

# Beaver Damage Management In North Carolina

## Twenty-Ninth Summary Report



July 1, 2020 through June 30, 2021

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# Executive Summary



42

Counties  
Participated



857

Projects  
Worked



1,422

Beaver Dams  
Removed



\$1,500,038

In Services  
Provided

\$9,635,637

In Prevented  
Damage

For every

\$1 spent,

\$6.42 in property and  
infrastructure were  
saved.



Reduced NCDOT funding meant fewer projects were worked for preventative maintenance along highway rights-of-way.



Cost to the Landowner\*

\$25 per site visit

\$125 per dam removed

\*293 adjacent landowners benefitted from BMAP services at no cost to them.

# Beaver Management Assistance Program

## Background

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. BMAP was structured to be flexible, fair, and feasible. Since its inception, the program has grown more than tenfold from four participating counties during its pilot version to 42 participating in 2020-21. Because of practical and ecological considerations, the program's goal is to address specific beaver damage problems rather than to eliminate beaver from the state. Beaver are present in all North Carolina counties. Their population is considered stable or slightly increasing and is conservatively estimated to be near 500,000. BMAP-related beaver removals account for about 0.5% of the total beaver population annually and around 17% of the total known annual beaver harvest (including recreational trapping and nuisance removals). Even if the combined recreational and nuisance beaver take was as much as 20,000 annually (or 4% of the estimated statewide population), this would have little to no effect on the beaver population. The program instead prioritizes activities first that remove threats to public health and safety, and secondly on assistance to landholders experiencing beaver damage.

BMAP is implemented by USDA Wildlife Services (WS) through Cooperative Service Agreements with the NC Department of Transportation (DOT), NC Wildlife Resources Commission (WRC), participating counties, and private landholders through a cost-share system. The Cooperative Service Agreements between WS, DOT, WRC, and counties in this summary report cover activities from July 1, 2020 through June 30, 2021.

Information about the program can be found on the main BMAP webpage: [www.ncwildlife.org/bmap](http://www.ncwildlife.org/bmap)

A 3-minute video about the program can be viewed on YouTube at:  
<https://www.youtube.com/watch?v=3Qrg6WInozc&feature=youtu.be>.

## Beaver Damage Control Advisory Board

The Beaver Damage Control Advisory Board is composed of representatives from nine State/Federal agencies and non-governmental organizations. It meets annually to review the previous year's accomplishments and to make recommendations for the coming year to the Executive Director of the WRC.

Falyn Owens (Chair)	NC Wildlife Resources Commission
Tim Sherrill	NC Department of Transportation
Davis Brinson	NC Association of County Commissioners
Eric Galamb	NC Division of Soil and Water Conservation
Joseph Hudyncia	NC Department of Agriculture and Consumer Services
Barry New	NC Forest Service
Anne Coan	NC Farm Bureau Federation
Samantha Long	NC Forestry Association
Todd Menke	USDA-APHIS–Wildlife Services

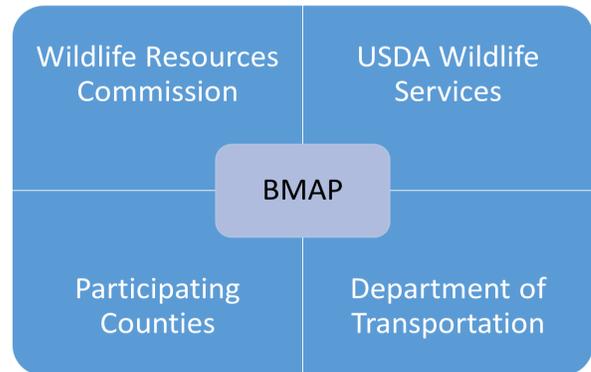


The photos above are from Camp Leach Road in Beaufort County where beaver dams blocked two, 48-inch culverts. Beaver damage management activities conducted through BMAP restored normal water drainage, preventing damage to the roadway and saving nearby timber from flood damage.

## Program Structure

BMAP is composed of 4 major entities, each with its own expectations and guidelines.

**NC Wildlife Resources Commission (WRC)** funds beaver damage management activities as part of a cost-share program with participating counties and landholders within those counties. Activities are conducted to reduce water levels that threaten private roadways, timber, agricultural crops, and general property. Administrative authority for the BMAP rests with the WRC but enabling legislation and cooperative agreement allows WRC to transfer program implementation to USDA Wildlife Services.



**NC Department of Transportation** funds beaver damage management activities to provide services along state-maintained road rights-of-way in all 100 counties. Activities are conducted to reduce flooding that impacts state roads and threatens roadway infrastructure as well as human health and safety.

**Individual counties** have the choice to participate annually in the BMAP at various levels. Participation levels range from no participation to baseline participation, and counties have the option to provide additional funding to support expanded program services.

**USDA Wildlife Services** provides at least \$25,000 annually to facilitate program implementation, and its staff conduct all beaver damage management activities.

## Funding Sources and Expenditures

Program funding by source and expenditures from July 1, 2020 through June 30, 2021 are summarized below:

Expenditure Type	Expenditures (a) by Funding Source (b, c)						Total Costs
	NCWRC	NCDOT	Counties (Baseline)	Counties (Additional)	Wildlife Services (c)	Landowner Collections (d)	
Personnel Costs	\$265,053	\$191,305	\$182,713	\$341,819	\$0	\$61,713	\$1,042,603
Vehicle Usage (fuel, maintenance, repair)	\$28,984	\$18,900	\$5,610	\$19,202	\$0	\$0	\$72,696
Other Services (phone, data lines, non-vehicle repairs & maintenance)	\$116	\$0	\$30	\$0	\$25,000	\$0	\$25,146
Supplies (waders, tools, explosives)	\$8,305	\$11,921	\$9,838	\$16,064	\$0	\$0	\$46,128
Equipment (traps, laptops, printers)	\$334	\$891	\$0	\$2,618	\$0	\$0	\$3,843
Pooled Job Costs	\$33,307	\$24,532	\$21,801	\$41,767	\$0	\$0	\$121,407
Indirect Costs to NCWS	\$33,307	\$24,532	\$21,801	\$41,767	\$0	\$6,789	\$128,196
Indirect Costs to APHIS	\$15,594	\$11,485	\$10,207	\$19,555	\$0	\$3,178	\$60,019
<b>Total Expenditures (e)</b>	<b>\$385,000</b>	<b>\$283,566</b>	<b>\$252,000</b>	<b>\$482,792</b>	<b>\$25,000</b>	<b>\$71,680</b>	<b>\$1,500,038</b>

(a) Expenditure figures are subject to adjustment.

(b) Funding sources:

NCWRC	NCDOT	42 Counties (Baseline)
<b>\$385,000</b>	<b>\$283,566</b>	<b>\$252,000</b>

Counties and Municipalities that provided funding for additional services:

**Bladen \$52,845; Brunswick \$10,142; Columbus \$7,000; Duplin \$135,000; City of Fayetteville \$35,108; Greene \$6,000; Lee \$6,000; Lenoir \$17,800; Pitt \$4,081; Robeson \$120,872; Sampson \$20,000; Wayne \$55,000; Wilson \$12,944**

(c) USDA Wildlife Services contributed \$25,000 to fund the BMAP in FY 2020/2021. Wildlife Services provided additional indirect support to administer the program that is not included in the \$25,000.

(d) BMAP cost-share collections by Wildlife Services from landowners, municipalities, and other sources. As of July 1, 2021, \$7,150 in outstanding landowner cost-share invoices were over 90 days past due.

(e) All funds provided for the program by each funding source were spent in full, with an end-of-year balance of \$0.

# Program Statistics in Summary

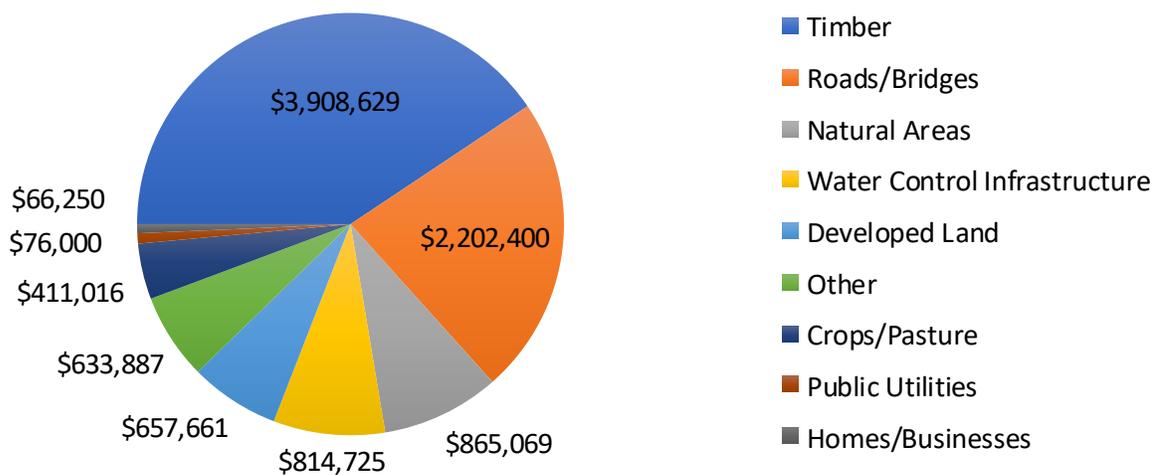
The Cooperative Service Agreements between WS, DOT, WRC, and participating counties resulted in a total of 857 projects worked from July 1, 2020 through June 30, 2021. An additional **293 adjacent landholders benefitted from BMAP services at no cost to them.**

Projects Worked	Dams Removed w/Explosives	Dams Removed Manually	Beaver Removed
857	433	989	2,819

## Economic Impact of BMAP

USDA Wildlife Services staff and cooperators reported that BMAP services prevented the impending loss or repair expenditures of an estimated \$9,635,637 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 6.42. In other words, for every \$1.00 spent, \$6.42 in resources were 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. It also does not include any state revenue generated from taxes on timber sales that otherwise would have been lost had beaver destroyed the timber, or indirect losses due to agriculture from farmers being prevented from planting or using land that is flooded or saturated.

### Resources Protected



In the chart above, Natural Areas include undeveloped areas that are not considered “working lands” (e.g., wetlands). Homes/Businesses include public buildings (e.g., schools and offices). Developed Land includes golf courses, landscaped areas, cemeteries, yards, etc. Water Control Infrastructure includes dams, dikes, ditches, and drainage systems.

## Beaver Damage Examples

Beaver damage can take many forms, but the situations depicted below are typical.

The photos below show a field in Harnett County affected by two beaver dams. After BMAP activities were conducted, drainage returned to normal and the damages were controlled.



In the photos below, timber, a private road, and a pond dam were damaged due to a beaver dam inside an overflow pipe in Harnett County. After BMAP activities were conducted, all damages were controlled.

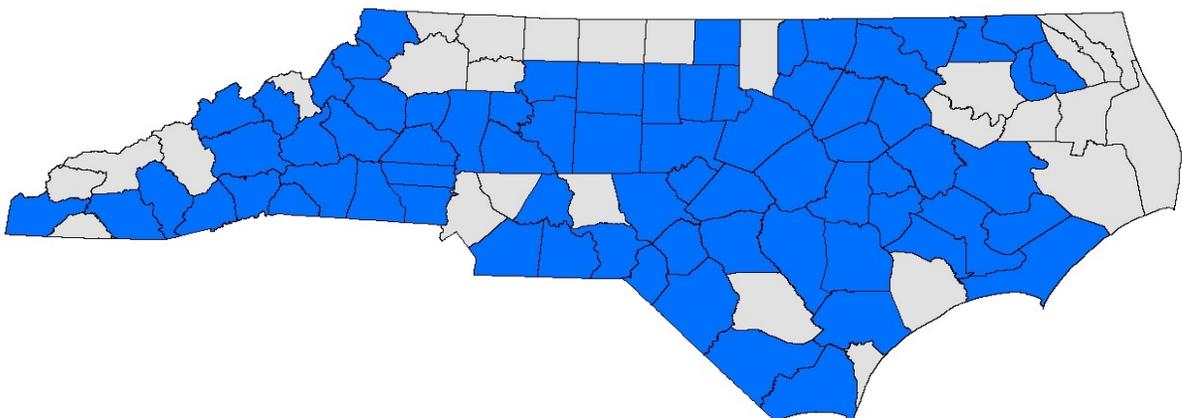


The photos below show water near the I-40/Hwy. 140 intersection in New Hanover County. BMAP services prevented additional threats to the driving public.



## NC Department of Transportation

Beaver management services to the North Carolina Department of Transportation (DOT) were available in all 100 counties regardless of a county's participation in the program. Due to health and safety concerns along roadways, DOT agreements continued to receive priority, but response to these projects was balanced against any backlogged requests on public and private lands. DOT received on average 4 to 6 completed agreements in counties where DOT work was done. Services were provided based on demand and the program's ability to meet those demands at current funding levels. Counties that did not participate in BMAP during this fiscal year received services on DOT rights-of-way where requested. There were no additional cost-share charges to the DOT relating to beaver damage management along state-owned highways, roads, and bridges throughout North Carolina. When beaver damage management work was conducted on adjacent properties to resolve a problem affecting DOT rights-of-way, those landholders were not charged for services.



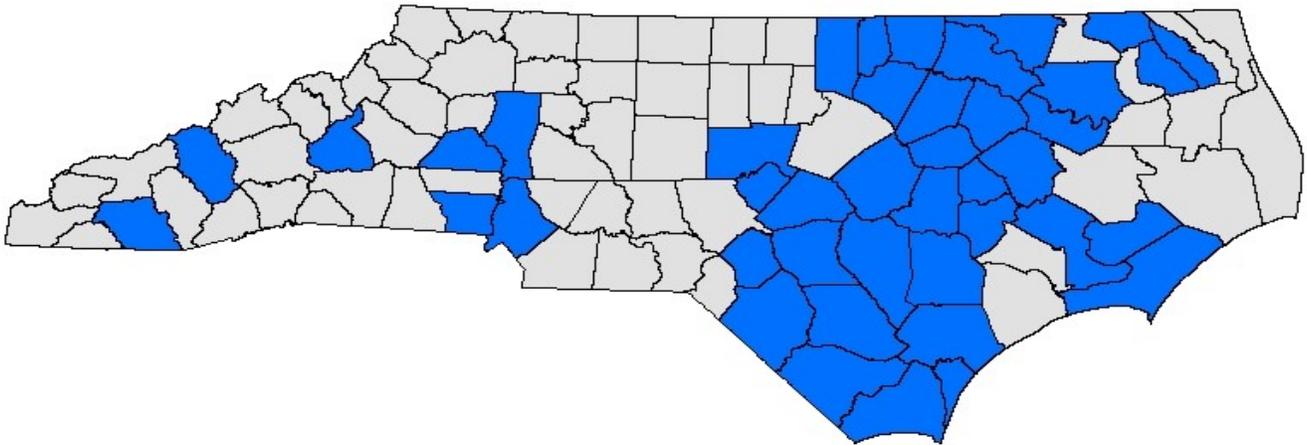
BMAP services were conducted in 72 counties for DOT

Beaver damage management activities were conducted on NC Department of Transportation property in 72 of North Carolina's 100 counties. DOT received a total of 214 completed projects, resulting in the removal of 742 beaver and 337 dams. In addition, WS worked with 224 adjacent landholders who benefitted from these services at no cost to them.

Projects Worked	Dams Removed w/ Explosives	Dams Removed Manually	Beaver Removed
214	63	274	742

## NC Wildlife Resources Commission

The North Carolina Wildlife Resources Commission (WRC) funds beaver damage management activities as part of a cost-share program with participating counties and landholders within those counties. County participation is required before any direct beaver damage management assistance is provided to landholders. Participation in the program is open to all North Carolina counties. Participating counties received 10 to 14 agreements (6-8 non-DOT and 4-6 DOT) each, on average. Services in each county were provided based on demand and the program's ability to meet those demands at current funding levels.

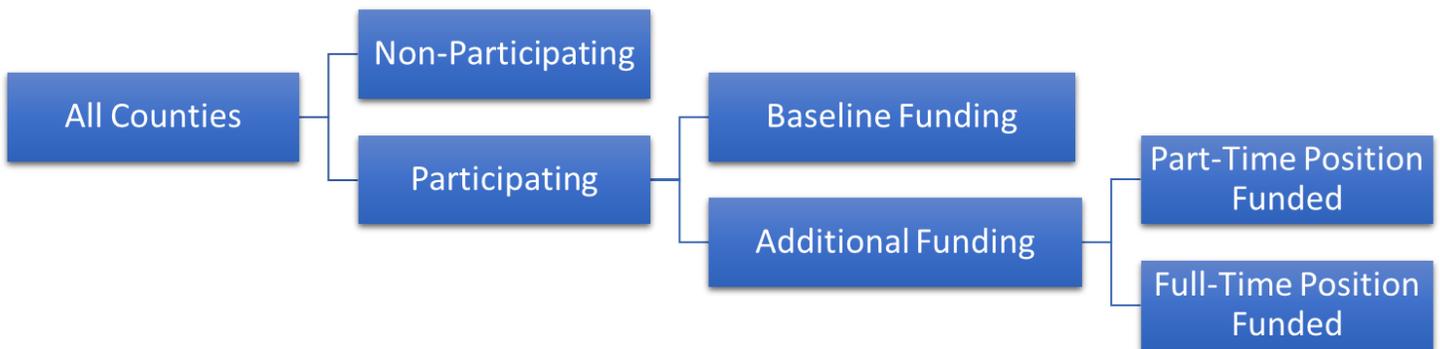


BMAP services were conducted in 42 participating counties

Beaver damage management activities were conducted in 42 participating counties with combined funding provided by WRC, participating counties, and individual landholders. A total of 443 projects were completed and resulted in the removal of 1,437 beaver and 741 dams.

Projects Worked	Dams Removed w/ Explosives	Dams Removed Manually	Beaver Removed
443	248	493	1,437

# Individual Counties



Individual North Carolina counties are invited to participate in the BMAP on an annual basis and must opt in each year. Counties can choose several levels at which to participate, from baseline coverage to funding a full-time, dedicated BMAP professional in that county (see diagram above).

**Non-participating counties** – Landholders in non-participating counties have access to beaver damage management services through USDA Wildlife Services if requested. They are not eligible to receive services at the BMAP cost-share rate and must pay full market cost for services rendered.

**Participating counties at Baseline Funding** – In FY 2020-21, counties could participate in BMAP for a \$6,000 fee. A county’s participation fee is combined with funding provided by the NC Wildlife Resources Commission to offset the cost of beaver damage control services to landholders in that county. Landholders in participating counties were eligible for services at a reduced cost-share rate of \$25 per visit and \$125 per large dam. The 42 counties listed below participated at the baseline level during FY 2020-21.

Bertie	Craven	Granville	Johnston	Nash	Pitt
Bladen	Cumberland	Greene	Lee	New Hanover	Robeson
Brunswick	Duplin	Halifax	Lenoir	Northampton	Sampson
Carteret	Edgecombe	Harnett	Macon	Pamlico	Vance
Catawba	Franklin	Haywood	Martin	Pasquotank	Warren
Chatham	Gates	Hoke	McDowell	Pender	Wayne
Columbus	Gaston	Iredell	Mecklenburg	Perquimans	Wilson

# Services Provided through Additional Funding

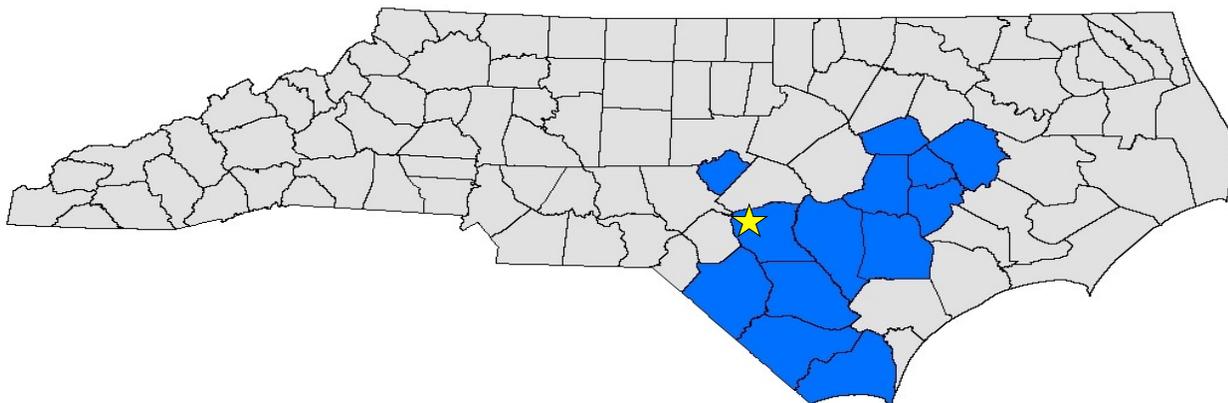
Participating counties occasionally request expanded BMAP services in addition to those received under the cost-share program at baseline. Generally, requests for additional assistance require hiring additional experienced personnel, which is inherently difficult, especially if such a request is for seasonal or less than full time work. If USDA Wildlife Services is able to accommodate such requests, any additional work provided to landholders in the county follows BMAP policies and procedures. Cost share fees paid by landholders are used to support the overall BMAP. Any county requesting additional assistance pays full program costs (labor, vehicle usage, supplies and equipment, etc.). In addition, both landholders and the DOT will receive services. To receive additional services, a county must enter into a cooperative service agreement with USDA Wildlife Services with payment going directly to USDA Wildlife Services.

**Participating counties with additional funding** – 12 counties and 1 city opted to provide funding beyond the baseline \$6,000 participation fee, totaling \$482,792 worth of additional service to those areas. These counties/city provided this additional funding directly to USDA Wildlife Services to cover the remaining expenses of a part-time, full-time or sometimes multiple full-time beaver damage management specialists. Counties/cities that participated at one of these levels included:

**Multiple full-time personnel** - Duplin (\$135,000) and Robeson (\$120,872) Counties

**Single full-time personnel** – Bladen (\$52,845) and Wayne (\$55,000) Counties

**Part-time personnel** – Brunswick (\$10,142), Columbus (\$7,000), City of Fayetteville (\$35,108), Greene (\$6,000), Lee (\$6,000), Lenoir (\$17,800), Pitt (\$4,081), Sampson (\$20,000), and Wilson (\$12,944) Counties



13 counties/municipalities funded additional BMAP services

A total of 236 projects were worked resulting in the removal of 756 beaver and 398 dams.

Projects Worked	Dams Removed w/ Explosives	Dams Removed Manually	Beaver Removed
236	133	265	756

# Educational Activities

Advice and information (technical assistance) were provided to landholders statewide through on-site visits, 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. The BMAP strives to educate landholders and others about both positive and negative aspects of beaver activity so they can make informed decisions about management options on their land. If landholders decide to address a beaver damage problem themselves, whether by lethal or non-lethal means, they are always given the option to do so with direction and training provided by USDA Wildlife Services at no cost.



# State Fiscal Year 2021-22

BMAP continues to be popular among landholders, counties, municipalities, businesses, and the DOT. Landholders who request BMAP services are often faced with significant losses as a result of beaver activity. The severity of these losses is evident by sustained demand and support for the program. As in previous years, BMAP participants continued to show little interest in conducting damage management activities themselves, which is most likely due to lack of ability and/or time. USDA Wildlife Services specialists will, however, continue to make concerted efforts to encourage individuals to solve their own problems through on-site training and damage management workshops.

## **Estimated Funding Sources for State FY 2021-22**

NC Department of Transportation	\$750,000
NC Wildlife Resources Commission	\$385,000
42 Participating Counties	\$252,000
USDA Wildlife Services	\$25,000
Private Cost-Share (estimated)	\$72,000
Counties Providing Additional Funds	\$737,000
<b>Total</b>	<b>\$2,221,000</b>

# Obtaining Services

## **How Counties Participate**

All counties were eligible to participate in FY 2020-21 through an annual participation fee of \$6,000 per county. Individuals residing in these counties could obtain assistance with beaver damage by contacting their county Cooperative Extension Service or Soil and Water Conservation District office. Statewide assistance with beaver damage problems was also provided to the DOT. All requests for assistance received an immediate response, but the start of direct assistance activities varied based on the workload of USDA Wildlife Services personnel at the time of the request.

## **Cost Share**

Landowners in participating counties paid a small cost-share fee for services. There was no charge for time spent discussing the program or signing paperwork. During this assessment, USDA Wildlife Services personnel discuss both the positive and negative impacts of beaver with the landholder and recommend the best course of action. If damage management activities are recommended, time and costs are estimated before work begins. Landholders wishing to conduct their own work were provided individualized training at no cost. The cost-share fee for individuals in participating counties was \$25 for each visit to their property, with no charge for travel time. There was also a \$125 charge per large dam removal. USDA Wildlife Services personnel 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 to the landholder increase to the full market value of beaver removal services.

## **Assistance Priorities**

Requests for assistance are handled on a first-come, first-served basis with top priority given to projects that address 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 BMAP please call or write:

USDA Wildlife Services, 6213-E Angus Drive, Raleigh, NC 27617, 1-866-487-3297

- OR -

NC Wildlife Resources Commission, Division of Wildlife Management at 1751 Varsity Drive, Raleigh, NC 27606, 1-919-707-0050.

# Appendix

## NC Beaver Management Assistance Program OBTAINING SERVICES

Since beavers were successfully reintroduced to North Carolina in 1939, this native species has thrived, benefitting wildlife and people by creating wetland habitat, reducing erosion, and improving water quality across the state. Damages caused by beaver activity, however, can be substantial and costly. The Beaver Management Assistance Program (BMAP) aims to help manage beaver-related problems on private and public lands. Because of practical and ecological considerations, the program is not designed to eradicate beaver populations; rather its aim is to assist the NC Department of Transportation, local governments, and private landholders in addressing specific beaver damage issues.



BMAP specialists work to educate customers about a variety of beaver management strategies, such as exclusion, pond levelers, and other nonlethal techniques. When deemed necessary, they will remove beaver and/or dams using humane and environmentally acceptable techniques.

In 2018-2019, BMAP services prevented the impending loss or repair costs of an estimated \$10.06 million in roads, bridges, timber and other agricultural resources, railroad trestles, dams, sewer systems, water treatment facilities, landscape plantings, homes, airport runways, and golf courses. Comparing the costs of BMAP to its savings, for every \$1.00 spent, \$5.28 in resources were saved.

### County Cost-Share

Counties are invited to participate each year by contributing a \$6,000 participation fee, which grants them access to additional funding provided by the NC Wildlife Resources Commission. Landholders experiencing beaver damage in these counties may reach out to their county's BMAP contact to receive assistance.



### Landholder Cost-Share

Landholders pay the following cost-share fees for services:

- \$25 per site visit
- \$125 per dam removed

Initial damage assessments are provided at no charge. Beaver management specialists average 10 visits over a 30-day period to resolve the problem. Costs to the landholder increase after 15 visits to the full market value of beaver management services.

Landholders willing to conduct beaver management activities themselves are provided individual training at no cost.

### Service Priorities

Requests for assistance are handled on a first-come, first-served basis. However, projects that address threats to public health and safety receive top priority.

## BMAP County Contacts: July 1, 2020 – June 30, 2021

Bertie	252-565-2731	Johnston	919-989-5100
Bladen	910-862-4591	Lee	919-775-5624
Brunswick	910-253-2508	Lenoir	252-527-2191
Carteret	252-222-6360	Macon	910-934-5025
Catawba	828-465-8240	Martin	252-792-4350 x 3
Chatham	919-542-8228	McDowell	828-652-4434
Columbus	910-642-2196 x 3	Mecklenburg	980-721-3760
Craven	252-633-1477	Nash	252-459-9800
Cumberland	910-321-6860	New Hanover	910-798-6667
Currituck	252-232-2075	Northampton	252-534-2501
Duplin	910-296-2120	Pamlico	252-745-4121
Edgecombe	252-823-8187 x 3258	Pasquotank	252-338-3954
Franklin	919-496-3344	Pender	910-259-1233
Gaston	704-922-2152	Perquimans	252-426-8484
Gates	225-357-1499	Pitt	252-902-3250
Granville	919-603-1350	Robeson	910-671-3022
Greene	252-747-3705 x 3	Sampson	910-592-7161
Halifax	252-583-1131	Vance	252-438-8188
Harnett	910-893-7584	Warren	252-257-3640
Haywood	828-452-2741 x 3	Wayne	919-731-1650
Hoke	910-875-3461	Wilson	252-237-5147 x 3
Iredell	704-873-6761		



Before and after BMAP services resolved flooding and associated damage to home septic systems in Lenoir County.  
Photos: Nicole Lynch  
USDA Wildlife Services



### Additional Information

Learn about BMAP online at <http://www.ncwildlife.org/BMAP>.

#### **Statewide Contacts:**

USDA Wildlife Services  
6213-E Angus Drive, Raleigh, NC 27617  
866-487-3297  
[todd.a.menke@usda.gov](mailto:todd.a.menke@usda.gov)

NC Wildlife Resources Commission  
1751 Varsity Drive, Raleigh, NC 27699  
919-707-0068  
[falyn.owens@ncwildlife.org](mailto:falyn.owens@ncwildlife.org)

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