

United States  
Department of  
Agriculture

Animal and Plant  
Health Inspection  
Service

Wildlife Services

# NORTH CAROLINA BEAVER MANAGEMENT ASSISTANCE PROGRAM (BMAP)



October 1, 2011  
through  
September 30, 2012

**2012**

*20TH*

*ANNUAL  
REPORT*



**WS Wildlife  
Services**

Protecting People  
Protecting Agriculture  
Protecting Wildlife

The North Carolina Beaver Management Assistance Program (BMAP) was created by state legislative action in 1992 with the express purpose of helping manage ever-increasing problems caused by beaver on private and public lands. The primary focus of the program is oriented toward public health and safety and assistance to landholders experiencing beaver damage problems. Because of practical and ecological considerations, the program is designed to assist the North Carolina Department of Transportation (DOT), local governments, private landholders, and others to address specific beaver damage problems rather than eradicate beaver populations. The BMAP has grown from four counties in 1992-1993 to 43 counties in 2011-2012. At the same time, BMAP services specifically delivered to the DOT now covers all 100 counties.



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# Background Information

The BMAP is a cooperative endeavor funded by the North Carolina Wildlife Resources Commission (NCWRC), DOT, USDA Wildlife Services, participating counties, and cost-share collections from private landholders, businesses, municipalities, and others. (See program funding sources and expenditures on page 10.) The BMAP is administered by USDA Wildlife Services through a cooperative service agreement with the NCWRC. In 2011-2012 BMAP services were available to the DOT in all 100 counties as well as landholders, local governments, soil and water conservation districts, and others in the 43 participating counties who each opted to contribute \$4,000 to the program.

## BMAP Participating Counties in FY12

- |             |              |
|-------------|--------------|
| •Bertie     | •Martin      |
| •Bladen     | •McDowell    |
| •Brunswick  | •Nash        |
| •Camden     | •New Hanover |
| •Carteret   | •Northampton |
| •Catawba    | •Onslow      |
| •Columbus   | •Pamlico     |
| •Craven     | •Pasquotank  |
| •Cumberland | •Pender      |
| •Duplin     | •Perquimans  |
| •Edgecombe  | •Pitt        |
| •Franklin   | •Robeson     |
| •Gates      | •Rutherford  |
| •Granville  | •Sampson     |
| •Greene     | •Surry       |
| •Halifax    | •Union       |
| •Harnett    | •Vance       |
| •Henderson  | •Warren      |
| •Hoke       | •Washington  |
| •Iredell    | •Wayne       |
| •Johnston   | •Wilson      |
| •Lenoir     |              |



## BMAP Advisory Board

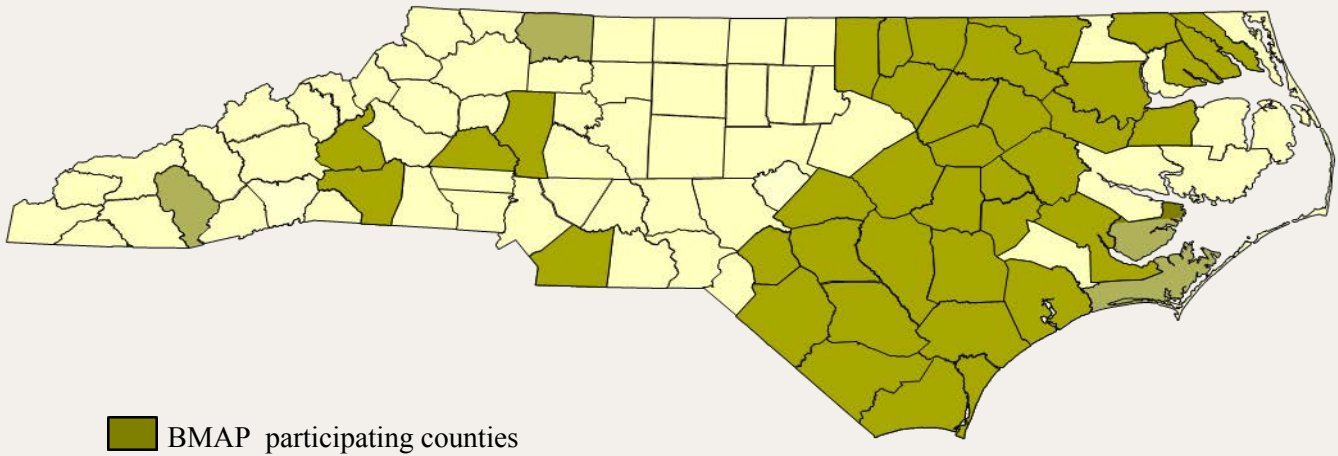
- **Ann May (Chair), NC Wildlife Resources Commission**
- **Greg Perfetti/Rick Nelson, NC Department of Transportation**
- **James Jeuck, NC Cooperative Extension Service**
- **Charles Bowden, NC Division of Soil and Water Conservation**
- **Vernon Cox, NC Department of Agriculture and Consumer Services**
- **Bill Pickens, NC Forest Service**
- **Anne Coan / Paula Gupton Page, NC Farm Bureau Federation**
- **Chris Brown, NC Forestry Association**
- **Jon Heisterberg / Todd Menke USDA Wildlife Services**

The BMAP is overseen by a nine member Advisory Board with current members and respective affiliations listed above. In FY 2012, the BMAP Advisory Board met twice, once in November 30, 2011 and once on March 12, 2012, to review program accomplishments and to make recommendations on future activities to the Executive Director of the NCWRC.



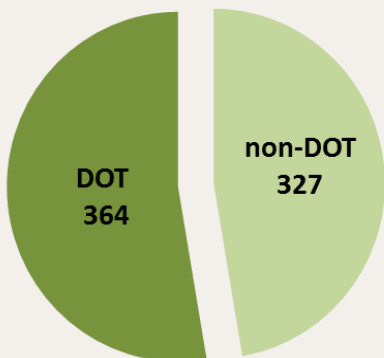
# Program Activities and Accomplishments

## BMAP Statistics

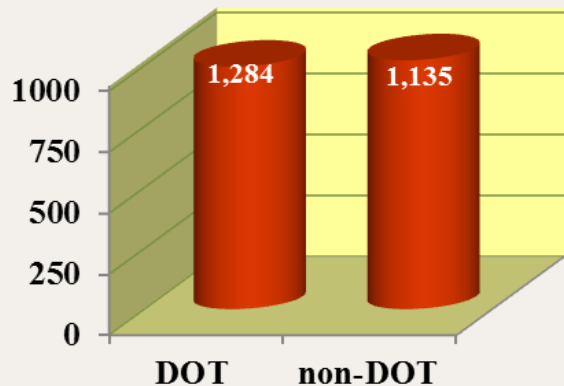


Beaver damage control activities were conducted in 83 counties under 691 non-DOT (private landholder or business, local government, soil and water conservation district, other) and DOT agreements with 2,419 beavers being removed (see charts below). An additional 30 agreements were underway as of September 30, 2012. In FY 2012, 53% of all agreements completed were for the DOT. This work also benefitted an additional 296 adjacent landholders where wildlife specialists worked on private properties adjoining DOT rights-of-way and other private property to resolve beaver damage. Agreements with private landholders may include several noncontiguous areas, all of which are identified as one agreement. Agreements with local governments and soil and water conservation districts sometimes involve numerous landholders; however, all are identified as just one agreement.

**Service Agreements**



**Beavers Removed By Service Agreement**

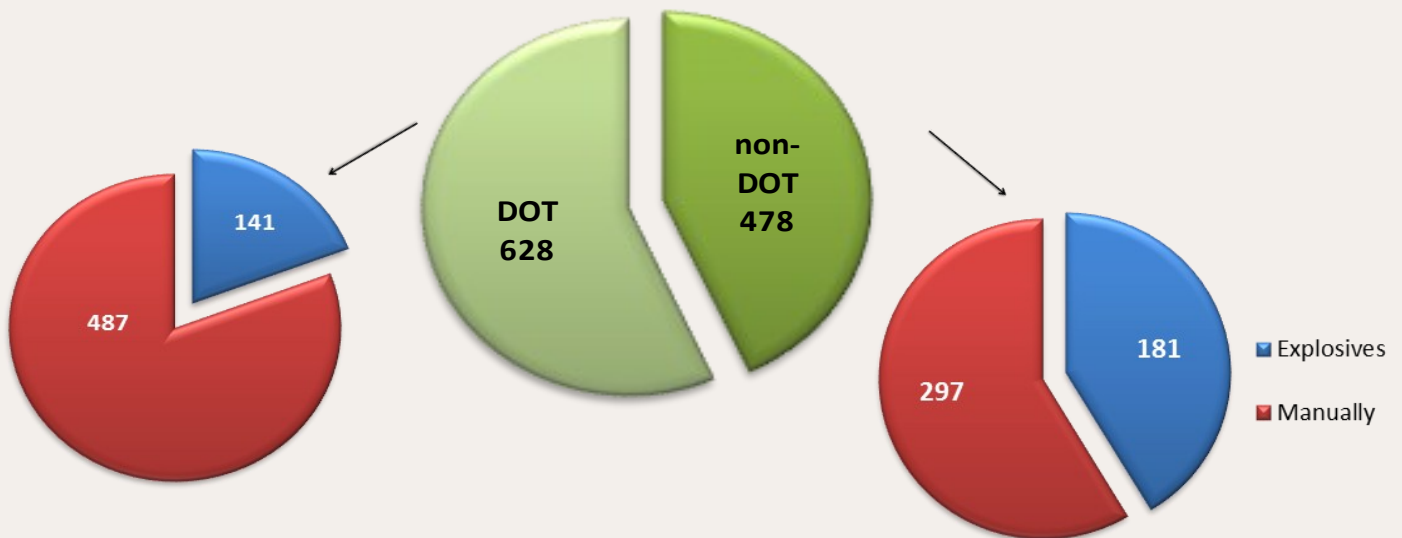


## BMAP Statistics

In FY 2012, the numbers of agreements completed, beaver removed and beaver dams removed all increased compared to previous years. This increase is mostly due to an increase in number of requests for assistance, most of which came from the DOT. For example, service agreements completed for the DOT increased 26% from 288 in FY 2011 to 364 in FY 2012. Fortunately, increased BMAP funding in FY 2012 allowed USDA Wildlife Services to meet this increased demand. During this same time period, the value of resources saved decreased from \$6.3 million in FY 2011 to \$5.7 million in FY 2012. This decrease was mostly due to a drop in timber and agricultural prices from a weak economy coming out of a recession.

FY	Agreements Completed	Beaver Removed	Dams Removed	Resources Saved
2010	534	2,002	746	\$2.6 million
2011	628	2,128	1,048	\$6.3 million
<b>2012</b>	<b>691</b>	<b>2,419</b>	<b>1,106</b>	<b>\$5.7 million</b>

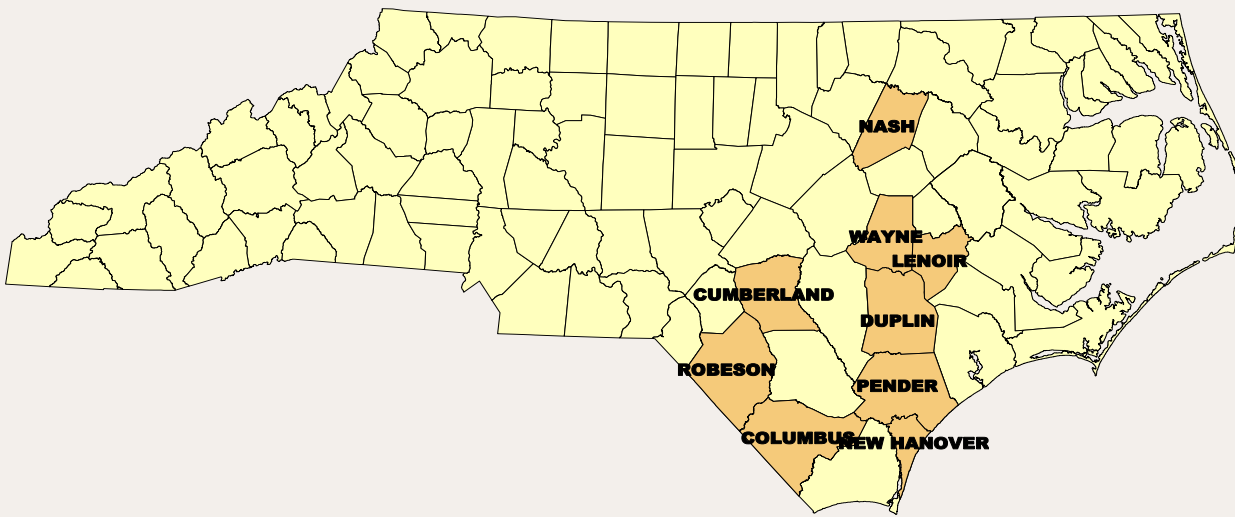
### Beaver Dams Removed



BMAP wildlife specialists used explosives and hand tools to remove 1,106 beaver dams backing up water and flooding public roads and highways, timber, croplands, sewer and septic systems and other lands.

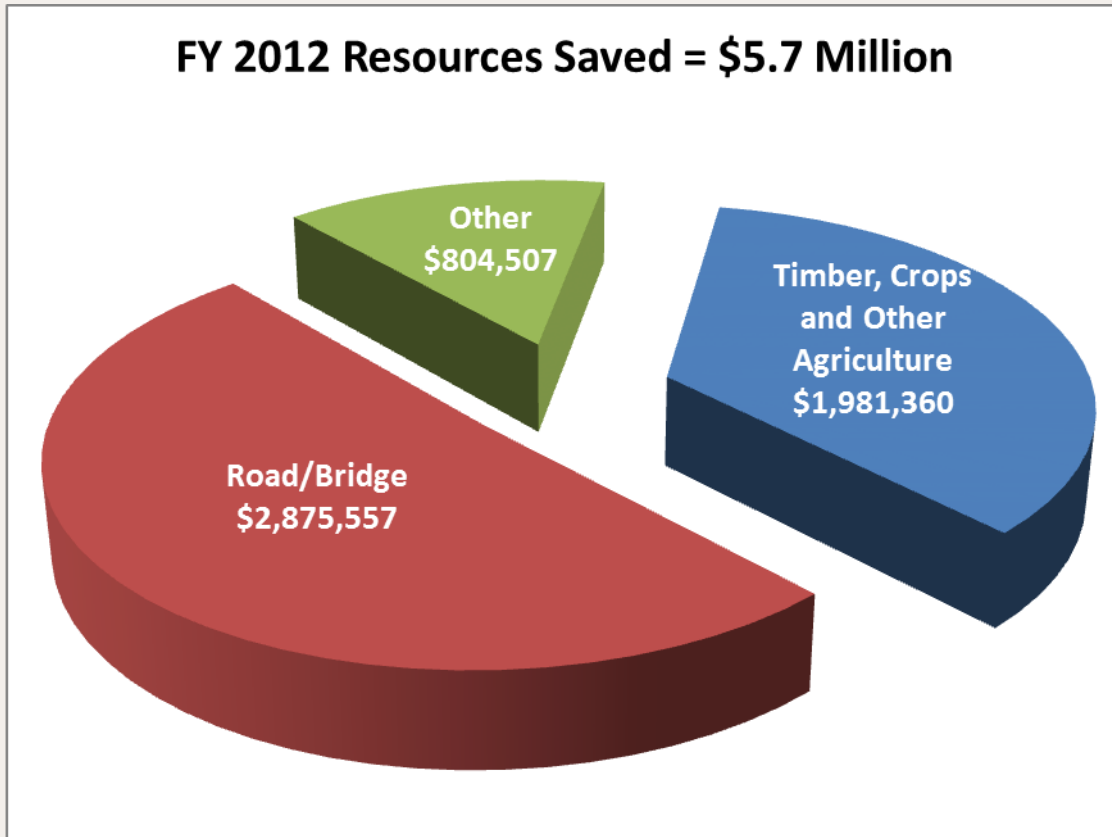
# Counties Paying for Beaver Damage Management Services in Addition to BMAP

Nine BMAP participating counties (highlighted below) requested beaver damage management services over and above those received through the BMAP. These counties paid USDA Wildlife Services directly for these additional services. Per BMAP guidelines, these counties also paid for a portion of the DOT work conducted in these counties. Results of this work are listed below, but are not included elsewhere in this report except where noted. A total of \$3.1 million dollars in resources was saved during FY 2012 (see chart below).



FY 2012	Agreements Completed	Beaver Removed	Dams Removed	Resources Saved
Non-DOT	146	607	410	\$1.6 million
DOT	138	563	296	\$1.5 million

## Damage Economics



**For every \$1 spent,  
\$4.25 in resources was saved**

In FY 2012, wildlife specialists and cooperators reported that BMAP services prevented the impending loss or repair expenditures of an estimated \$5.7 million in roads and bridges, timber and other agricultural resources, railroad trestles, dams and ditches, city and county sewer systems and water treatment facilities, landscape plantings, and other resources such as homes, airport runways, and golf courses. Comparing BMAP expenditures to savings, the estimated cost-benefit ratio was 1 to 4.25. In other words, for every \$1.00 spent, \$4.25 in resources was saved. Also, the benefits of BMAP services reported by the DOT does not include projected future savings estimates, which can be significant. Furthermore, the cost-benefit ratio does not include the benefits of educational activities such as training individuals to address their own beaver damage problems and state revenue generated from taxes on timber sales that otherwise would have been lost had beaver destroyed the timber.



## Damage Economics - DOT

In FY 2012, USDA wildlife specialists conducted 502 separate agreements in 81 counties for the DOT. Of these 502 projects, 364 were completed under the BMAP and 138 were paid with additional county funds. Nine counties (Columbus, Cumberland, Duplin, Lenoir, Nash, New Hanover, Pender, Robeson, Wayne) entered into separate agreements with USDA Wildlife Services to conduct these additional beaver damage management services over and above that provided through the BMAP. These counties understood that beaver damage management services not only benefits the driving public but also the landowners adjacent to DOT rights-of-way. In FY 2012, USDA Wildlife Services saved the DOT an estimated \$4.4 million in labor and repair expenditures to the state's roadways (\$2.9 million under the BMAP and \$1.5 million with funds provided by the nine counties listed above).

Aside from protecting the state's roadways, USDA Wildlife Services also assisted the DOT in Union County with stream maintenance to improve the habitat for an endangered mussel, the Carolina heelsplitter. The DOT had been requested by the Environmental Protection Agency to remove obstructions from a stream that was within one of their construction areas. These obstructions inhibited movements of the Carolina heelsplitter. USDA Wildlife Services removed beaver and the DOT removed multiple dams.



## Damage Economics - Non-DOT

Wildlife specialists continue to use the worksheet developed by the North Carolina Forestry Service and North Carolina Department of Agriculture and Consumer Services to help estimate the value of BMAP services, which is measured as prevented expenditures or losses to timber and other agricultural resources. Timber and crop values are updated annually. However, some non-agriculture prevented losses or expenditures such as those to roadways, water treatment facilities, drainage control structures, sewer or septic systems, and man-made structures were better estimated by resource owners.

Beaver and their dams were removed from 28 sewer and waste water treatment facilities in Bertie, Cumberland, Duplin, Franklin, Harnett, Henderson, Johnston, Nash, Pitt, and Wayne Counties averting over \$90,000 in damages, repair costs, and regulatory penalties.

The pictures show a wastewater lift station operated by the Town of Fremont in Wayne County that was clearly in danger of flooding from rising water of a nearby creek. If the creek's water level were to rise high enough it would flood the lift station thus allowing sewage to spill mixing wastewater with ground water. The administrator for the site also stated that if the spill were to occur the fine would be as much as \$10,000 per day. Because explosives were not an option with the sewer lines proximity to the site, the dams were manually raked out and the beavers removed. The citizens of Fremont were spared sewage issues, contaminated drinking water, and addition taxpayer money that would have been necessary to repair the lift station.



# BMAP Funding Sources and Expenditures

The table below outlines BMAP funding sources and expenditures from October 2011 through September 2012. USDA Wildlife Services personnel worked 22.9 staff years on the BMAP. In addition, State Director Heisterberg and Assistant Sate Director Menke provided an estimated 1.0 staff years supporting BMAP activities. Their salaries were not charged to the BMAP program.

In FY 2012, the BMAP operating budget was \$1,331,603 which is an increase of \$118,035 over FY 2011. Although Congress eliminated the \$208,000 Congressional Directive funding the BMAP in 2011, in state FY 2011-12 the NC General Assembly directed the NCWRC to increase their contribution by \$250,000 which more than offset the reduction in federal funding.

Expenditure Type	Expenditures (a) by Funding Source			Totals
	NCWRC/DOT/USDA Wildlife Counties	Services (WS)	WS Cost Share Collections	
Personnel Costs	\$910,562	\$24,993	\$71,595	\$1,007,150
Travel & Per Diem	\$8,951	\$0	\$0	\$8,951
Vehicle Usage (fuel, maintenance, repair)	\$97,446	\$0	\$0	\$97,446
Other Services (telephone, data lines, non-vehicle repairs & maintenance, etc.)	\$7,762	\$13,690	\$0	\$21,452
Economic Survey	\$17,416	\$0	\$0	\$17,416
Supplies and Materials (trap supplies, tools, ammo, work gear, explosives, misc.)	\$86,091	\$7	\$318	\$86,416
Equipment (vehicles, ATV's, canoes, misc.)	\$92,772	\$0	\$0	\$92,772
Total spent (10/1/11-9/30/12)	\$1,221,000	\$38,690	\$71,913	\$1,331,603
Amount Funded (10/1/11-9/30/12)	\$1,221,000	\$38,690	\$71,913	\$1,331,603
	( b )	( c )	( d )	
<b>BALANCE (10/1/12)</b>	<b>\$0</b>	<b>\$0</b>	<b>\$0</b>	<b>\$0</b>

(a) Expenditure figures are subject to adjustment.

(b) Funding sources: NCWRC. NCDOT 43 Counties  
**\$599,000 \$450,000 \$172,000**

(c) USDA Wildlife Services contributed \$38,690 to fund the BMAP in FY12. USDA Wildlife Services provided additional indirect support to administer the program that are not included in the \$38,690.

(d) BMAP cost-share collections by USDA Wildlife Services from landowners, municipalities, and other sources. As of October 1, 2012, \$260 in outstanding landowner cost-share invoices are over 90 days past due.

## Customer Service

Landholders, county governments, municipalities, water conservation districts, businesses, and others with beaver damage problems sign up for BMAP services at their local county Cooperative Extension Service office, Soil and Water Conservation District office or with the wildlife specialist directly. Wildlife specialists make every attempt to contact those requesting assistance within 72 hours of requesting services. Arrangements are made to meet with the landholder or property manager, evaluate the problem, and recommend a course of action. If the landholder or property manager wishes to have the wildlife specialist do the work, time and costs are estimated. Depending on location, current workloads and time of the year, the work is initiated. Landholders wishing to address beaver damage problems themselves are provided training at no cost.

Wildlife specialists keep cooperators advised of all work in progress and provide periodic work updates. County DOT personnel contact wildlife specialists directly for assistance with beaver damage problems to roadways.

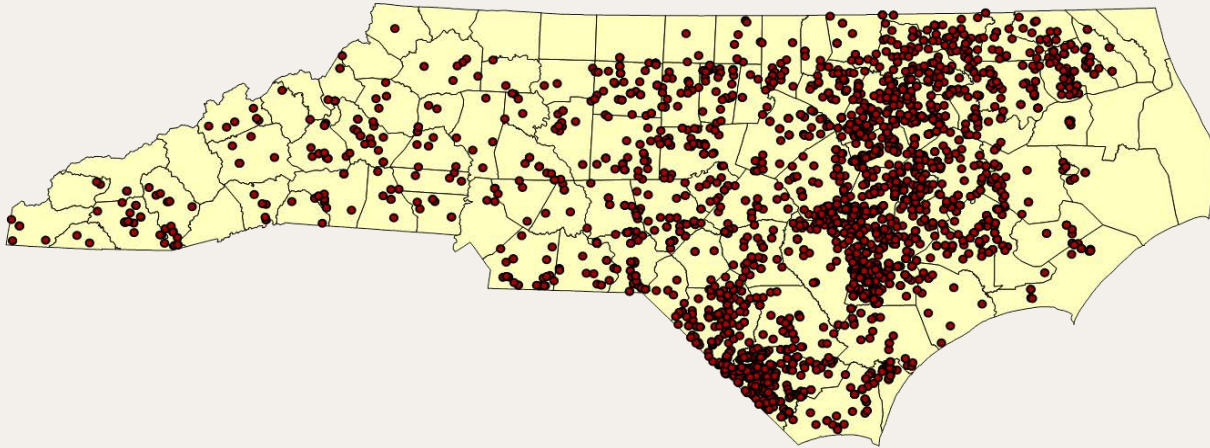


Left photo shows where beaver clogged up a concrete water control structure in a McDowell County flood control watershed.

Right photo shows same site after beaver were removed and the water control structure unclogged.



# Protecting Roadways and the Traveling Public



**Location of DOT sites with beaver damage that were worked by USDA Wildlife Services, 2008 - 2012**

Between 2008 and 2012, USDA Wildlife Services resolved beaver damage problems at a minimum of 2,808 distinct DOT sites (see map). Sites worked include work paid for by both BMAP funds and funds from counties requesting additional beaver management services for their residents. Approximately one-quarter of the work USDA Wildlife Services completed in FY 2012 was at DOT sites where USDA Wildlife Services had previously removed beaver and their dams. Some of these sites are repopulated with beaver in as little time as a few months while others may go years and years without further problems. Unfortunately, there is no way to avoid this as the narrowed stream or creek channel created by the pipe or culvert presents an ideal location for beaver dam construction.



Left Photo shows a beaver-created pond that was threatening to overtop this Alexander County roadway. Right photo shows the same area after USDA Wildlife Services removed the beaver and dams causing the flooding.

# Using Explosives to Remove Beaver Dams

In FY 2012, USDA Wildlife Services used customized charges and delayed detonators on 51 occasions to safely remove beaver dams within pipes and culverts, under power lines, etc. that otherwise would have been difficult, if not impossible to remove using conventional techniques. This has resulted in significant savings to the DOT which sometimes had to dig up and replace such pipes. USDA Wildlife Services currently has 17 explosive specialists, four of whom are advance certified to use explosives in confined areas.

Between 2008-2012, USDA Wildlife Services personnel used explosives to safely remove 1,185 beaver dams with no damage to property or personnel. Of these 1,185 dams, over 200 required specialized detonation techniques to be employed. The North Carolina USDA Wildlife Services program leads the nation in beaver dam removal expertise and frequently hosts explosives certification training for USDA Wildlife Services employees from throughout the country.



Above: Wildlife specialist rigging a delayed explosives detonator to remove a beaver dam clogging a DOT pipe in Nash County.



Above: Wildlife specialists setting up a large beaver dam for removal using explosives in Pender County.



Left: Picture shows the same site immediately after dam removal.

## Educational Activities

Technical assistance was provided landholders statewide through personal consultations on site, written/telephone consultations, and educational programs and exhibits. USDA Wildlife Services distributed thousands of leaflets to landholders and the general public on how best to address beaver damage on their property. An important aspect of the BMAP is to educate landholders and others about both the positive and negative aspects of beaver activity on their land so that they can make informed decisions about management options. If landholders decide to use non-lethal or lethal means to address a beaver damage problem, they are always given the option to do the work themselves with direction and training provided by the wildlife specialist at no cost.

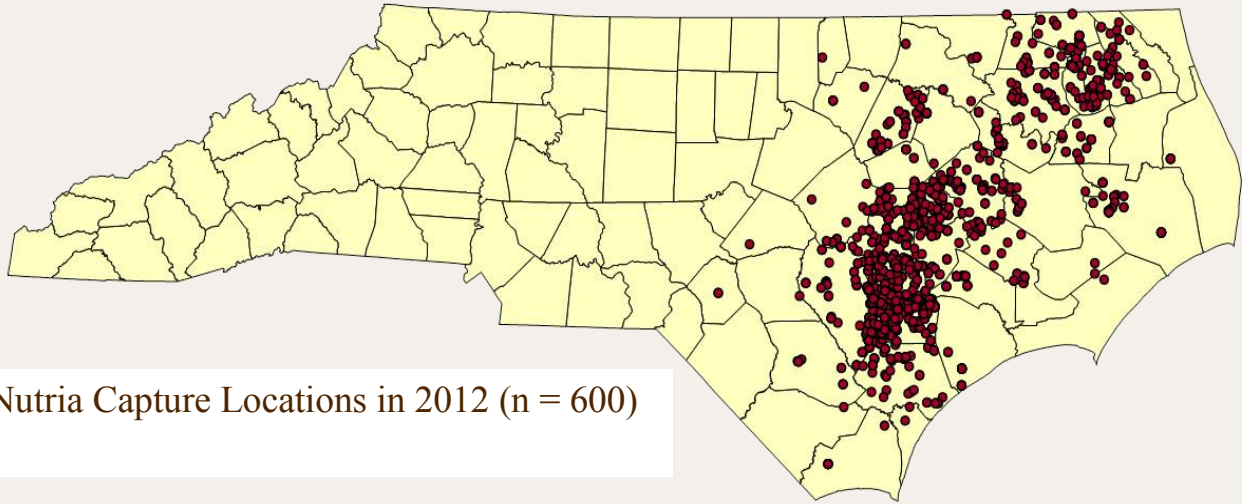


USDA’s mobile 16-ft. trailer was used 31 times in FY 2012 to educate the public about beaver ecology and management.



USDA Wildlife Services District Supervisor Butch Adams explains how he uses explosives to remove a beaver dam backing up water near the City of Creedmoor’s drinking water reservoir in Granville County.

# Nutria in North Carolina



Nutria Capture Locations in 2012 (n = 600)

Nutria are 12-15 lb. rodents native to South America. In 1939 they were introduced into the Outer Banks. Since that time nutria have expanded their range into 43 counties. Nutria are voracious eaters causing widespread damage to native vegetation such as cattails, bulrush and coastal marshes. Their burrowing activities also undermine highway rights-of-way, dikes and dams causing millions in damages annually. Although not targeted directly, BMAP personnel removed 600 of these exotic rodents in FY 2012. Since FY 2005 BMAP personnel have removed over 4,000 non-native nutria.



Nutria in the City of Goldsboro’s Waste Water Treatment Wetlands Reclamation site.



## Research Activities

In FY 2012, USDA Wildlife Services began testing a high pressure (350 psi), high output (90 gal/min.) pump to remove beaver dams. With financial assistance from the National Wildlife Research Center (NWRC), three “wick” pumps were purchased. Data collected will be analyzed by NWRC research scientists with the intention of publishing a techniques paper on its use.

In FY 2012, wildlife specialists used the pump on five occasions, finding it a useful tool for removing beaver dams, especially those in difficult to reach places such as inside pipes and drainage control structures.

The accompanying pictures show Wildlife Specialist Clay Heafner using the pump to remove a beaver dam from inside a water control structure. Estimated labor savings using the pump was 5 work-hours.



## FY 2013 and Beyond

The BMAP continues to be a popular program among landholders, counties, municipalities, businesses, and the DOT. Landholders requesting BMAP services are threatened with significant losses as a result of beaver activity which is evident by the value set on BMAP services. As in previous years, BMAP participants continued to show little interest in conducting beaver damage management activities themselves. This is most likely because of a lack of ability and/or time. Wildlife specialists will, however, continue to make concerted efforts to encourage individuals to solve their own problems through on-site training and damage management workshops.

The NCWRC conservatively estimates beaver populations in the state to be near 500,000 and increasing. In 2011-2012, the NCWRC reported 10,358 beaver being trapped and removed by both recreational and nuisance wildlife damage control agents. This is a minimum figure because beaver are considered a nuisance species and as such are not required to be reported by private trappers or landholders. Even if the combined recreational and nuisance beaver take was as much as 20,000, this would still only represent only 4% of the estimated statewide population. Such low take percentages will have little effect on keeping beaver numbers and damage in check, and populations are expected to continue to increase into the future.

With increased beaver populations comes increased beaver damage problems for private landholders, businesses, county and local governments, and the DOT. This is especially true as humans move into areas where beaver are present. The NC General Assembly recognized this and in state FY 2011-12 and FY 2012-13 directed the NCWRC to increase BMAP funding by \$250,000 from \$349,000 to \$599,000. This increased funding came at an opportune time as the federal government eliminated all Congressional Directives (“Earmarks”) in FY 2011, including the \$208,000 Directive funding the BMAP. Although the Directive was eliminated, USDA Wildlife Services was able to contribute \$38,690 from their base federal appropriation to help fund the BMAP in FY 2012. This met the required \$25,000 minimum federal funding mandate outlined in NC State Statute 113-291.10(f).

<b>Estimated Funding Sources for FY 2013</b>	
<b>NCWRC</b>	<b>\$599,000</b>
<b>DOT</b>	<b>\$450,000</b>
<b>Federal</b>	<b>\$25,000</b>
<b>Counties</b>	<b>\$168,000</b>
<b>Private Cost-Share (a)</b>	<b>\$71,000</b>
<b>Total</b>	<b>\$1,313,000</b>

*(a) estimate based on FY 2012 collections*

# Obtaining BMAP Services in 2012-2013

## How to Participate

All counties are eligible to participate in the program through an annual cost share assessment of \$4,000 per county. In 2012-13, 42 counties participate in the program. Individuals residing in these counties may obtain assistance with beaver damage by contacting their county Cooperative Extension or Soil and Water Conservation District office (see below). Statewide assistance with beaver damage problems is also provided to the DOT. All requests for assistance receive an immediate response, but due to current workloads the start of direct assistance activities may vary.

## Cost Share

Participants in the program pay a small cost-share fee for services. This cost-share fee is \$20 for each visit to their property. There are no charges for travel time. There is also a \$125 charge for dam removal. Wildlife specialists average about 10 visits over a 30-day period to resolve a beaver problem. After 15 visits to a landholder's property in any one year, costs increase. There is no charge for the initial assessment which includes time spent discussing the program and signing paperwork. During this assessment the wildlife specialist discusses with the landholder the positive and negative impacts of beaver and recommends the best course of action. If damage management activities are recommended, time and costs are estimated and the wildlife specialist begins work. Landholders wishing to conduct their own work are provided individualized training at no cost.

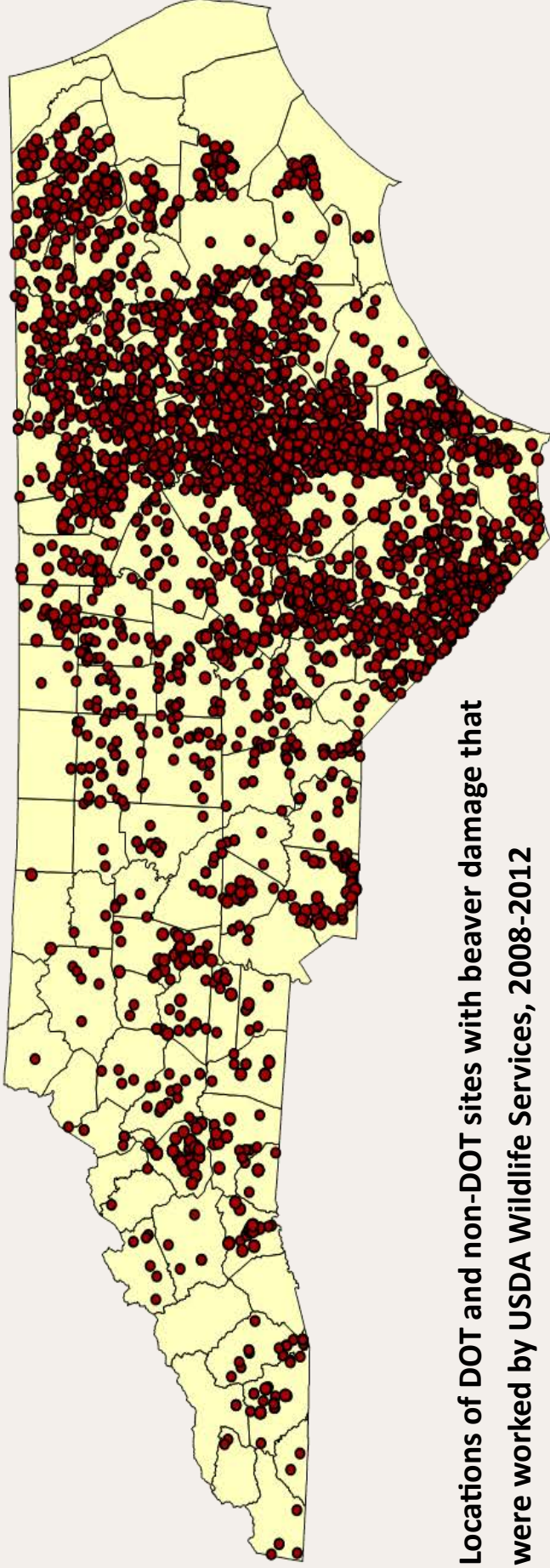
## Assistance Priorities

Requests for assistance are handled on a first-come, first-served basis with top priority addressing threats to public health and safety, particularly along highway rights-of-way and county-owned property. Work for individual landholders is next, followed by work for soil and water conservation districts, municipalities, corporate landholders, and others.

## Additional Information

For additional information about the Beaver Management Assistance Program, please call or write the USDA Wildlife Services at 6213-E Angus Drive, Raleigh, NC 27617, tel. 866-487-3297, or the NC Wildlife Resources Commission, Division of Wildlife Management at 1751 Varsity Drive, Raleigh, NC 27606, tel. 919-707-0050.

Bertie	252-794-5317	Halifax	252-583-4511	Pamlico #2	252-745-3133
Bladen	910-862-4591	Halifax #2	252-583-5161	Pasquotank	252-338-3954
Brunswick	910-253-2610	Harnett	910-893-7530	Pender	910-259-1235
Camden	252-331-7630 (Mark)	Hoke	910-875-3461	Perquimans	252-426-5428
Carteret	252-222-6352 (Todd)	Iredell	704-872-5061 Ext. 3	Pitt	252-902-3250
Catawba	828-465-8240	Jackson	828-631-2255	Robeson	910-671-3022
Columbus	910-642-2196 Ext. 3	Johnston	919-989-5380	Rutherford	828-287-6010
Craven	252-633-1477	Lenoir	252-527-2191	Sampson	910-592-7161
Cumberland	910-321-6860	Martin	252-789-4370	Union	704-283-3739
Duplin	910-296-2120 Ext. 3	McDowell	828-652-7874	Vance	252-438-8188
Edgecombe	252-641-7815	Nash	252-459-9810	Warren	252-257-3640
Franklin	919-496-3344	New Hanover	910-798-7660	Washington	252-793-3870 Ext 3
Gates	252-357-1400	Northampton	252-534-2711	Wayne	919-731-1521
Granville	919-603-1350	Onslow	910-455-0181	Wilson	252-237-0111
Greene	252-747-5831	Pamlico	252-745-4121		



**Locations of DOT and non-DOT sites with beaver damage that were worked by USDA Wildlife Services, 2008-2012**

**WS Wildlife Services**

Protecting People  
Protecting Agriculture  
Protecting Wildlife

For more information contact USDA

Wildlife Services at 866-487-3297

-or-

North Carolina Wildlife Resources

Commission at 919-707-0050

