ammonium nitrate and nitromethane, and are not technically classified as explosives until they are mixed, therefore, are subject to fewer regulations and controls. However, once mixed, binary explosives are considered high explosives and subject to all applicable federal requirements. Detonating cord and blasting caps that are used with binary explosives, are considered explosives and WS must adhere to all applicable state and federal regulations for storage and handling. 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. Re-certification is required every 2-years and Specialists must pass competency evaluations/exams administered by WS' Explosives Training Officers (WS Directive 2.435). All blasting activities are conducted by well trained, certified blasters and supervised by professional wildlife biologists. 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 transportation and storage regulations from state and federal agencies such as Occupational Safety and Health Administration, Alcohol Tobacco and Firearms, U.S. Department of Transportation and Washington Department of Transportation.

## **LETHAL**

**Grain/Vegetable Bait Rodenticides** are a group of chemical rodenticides that normally require the target animal to ingest the pesticide. To encourage ingestion, pesticides are introduced to the aquatic mammals in baits or foods that are attractive to the rodent.

**Zinc Phosphide** was first used as a rodenticide by Italy in 1911. Extensive use of zinc phosphide in the United States did not occur until 1942, when the availability of strychnine became uncertain due to World War II. Zinc phosphide is a heavy, finely ground gray-black powder that is practically insoluble in water and alcohol. When exposed to moisture, it decomposes slowly and releases phosphine gas (PH<sub>3</sub>). Zinc phosphide concentrate is a stable material when kept dry and hermetically sealed. Although zinc phosphide baits have a strong, pungent, phosphorous-like odor (garlic like), this characteristic seems to attract rodents, particularly rats, and apparently makes the bait unattractive to some other animals. For many uses of zinc phosphide formulated on grain or grain-based baits, prebaiting is recommended or necessary for achieving good bait acceptance (Timm 1994). In general, zinc phosphide is less toxic than Compound 1080 or strychnine and is slower-acting than either of these compounds. In soil, zinc phosphide breaks down rapidly to PH<sub>3</sub>, which is either released into the atmosphere or converted to phosphates and zinc complexes. The use of zinc phosphide on various types of fruit, vegetable or cereal baits (apples, carrots, sweet potatoes, oats, barley) has proven to be effective at suppressing a local population. Specific bait applications are designed to minimize non-target hazards (Evans 1970). Zinc phosphide presents minimal secondary hazard to predators and scavengers, and is an emetic, so meat-eating animals such as mink, dogs, cats and raptors regurgitate rodents that are killed with zinc phosphide with little or no effect.

Zinc phosphide poses little threat to listed salmonid populations for many reasons. First, the rate at which WS applies zinc phosphide results in concentration substantially less than the 0.5mg/L recognized as the LD<sub>50</sub> for cold water fish and does not exceed the EPA's level of concern quotient for endangered species. Second, when zinc phosphide comes in contact with water, it dissolves, releasing phosphine gas into the water and not into the GI tract of any animal. Third, bait treated with zinc phosphide is placed on rafts out of that water, per label instructions, making it highly unlikely that fish the bait would be exposed to the bait or zinc phosphide available to fish at all. Carrots are generally used as bait, again, further reducing the attraction of salmon or trout. Fourth, zinc phosphide is registered for muskrats and nutria, who generally reside in warmer, slow moving waters not associated with salmon use or desirable habitat. This reduces the potential to affect listed species even further. For further application information, see USDA (1997) to view the EPA label.

**Chemical Euthanasia** are products available and/or approved for use on certain wildlife. WS personnel who utilize chemical euthanasia drugs/products are in compliance with all applicable laws and regulations (WS Directive 2.430), including state certification requirements. No chemicals are used on public or private lands without authorization from the land management agency or property owner/manager.

**Carbon dioxide (CO<sub>2</sub>)** is sometimes used to euthanize individual rodents which are captured in live traps and when

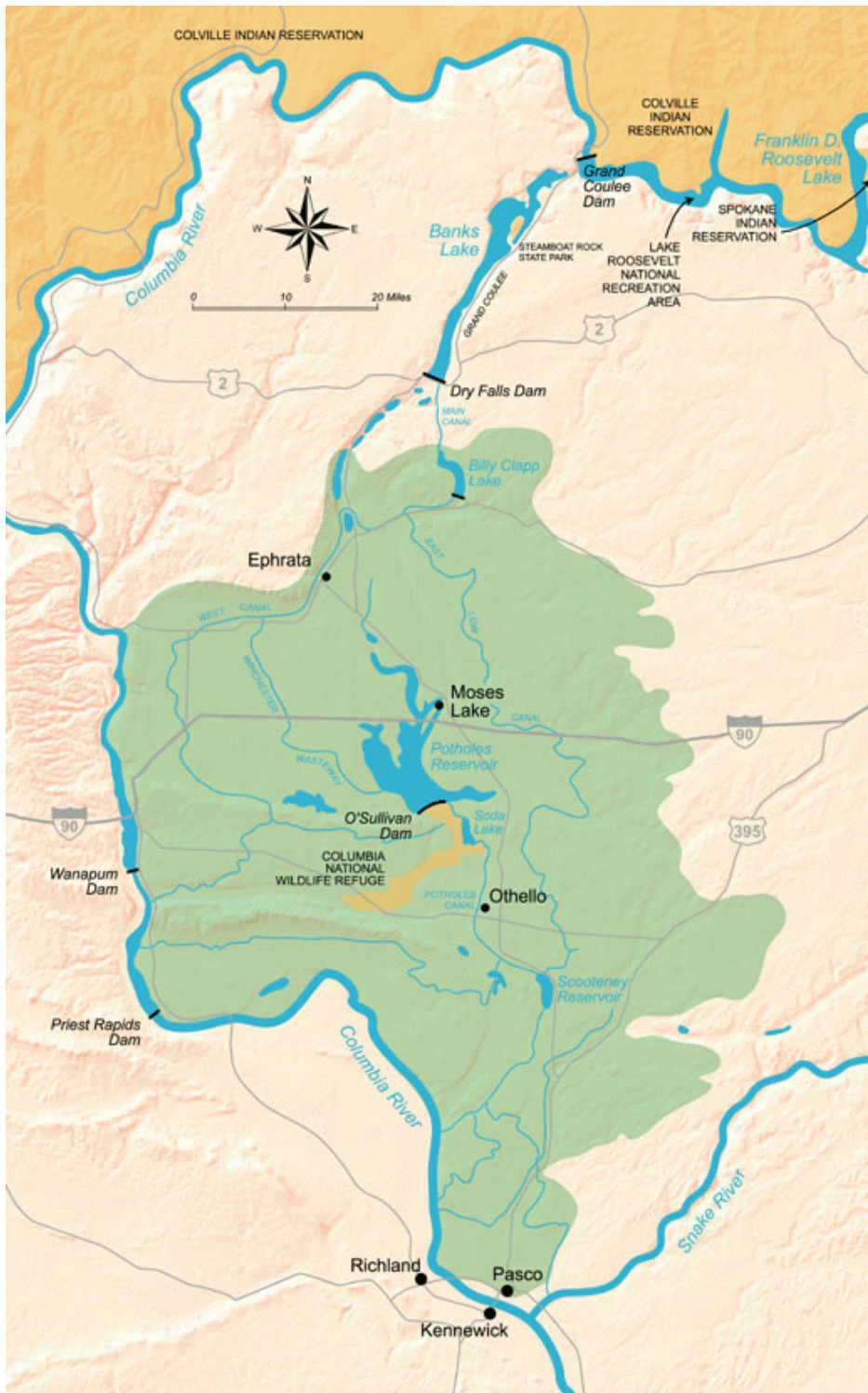
relocation is not a feasible option. Live rodents are placed in a container such as a plastic 5-gallon bucket or chamber and sealed shut. CO<sub>2</sub> gas is released into the bucket or chamber and the rodent quickly dies after inhaling the gas. Normally, only the larger species of rodents, such as yellow-bellied marmots and fox squirrels are euthanized with CO<sub>2</sub>.

**Potassium Chloride** is a common laboratory chemical and is used by WS personnel as a euthanizing agent (WS Directive 2.430). Potassium chloride may cause respiratory arrest before unconsciousness; therefore it should only be used with heavily sedated or anesthetized rodents. Potassium chloride is a powder that must first be reconstituted with water. The solution is administered by intravenous or intracardiac injection.

**Sodium Pentobarbital** is a barbiturate that rapidly depresses the central nervous system to the point of respiratory arrest. Intravenous injection is the most rapid, reliable, and desirable euthanasia technique; however intraperitoneal injection may be used when it would cause less distress than intravenous injection (WS Directive 2.430, AVMA 1993).

# APPENDIX C

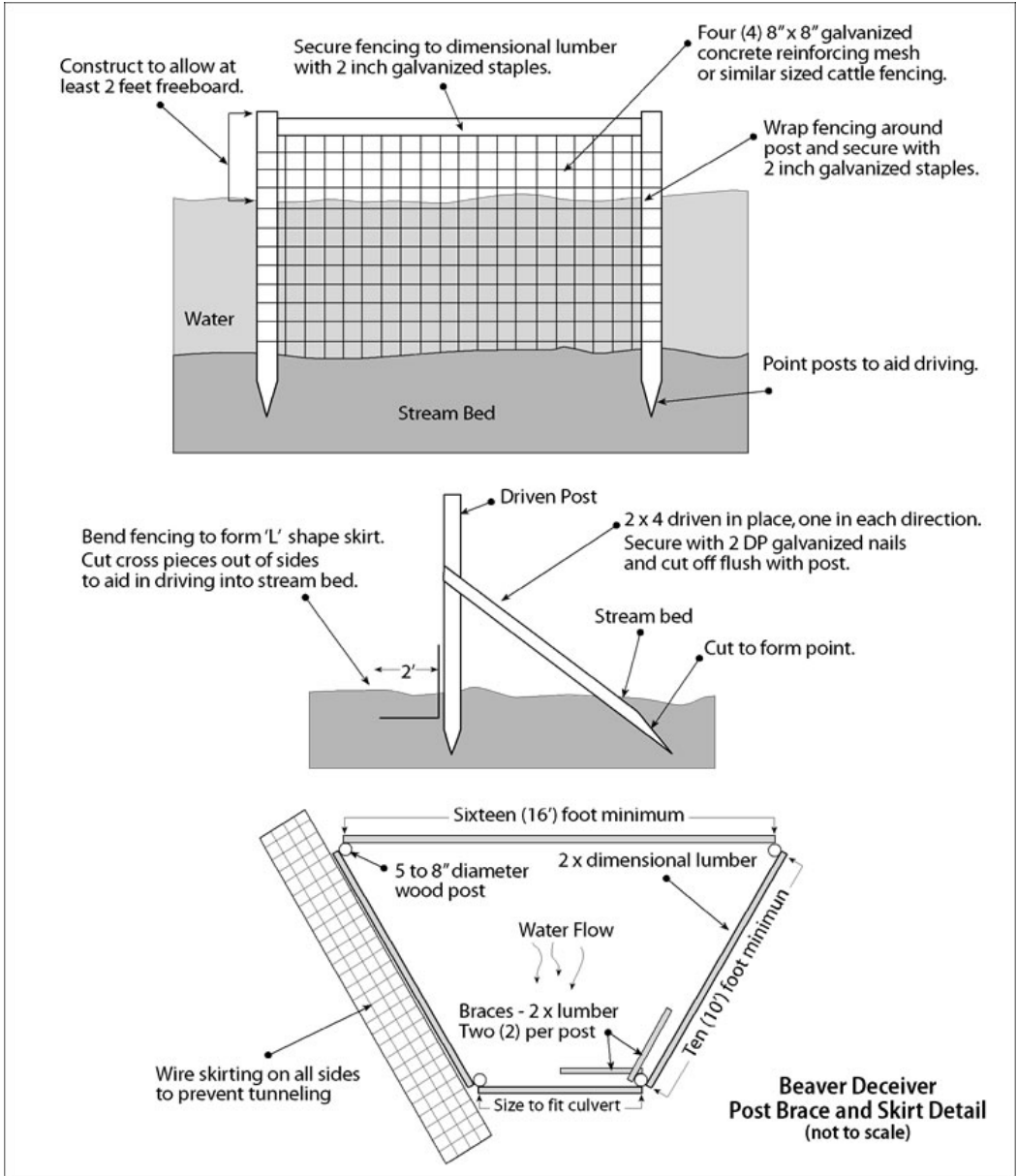
## Map of the Columbia Basin Project

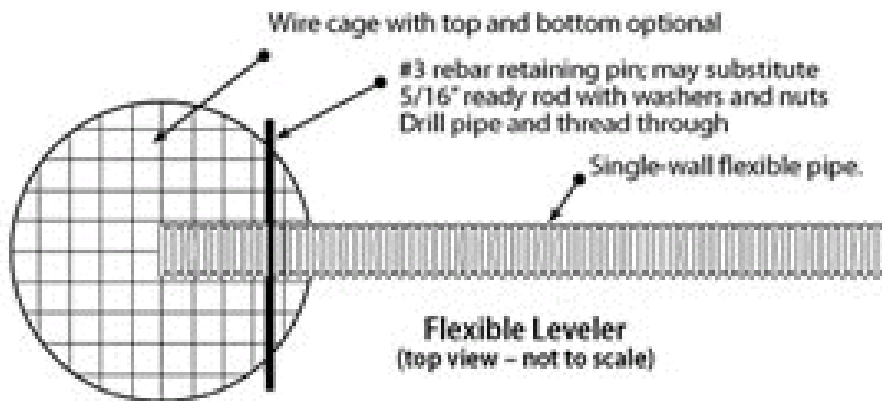
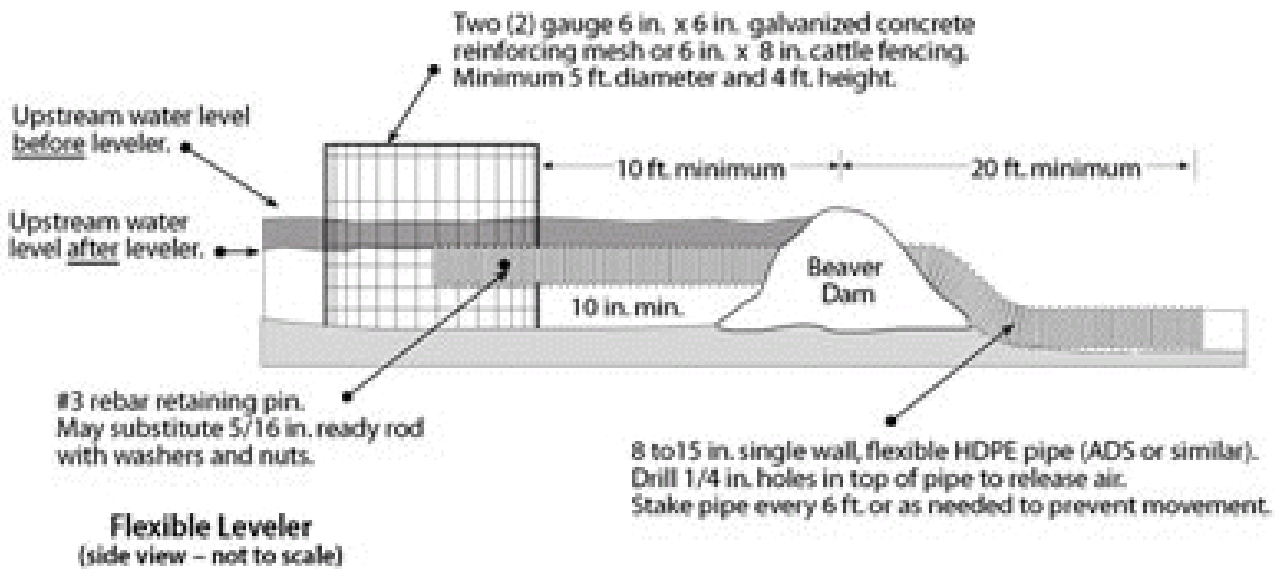




# APPENDIX D

## WDFW Beaver Deceiver and Pond Leveler





**Construction notes:**

1. Construct wire cage using hog rings or similar devices for fasteners. Overlap one section for cage wall.
2. Cut out hole for flexible pipe in cage wall.
3. Remove dam as needed to place flexible pipe. Replace dam after leveler is installed.
4. Stake single-wall HDPE pipe every 6 ft. To prevent it from floating or beavers from moving it, use two T-posts and wire between them and over the top of the pipe to secure the pipe.
5. Drill 3/8th in. hole in culvert for rebar to allow for friction fit. If ready rod is used, place washers next to pipe and secure with double nuts.
6. One (1) 16 foot section of fencing will construct a cage wall approximately 5 feet in diameter. An additional section is needed to construct the top and bottom of each cage.
7. Pipe diameter should be sized to pass the stream base flow.
8. Final layout of the pipe should allow for a shallow gradient to facilitate fish passage.

# APPENDIX E

## JARPA Permit Application

Found online at <http://www.ecy.wa.gov/biblio/ecy07015.html>

AGENCY USE ONLY	
Agency reference # _____	Date received: _____
Circulated by: _____	Project Tracking #: _____



## WASHINGTON STATE

### Joint Aquatic Resources Permit Application Form [\[help\]](#)



#### Part 1–Project Identification

<b>1a. Unique Project Identifier</b> <a href="#">[help]</a> Don't have one yet? Get one at <a href="http://www.epermitting.wa.gov">www.epermitting.wa.gov</a> or call the Office of Regulatory Assistance at 1-800-917-0043.
<b>1b. Project Name</b> ( <i>Examples: Smith's Dock or Seabrook Lane Development</i> ) <a href="#">[help]</a>

#### Part 2–Applicant

Person or organization legally responsible for the project. [\[help\]](#)

<b>2a. Name</b> ( <i>Last, First, Middle</i> ) and Organization ( <i>if applicable</i> )			
<b>2b. Mailing Address</b> ( <i>Street or PO Box</i> )			
<b>2c. City, State, Zip</b>			
<b>2d. Phone (1)</b>	<b>2e. Phone (2)</b>	<b>2f. Fax</b>	<b>2g. E-mail</b>
( )	( )	( )	

#### Part 3 – Authorized Agent or Contact

Applicants can authorize someone else to represent them. If you use an authorized agent or contact for this project, please fill out the section below. Authorized agent(s) must sign Part 10.b. of the JARPA. [\[help\]](#)

<b>3a. Name</b> ( <i>Last, First, Middle</i> ) and Organization ( <i>if applicable</i> )
<b>3b. Mailing Address</b> ( <i>Street or PO Box</i> )

<b>3c. City, State, Zip</b>			
<b>3d. Phone (1)</b>	<b>3e. Phone (2)</b>	<b>3f. Fax</b>	<b>3g. E-mail</b>
( )	( )	( )	

**Part 4–Property Owner** [\[help\]](#)

- Same as applicant. (Please skip to Part 5.)
- Repair or maintenance activities on existing rights of way or easements. (Please skip to Part 5.)
- There are multiple property owners. (Please provide the information requested below for each property owner. Please attach an additional sheet to the form if necessary.)

<b>4a. Name (Last, First, Middle) and Organization (if applicable)</b>			
<b>4b. Mailing Address (Street or PO Box)</b>			
<b>4c. City, State, Zip</b>			
<b>4d. Phone (1)</b>	<b>4e. Phone (2)</b>	<b>4f. Fax</b>	<b>4g. E-mail</b>
( )	( )	( )	

**Part 5–Property and Project Locations**

- There are multiple properties or project locations (e.g., linear projects). For each property, please include the information below in an attachment.

<b>5a. Street Address (Cannot be a PO Box. If there is no address, please provide other location information in 5k.)</b> <a href="#">[help]</a>			
<b>5b. City, State, Zip (If the project is not in a city or town, please provide the name of the nearest city or town.)</b> <a href="#">[help]</a>			
<b>5c. County</b> <a href="#">[help]</a>			
<b>5d. Please provide the section, township, and range for the project location.</b> <a href="#">[help]</a>			
<b>¼ Section</b>	<b>Section</b>	<b>Township</b>	<b>Range</b>
<b>5e. Please provide the latitude and longitude of the project location.</b> <a href="#">[help]</a>			
▪ Example: 47.03922 N lat. / -122.89142 W long			
<b>5f. List the tax parcel number for the project location.</b> <a href="#">[help]</a>			
▪ The local county assessor’s office can provide this information.			

**5g.** Identify the type of ownership of the property. (Check all that apply.) [\[help\]](#)

State Owned Aquatic Land     Tribal land     Private land

Other publicly owned land (federal, state, county, city, special districts like schools, ports, etc.)

**5h.** Contact information for all adjoining property owners, lessees, etc. (If more space is needed, please attach a separate piece of paper.) [\[help\]](#)

Name	Mailing Address	City, State, Zip

**5i.** Is any part of the project area within a 100-year flood plain? [\[help\]](#)     Yes  No

**5j.** Briefly describe the vegetation and habitat conditions on the property. [\[help\]](#)

**5k.** Describe how the property is currently being used. [\[help\]](#)

**5l.** Describe how the adjacent properties are currently being used. [\[help\]](#)

**5m.** Describe the structures (whether above or below ground) currently located on the property, including their purpose. [\[help\]](#)

**5n.** Provide driving directions from the closest major highway to the project location, and attach a map.  
▪ Include other information about the property location (e.g. mileposts, river miles) [\[help\]](#)

**Part 6--Project Description**

**6a.** Provide a very brief description of the overall project. [\[help\]](#)

**6b.** What is your project category? [\[help\]](#)  
▪ Check all that apply.

- Commercial    Residential    Institutional    Transportation    Recreational  
 Maintenance    Environmental Enhancement & Restoration

**6c.** Please indicate the major elements of your project. [\[help\]](#)  
▪ Check all that apply. Use "Other" to identify pertinent elements not listed.

<input type="checkbox"/> Aquaculture	<input type="checkbox"/> Culvert	<input type="checkbox"/> Ferry Terminal	<input type="checkbox"/> Pier / Dock
<input type="checkbox"/> Bank Stabilization	<input type="checkbox"/> Dam / Weir	<input type="checkbox"/> Fishway	<input type="checkbox"/> Piling
<input type="checkbox"/> Boat Launch	<input type="checkbox"/> Dike / Levee / Jetty	<input type="checkbox"/> Float	<input type="checkbox"/> Road
<input type="checkbox"/> Bridge	<input type="checkbox"/> Ditch	<input type="checkbox"/> Geotechnical Survey	<input type="checkbox"/> Scientific Measurement Device
<input type="checkbox"/> Bulkhead	<input type="checkbox"/> Dredging	<input type="checkbox"/> Marina / Moorage	<input type="checkbox"/> Stormwater facility
<input type="checkbox"/> Buoy		<input type="checkbox"/> Mining	<input type="checkbox"/> Utility Line
<input type="checkbox"/> Channel Modification		<input type="checkbox"/> Outfall Structure	

Other:

**6d.** Please describe how you plan to construct each project element checked in 6c. Include the specific

construction methods and equipment that will be used. [\[help\]](#)

- Identify where each element will occur in relation to the nearest waterbody.
- Indicate whether each activity is within the 100-year flood plain.

**6e.** What are the start and end dates for the construction of the project? (*month/year*) [\[help\]](#)

- If the project will be constructed in phases/stages, attach an outline of the construction sequence and the timing of activities, including the start and end dates of each phase/stage.

Start date: \_\_\_\_\_ End date: \_\_\_\_\_  See attached

**6f.** Describe the purpose of the work and why you want or need to perform it. [\[help\]](#)

**6g.** Fair market value of the project, including materials, labor, machine rentals, etc. [\[help\]](#)

**6h.** Will any portion of the project receive federal funding? [\[help\]](#)  Yes  No

- If yes, list each agency providing funds.

**6i.** Compliance with the State Environmental Policy Act (SEPA) [\[help\]](#)

- Check the box(s) below that applies to the project.
- For more information about SEPA, go to [www.ecy.wa.gov/programs/sea/sepa/e-review.html](http://www.ecy.wa.gov/programs/sea/sepa/e-review.html).

A copy of the SEPA determination or letter of exemption is included with this application.

A SEPA determination is pending with \_\_\_\_\_ (lead agency); expected decision date is \_\_\_\_\_.

I am applying for a Fish Habitat Enhancement Exemption. Please submit the Fish Habitat Enhancement Project form with this application.

This project is exempt.

Categorical Exemption. Under what section of the SEPA administrative code (WAC) is it exempt?  
\_\_\_\_\_

Other: \_\_\_\_\_

SEPA is pre-empted by federal law.

**Part 7–Wetlands: Impacts and Mitigation**

If the project will not impact wetlands or wetland buffers, please skip to Part 8.

**7a.** Will the project impact wetland buffers? [\[help\]](#)  Yes  No

**7b.** Will the project impact wetlands? [\[help\]](#)  Yes  No

**7c.** Describe how the project has been designed to avoid and minimize adverse impacts to wetlands. [\[help\]](#)

**7d.** If you have already worked with any government agencies to reduce or avoid impacts, please list them below. [\[help\]](#)

Name	Agency	Phone	Most Recent Date of Contact
		( )	
		( )	

**7e.** Has a wetland delineation report been prepared? [\[help\]](#)  Yes  No

- **If yes**, submit the report with the application. Include copies of delineation data sheets.

**7f.** Have the wetlands been rated using the Washington State Wetland Rating System? [\[help\]](#)

Yes  No  Not applicable

- **If yes**, submit the wetland rating forms, including figures, with the application.

**7g.** Have you prepared a mitigation plan to compensate for the project's adverse impacts to wetlands? [\[help\]](#)

Yes  No  Not applicable

- **If yes**, submit the plan with the application.

**7h.** For each project activity that will adversely impact wetlands, list the type and rating of each wetland to be impacted, the extent and duration of the impact, and the type and amount of compensatory mitigation proposed. If you are submitting a compensatory mitigation plan that includes a similar table, you may simply state (below) the page number in the mitigation plan where this information can be found. [\[help\]](#)

Activity causing Impact (filling, draining, flooding, etc.)	Wetland Type and Rating Category <sup>1</sup>	Impact Area (sq ft. or acres)	Duration of Impact <sup>2</sup>	Proposed Mitigation Type <sup>3</sup>	Wetland Mitigation Area (sq ft. or acres)



<sup>1</sup> Ecology wetland category based on current Western Washington or Eastern Washington wetland rating system. If impacting wetlands, please include copies of wetland rating forms with application.					
<sup>2</sup> Indicate the time (in months or years, as appropriate) the wetland will be measurably impacted by the work. Enter "permanent" if applicable.					
<sup>3</sup> Creation (C), Re-establishment/Rehabilitation (R), Enhancement (E), Preservation (P), Mitigation Bank/In-lieu fee (B)					
Reference to a similar chart/table in mitigation plan, if available.					
<b>7i.</b> Provide a summary of what the compensatory mitigation plan is intended to accomplish, and describe how a watershed approach was used to design the plan. <a href="#">[help]</a>					
<b>7j.</b> For all filling activities identified in 7h., please describe, in detail, the source and nature of the fill material, the amount that will be used, and how and where it will be placed into the wetland. <a href="#">[help]</a>					

<b>7k.</b> For all excavating activities identified in 7h., please describe the type of material proposed to be excavated, the methods to be used, the amount of material to be removed, and where the material will be disposed. <a href="#">[help]</a>					

**Part 8. – Waterbodies (other than wetlands): Impacts and Mitigation**

If the project will not impact waterbodies or areas around waterbodies, please skip to Part 9.

<b>8a.</b> Will your project impact a waterbody or the area around a waterbody? <a href="#">[help]</a> <input type="checkbox"/> Yes <input type="checkbox"/> No					
<b>8b.</b> Summarize the impact(s) to each waterbody in the following table. <a href="#">[help]</a>					
Activity causing Impact (clearing, dredging, filling, pile driving, etc.)	Waterbody name	Impact location <sup>1</sup>	Duration of Impact <sup>2</sup>	Amount of material to be placed in OR removed from waterbody	Area (sq ft. or linear ft.) of waterbody directly affected

<sup>1</sup> Indicate whether the impact will occur in the waterbody, or provide the distance to the waterbody and indicate

whether it will occur within the 100-year flood plain.

<sup>2</sup> Indicate the time (in months or years, as appropriate) the waterbody will be measurably impacted by the work. Enter "permanent" if applicable.

**8c.** Describe how the project has been designed to avoid and minimize adverse impacts to the aquatic environment. [\[help\]](#)

**8d.** Have you prepared a mitigation plan to compensate for the project's adverse impacts to non-wetland waterbodies? [\[help\]](#)

Yes  No  Not applicable

- **If yes**, submit the plan with the application.

**8e.** Provide a summary of what the compensatory mitigation plan is intended to accomplish, and describe how a watershed approach was used to design the plan. If you have already completed 7i, you do not need to restate your answer here. [\[help\]](#)

**8f.** Please describe in detail the source and nature of the fill material, the amount that will be used, and how and where it will be placed into the waterbody. [\[help\]](#)

**8g.** For excavating or dredging impacts, please describe the type of material proposed to be excavated or dredged, the methods to be used, the amount of material to be removed, and where the material will be disposed. [\[help\]](#)

### Part 9–Additional Information

Providing answers to the questions below is optional, but will help the review of your application.

**9a.** What is the zoning designation for the project location? [\[help\]](#)

- You can get this information from the local city or county planning department.
- Zoning designation examples include, but are not limited to, residential, rural, agricultural, and general commercial.

**9b.** What US Geological Survey Hydrological Unit Code (HUC) is the project in? [\[help\]](#)

- Go to <http://cfpub.epa.gov/surf/locate/index.cfm> to help identify the HUC.

**9c.** What Water Resource Inventory Area Number (WRIA #) is the project in? [\[help\]](#)

- Go to [www.ecy.wa.gov/services/gis/maps/wria/wria.htm](http://www.ecy.wa.gov/services/gis/maps/wria/wria.htm) to find the WRIA #.

<p><b>9d.</b> Are any of the waterbodies identified in 7h. or 8b. on the WA Dept. of Ecology 303(d) List? <a href="#">[help]</a></p> <p><input type="checkbox"/> Yes      <input type="checkbox"/> No</p> <ul style="list-style-type: none"> <li>▪ <b>If yes</b>, list the parameter(s) below.</li> <li>▪ If you don't know, use WA Dept. of Ecology's Water Quality Assessment tools at: <a href="http://www.ecy.wa.gov/programs/wq/303d/">http://www.ecy.wa.gov/programs/wq/303d/</a>.</li> </ul>
<p><b>9e.</b> For in-water construction work, will the project comply with the State of Washington water quality standards for turbidity (<a href="#">WAC 173-201A</a>)? <a href="#">[help]</a>    <input type="checkbox"/> Yes <input type="checkbox"/> No</p>
<p><b>9f.</b> If the project is within the jurisdiction of the Shoreline Management Act, what is the local shoreline environment designation? <a href="#">[help]</a></p> <ul style="list-style-type: none"> <li>▪ If you don't know, contact the local planning department.</li> <li>▪ For more information, go to: <a href="http://www.ecy.wa.gov/programs/sea/sma/laws_rules/173-26/211_designations.html">www.ecy.wa.gov/programs/sea/sma/laws_rules/173-26/211_designations.html</a>.</li> </ul>
<p><input type="checkbox"/> Rural    <input type="checkbox"/> Urban      <input type="checkbox"/> Conservancy    <input type="checkbox"/> Natural    <input type="checkbox"/> Other _____</p>
<p><b>9g.</b> What is the Department of Natural Resources Water Type? (<i>Check all that apply.</i>) <a href="#">[help]</a></p> <ul style="list-style-type: none"> <li>▪ Go to <a href="http://www.dnr.wa.gov/BusinessPermits/Topics/ForestPracticesApplications/Pages/fp_watertyping.aspx">http://www.dnr.wa.gov/BusinessPermits/Topics/ForestPracticesApplications/Pages/fp_watertyping.aspx</a> for the Forest Practices Water Typing System.</li> </ul>
<p><input type="checkbox"/> S      <input type="checkbox"/> F      <input type="checkbox"/> Np      <input type="checkbox"/> Ns</p>
<p><b>9h.</b> Will this project be designed to meet the WA Dept. of Ecology's most current stormwater manual? <a href="#">[help]</a></p> <p><input type="checkbox"/> Yes    <input type="checkbox"/> No</p> <ul style="list-style-type: none"> <li>▪ <b>If no</b>, and it is designed to a different manual, provide the name of the WA Dept. of Ecology approved manual the project is designed to meet.</li> </ul>
<p><b>9i.</b> If you have any historical knowledge of what the property was used for before identifying it for this project, please describe it below. <a href="#">[help]</a></p>
<p><b>9j.</b> Has a cultural resource survey been performed on the project area? <a href="#">[help]</a></p> <p><input type="checkbox"/> Yes    <input type="checkbox"/> No</p> <ul style="list-style-type: none"> <li>• <b>If yes</b>, please attach to your application.</li> </ul>

**Part 10—Authorizing Signatures**

**10a. Applicant Signature (required)**

*I certify that to the best of my knowledge and belief, the information provided in this application is true, complete, and accurate. I also certify that I have the authority to carry out the proposed activities, and I agree to start work **ONLY** after I have received all necessary permits.*

*I hereby authorize the agent named in Part 4 to act on my behalf in matters related to this application.*

\_\_\_\_\_ (initial)

*By initialing here, I state that I have the authority to grant access to the property. I also consent to the permitting agencies entering the property where the project is located to inspect the project site or any work. \_\_\_\_\_ (initial)*

\_\_\_\_\_  
Applicant

\_\_\_\_\_  
Date

**10b. Authorized Agent Signature**

*I certify that to the best of my knowledge and belief, the information provided in this application is true, complete, and accurate. I also certify that I have the authority to carry out the proposed activities and I agree to start work **ONLY** after all necessary permits have been issued.*

\_\_\_\_\_  
Authorized Agent

\_\_\_\_\_  
Date

**10c. Property Owner Signature**

*I consent to the permitting agencies entering the property where the project is located to inspect the project site or any work. These inspections shall occur at reasonable times and, if practical, with prior notice to the landowner.*

\_\_\_\_\_  
Property Owner

\_\_\_\_\_  
Date

18 U.S.C §1001 provides that: Whoever, in any manner within the jurisdiction of any department or agency of the United States knowingly falsifies, conceals, or covers up by any trick, scheme, or device a material fact or makes any false, fictitious, or fraudulent statements or representations or makes or uses any false writing or document knowing same to contain any false, fictitious, or fraudulent statement or entry, shall be fined not more than \$10,000 or imprisoned not more than 5 years or both.

## Part 11–Submitting the Completed JARPA Form

### Instructions:

1. Use the checklist below to indicate which permits you are applying for.
2. Make copies of the JARPA form and send it to the appropriate agencies. Remember to include any necessary attachments:
  - Complete construction drawings and specifications along with any maps and photos to support your description. These must be in 8 ½ x 11 format.
  - A SEPA decision letter is required for a complete application to the Washington Department of Fish and Wildlife. The Department also requires two complete copies of all application documents. If your application contains more than 25 pages, also include digital files of all application documents on a CD or other digital storage media.
  - If applicable:
    - Wetland delineation report and copies of delineation data sheets.
    - Wetland rating forms, including figures.
    - Mitigation plan.
3. If it is not clear what permit(s) you need for the project, use the resources below:
  - Online Project Questionnaire at <http://apps.ecy.wa.gov/opas/>.
  - Office of Regulatory Assistance at 1-800-917-0043 or [assistance@ora.wa.gov](mailto:assistance@ora.wa.gov)

<b>Identify the permits you are applying for: (Check all that apply)</b>
<p><b>Shoreline permits:</b></p> <p><input type="checkbox"/> Substantial Development   <input type="checkbox"/> Conditional Use</p> <p><input type="checkbox"/> Shoreline Exemption   <input type="checkbox"/> Variance</p> <p>Send to: <b>Appropriate city or county planning, building, or community development department.</b></p>
<p><b>Other city/county permits:</b></p> <p><input type="checkbox"/> Floodplain Development Permit   <input type="checkbox"/> Critical Areas Ordinance</p> <p>Send to: <b>Appropriate city or county planning, building, or community development department.</b></p>
<p><input type="checkbox"/> <b>Hydraulic Project Approvals</b></p> <p>Send to: <b>Department of Fish and Wildlife</b></p>
<p><input type="checkbox"/> <b>Section 401 Water Quality Certifications</b></p> <p>Send to: <b>Department of Ecology regional office– Federal Permit Unit</b></p>

**Aquatic Resources Use Authorizations**

**Send to: Department of Natural Resources regional office**

**Department of the Army permits:**

**Section 404 (discharges into waters of the US waters)**       **Section 10 (work in navigable waters)**

**Send to: US Army Corps of Engineers**

**United States Coast Guard permits:**

**General Bridge Act Permit**       **Private Aids to Navigation (for non-bridge projects)**

**Send to: United States Coast Guard**

## Mailing Addresses and Contact Information

### Mailing location for Shoreline permits

Send to: Appropriate city or county planning, building, or community development department.

- For city and county contact information, go to: <http://www.ora.wa.gov/today.asp>

### Mailing location for Hydraulic Project Approvals

Send to: Department of Fish and Wildlife

- If you are **NOT** requesting emergency or expedited processing, please submit applications to the Headquarters office in Olympia.
- If you are requesting emergency or expedited processing, please submit applications to the appropriate Regional office.

#### Headquarters:

**Receives all applications when emergency or expedited processing is NOT being requested**

Washington State Department of Fish and Wildlife  
Habitat Program  
600 Capitol Way North  
Olympia, Washington 98501-1091

Tel (360) 902-2534  
TDD (360) 902-2207  
Fax (360) 902-2946



**Regions:****Receives all applications for emergency or expedited processing**

<b>Region 1</b> (Pend Oreille, Ferry, Stevens, Spokane, Lincoln, Whitman, Columbia, Garfield, Asotin, and Walla Walla Counties)	Washington State Department of Fish and Wildlife 2315 North Discovery Place Spokane, WA 99216	Tel (509) 892-1001 Fax (509) 921-2440
<b>Region 2</b> (Okanogan, Douglas, Grant, Adams, and Chelan Counties)	Washington State Department of Fish and Wildlife 1550 Alder Street NW Ephrata, WA 98823-9699	Tel (509) 754-4624 Fax (509) 754-5257
<b>Region 3</b> (Franklin, Kittitas, Yakima, and Benton Counties)	Washington State Department of Fish and Wildlife 1701 South 24th Avenue Yakima, WA 98902-5720	Tel (509) 575-2740 Fax (509) 575-2474
<b>Region 4</b> (Whatcom, Skagit, Snohomish, King, Island, and San Juan Counties)	Washington State Department of Fish and Wildlife 16018 Mill Creek Boulevard Mill Creek, WA 98012-1296	Tel (425) 775-1311 Fax (425) 338-1066
<b>Region 5</b> (Lewis, Wahkiakum, Cowlitz, Skamania, Clark, and Klickitat Counties)	Washington State Department of Fish and Wildlife 2108 Grand Blvd. Vancouver, WA 98661-4624	Tel (360) 906 -6700 Fax (360) 906-6776
<b>Region 6</b> (Pacific, Pierce, Thurston, Grays Harbor, Mason, Jefferson, Clallam, and Kitsap Counties)	Washington State Department of Fish and Wildlife 48 Devonshire Road Montesano, WA 98563-9618	Tel (360) 249-4628 Fax (360) 664-0689

**Mailing location for 401 Water Quality Certification**

Send to: Department of Ecology regional office– Federal Permit Unit

- For a map of Ecology Regional Offices, go to: [www.ecy.wa.gov/org.html](http://www.ecy.wa.gov/org.html)

<b>Headquarters</b>	<u>Mailing Address</u> P.O. Box 47600 Olympia, WA 98504-7600 <u>Physical Address</u> 300 Desmond Drive Lacey, WA 98504	Tel (360) 407-6000
<b>Central Region</b>	15 West Yakima Avenue, Suite 200 Yakima, WA 98902-3401	Tel (509) 575-2490 Fax (509) 575-2809

<b>Eastern Region</b>	4601 North Monroe, Suite 202 Spokane, WA 99205-1295	Tel (509) 329-3400 Fax (509) 329-3529
<b>Northwest Region</b>	3190 - 160th Avenue S.E. Bellevue, WA 98008-5452	Tel (425) 649-7000 Fax (425) 649-7098
<b>Southwest Region</b>	<u>Mailing Address:</u> P.O. Box 47775 Olympia, WA 98504-7775 <u>Physical Address:</u> 300 Desmond Drive Lacey, WA 98504	Tel (360) 407-6300 Fax (360) 407-6305

<b>Mailing location for Aquatic Resources Use Authorizations</b>	
Send to: Department of Natural Resources regional office	
<ul style="list-style-type: none"> <li>▪ For a map of DNR regional offices, go to: <a href="http://www.dnr.wa.gov/ContactDNR/Pages/Home.aspx">http://www.dnr.wa.gov/ContactDNR/Pages/Home.aspx</a></li> </ul>	
Headquarters	Tel (360) 902-1100
Northwest Region	Tel (360) 856-3800
Pacific Cascade Region	Tel (360) 577-2025
South Puget Sound Region	Tel (360) 825-1631
Northeast Region	Tel (509) 684-7474
Southeast Region	Tel (509) 925-8510
Olympic Region	Tel (360) 374-6131

**Mailing location for Department of the Army Permits**

Send to: US Army Corps of Engineers

US Army Corps of Engineers	Seattle District Regulatory Branch P.O. Box 3755 Seattle, WA 98124-3755	Tel (206) 764-3495 Fax (206) 764-6602
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**Mailing location for General Bridge Act Permits and Private Aids to Navigation (for non-bridge projects)**

Send to: United States Coast Guard

<b>Section 9 Bridge Permit</b>	Commander 13th Coast Guard District (OAN) 915 Second Avenue, Room 3510 Seattle, WA 98174-1067 Attn: Bridge Administrator	Tel (206) 220-7282 Fax (206) 220-7265
<b>Private Aids to Navigation</b>	Commander 13th Coast Guard District (OAN) 915 Second Avenue, Room 3510 Seattle, WA 98174-1067 Attn: PATON Manager	Tel (206) 220-7285 Fax (206) 220-7265