

**DECISION  
AND  
FINDING OF NO SIGNIFICANT IMPACT**

**ENVIRONMENTAL ASSESSMENT: REDUCING AQUATIC RODENT DAMAGE THROUGH  
AN INTEGRATED WILDLIFE DAMAGE MANAGEMENT PROGRAM IN THE STATE OF  
MISSISSIPPI**

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

**August 2009**

**I. INTRODUCTION**

The United States Department of Agriculture (USDA), Animal and Plant Health Inspection Service (APHIS), Wildlife Services (WS) program prepared an environmental assessment (EA) to evaluate potential impacts to the quality of the human environment from the implementation of a management program to address damage to property, agricultural resources, natural resources, and threats to human safety caused by beaver (*Castor canadensis*), nutria (*Myocastor coypus*), and muskrats (*Ondatra zibethicus*) (USDA 2003)<sup>1</sup>. The EA evaluated the need for damage management and the relative effectiveness of five alternatives to meet that proposed need, while accounting for the potential environmental effects of those activities. WS' proposed action in the EA evaluates an integrated damage management program in Mississippi to fully address the need for resolving damage caused by beaver, nutria, and muskrats while minimizing impacts to the human environment.

**II. PUBLIC INVOLVEMENT**

The pre-decisional EA<sup>2</sup> was made available to the public for review and comment during a 34-day public comment period (April 28, 2003-May 31, 2003) by a legal notice published in the *Clarion Ledger*. The legal notice was published for three consecutive days in the newspaper (April 28, 2003-April 30, 2003). A letter of availability for the pre-decisional EA was also mailed directly to 28 agencies, organizations, and individuals with probable interest in the proposed program. A total of three comment documents were received from the public during the public involvement process supporting the selection of the proposed action. Comments from the public involvement process were reviewed for substantive issues and alternatives which were considered in developing the Decision for the EA.

After consideration of the analysis contained in the pre-decisional EA and review of public comments, a Decision and Finding of No Significant Impact (FONSI) for the EA was issued on June 23, 2003. The Decision and FONSI selected the proposed action which implemented an integrated damage management program in Mississippi using multiple methods to adequately address the need to manage damage caused by beaver, nutria, and muskrats.

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<sup>1</sup>Copies of the EA and the associated Decision/Finding of No Significant Impact (FONSI) are available for review from the State Director, USDA APHIS WS, 200 Thompson Hall, Mississippi State, Mississippi 39762 or from the APHIS website at [http://www.aphis.usda.gov/wildlife\\_damage/nepa.shtml](http://www.aphis.usda.gov/wildlife_damage/nepa.shtml).

<sup>2</sup>Before a Decision for the EA is issued, the EA is considered pre-decisional. After the development of the EA by WS and consulting agencies and after public involvement in identifying new issues and alternatives, WS issues a Decision. Based on the analysis in the EA after public involvement, a decision is made to either publish a Notice of Intent to prepare an Environmental Impact Statement or a Finding of No Significant Impact will be noticed to the public in accordance to the NEPA, the Council of Environmental Quality regulations, and APHIS' NEPA implementation regulations.

This summary report and new Decision along with the EA and the 2003 Decision/FONSI will be made available for public review and comment through the publication of a legal notice announcing a minimum of a 30-day comment period. The legal notice will be published in the *Clarion Ledger* and posted on the APHIS website located at [http://www.aphis.usda.gov/wildlife\\_damage/nepa.shtml](http://www.aphis.usda.gov/wildlife_damage/nepa.shtml) according to WS' public notification requirements (72 FR 13237-13238). This new Decision will also be directly mailed to agencies, organizations, and individuals with probable interest in the proposed program. Comments received during the public involvement process will be fully considered for new substantive issues and alternatives. Unless new substantive issues and/or new alternatives are brought to WS' attention, this new Decision will take effect upon the close of the comment period.

### III. PURPOSE

This new Decision and summary report will analyze WS' beaver, nutria, and muskrat damage management activities in Mississippi since the 2003 Decision/FONSI was signed for the EA to: 1) facilitate planning and interagency coordination, 2) streamline program management, 3) ensure WS' activities remain within the scope of analyses contained in the EA, and 4) clearly communicate to the public the analysis of individual and cumulative impacts of the proposed action since 2003. This new Decision/FONSI ensures WS' actions comply with the NEPA, with the Council on Environmental Quality (40 CFR 1500), and with APHIS' NEPA implementing regulations (7 CFR 372). All damage management activities, including disposal requirements, are conducted by WS consistent with: 1) the Endangered Species Act of 1973, 2) the Clean Water Act, 3) Executive Order (EO) 12898<sup>3</sup>, 4) EO 13045<sup>4</sup>, 5) EO 13112<sup>5</sup>, and 6) federal, state, and local laws, regulations, and policies.

### IV. MONITORING

The WS program in Mississippi annually reviews program activities to determine impacts on issues identified and to ensure that program activities are within the scope of analysis contained in the EA. The annual monitoring reports document WS' activities while discussing any new information that becomes available since the completion of the EA and the last monitoring report. If WS' activities, as identified in the annual monitoring reports, are outside the scope of the analyses in the EA or if new issues are identified from available information, further analysis would occur and the EA would be supplemented to the degree as identified by those processes pursuant to the NEPA or a notice of intent to prepare an Environmental Impact Statement (EIS) would occur.

This summary report and new Decision will evaluate WS' activities to resolve and prevent damage caused by beaver, nutria, and muskrats in Mississippi under the proposed action described in the EA since the 2003 Decision and FONSI were signed. WS will continue to coordinate activities to alleviate or prevent beaver, nutria, and muskrat damage with the Mississippi Department of Wildlife, Fisheries, and Parks (MDWFP) to ensure WS' activities are considered as part of the management objectives for those species.

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<sup>3</sup>Executive Order 12898 promotes the fair treatment of people of all races, income levels, and cultures with respect to the development, implementation, and enforcement of environmental laws, regulations, and policies.

<sup>4</sup>Executive Order 13045 ensures the protection of children from environmental health and safety risks since children may suffer disproportionately from those risks.

<sup>5</sup>Executive Order 13112 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.

## V. RELATIONSHIP OF THIS DOCUMENT TO OTHER ENVIRONMENTAL DOCUMENTS

***WS' Programmatic Environmental Impact Statement:*** WS has developed a programmatic Final Environmental Impact Statement (FEIS) that addresses the need for wildlife damage management in the United States (USDA 1997)<sup>6</sup>. The FEIS contains detailed discussions of potential impacts to the human environment from wildlife damage management methods used by WS. Information from WS' programmatic FEIS has been incorporated by reference into the EA along with this summary report and new Decision.

## VI. AFFECTED ENVIRONMENT

Upon receiving a request for assistance, beaver, nutria, and muskrat damage management could be conducted on private, federal, state, tribal, county, and municipal lands in Mississippi to protect agricultural and natural resources, property, roads, bridges, railroads, and to reduce threats to public safety. Areas of the proposed action could include state and interstate highways and roads, and railroads and their right-of-ways where beaver, nutria, and muskrat activities cause damage or threats of damage. Areas may also include property in or adjacent to subdivisions, businesses, and industrial parks where beaver impound water and gnaw on or fell trees. Additionally, affected areas could include timberlands, croplands, and pastures that experience financial losses from beaver flooding or gnawing. The proposed action also could include private and public property where beaver, nutria, and muskrat burrowing causes damage to dikes, ditches, ponds and levees, and where feeding causes agricultural crop losses and negatively impacts wildlife, including threatened and endangered (T&E) species.

WS has reviewed the affected environment during evaluations of program activities under the proposed action through annual monitoring reports and this summary report. The affected environment has not changed since the implementation of the proposed action and continues to be as addressed in the EA.

## VII. WS' ACTIVITIES TO MANAGE DAMAGE CAUSED BY AQUATIC RODENTS

WS continued to assist those cooperators requesting assistance with damage caused by beaver, nutria, and muskrats in Mississippi from federal fiscal year (FY)<sup>7</sup> 2003 through FY 2008. Those persons requesting assistance reported damages to timber, roads, crops, pasture, and drainage control devices, primarily from beaver burrowing into embankments, beaver gnawing on and felling trees, and from flooding caused by beaver impounding water through dam building.

WS provided both technical assistance and direct management activities as described in the EA from FY 2003 through FY 2008. Technical assistance provides those interested with information and recommendations on preventing wildlife damage and effective methods for resolving damage which are legally available for use. This information can then be employed by those persons experiencing wildlife damage to effectively resolve damage without WS' direct involvement.

Operational assistance occurs when WS is directly involved with employing methods to resolve, alleviate, or reduce threats associated with beaver, nutria, and muskrats. As directed by the selected alternative, WS applies multiple methods as part of an integrated damage management program to resolve requests for assistance. WS' technical assistance and direct operational programs are discussed in detail in the EA (USDA 2003) along with WS' programmatic FEIS (USDA 1997). WS' activities from FY 2003 through FY 2008 are summarized below:

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<sup>6</sup>Copies of WS' programmatic FEIS are available from USDA/APHIS/WS-Operational Support Staff, 4700 River Road, Unit 87, Riverdale, MD 20737-1234.

<sup>7</sup>The federal fiscal year begins on October 1 and ends on September 30 the following year.

### **Summary of WS' Aquatic Rodent Damage Management Activities in Mississippi during FY 2003**

During FY 2003, WS continued to provide both technical and direct operational assistance to those persons experiencing aquatic rodent damage in the State. In FY 2003, WS conducted 79 technical assistance projects involving damage to agricultural resources caused by beaver involving 169 participants. WS provided technical assistance to alleviate beaver damage to property during 64 technical assistance projects involving 137 participants. Information on alleviating beaver damage to natural resources was provided to three participants during two technical assistance projects in FY 2003. WS conducted one technical assistance project with one individual in FY 2003 associated with alleviating damage to agricultural resources caused by muskrats. WS also conducted three technical assistance projects associated with muskrat damage to property involving four participants. No technical assistance projects were conducted by WS in the State involving nutria during FY 2003.

WS also conducted 1,455 technical assistance projects through instructional sessions, on-site visits, and information transfers associated with beaver damage management involving 2,714 people in the State. In addition, WS conducted three technical assistance projects through instructional sessions, on-site visits, and information transfers associated with muskrat damage management involving nine people in the State during FY 2003.

During direct operational assistance in FY 2003, WS live-captured and freed two beaver that were captured with restraining cables (snares). As part of direct operational assistance provided by WS to those requesting assistance with alleviating beaver damage, WS lethally removed a total of 4,369 beaver in FY 2003. WS employed body-gripping traps (conibear) to lethally take 3,272 beaver, 300 beaver were lethally taken using foothold traps, 395 were lethally taken with restraining cables, and 402 beaver were taken by shooting during FY 2003.

To alleviate damage caused by muskrats, WS employed lethal methods to take a total of 33 muskrats in FY 2003. WS employed body-gripping traps to lethally take 27 muskrats and shooting to lethally take an additional six muskrats during FY 2003. To alleviate damage caused by nutria in the State, WS employed lethal methods to take a total of 298 nutria during FY 2003. While those standard operating procedures and measures discussed in the EA are intended to minimize the unintentional take of non-targets, the unintentional take of non-targets does occur when conducting aquatic rodent damage management. WS' unintentional take of non-targets is discussed in detail under Issue 2 below.

During FY 2003, WS' aquatic rodent damage management program in Mississippi reduced or eliminated damage to property including timber, crops, landscaping, levee damage to private and public ponds and lakes, roads, bridges, culverts, and ditches. To alleviate flooding damage caused by water impounded by beaver dams, WS' employed explosives to remove 315 dams and hand tools to breach 2,047 dams during FY 2003. WS' activities reduced, prevented, or terminated economic property losses valued at \$2,936,160 in FY 2003.

### **Summary of WS' Aquatic Rodent Damage Management Activities in Mississippi during FY 2004**

WS continued to implement the proposed action in FY 2004 through the integration of technical and operational assistance to those requesting assistance with beaver, nutria, and muskrat damage in Mississippi. Damage reported and verified by WS in FY 2004 occurred primarily from beaver dams impounding water that flooded resources, from beaver gnawing on trees, the felling of trees, and from beaver burrowing into earthen dams that threatened the structural integrity of those structures. Damage also occurred to earthen embankments from muskrat burrows. WS conducted 82 technical assistance projects in FY 2004 that provided information to 189 participants seeking assistance to alleviate agricultural damage caused by beaver. WS provided technical assistance to 148 participants seeking

information and assistance with beaver damage to property during FY 2004. WS conducted one technical assistance project associated with damage caused by beaver to natural resources involving two people. WS also conducted nine technical assistance projects with those cooperators seeking assistance with damage to property and threats to human safety caused by muskrats in FY 2004. In addition, seven technical assistance projects involving 24 people were completed by WS in FY 2004 addressing damage caused by nutria to agricultural resources and property.

WS also conducted 1,034 technical assistance projects involving 2,238 people in Mississippi to address beaver damage through instructional sessions, exhibits, on-site visits, and information transfer. One informational session was also conducted by WS during FY 2004 involving muskrat damage management.

WS also provided direct assistance to requestors through the direct application of methods to resolve aquatic rodent damage in Mississippi during FY 2004. WS used body-gripping traps (conibears), foothold traps, cable restraints, and shooting to intentionally take 4,696 beaver in FY 2004 to alleviate damage in the State. Nearly 84% of the beaver taken by WS in FY 2004 were lethally taken in body-gripping traps. To alleviate damage caused by muskrats, WS employed primarily conibear traps and shooting to lethally take 23 muskrats during FY 2004. WS was also requested to alleviate damage associated with nutria in the State during FY 2004. WS employed body-gripping traps to take a total of 204 nutria. Nutria were primarily lethally taken using body-gripping traps.

To alleviate flooding damage, WS employed explosives as described in the EA to remove 300 beaver dams during FY 2004 in Mississippi and employed handtools to breach 3,239 beaver dams to alleviate damage. WS' aquatic rodent damage management activities reduced or eliminated damage to timber, crops, landscaping, levee damage to private and public ponds and lakes, roads, bridges, culverts, and ditches valued at \$1,893,363 during FY 2004.

#### **Summary of WS' Aquatic Rodent Damage Management Activities in Mississippi during FY 2005**

WS continued to receive requests for assistance in FY 2005 to resolve damage caused by beaver, nutria, and muskrats in Mississippi. Beaver damage occurred primarily from flooding, damage to trees, and from beaver burrowing into earthen embankments. Damage caused by nutria and muskrats occurred primarily from burrowing activities that weakened earthen embankments. WS continued to provide technical assistance by providing information on beaver, nutria, and muskrat damage management.

Direct operational assistance was also provided by WS in FY 2005 to those requesting assistance. To resolve beaver damage, WS employed lethal methods to take 4,221 beaver in Mississippi during FY 2005. Beaver were primarily taken using body-gripping traps (conibears) and shooting. WS also employed body-gripping traps to take 30 muskrats in FY 2005 to alleviate damage. To alleviate nutria damage, WS used primarily body-gripping traps and shooting to lethally take 170 nutria during FY 2005.

During FY 2005, WS employed handtools to breach 1,327 beaver dams in the State to alleviate flooding damage. In addition, WS employed explosives to remove 346 beaver dams to release impounded water causing damage to resources. WS' aquatic rodent damage management activities reduced, prevented, or terminated economic losses valued at \$1,890,300 in the State.

#### **Summary of WS' Aquatic Rodent Damage Management Activities in Mississippi during FY 2006**

Both operational assistance and technical assistance were provided to those requesting assistance with resolving damage caused by aquatic rodents in Mississippi during FY 2006. Damages reported to and verified by WS occurred primarily from beaver flooding resources causing damage to trees and damage

threats associated with beaver burrowing into earthen embankments. WS conducted 343 technical assistance projects involving beaver damage management in FY 2006 through recommendations to 754 participants and the distribution of 101 leaflets. WS also conducted one technical assistance project involving damage associated with muskrats in Mississippi during FY 2006. In addition, WS conducted eight technical assistance projects with 20 people involving damage caused by nutria in the State.

Direct operational assistance was also conducted by WS in FY 2006. WS employed lethal methods resulting in the take of 2,652 beaver in FY 2006, primarily from the use of body-gripping traps and shooting. A total of 12 muskrats were lethally taken by WS in the State during FY 2006 using body-gripping traps. In addition, 435 nutria were taken by WS with body-gripping traps.

Similar to previous years, WS continued to alleviate flooding damage through the use of hand raking and explosives in Mississippi. During FY 2006, WS removed 156 beaver dams using explosives in the State and hand tools to breach 904 beaver dams to alleviate flooding damage. WS' activities reduced, prevented, or alleviated damages valued at approximately \$3.1 million in the State during aquatic rodent damage management activities.

### **Summary of WS' Aquatic Rodent Damage Management Activities in Mississippi during FY 2007**

WS continued to provide both technical assistance and direct management activities in FY 2007 as described in the EA. Technical assistance provides those interested with information and recommendations on preventing wildlife damage and effective methods for resolving damage legally available to those requesting assistance. This information can then be employed by those persons experiencing wildlife damage to effectively resolve that damage without WS' involvement. In FY 2007, the WS program in Mississippi conducted 269 technical assistance projects with 696 people and distributed 122 leaflets involving beaver damage management. A total of two technical assistance projects were conducted in FY 2007 by the WS program in Mississippi for resolving damage caused by muskrats. WS also provided ten people with information on resolving damage caused by nutria during three technical assistance projects.

WS also continued to employ direct operational damage management activities in which WS was directly involved with employing methods to alleviate damage caused by aquatic rodents at the request of the cooperator. WS continued to employ those methods available for preventing and resolving damage caused by aquatic rodents in Mississippi as described in the EA during FY 2007. To resolve requests for assistance to prevent or resolve damage, WS lethally removed 3,154 beaver in FY 2007 by shooting and through the use of traps and restraining cables as described in the EA. Beaver were lethally removed primarily to prevent and resolve damage that occurred from beaver burrowing into earthen embankments, from flooding, and from tree loss due to beaver cutting or girdling trees. In addition, WS employed firearms and foothold traps to lethally take four muskrats and primarily body-gripping traps and firearms to lethally remove 160 nutria during FY 2007.

Those persons requesting assistance reported damages to timber, roads, crops, pasture, and drainage control devices, primarily from flooding caused by beaver impounding water through dam building. To alleviate flooding damage, WS removed 219 beaver dams using explosives and 1,321 beaver dams using handtools during FY 2007. Activities conducted by WS in FY 2007 to prevent beaver damage caused by flooding, dam building, and tree loss protected an estimated \$8 million in resources. Timber resources represented the primary resource protected by WS' activities. Table 1 lists the resources that could have been further damaged by beaver without WS' involvement in resolving and preventing the initial damage. Over 55% of the resource value protected was preventing tree loss to timber resources in FY 2007.

**Table 1 – Estimated value of resources protected by WS from conducting beaver damage management in Mississippi during FY 2007**

Species	Timber	Roads/Bridges	Crops/Pasture	Water Control Devices	Other	TOTAL
Beaver	\$4,492,775	\$1,618,977	\$177,950	\$631,830	\$1,145,775	\$8,067,307

**Summary of WS’ Aquatic Rodent Damage Management Activities in Mississippi during FY 2008**

WS continued to assist those cooperators requesting assistance with damage caused by beaver, muskrats, and nutria in Mississippi during FY 2008. Those persons requesting assistance reported damages to timber, roads, crops, pasture, and drainage control devices, primarily from flooding caused by beaver impounding water through dam building. Activities in FY 2008 to prevent beaver damage caused by flooding, dam building, and tree loss protected an estimated \$261 million in resources, with timber resources representing the primary resource protected by WS’ activities. One project impacted an economic development project. Savings to just this one project were estimated at \$250,031,700 from beaver control work conducted in the area which enhanced the property use. This one project accounts for the majority of the economic value of resources protected in FY 2008. Table 2 lists the resources that could have been further damaged by beaver without WS’ involvement in resolving and preventing the initial damage originating from a request for assistance.

**Table 2 – Estimated value of resources protected by WS from conducting beaver damage management in Mississippi during FY 2008**

Species	Timber	Roads/Bridges	Crops/Pasture	Water Control Devices	Other	TOTAL
Beaver	\$5,881,775	\$4,203,003	\$101,720	\$1,242,500	\$250,115,850	\$261,544,848

WS continued to provide both technical assistance and direct management activities in FY 2008 as described in the EA. Technical assistance provides those interested with information and recommendations on preventing wildlife damage management and effective methods for resolving damage legally available to those requesting assistance. This information can then be employed by those persons experiencing wildlife damage to effectively resolve that damage without WS’ involvement. In FY 2008, the WS program in Mississippi conducted 355 technical assistance projects involving beaver and nine technical assistance projects involving nutria. No technical assistance projects were conducted by WS in FY 2008 involving muskrats.

WS also continued to employ direct operational damage management activities in which WS was directly involved with employing methods to alleviate damage caused by aquatic rodents at the request of the cooperator. WS continued to employ those methods available for preventing and resolving damage caused by aquatic rodents in Mississippi as described in the EA during FY 2008. To resolve requests for assistance to prevent or alleviate damage, WS lethally removed 3,390 beaver, nine muskrats, and 176 nutria during FY 2008. Beaver were lethally removed primarily to prevent and resolve damage that occurred from beaver burrowing into earthen levees and dikes, from flooding, and from tree loss due to beaver cutting or girdling. Muskrats were removed to prevent or reduce damage associated with collapses caused by a weakening of earthen embankments from muskrat burrowing. Nutria are considered an invasive species that has the potential for ecological and economic harm. Nutria are voracious eaters that can denude wetlands and coastal areas of vegetation which makes the area unattractive to native wildlife.

To alleviate flooding damage, WS removed a total of 2,047 beaver dams in the State during FY 2008. Explosives were used to remove 322 beaver dams with handtools employed to breach an additional 1,725 beaver dams to alleviate damage.

## VIII. ISSUES ANALYZED IN DETAIL

Issues are concerns of the public and/or professional community raised regarding potential environmental problems that might occur from a proposed action. Such issues must be considered in the NEPA decision-making process. Issues relating to the reduction of wildlife damage were raised during the scoping process for WS' programmatic FEIS (USDA 1997) and were considered in the preparation of the EA. Issues related to managing damage associated with aquatic rodents in Mississippi were developed by WS in consultation with the United States Fish and Wildlife Service (USFWS), MDWFP, and the Mississippi Department of Agriculture and Commerce. The pre-decisional EA and Decision were also made available to the public for review and comment to identify additional issues and alternatives.

The EA fully describes the issues identified during the scoping process for WS' programmatic FEIS and during the development of the EA. The following issues were identified as important to the scope of the analysis (40 CFR 1508.25) and are discussed here as they relate to program activities conducted since FY 2003:

### **Issue 1 - Effects on beaver, nutria, and muskrat populations**

A common issue when addressing damage caused by wildlife are the potential impacts of management actions on the populations of target species. Methods used to resolve damage can involve altering the behavior of target species and may require the use of lethal methods when appropriate. Under the proposed action, WS provided technical and direct damage assistance using methods described in Appendix D of the EA in an integrated approach in which all or a combination of methods could be employed to resolve a request for assistance (USDA 2003).

Of primary concern is the magnitude of take on a species' population from the use of lethal methods. Lethal methods are employed to remove an individual or those individuals responsible for causing damage and only after requests for such assistance are received by WS. The use of lethal methods would therefore result in local population reductions in the area where damage or threats were occurring. The number of target species removed from the population using lethal methods under the proposed action would be dependent on the number of requests for assistance received, the number of individuals involved with the associated damage or threat, and the efficacy of methods employed. The EA evaluated a lethal take of up to 8,000 beaver, up to 500 muskrats, and up to 500 nutria annually by WS in Mississippi to alleviate damage.

The analysis for magnitude of impact generally follows the process described in Chapter 4 of WS' programmatic FEIS (USDA 1997). Magnitude is described in WS' programmatic FEIS as "...a measure of the number of animals killed in relation to their abundance." Magnitude may be determined either quantitatively or qualitatively. Quantitative determinations are based on population estimates, allowable harvest levels, and actual harvest data. Qualitative determinations are based on population trends and harvest data when available. Generally, WS only conducts damage management involving species whose population densities are high and only after they have caused damage.

#### ***Beaver Population Impact Analysis***

As shown in Table 3, the highest annual take level of beaver by WS occurred in FY 2004 when 4,696 beaver were taken. Since FY 2003, WS has lethally removed a total of 22,482 beaver in Mississippi to alleviate damage associated with flooding, burrowing, and damage to trees.

**Table 3 - Beaver lethally taken by method in Mississippi from FY 2003 through FY 2008 by WS.**

Fiscal Year	Body Gripping	Foothold Trap	Cable Restraint	Shooting	Other	TOTAL
2003	3,272	300	395	402	0	4,369
2004	3,931	196	298	270	1	4,696
2005	3,309	191	199	221	301	4,221
2006	2,214	125	63	246	4	2,652
2007	2,399	83	147	525	0	3,154
2008	2,727	140	220	303	0	3,390

Beaver can be found statewide in Mississippi wherever suitable habitat exists. The MDWFP reported in 2001 during the scoping process of the pre-decisional EA, that the statewide beaver population was stable (B. Thomason, MDWFP, letter to T. Aderman, WS, July 26, 2001). Furthermore, the MDWFP provided that there is no evidence to suggest that human mediated mortality resulting from regulated fur harvest and damage management activities would be detrimental to the survival of beaver populations in the State of Mississippi (B. Thomason, MDWFP, letter to T. Aderman, WS, July 26, 2001). The current population of beaver in the State is unknown. During the development of WS' programmatic FEIS, the population of beaver in the State was estimated at 150,000 beaver with an overall increasing population trend in the State (USDA 1997).

Beaver population estimates are often derived from density estimates for beaver based on the number of beaver colonies per a linear unit of measure (e.g., stream miles) or per unit of area (e.g., habitat) (Baker and Hill 2003). Beaver densities specific to Mississippi are currently unavailable. Beaver densities by habitat calculated from other studies in the United States and Canada have ranged from 0.4 beaver colonies per square mile to a high of 12 beaver colonies per square miles (Novak 1987). Density estimates in the United States and Canada based on stream miles have ranged from 0.5 beaver colonies per stream mile to two beaver colonies per stream mile (Novak 1987). To derive a population estimate, the number of beaver per colony must also be known. Currently, the average number of beaver per colony in Mississippi is currently unknown. From other studies, the average size of beaver colonies has ranged from 3.2 beaver to 9.2 beaver per colony (Novak 1987). In the southeastern United States, the average number of beaver per colony in Alabama was estimated at 4.6 beaver (Wilkinson 1962) and the average beaver per colony in Georgia was estimated at 5.3 beaver (Parrish 1960). There are over 2.7 million acres of freshwater wetlands in Mississippi along with 83,674 miles of rivers and streams in the State (Alley and Segrest 2008).

Using the lowest beaver colony density per linear measure derived from other studies of 0.5 beaver per stream mile and using the assumption that all stream miles in Mississippi are suitable beaver habitat and occupied by beaver colonies, a statewide population of beaver in Mississippi using the lowest calculated number of beaver per colony of 4.6 beaver in the southeastern United States, a statewide population of beaver inhabiting rivers and streams could be estimated at nearly 193,000 beaver. Of the 83,674 miles of streams and rivers in the State, 53,754 miles are considered intermittent streams where water is not present throughout the year. Using only those river miles with water throughout the year, a beaver population in the State could be estimated at 63,000 beaver using the lowest densities of colonies and the lowest number of beaver per colony.

The MDWFP, with management authority over beaver, currently allows beaver to be harvested in the State during a continuously open season with no limit on the number of beaver that can be harvested (MDWFP 2009). As shown in Table 4, an estimated 87,009 beaver have been harvested in Mississippi during the continuously open season since 2003. When compared to the harvest take, WS' take has not

exceeded 25.7% of the estimated annual harvest of beaver in the State and has averaged 20.5% from 2003 through 2008.

**Table 4 – Estimated beaver harvest compared to WS’ take of beaver from 2003 to 2008 in Mississippi**

Year	Harvest <sup>a,b</sup>	WS’ Take <sup>c</sup>	Total Take	WS % Take
2003	12,626	4,369	16,995	25.7%
2004	14,085	4,696	18,781	25.0%
2005	14,207	4,221	18,428	22.9%
2006	17,158	2,652	19,810	13.4%
2007	17,007	3,154	20,161	15.6%
2008	11,926	3,390	15,316	22.1%
<b>TOTAL</b>	<b>87,009</b>	<b>22,482</b>	<b>109,491</b>	<b>20.5%</b>

<sup>a</sup>Harvest data reported by calendar year

<sup>b</sup>Harvest data provided by the MDWFP

<sup>c</sup>WS’ take is reported by FY

The MDWFP reported during the scoping process for the pre-decisional EA that the statewide beaver populations were stable (B. Thomason, MDWFP, letter to T. Aderman, WS, July 26, 2001). If populations of beaver have remained relatively stable at 193,000 in Mississippi, WS’ highest level of annual take that occurred in FY 2004 would represent 2.4% of the estimated population. Using the lowest population estimate for beaver in the State based on the best available information, WS’ take in FY 2004 would represent 7.4% of the estimated population. The highest level of overall take from fur harvest and WS’ take also occurred in 2007. With an estimated 20,161 beaver taken in 2007 and a stable beaver population, the overall take of beaver would represent 10.4% of the estimated population in the State using the highest population estimate. Using the lowest beaver population in the State, would represent 32.0% of the estimated statewide population. The number of beaver taken for damage management by other entities in Mississippi is unknown. However, the MDWFP has determined that there is no evidence to suggest that human mediated mortality resulting from regulated fur harvest and damage management activities, including removal by WS, will be detrimental to the survival of the beaver populations in the State of Mississippi (B. Thomason, MDWFP, letter to T. Aderman, WS, July 26, 2001).

An allowable harvest level for beaver has been estimated at 30% of the population (Novak 1987). The total known take of beaver in the State has not exceeded 30% of the estimated statewide population of beaver in Mississippi except for the overall take of beaver that occurred in 2007 that was 32% of the lowest population of 63,000 beaver estimated in the State using density data. As mentioned previously, during the development of WS’ programmatic FEIS, the statewide beaver population was estimated at 150,000 beaver in 1988 and the population was increasing (USDA 1997). Given the increasing trend of beaver in the State, the population estimated previously of 193,000 beaver statewide is likely a closer estimate of the actual beaver population in the State. If the 193,000 beaver population estimate is used based on density data, the highest total take of beaver that occurred in 2007 would represent 10.4% of the estimated beaver population which is considered a low magnitude of take.

WS’ annual take of beaver in Mississippi has been within annual take levels analyzed in the EA. When compared to the estimated population of beaver in the State based on a stable population and when compared to the overall harvest of beaver taken in the State, the magnitude of WS’ annual take has been low. WS’ activities did not adversely affect beaver populations in Mississippi based on the limited number of beaver taken by WS, the unlimited take allowed by the MDWFP, and the concurrence of the MDWFP that WS’ activities would not adversely affect beaver populations in the State.

### *Muskrat Population Impact Analysis*

Similar to beaver populations, the current population of muskrats in Mississippi is unknown. The MDWFP allows muskrats to be harvested in the State during a harvest season in which there is no limit on the number of muskrats that can be taken (MDWFP 2009).

During the development of the EA, the MDWFP reported the statewide muskrat population could be decreasing likely due to an increasing nutria population in the State. However, the MDWFP determined that the annual fur harvest of muskrats and WS' take of muskrats to alleviate damage would not adversely affect muskrat populations in the State (USDA 2003). As shown in Table 5, the highest level of take by WS occurred in FY 2003 when 33 muskrats were lethally taken which represents 2.9% of the total take of muskrats in the State during 2003. WS' take of 30 muskrats in FY 2005 represented 4.6% of the muskrats harvested in the State during 2005.

**Table 5 – Estimated muskrat harvest compared to WS' take of muskrats from 2003 to 2008 in Mississippi**

Year	Harvest <sup>a,b</sup>	WS' Take <sup>c</sup>	Total Take	WS % Take
2003	1,117	33	1,150	2.9%
2004	718	23	741	3.1%
2005	616	30	646	4.6%
2006	1,070	12	1,082	1.1%
2007	1,022	4	1,026	0.4%
2008	853	9	862	1.0%
<b>TOTAL</b>	<b>5,396</b>	<b>111</b>	<b>5,507</b>	<b>2.1%</b>

<sup>a</sup>Harvest data reported by calendar year

<sup>b</sup>Harvest data provided by the MDWFP

<sup>c</sup>WS' take is reported by FY

WS' take has ranged from a low of 0.4% of the total muskrat take in the State to a high of 4.6% of the statewide take of muskrats. Since FY 2003, WS' take of muskrats, including non-target take, has averaged 2.1% of the total muskrats taken in the State annually. WS' has taken 111 muskrats in the State from FY 2003 through FY 2008. WS' total take of muskrats from FY 2003 through FY 2008 was below the level of annual take evaluated in the EA. The MDWFP indicated during the development of the EA that evidence did not exist that the take of muskrats during the regulated harvest season and from damage management activities would be detrimental to the muskrat population in the State (USDA 2003). Based on the limited take occurring by WS annually, WS' take of 111 has not adversely affected muskrat populations in the State. In addition, WS' take has not limited the ability to harvest muskrats during the regulated harvest season based on the limited take occurring by WS. WS' take when compared to the take during the harvest season could be considered of low magnitude.

### *Nutria Population Impact Analysis*

Nutria are considered a non-native species in Mississippi which can be lethally taken throughout the year without a limit on the number that can be taken. The current population of nutria in the State is unknown. The total known take of nutria in Mississippi, including take by WS, from 2003 through 2008 is shown in Table 6. Since 2003, a total of 12,289 nutria have been taken in the State during the harvest season and by WS of which 1,443 were lethally taken. WS' annual take of nutria, including nutria taken as non-targets, has averaged 11.7% of the total known take of nutria in the State. The highest level of take of nutria by WS occurred in FY 2006 when 435 nutria were taken which represent 18% of the estimated total take of nutria in the State.

**Table 6 – Estimated nutria harvest compared to WS’ take of nutria from 2003 to 2008 in Mississippi.**

Year	Harvest <sup>a,b</sup>	WS’ Take <sup>c</sup>	Total Take	WS % Take
2003	1,033	298	1,331	22.4%
2004	1,278	204	1,482	13.8%
2005	3,332	170	3,502	4.9%
2006	1,983	435	2,418	18.0%
2007	1,955	160	2,115	7.6%
2008	1,265	176	1,441	12.2%
<b>TOTAL</b>	<b>10,846</b>	<b>1,443</b>	<b>12,289</b>	<b>11.7%</b>

<sup>a</sup>Harvest data reported by calendar year

<sup>b</sup>Harvest data provided by the MDWFP

<sup>c</sup>WS’ take is reported by FY

WS’ take of 298 nutria in FY 2003 represented 22.4% of the estimated total take of nutria in the State during 2003 which was the highest level of take by WS when compared to the statewide harvest between 2003 and 2008. Based on the non-native status of nutria, any take could be considered as benefiting the native environment. Nutria often compete with other native wildlife for resources, primarily food. Nutria have been implicated in declines in muskrat populations in many areas where nutria occur. Therefore, any take by WS when considered with the take occurring from other sources could be considered as benefiting the native environment.

WS’ annual take of nutria has been within the take level analyzed in the EA in which the MDWFP concluded that WS’ annual take would not adversely affect nutria populations in the State. Based on the limited take occurring of nutria in the State and the non-native status of nutria, WS’ annual take has not adversely affected nutria populations in Mississippi.

**Issue 2 - Effects on plants, and other wildlife species, including T&E species**

The issue of non-target species effects, including effects on threatened and endangered species arises from the use of non-lethal and lethal methods identified in the alternatives. The use of non-lethal and lethal methods has the potential to inadvertently disperse, capture, or kill non-target wildlife. WS’ minimization measures and SOPs are designed to reduce the effects of damage management activities on non-target species’ populations. To reduce the risks of adverse affects to non-target wildlife, WS selects damage management methods that are as target-selective as possible or applies such methods in ways that reduces the likelihood of capturing non-target species. Before initiating management activities, WS also selects locations which are extensively used by the target species and employs baits or lures which are preferred by those species. Despite WS’ best efforts to minimize non-target take during program activities, the potential for adverse affects to non-targets exists when applying both non-lethal and lethal methods to manage damage or reduce threats to safety. WS’ unintentional take of non-targets from FY 2003 through FY 2008 are shown in Table 7.

Non-target take by WS occurs primarily during activities to reduce damage associated with beaver in the State. Non-targets are unintentionally taken primarily with body-gripping traps and snares during beaver damage management activities. Since FY 2003, WS has unintentionally lethally taken 422 river otter in the State during beaver damage management activities, primarily in body-gripping traps. In addition, 257 turtles have been lethally taken by WS in the State, primarily the common snapping turtle (*Chelydra serpentina*). Since FY 2003, an average of 43 turtles have been unintentionally lethally taken by WS.

Raccoons are also unintentionally taken during aquatic rodent damage management activities. On average, 23 raccoons are lethally taken by WS in the State as unintentional non-targets.

**Table 7 – WS’ lethal non-target take by species in Mississippi during FY 2003 through FY 2008.**

Species	Fiscal Year						TOTAL
	2003	2004	2005	2006	2007	2008	
American Alligator	5	1	1	3	4	3	17
Armadillo	0	3	0	2	1	0	6
Bobcats	1	0	1	0	0	0	2
Common Merganser	0	0	0	0	0	1	1
Cottontail Rabbit	0	0	1	0	0	0	1
Coyote	0	0	1	0	0	0	1
Double-crested Cormorant	0	0	0	0	1	0	1
Feral Dog	1	0	0	0	0	0	1
Fish <sup>1</sup>	1	0	0	2	0	0	3
Gadwall	0	0	0	1	0	0	1
Mink	0	0	0	1	0	0	1
River Otter	76	40	115	63	59	69	422
Raccoon	25	11	24	32	22	23	137
Snake, Poisonous <sup>1</sup>	0	0	0	1	0	0	1
Swamp Rabbit	1	1	0	0	2	1	5
Turtles <sup>1</sup>	34	21	64	36	68	34	257
Virginia Opossum	1	2	0	7	0	0	10
White-tailed Deer	1	0	1	0	0	0	2
Wood Duck	0	0	1	0	0	0	1

<sup>1</sup> WS’ information tracking systems does not distinguish by species

Unintentional non-targets live-captured by WS during aquatic rodent damage management activities have been released when deemed appropriate for the survival of the animal (see Table 8). In FY 2003, WS live-captured and released at least ten species of wildlife during aquatic rodent damage management activities. Non-targets released unharmed were primarily live-captured in body-gripping traps or snares. From FY 2003 through FY 2008, WS live-captured and released 444 turtles in the State during damage management activities. The common snapping turtle was the species of turtle most often live-captured and released by WS. A total of 22 river otter were also live-captured and released primarily during beaver damage management activities.

In 2003, one wood stork (*Mycteria americana*) was live-captured and released from a foothold trap set to capture beaver. The breeding population of wood storks in Alabama, Florida, Georgia, South Carolina, and Texas are classified as endangered by the USFWS. Non-breeding wood storks are known to occur in Mississippi but are not classified as endangered in the State. No additional wood storks have been live-captured by WS in Mississippi since 2003.

Since 2003, 17 American alligators (*Alligator mississippiensis*) have been live-captured and released by WS during aquatic rodent damage management. American alligators are currently classified as threatened due to similarity of appearance in Mississippi by the USFWS. WS’ unintentional take of alligators in Mississippi occurs under special rules (50 CFR 17.42). WS’ take of alligators is further discussed below.

**Table 8 – Non-targets captured and released by WS during aquatic rodent damage management activities from FY 2003 through FY 2004.**

Species	Fiscal Year						TOTAL
	2003	2004	2005	2006	2007	2008	
American Alligator	1	0	1	7	5	3	17
Canada Goose	1	0	0	0	0	0	1
Ducks <sup>1</sup>	2	1	0	0	0	0	3
Feral Dog	2	1	0	0	1	0	4
Gray Fox	1	0	0	0	0	0	1
Raccoons	2	0	3	1	4	1	11
River Otter	3	2	3	1	4	9	22
Snowy Egret	1	0	0	0	0	0	1
Turtles <sup>1</sup>	57	25	86	70	104	102	444
Wood Stork	1	0	0	0	0	0	1

<sup>1</sup>WS' information tracking systems does not distinguish by species

Population impact analyses for species lethally taken during aquatic rodent damage management activities are addressed below.

#### ***Non-target Species' Population Impact Analyses***

Similar to the analyses of take on the populations of target species addressed under Issue 1, of primary concern with the unintended take of non-targets is the magnitude of take on those species' populations. As shown in Table 7, WS' take of any single species of non-targets since FY 2003 has not exceeded 17 individuals, except for river otters, raccoons, and turtles. For those species in which WS' unintentional take did not exceed 20 individuals from FY 2003 through FY 2008, WS' take did not adversely affect those species' populations. Many of the mammal species unintentionally lethally taken by WS can be harvested in the State during regulated hunting and trapping seasons. Nine-banded armadillos (*Dasypus novemcinctus*), bobcats (*Lynx rufus*), cottontail rabbits (*Sylvilagus floridanus*), coyotes (*Canis latrans*), mink (*Mustela vison*), swamp rabbits (*Sylvilagus aquaticus*), Virginia opossum (*Didelphis virginiana*), and white-tailed deer (*Odocoileus virginianus*) are all species in which harvest seasons exist in Mississippi. WS' unintentional take of those species when compared to the harvest level of those species would be of low magnitude. WS' activities did not limit the ability to harvest those species during the regulated season given the limited take occurring by WS. Feral dogs are a non-native component of the environment which can adversely affect native wildlife species in the State. WS' unintentional take of one feral dog in FY 2003 did not adversely affect populations in the State. WS' take of three fish and one poisonous snake from FY 2003 through FY 2008 did not adversely affect populations of those species.

Since FY 2003, WS' has taken one double-crested cormorant, one common merganser, one gadwall, and one wood duck during aquatic rodent damage management. All unintentional take of bird species occurred under allowed take levels authorized in depredation permits issued by the USFWS for those species. The limited take by WS of those species did not adversely affect populations of those species. Common mergansers, gadwalls, and wood ducks are harvested annually during regulated hunting seasons in the State. WS' take of one merganser, one gadwall, and one wood duck would be considered of low magnitude when compared to the annual take of those species of waterfowl. The take of one cormorant did not adversely affect populations in the State.

### *Alligator Population Impact Analysis*

Since FY 2003, WS has lethally taken 17 American alligators during aquatic rodent damage management and live-captured and released an additional 17 alligators. Alligators live-captured during aquatic rodent damage management activities conducted by WS that are lethally taken are euthanized at the request of the MDWFP. As mentioned previously, American alligators are listed as threatened by the USFWS due to similarity of appearance in Mississippi. However, under special rules for alligators (50 CFR 17.429(a)(2)(i)), “Any employee or agent of...a State conservation agency, who is designated by the agency for such purposes, may, when acting in the course of official duties, take an American alligator”. Any take of alligators by WS is reported to the MDWFP including any biological data gathered by WS on the alligator for scientific research purposes which is used by the MDWFP to monitor and establish management objectives for alligators in the State. The current population of alligators in Mississippi is unknown. In 2000, the statewide alligator population was estimated at 32,000 to 38,000 alligators (MDWFP 2007). However, an alligator hunting season also exists in Mississippi which was first initiated in 2005. Currently there are two zones in which alligators can be harvested that encompasses 13 counties within the State.

During 2008, a total of 433 alligators were harvested in the State with 241 taken to alleviate damage or threats (R. Flynt, MDWFP pers. comm. 2009). WS’ non-target take of three alligators in FY 2008 would represent 0.7% of the total alligators lethally taken in the State. Given the regulated hunting season for alligators in the State and the permitting of the take by the MDWFP, WS’ limited take of alligators has not adversely affected alligator populations nor has the non-target take of alligators by WS limited the ability to harvest alligators during the regulated hunting season. WS will continue to release alligators live-captured during aquatic rodent damage management activities unless directed by the MDWFP to euthanize those alligators captured by WS. WS will also continue to report any take to the MDWFP to ensure take is considered as part of management objectives for alligators in the State.

### *River Otter Population Impact Analysis*

River otter can be found statewide in Mississippi wherever suitable habitat exists. The MDWFP allows river otter to be taken during a regulated trapping season each year with no limit on the number of otter that can be taken during the season. The current otter population in Mississippi is unknown. As shown in Table 9, the highest annual take level of otters by WS occurred in FY 2005 when 115 otters were unintentionally taken.

**Table 9 – Estimated otter harvest compared to WS’ take of otter from 2003 to 2008 in Mississippi.**

Year	Harvest <sup>a,b</sup>	WS’ Take <sup>c</sup>	Total Take	WS % Take
2003	2,610	76	2,686	2.8%
2004	3,024	40	3,064	1.3%
2005	3,546	115	3,661	3.1%
2006	3,506	63	3,569	1.8%
2007	1,395	59	1,454	4.1%
2008	N/A <sup>d</sup>	69	N/A	N/A
<b>TOTAL</b>	<b>14,081</b>	<b>422</b>	<b>14,434<sup>e</sup></b>	<b>2.4%<sup>e</sup></b>

<sup>a</sup>Harvest data reported by trapping season

<sup>b</sup>Harvest data provided by the MDWFP

<sup>c</sup>WS’ take is reported by FY

<sup>d</sup>Information is currently unavailable

<sup>e</sup>Total does not include WS’ take of otter in FY 2008

Since FY 2003, WS' unintentional take of otters has averaged 2.4% of the total known take of otter when WS' take is combined with otter taken during the open harvest season in the State. The magnitude of WS' unintentional take of river otters during beaver damage management activities is low. Based on the unlimited take allowed by the MDWFP during the open otter harvest season and the low magnitude of WS' take when compared to the total known take of otter, WS' unintentional take of otters has not adversely affected river otter populations in the State. WS' unintentional take of otter has been below 5% of the total take of river otters in the State as addressed in the EA (USDA 2003). WS' take of otter has not limited the ability of those interested to harvest otter during the open season based on the low magnitude of WS' activities on otter populations.

### ***Raccoon Population Impact Analysis***

Exact population estimates for raccoons in Mississippi are not currently available. Raccoons can be harvested in Mississippi during regulated harvest seasons. Since FY 2003, WS has unintentionally taken 137 raccoons as non-targets during aquatic rodent damage management with an average of 23 raccoons taken annually. The highest raccoon take by WS occurred in FY 2006 when 32 raccoons were lethally taken as non-targets during beaver damage management activities. During the 2005-2006 hunting season for raccoons in the State, a total of 103,878 raccoons were harvested (Hunt et al. 2007). WS' unintentional take of 32 raccoons in FY 2006 would represent 0.03% of the number of raccoons harvested during the 2005-2006 season. From 2003 through 2006, a total of 327,172 raccoons have been harvested during the regulated hunting season in the State (Hunt et al. 2007).

The magnitude of WS' non-target take of raccoons during aquatic rodent damage management activities in the State has been low when compared to the annual harvest of raccoons during the regulated hunting season. WS' limited take of raccoons has not limited the ability to harvest raccoons during the regulated hunting season.

### ***Turtle Population Impact Analysis***

As mentioned previously, an average of 43 turtles have been unintentionally lethally taken by WS' during aquatic rodent damage management activities since FY 2003 in the State. WS' highest level of take occurred in FY 2007 when 68 turtles were lethally taken. Take consists primarily of common snapping turtles during beaver damage management activities. Since FY 2003, 444 turtles have been captured and released during aquatic rodent damage management activities in Mississippi. WS' lethal take of turtles in FY 2008 consisted of 27 common snapping turtles, one painted turtle, and six other turtles. Snapping turtles can be harvested in Mississippi with no limit on the number of turtles that can be harvested. The annual harvest of common snapping turtles is currently unknown. Similarly, the population of snapping turtles in the State is currently unknown.

Take of other turtle species has occurred during beaver damage management activities. Similar to snapping turtles, the populations of other turtles in the State is currently unknown. Three freshwater species of turtles, the Alabama red-belly turtle (*Pseudemys alabamensis*), ringed map turtle (*Graptemys oculifera*), and the yellow-blotched map turtle (*Graptemys flavimaculata*), are federally-listed as threatened in Mississippi. In addition, the black-knobbed sawback turtle (*Graptemys nigrinoda*), Alabama red-belly turtle, ringed map turtle, and the yellow-blotched map turtle are State-listed as endangered freshwater turtles in Mississippi. Several marine turtles and the gopher tortoise (*Gopherus polyphemus*) are also federal- and State-listed species in Mississippi. No known take of any State- or federally-listed turtles has occurred by WS during aquatic rodent damage management activities in the Mississippi.

WS' annual take of turtles since FY 2003 did not reach magnitudes that would adversely impact populations in Mississippi considering that take was distributed across several species. All precautions are taken to avoid capture of turtles during activities to alleviate damage caused by aquatic rodents. Over 76% of the turtles captured were released unharmed. Given that turtle densities in Mississippi are not considered to be low and the limited take of turtles of any given species by WS, WS' aquatic rodent damage management activities did not adversely affect turtle populations in Mississippi.

While every precaution is taken to safeguard against taking non-targets during operational use of methods and techniques for resolving damage and reducing threats caused by wildlife, the use of such methods can result in the incidental take of unintended species. Those occurrences are minimal and should not affect the overall populations of any species. WS' take of non-target species during activities to reduce damage caused by aquatic rodents is expected to be extremely low. WS will continue to monitor annually the take of non-target species to ensure program activities used in aquatic rodent damage management do not adversely impact non-targets. WS' activities are not likely to adversely affect the viability of any wildlife populations from damage management activities.

The EA concluded that WS' damage management activities would not adversely affect wildlife species (non-target), including threatened and endangered species throughout the State when those activities were conducted within the scope analyzed in the EA. Methods used by WS are essentially selective for target species when applied appropriately. In addition, WS adheres to those minimization measures and procedures discussed in the EA to minimize the potential for non-target take. WS will continue to report to the MDWFP all take of wildlife to ensure WS' activities are considered in management objectives for wildlife in the State.

#### ***Threatened and Endangered Species Analyses***

A review of T&E species listed by the Mississippi Museum of Natural Resources, the USFWS, and the National Marine Fisheries Service showed that additional listings of T&E species in Mississippi have occurred since the completion of the EA. Several species were listed as threatened and endangered in Mississippi that are not known to occur in the State. Those species included the American burying beetle (*Nicrophorus americanus*), American chaffseed (*Schwalbea americana*), Eskimo curlew (*Numenius borealis*), Florida panther (*Puma concolor coryi*), and the gray wolf (*Canis lupus*). WS determined that program activities, based on those methods described in the EA, would have no effect on those species listed as threatened and endangered in Mississippi that do not occur in the State, including any designated critical habitat. The no effect determination is based on those species being absent from the State based on the current known distributions of those species.

The smalltooth sawfish (*Pristis pectinata*) and the Alabama red-belly turtle (*Pseudemys alabamensis*) are known to occur in the State but are not currently listed in the State by the USFWS. The Alabama red-belly turtle is listed as a threatened and endangered species in the State by the Mississippi Museum of Natural Resources. The red-belly turtle is only known to occur in Mississippi from the lower portions of the coastal streams between the Escatawpa River and the Biloxi River in waters under tidal influence (Mississippi Museum of Natural Resources 2001). Given the limited distribution of the red-belly turtle in the State and the limited habitat requirements, WS' aquatic rodent damage management activities when conducted within the scope of the proposed action analyzed in the EA, will have no effect on the Alabama red-belly turtle, including any designated critical habitat.

The smalltooth sawfish historically has occurred in the shallow coastal waters of the Gulf of Mexico from Texas to Florida and the shallow coastal areas along the Atlantic Ocean from Florida to New York. WS' activities to resolve damage or threats associated with aquatic rodents are not those that cause major disturbances to habitat or the introduction of pollutants into the waters where sawfish are known to occur.

Current populations of smalltooth sawfish are only known to occur off the southern coasts of Florida (National Marine Fisheries Service 2009). Based on the current known range of the smalltooth sawfish being restricted to peninsular Florida, WS' aquatic rodent damage management activities conducted pursuant to the EA will have no effect on the smalltooth sawfish, including any designated critical habitat.

Based on the use pattern of methods available to alleviate damage and threats associated with aquatic rodents, activities conducted pursuant to the proposed action in the EA will have no effect on hawksbill sea turtles, leatherback sea turtles, finback whale, and humpback whales or their designated critical habitats. Those species inhabit marine environments where aquatic rodent damage management activities do not occur. Although sea turtles nest on land, the use of methods pursuant to the proposed action would have no effect on sea turtles given their use patterns, including any designated critical habitat.

The flat pigtoe (*Pleurobema marshalli*) and the stirrupshell (*Quadrula stapes*) were freshwater mussels unique to the Tombigdee River system that are now believed to be extinct (USFWS 2009). Based on the current known status of the flat pigtoe and the stirrupshell, WS' aquatic rodent damage management activities conducted pursuant to the proposed action will have no effect on the pigtoe and stirrupshell given the likely extinction of those species, including any designated critical habitat.

The Cumberlandian combshell (*Epioblasma brevidens*) is believed to occur in the State only in Bear Creek (USFWS 2004, USFWS 2007a). Given the limited distribution of the combshell in the State, WS' aquatic rodent damage management activities will have no effect on the status of the combshell in Mississippi, including any designated critical habitat. If beaver dams are to be removed along Bear Creek in Mississippi, WS will consult with the USFWS pursuant to the Endangered Species Act to ensure those activities does not affect the status of the combshell in the State.

The historical range of the Alabama sturgeon (*Scaphirhynchus suttkusi*) included the Tombigdee River in Mississippi (74 FR 26487-26510). The sturgeon is now known only to occur along a stretch of the lower Alabama River in Alabama. Given the habitat requirements of sturgeon on large river systems and the likely extirpation of the species from the Tombigdee River in Mississippi, aquatic rodent damage management activities will have no effect on sturgeon populations or designated critical habitat.

The slabside pearl mussel (*Lexingtonia dolabelloides*) is currently considered a candidate species for listing by the USFWS (USFWS 2008a). The slabside pearl mussel is only known to occur in Mississippi along a six-mile stretch of Bear Creek in Tishomingo County. Given the limited distribution of the pearl mussel in the State, WS' aquatic rodent damage management activities will have no effect on the status of the pearl mussel in Mississippi or any designated critical habitat. If beaver dams are to be removed along Bear Creek in Mississippi, WS will consult with the USFWS pursuant to the Endangered Species Act to ensure those activities do not affect the status of the pearl mussel in the State.

The pearl darter (*Percina aurora*) is also listed as a candidate species for listing in Mississippi. Currently, the pearl darter is believed to only occur in the Pascagoula River drainage, including the Pascagoula, Chickasawhay, Chunky, Leaf, and Bouie Rivers and Okatoma and Black Creeks (USFWS 2008b). River habitat where darters have been collected has varied but they are thought to inhabit rivers and large creeks in areas of moderate current, usually over sandy or gravel substrates at the edges of riffles or deep channels (USFWS 2008b). Of concern with aquatic rodent damage management activities is the release of water and particulates from removing beaver dams to alleviate flooding. Although beaver damage management activities could occur along large rivers and creeks, requests for assistance to manage damage are not generally associated with beaver dams. Given the habitat requirements of the pearl darter of large river systems, WS' aquatic rodent damage management will have no effect on the pearl darter.

Another candidate for listing in Mississippi is the sheepsnose mussel (*Plethobasus cyphus*) which is currently only known to occur in the Big Sunflower River in the State (USFWS 2007b). Sheepsnose mussels are commonly found in river habitat with shallow shoals in moderate to swift currents over coarse sand and gravel (USFWS 2007b). As mentioned previously, requests for assistance to manage damage caused by aquatic rodents along major river systems is associated with beaver. Most requests for assistance to manage damage associated with beaver along rivers is not associated with water being impounded by beaver dams on the river. Sufficient water depth in rivers negates the need for beaver to build dams and most beaver that inhabit river systems use bank dens. Based on the limited distribution and the habitat requirements of sheepsnose mussels, WS' beaver damage management activities will have no effect on populations of mussels in the State.

The black pine snake (*Pituophis melanoleucus lodingi*) has been listed as a candidate for listing in Mississippi. Currently, populations of pine snakes are known to occur in Forrest, George, Greene, Harrison, Jackson, Jones, Marion, Perry, Stone, and Wayne counties in Mississippi (USFWS 2008c). The highest densities of pine snakes occur on Desoto National Forest with isolated populations in suitable habitat outside of the National Forest (USFWS 2008c). Pine snakes can be found in upland longleaf pine forests with sandy, well drained soils with dense ground cover (USFWS 2008c). Given the habitat requirement of the pine snake, the limited distribution of the snake, and habitat requirements, WS' aquatic rodent damage management activities will have no effect on the status of the pine snake in the State.

In addition, the white fringeless orchid (*Platanthera integrilabia*) has been designated as a candidate for listing in Mississippi by the USFWS. In Mississippi, the orchid is known from two records that were taken in Alcorn County in 1863 and another from Tishomingo County in 1974 (USFWS 2008d). The population in Alcorn County is thought to be extirpated. In Tishomingo County, the population where the first county record was described is believed to still be extant with an additional population located in the County since the first record was noted (USFWS 2008d). The fringeless orchid can be found in boggy areas at the head of streams and on slopes with water seepage (USFWS 2008d). With current populations of orchids in Mississippi only occurring at two sites in Mississippi, WS' aquatic rodent damage management will have no effect on populations in the State. If aquatic rodent damage management activities are conducted in Tishomingo County in the area where orchids are known to occur, WS would consult with the USFWS pursuant to the Endangered Species Act.

Program activities and methods have not changed from those analyzed in the EA. Thus, WS' determination that beaver damage management activities will not likely adversely affect T&E species in Mississippi is still valid and appropriate for the proposed action as addressed in the EA. For those species listed during the development of the EA, WS' determination of no effect is still valid and appropriate based on WS' activities to alleviate damage and threats of damage associated with nutria and muskrats in Mississippi.

*Native Plant Species* - As described in the EA, removal of beaver, nutria, and muskrats and breaching/removing beaver dams would be beneficial to some native plant species that may be killed by foraging aquatic rodents and beaver related flooding and inundation. Some native plants may be trampled as WS' employees walk into sites or take an All Terrain Vehicle (ATV) into sites. Disturbance to most sites from entering and exiting is minimal. Some native vegetation may be disrupted from the blasting of dams as debris falls immediately around the area. Generally, the debris is scattered out around the site and is not overly destructive to surrounding vegetation

Program activities and their potential impacts on plant and other wildlife species have not changed from those analyzed in the EA. The effects on this issue are expected to remain insignificant.

### **Issue 3 - Effects on Public and Pet Health and Safety**

The EA concluded that the effects of WS' aquatic rodent damage management activities when conducted within the scope analyzed would have no adverse impact on human safety or pet safety. WS' implementation of the proposed action from FY 2003 through FY 2008 did not result in any adverse impacts to human or pet safety. The methods available for use to manage damage caused by aquatic rodents in the State remain as addressed in the EA. Therefore, the potential impacts of program activities on human health and safety have not changed from those analyzed in the EA. Impacts of the program on this issue are expected to remain insignificant.

### **Issue 4 - Humaneness of Methods to be Used**

As discussed in the EA, humaneness, in part, appears to be a person's perception of harm or pain inflicted on an animal. People may perceive the humaneness of an action differently. The challenge in coping with this issue is how to achieve the least amount of animal suffering within the constraints imposed by current technology.

Some individuals believe any use of lethal methods to resolve damage associated with wildlife is inhumane because the resulting fate is the death of the animal. Others believe that certain lethal methods can lead to a humane death. Others believe most non-lethal methods of capturing wildlife to be humane because the animal is generally unharmed and alive. Still others believe that any disruption in the behavior of wildlife is inhumane. With the multitude of attitudes on the meaning of humaneness, the analyses must consider the most effective way to address damage and threats caused by wildlife in a humane manner. WS is challenged with conducting activities and employing methods that are perceived to be humane while assisting those persons requesting assistance to manage damage and threats associated with wildlife. The goal of WS is to use methods as humanely as possible to effectively resolve requests for assistance to reduce damage and threats to human safety. WS continues to evaluate methods and activities to minimize the potential pain and suffering of those methods addressed when attempting to resolve requests for assistance.

As mentioned previously, some methods have been stereotyped as "humane" or "inhumane". However, many "humane" methods can be inhumane if not used appropriately. For example, a cage trap is generally considered by most members of the public as "humane" since an animal is live-captured. Yet, without proper care, live-captured wildlife in a cage trap can be treated inhumanely if not attended to appropriately.

Therefore, WS' mission is to effectively address requests for assistance using methods in the most humane way possible that minimizes the stress and pain of the animal. WS' personnel are experienced and professional in their use of management methods. When employing methods to resolve damage to resources or threats to human safety, methods are applied as humanely as possible. Methods used in aquatic rodent damage management activities in Mississippi since the completion of the EA and their potential impacts on humaneness and animal welfare have not changed from those analyzed in the EA. No new methods were identified in this report that would alter the analysis contained in the EA on the issue of method humaneness. Therefore, the analyses of the humaneness of methods used by WS to manage damage and threats caused by aquatic rodents have not changed from those analyzed in the EA.

### **Issue 5 - Effects on Wetlands**

Beaver dams in Mississippi are removed by hand or with explosives with the purpose of returning streams, dikes, culverts, and irrigation canals to their original channel. Dams are removed in accordance with provisions of the Clean Water Act. As described in the EA, WS often receives requests for

assistance soon after the initiation of damage caused by beaver. Therefore, dams that are breached by WS are created as a result of recent beaver activity and have not developed into wetlands subject to regulations under the Clean Water Act. Since beaver dams removed by WS are recently occurring and have not established wetland characteristics, WS' beaver damage management activities are not negatively affecting the statewide status of wetlands. Dams are removed or breached to alleviate flooding damage and to restore original channels.

Program activities and their potential impacts on wetlands have not changed from those analyzed in the EA. No new methods, circumstances, or regulations have been implemented since the implementation of the proposed action addressed in the EA and the Decision. The EA concluded that WS' beaver dam removal/breaching activities should have minimal impact on wetlands. The impacts of WS' aquatic rodent damage management activities on wetlands are expected to remain insignificant.

### **Issue 6 - Economic Losses to Property**

Another issue often raised is the negative economic impact that aquatic rodents have on resources and whether damage management strategies are effective at reducing damages occurring to acceptable levels. The effectiveness of any damage management program could be defined in terms of losses prevented or risks potentially prevented. Effectiveness is based on the species responsible for the damage, how accurately practitioners diagnose damage, how actions are implemented to correct or mitigate risks and damages, how quickly damage is reduced or prevented, and finally the duration damage or threats are resolved after employing methods. To determine that effectiveness, WS must be able to complete management actions expeditiously to minimize harm to non-target animals and the environment, while at the same time, using methods as humanely as possible.

During the reporting period, WS' activities reduced or eliminated aquatic rodent damage to property including timber, crops, landscaping, levee damage to private and public ponds and lakes, roads, bridges, culverts, and ditches. For example, once beaver and associated dams were removed, damage from beaver burrowing into embankments, damage from beaver gnawing and felling trees, and flooding damage from beaver impounding water were alleviated since beaver and dams were no longer present at the location to cause damage. Therefore, those methods used to remove beaver from the site and to remove the beaver dam were effective in alleviating damage.

Aquatic rodents could potentially re-inhabit those areas where WS' activities alleviated damages previously. The amount of time before aquatic rodents repopulate areas where damages were previously reduced would be dependent on available habitat and densities in the area where damage was occurring. However, the repopulation of areas by beaver, muskrats, or nutria in areas where damages were previously alleviated does not indicate methods and techniques are ineffective at reducing damage. The issue is the limited availability of methods to prevent damage from occurring initially or from re-occurring once alleviated. Those methods available to prevent damage which were described in Appendix D of the EA are often costly and impracticable when application is required over large areas, are ineffective at preventing damage, or would require drastic habitat modifications (USDA 2003). No additional methods have become available since the completion of the EA that would increase the effectiveness of preventing damage from occurring or from re-occurring once alleviated.

Program activities and the potential economic impacts to property have not changed from those analyzed in the EA. During the reporting period, WS reduced or alleviated damage to property including timber, crops, landscaping, levee damage to private and public ponds and lakes, roads, bridges, culverts, and ditches. WS' aquatic rodent damage management program activities reduced, prevented, or terminated economic property losses valued at approximately \$270 million. A large portion of this damage was to

timber resources. The effects of WS' aquatic rodent damage management activities on this issue are expected to remain insignificant.

#### **Issue 7 - Impacts to Stakeholders, including Aesthetics**

The EA concluded the effects on aesthetics would be variable, depending on the damage situation, stakeholder's values towards wildlife, and their compassion for those who are experiencing damage from aquatic rodents. The ability to view and enjoy the aesthetic value of beaver, muskrats, or nutria at a particular site would be somewhat limited if the animals were removed. However, new beaver, muskrats, or nutria would most likely use the site in the future, although the length of time until they arrive is variable, depending on the site, time of year, and population densities in the surrounding areas. The opportunity to view beaver, muskrat, and nutria is available if a person makes the effort to visit sites outside of the damage management area.

WS in Mississippi only conducts beaver, nutria, and muskrat damage management at the request of the affected home/property owner or resource manager. Upon receiving a request for assistance, WS addresses issues/concerns and explanations are given for all damage management activities. Management actions are carried out in a caring, humane and professional manner. Methods employed to resolve or alleviate damage have not changed from those analyzed in the EA. The potential impacts to stakeholders and aesthetics of conducting aquatic rodent damage management have not changed from those analyzed in the EA. The effects of WS' activities on this issue are expected to remain insignificant.

#### **IX. ISSUES NOT CONSIDERED IN DETAIL**

WS has reviewed the issues not considered in detail as described in the EA and has determined that the analysis provided in the EA has not changed and is still appropriate. Effects on those issues continue to be insignificant.

#### **X. ALTERNATIVES ANALYZED IN DETAIL**

The following five alternatives were developed in response to the issues identified in the EA and through public involvement:

- **Alternative 1** – No WS' Beaver, Nutria, or Muskrat Damage Management in Mississippi
- **Alternative 2** – Only Lethal Beaver, Nutria, and Muskrat Damage Management
- **Alternative 3** – Fully Integrated Beaver, Nutria, and Muskrat Damage Management for all Public And Private Land (No Action/Proposed Action)
- **Alternative 4** - Technical Assistance Only
- **Alternative 5** – Non-lethal Beaver, Nutria, and Muskrat Damage Management

The EA contains a detailed description and discussion of the alternatives and the effects of the alternatives on the issues identified. Appendix D of the EA provides a description of the methods that could be used or recommended by WS under each of the alternatives. WS has reviewed the alternatives analyzed and determined the analyses in the EA are still appropriate for those alternatives.

#### **XI. ALTERNATIVES CONSIDERED BUT NOT ANALYZED IN DETAIL**

The following alternatives were considered but not analyzed in detail:

- Eradication and Suppression
- Population stabilization through birth control

- Compensation for Wildlife Damage Losses
- Bounties
- Live-trap and Relocate
- Live-capture and Euthanasia Only

A complete evaluation and discussion of the alternatives not considered in detail can be found in the EA along with the rationale. WS has reviewed the alternatives analyzed but not in detail and determined the analyses in the EA are still appropriate for those alternatives considered.

## **XII. ANALYSIS**

WS has reviewed the potential environmental impacts and the scope of analysis contained in the EA. The EA and the associated Decision/FONSI determined that activities conducted pursuant to and within the scope of analyses would not have significant impacts on the quality of the human environment. After review of the EA, the associated Decision/FONSI, and information contained in this summary report, WS has determined that the environmental impacts on the quality of the human environment from those activities conducted pursuant to the EA and its Decision/FONSI will continue to be insignificant and that no substantive changes in the analyses are necessary.

WS' aquatic rodent damage management activities in Mississippi, based on the information found within this report, fall within the scope of analysis in the EA. No substantive changes have occurred in activities conducted or methods used since implementing the EA decision during the reporting period. Program activities have not changed from those described and analyzed in the EA. The EA discusses program procedures, protection measures, and mitigations that the WS program implements during direct control activities to provide an assurance of quality and consideration for environmental impacts.

## **XIII. DECISION AND RATIONALE**

I have carefully reviewed the EA, the comments received during the public involvement process, the 2003 Decision/FONSI, and the information provided in this summary and new Decision document. I find the proposed program to be environmentally acceptable, addressing the issues and needs while balancing the environmental concerns of management agencies, landowners, advocacy groups, and the public. The analyses in the EA adequately addresses the identified issues which reasonably confirm that no significant impact, individually or cumulatively, to wildlife populations or the quality of the human environment are likely to occur from the proposed action, nor does the proposed action constitute a major federal action that would warrant the development of an EIS. Therefore, the analysis in the EA remains valid and does not warrant the completion of an EIS.

Based on the EA, the issues identified are best addressed by continuing Alternative 3 (Proposed Action/No Action) and applying the associated mitigation measures discussed in Chapter 3 of the EA. Alternative 3 successfully addresses (1) beaver, muskrat, and nutria damage management using a combination of the most effective methods and does not adversely impact the environment, property, and/or non-target species, including T&E species; (2) it offers the greatest chance at maximizing effectiveness and benefits to resource owners and managers while minimizing cumulative impacts on the quality of the human environment that might result from the program's effect on target and non-target species' populations; (3) it presents the greatest chance of maximizing net benefits while minimizing adverse impacts to public health and safety; and (4) it offers a balanced approach to the issues of humaneness and aesthetics when all facets of those issues are considered. Further analysis would be triggered if changes occur that broaden the scope of beaver, muskrat, or nutria damage management activities, that affect the natural or human environment, or from the issuance of new environmental regulations.

The rationale for my decision is based on several considerations. This decision takes into account public comments, social/political and economic concerns, public health and safety, the best available science, and program activities conducted since the selected alternative was implemented. The foremost considerations are that: 1) aquatic rodent damage management will only be conducted by WS at the request of landowners/managers, 2) management actions are consistent with applicable laws, regulations, policies and orders, and 3) no adverse impacts to the environment were identified in the analysis. As a part of this new Decision, the WS program in Mississippi will continue to provide effective and practical technical assistance and direct management techniques that reduce damage.

The WS program in Mississippi will implement the proposed action in compliance with all applicable standard operating procedures and minimization measures described in Chapter 3 of the EA. If no substantive issues or alternatives are identified after publication of a legal notice making the EA, the 2003 Decision/FONSI, and this Decision available to the public for review and comment, this new Decision will take effect at the close of the public notification period. New issues or alternatives raised after publication of public notices will be fully considered to determine whether the EA and this Decision should be revisited and, if appropriate, revised, or if a Notice of Intent to prepare an EIS should be issued.

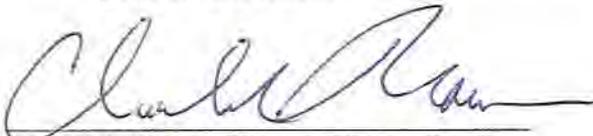
### **FINDING OF NO SIGNIFICANT IMPACT**

The analysis in the EA, the 2003 Decision/FONSI, and this summary report indicates that there will not be a significant impact, individually or cumulatively, on the quality of the human environment as a result of the proposed action. I agree with this conclusion and therefore, find that an EIS need not be prepared. This determination is based on the following factors:

1. Aquatic rodent damage management as conducted by WS in Mississippi is not regional or national in scope.
2. The proposed action would pose minimal risk to public health and safety. Risks to the public from WS' methods were determined to be low in a formal risk assessment (USDA 1997).
3. There are no unique characteristics such as park lands, prime farm lands, wetlands, wild and scenic areas, or ecologically critical areas that would be significantly affected. Built-in mitigation measures that are part of WS' standard operating procedures and adherence to laws and regulations will further ensure that WS' activities do not harm the environment.
4. The effects on the quality of the human environment are not highly controversial. Although there is some opposition to wildlife damage management, this action is not highly controversial in terms of size, nature, or effect.
5. Based on the analysis documented in the EA and the accompanying administrative file, the effects of the proposed damage management program on the human environment would not be significant. The effects of the proposed activities are not highly uncertain and do not involve unique or unknown risks.
6. The proposed action would not establish a precedent for any future action with significant effects.
7. No significant cumulative effects were identified through this assessment. The number of beaver, nutria, and muskrats killed by WS, when added to the total known take of those species, would fall within allowable harvest levels supported by the MDWFP. The EA and this summary report discussed potential cumulative effects of WS' activities on target and non-target species

populations and concluded that such impacts were not significant for this or other anticipated actions to be implemented or planned within the State.

8. The proposed activities would not affect districts, sites, highways, structures, or objects listed in or eligible for listing in the National Register of Historic Places, nor would they likely cause any loss or destruction of significant scientific, cultural, or historical resources.
9. WS has determined that the proposed beaver damage management program would not adversely affect any federal or state listed threatened or endangered species that were addressed in the EA. WS has also determined that muskrat and nutria damage management would have no effect on threatened and endangered species that were addressed in the EA. This determination is based upon concurrence from the USFWS and the MDWFP that the program will not likely adversely affect any of the threatened or endangered species listed in Mississippi that were addressed in the EA for WS' beaver damage management activities. WS has also determined that implementation of the proposed action will have no effect on those species listed in the State since the completion of the EA.
10. The proposed action would be in compliance with all federal, state, and local laws, regulations, policies, and orders.



Charles S. Brown, Director-Eastern Region  
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Raleigh, North Carolina

8/24/09

Date

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