# Beaver Damage Management In North Carolina

Thirty-First Summary Report



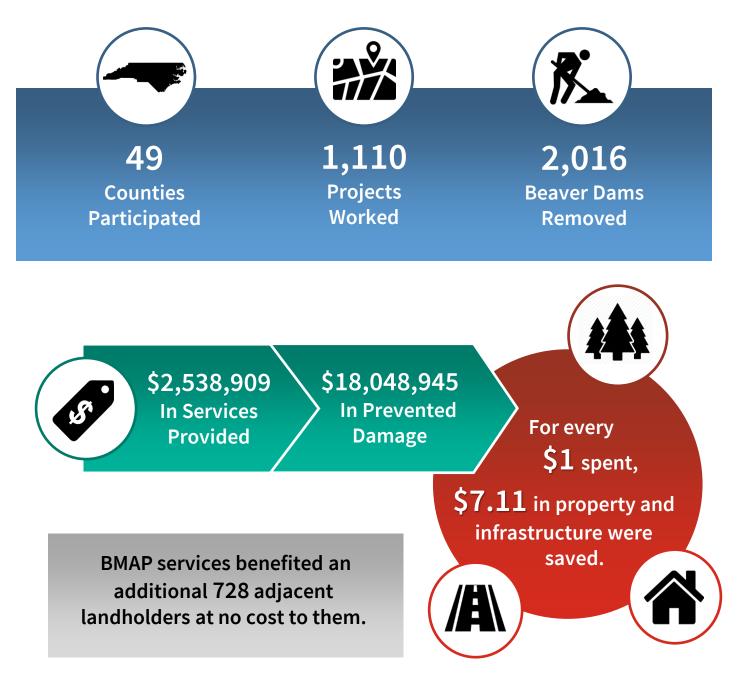
July 1, 2022 through June 30, 2023

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Cover photo: Chase Clifton, USDA Wildlife Services, Highway 130 in Brunswick County, February 9, 2023, demonstrating the height of a beaver dam that was to be removed through BMAP.

# Executive Summary





Cost to the Landholder \$25 per site visit \$125 per dam removed

# **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 49 participating in 2022-2023. Due to practical and ecological considerations, the program's goal remains 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 estimated to be around 1,000,000. BMAP-related removals account for less than 0.5% of the total beaver population annually and around 20% of the total known annual beaver harvest by regulated trapping. While this level of harvest has little to no effect on the beaver population, it is impactful in resolving damage issues for individual landholders. Rather than focusing on removing beaver, BMAP instead prioritizes activities that 1), remove threats to public health and safety and 2), directly assist landholders who are experiencing property damage from beaver.

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, 2022 through June 30, 2023.

Information about the program can be found on the main BMAP webpage: www.ncwildlife.org/bmap.

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

### **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
Joshua Vetter	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
Mike Powell	NC Forestry Association
Todd Menke	USDA–APHIS–Wildlife Services



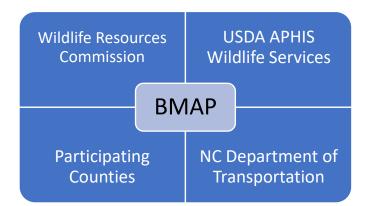


Reid Cooper, USDA Wildlife Services — Beasley Mill Road, Duplin County, February 15, 2023. A beaver dam blocking a DOT culvert was threatening its structural integrity and causing roadway flooding. BMAP services restored normal water flow, preventing damage to the roadway, saving nearby timber, and protecting the driving public.

### **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 focus on reducing water levels that threaten private roadways, timber, agricultural crops, and general property. Administrative authority for 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** (DOT) funds beaver damage management activities along statemaintained road rights-of-way in all 100 counties. Activities aim to reduce flooding that impacts state roads and threatens roadway infrastructure as well as human health and safety.

**Individual counties** have the option to participate in BMAP at various levels on an annual basis. Counties can opt out or participate at the baseline level, with the option to provide additional funding to support expanded program services based on that county's needs.

**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, 2022 through June 30, 2023 are summarized below:

		Expe	nditures (a)	by Funding So	urce (b. c)		
			Counties	Counties	Wildlife	Landowner	
Expenditure	NCWRC	DOT	(Baseline)	(Additional)	Services	Collections (d)	Totals
Personnel Costs	\$271,392	\$719,537	\$197,422	\$432,990	\$0	\$55,029	\$1,676,37
Vehicle fuel, maintenance & repair	\$24,416	\$57,426	\$14,717	\$25,479	\$0	\$2,684	\$124,722
Other Services (phones, data lines, non-vehicle repairs & maintenance)	\$22	\$46,038	\$1,570	\$9,630	\$25,000	\$80	\$82,340
Supplies (waders, tools, explosives)	\$6,412	\$54,363	\$16,018	\$30,196	\$0	\$2,894	\$109,883
Equipment (traps, laptops, printers)	\$550	\$1,267	\$1,495	\$9,600	\$0	\$1,250	\$14,162
Pooled Job Costs	\$33,307	\$96,649	\$25,435	\$55,869	\$0	\$0	\$211,260
Indirect Costs to NCWS	\$33,307	\$96,649	\$25,435	\$55,869	\$0	\$6,813	\$218,073
Indirect Costs to APHIS	\$15,594	\$45,250	\$11,908	\$26,157	\$0	\$3,190	\$102,099
Total Spent (e)	\$385,000	\$1,117,179	\$294,000	\$645,790	\$25,000	\$71,940	\$2,538,909
(a) Expenditure figures	s are subject to	o adjustment.					
(b) Funding sources:	NCW	/RC I	NCDOT	49 Cour	nties (Baseline	) Counties (A	dditional)
	\$385	<b>5,000</b> \$	1,117,179	\$294,00	0	\$645,790	
<u>Additional Fundin</u> Bladen \$54,000; B \$185,000; City of SCWD \$88,622; L	Brunswick \$42 Fayetteville \$2	26,342; Fayett	eville PWČ \$	7,786; Harnett	\$5,900; Hend	erson \$5,000; Jo	hnston

(c) USDA Wildlife Services contributed \$25,000 to fund BMAP in FY 2022/2023. 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, 2023, \$3,225 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.

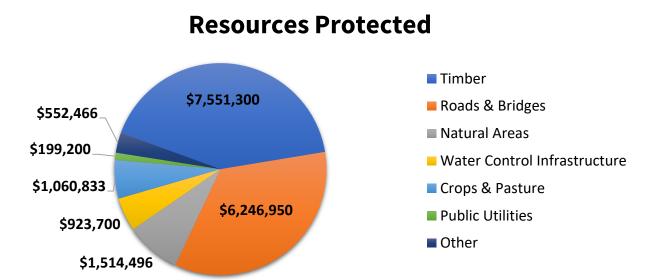
# **Program Statistics in Summary**

The Cooperative Service Agreements between WS, DOT, WRC, and participating counties resulted in a total of 1,110 projects worked from July 1, 2022 through June 30, 2023. An additional **728 adjacent landholders benefitted from BMAP services at no cost to them**.

Projects Worked	Dams Removed w/Explosives	Dams Removed Manually	Beaver Removed
1,110	720	1,296	3,915

### **Economic Impact of BMAP**

USDA Wildlife Services staff and cooperators reported that BMAP services prevented the impending loss or repair expenditures of an estimated \$18,048,945 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 7.11. In other words, for every \$1.00 spent, \$7.11 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 agricultural losses where farmers were prevented from planting, managing, or harvesting crops on land that was flooded or saturated.



In the chart above, **Natural Areas** include undeveloped areas that are not considered "working lands" (e.g., wetlands and restoration sites). **Water Control Infrastructure** includes dams, dikes, ditches, and drainage systems. **Other** includes resources labeled as "general property," buildings, golf courses, railroad trestles, etc.

### **Beaver Damage Examples**

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



Matt Cribb, USDA Wildlife Services — Stateline Road, Robeson County, April 21 (left) and May 8 (right), 2023. A corn field harvested the year prior year could not be replanted in spring due to flooding caused by beaver dams. BMAP services restored normal water drainage, preventing further damage and allowed the landholder to plant the field.



Erik Bufmeyer/Brandon Emert, USDA Wildlife Services — Hylan Avenue, Richmond County, October 27 (left) and December 13 (right), 2022. A railroad right of way, 20 acres of timber, and several sewer line hole covers for the City of Hamlet were under water due to five beaver dams. BMAP services restored normal water drainage and stopped 100,000 gallons of extra water per day from being treated by the wastewater treatment facility. This prevented the City of Hamlet from being fined by the State and benefitted multiple local landholders.

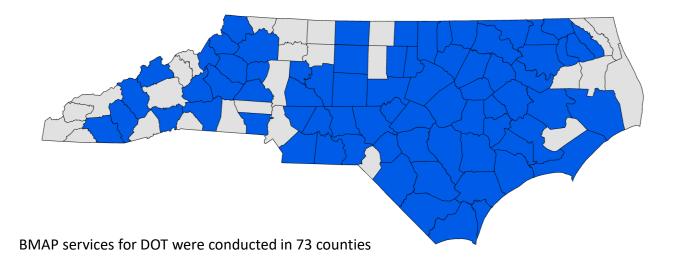


Erik Bufmeyer, USDA Wildlife Services — Sandhill and Loch Haven Road, Richmond County, January 31, 2023. Two 60-inch culverts were completely blocked by beaver activity, causing the two-lane road to collapse. BMAP services restored normal water drainage to the culverts, allowing the road to be reopened and protecting the driving public.

### **Program Statistics by Funding Source**

### **NC Department of Transportation**

Beaver damage management services to the North Carolina Department of Transportation (DOT) were available in all 100 counties regardless of a county's participation in BMAP. Due to human 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 5 to 7 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 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.





Erik Bufmeyer, USDA Wildlife Services—Zoo Parkway, Randolph County, September 26 (left) and November 8 (right), 2022. A beaver dam 100 yards downstream nearly blocked two large culverts and was flooding nearby timber and pasture land. BMAP services restored normal water drainage, protecting the driving public and resolved issues for multiple adjacent landholders.

Beaver damage management activities were conducted on NC Department of Transportation property in 73 of North Carolina's 100 counties. DOT received a total of 494 completed projects, resulting in the removal of 1,682 beaver and 888 dams. In addition, WS worked with 558 adjacent landholders who benefitted from these services at no cost to them.

Projects Worked	Dams Removed w/Explosives	Dams Removed Manually	Beaver Removed
494	243	645	1,682



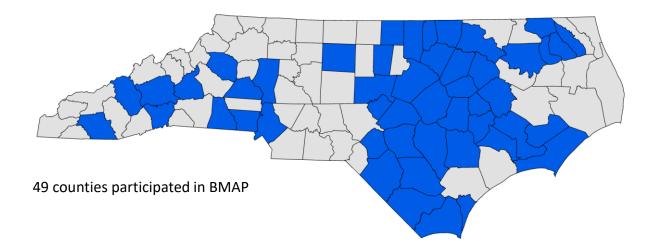
Nicholas Ryan USDA Wildlife Services—Benson Hardee Road, Johnston County, May 12, 2023. A large culvert was in the process of being blocked by beavers. BMAP services prevented further blockage and restored normal water drainage, protecting the driving public as well as prevented adjacent timber stands from being impacted, benefitting multiple adjacent landholders.



Chase Clifton/Bo Benton, USDA Wildlife Services — Highway 904, Columbus County, March 8 (left) and 22 (right), 2023. Beaver dams blocking a main drainage ditch were flooding several landholders' fields. BMAP services restored normal water drainage, allowing the farmers to plant soybeans.

### **NC Wildlife Resources Commission**

The North Carolina Wildlife Resources Commission (WRC) funds beaver damage management as part of a cost-share program with participating counties and landholders within those counties. County participation is required before any direct assistance is provided to landholders. Participation in the program is open to all North Carolina counties. Participating counties received an average of 80–112 site visits (32-48 DOT, 48-64 non-DOT) during the 2022-23 fiscal year. Services in each county were provided based on demand and the program's ability to meet those demands at current funding levels.



Forty-nine participating counties received assistance through funding provided by WRC, county participation fees, and individual landholders. A total of 230 projects were completed and resulted in the removal of 739 beaver and 303 dams. In addition, 31 adjacent landholders who benefitted from these services at no cost to them.

Projects Worked	Dams Removed w/Explosives	Dams Removed Manually	Beaver Removed
230	90	213	739

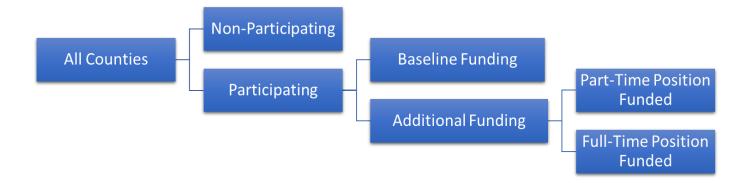


Nicholas Ryan, USDA Wildlife Services,—,Benson Hardee Road, Johnston County, May 12, 2023. A stand of timber was being flooded and in danger of loss due to beaver activity nearby. BMAP services restored normal water drainage, protecting the value of the timber stand.



Chase Clifton/Bo Benton, USDA Wildlife Services — Highway 130, Brunswick County, February 9 (left) and 10 (right), 2023. Multiple beaver dams were flooding 10+ acres of timber and causing damage to a drainage canal. BMAP services restored normal water drainage, protecting the canal and timber stand, as well as adjacent agricultural fields.

### **Individual Counties**



All 100 counties in North Carolina receive a written invitation to participate in BMAP annually and must opt in to the program 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 above).

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

**Participating Counties at Baseline Funding** – In FY 2022-23, counties could opt in to BMAP by contributing \$6,000 to participate at the baseline level. County participation fees are pooled with funding provided by the NC Wildlife Resources Commission to offset the cost of beaver damage control services in that county. Landholders in participating counties were eligible for services at a reduced cost-share rate of \$25 per site visit and \$125 per dam removed. The 49 counties below participated at baseline level during FY 2022-23.

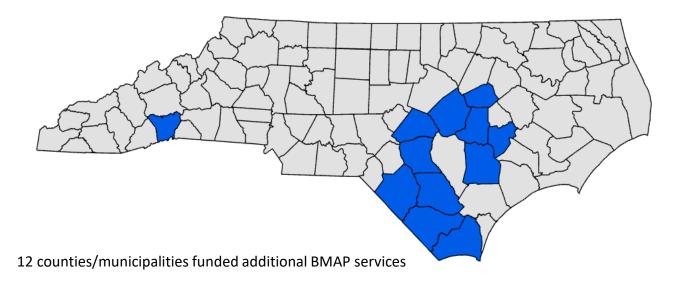
Counties Participating at Baseline for FY 2022-23						
Bertie	Cleveland	Granville	Johnston	Orange	Wake	
Bladen	Columbus	Greene	Jones	Pamlico	Warren	
Brunswick	Craven	Guilford	Lee	Pasquotank	Wayne	
Buncombe	Cumberland	Halifax	Lenoir	Perquimans	Wilson	
Caldwell	Duplin	Harnett	Macon	Person		
Carteret	Edgecombe	Haywood	McDowell	Pitt		
Catawba	Franklin	Henderson	Mecklenburg	Robeson		
Chatham	Gaston	Hoke	Nash	Sampson		
Chowan	Gates	Iredell	New Hanover	Vance		

## **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** – 11 counties and 1 city opted to provide funding beyond the baseline \$6,000 participation fee, totaling \$645,790 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 (\$185,000) and Robeson (\$120,317) Counties Single full-time personnel – Bladen (\$54,000), Johnston (\$88,622), and Wayne (\$77,896) Counties Part-time personnel – City of Fayetteville (\$34,128), Brunswick (\$46,439), Columbus (\$2,572), Harnett (\$5,900), Henderson (\$5,000), Lenoir (\$17,800), and Wilson (\$8,116) Counties



A total of 386 projects were	worked resulting in the removal	of 1,494 beaver and 825 dams.
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Projects Worked	Dams Removed w/Explosives	Dams Removed Manually	Beaver Removed
386	387	438	1,494



Joey Smith, USDA Wildlife Services — Wayne County, March 1, 2023. Students from the University of Mount Olive discussed the many benefits of regulated trapping while removing four beaver dams with explosives.

## **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. 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 2023-2024

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 Fiscal Year 2023-24				
NCDOT = \$1,000,000 NCWRC = \$385,000				
56 Participating Counties = \$336,000	USDA Wildlife Services = \$25,000			
Private Cost-share = \$75,000	Additional County Funding = \$780,000			
Total = \$2.601.000				

# **Obtaining Services**

#### **How Counties Participate**

All counties were eligible to participate in FY 2022-2023 by contributing a \$6,000 participation fee. Individuals residing in these counties could obtain assistance with beaver damage by contacting their county's designated BMAP liaison (typically the county Cooperative Extension 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

#### **NC Wildlife Resources Commission**

Wildlife Management Division 1722 Varsity Drive Raleigh, NC 27699 1-919-707-0050

# Appendix: 2022-2023 Guide to Obtaining Services

# NC Beaver Management Assistance Program OBTAINING SERVICES

Since beavers were successfully reintroduced to North Carolina in 1939, this native species has thrived, benefitting people and wildlife by creating quality wetland habitat, reducing erosion, and improving water quality across the state. Damage to property 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 focus 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 state fiscal year 2020-2021, BMAP services prevented the impending loss or repair costs of an estimated \$9.66 million in roads, bridges, timber and other agricultural crops, railroad trestles, dams, sewer systems, water treatment facilities, landscaping, homes, airport runways, and golf courses. Comparing the costs of BMAP to its savings, for every \$1.00 spent, \$6.42 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 request 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.

\* Fee for beaver dam removal will increase to \$150 per dam beginning July 1, 2023 due to increasing cost of materials.

#### **Service Priorities**

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

#### BMAP County Contacts: July 1, 2022 - June 30, 2023

	contacts belong to designa Cooperative Extension Se			BEFORE
Bertie	252-794-5317	Hoke	910-875-3461	
Bladen	910-862-6700	Iredell	704-873-6761	
Brunswick	910-253-2515	Johnston	919-989-5380	and the second
Buncombe	828-250-4788	Jones	252-448-2341	
Caldwell	828-757-8625	Lee	919-775-5624	ALL ALL ALL ALL
Carteret	252-222-6360	Lenoir	252-526-9799 x3	
Catawba	828-465-8240	Macon	828-349-2045	Beaver-related flooding was damaging corn and preventing the
Chatham	919-542-8228	McDowell	828-652-4434	landowner from harvesting their crop in Wayne County.
Chowan	252-482-4127 x3	Mecklenburg	980-721-3760	
Cleveland	704-482-4365	Nash	252-459-4116 x3	]
Columbus	910-642-2196 x3	New Hanover	910-798-7117	-
Craven	252-633-0397	Orange	919-245-2514	AFTER
Cumberland	910-321-6860	Pamlico	252-745-5064 x3	
Duplin	910-296-2120 x3	Pasquotank	252-338-3954	
Edgecombe	252-823-8187 x3258	Perquimans	252-482-4127 x3	Les albuma a solution
Franklin	919-496-3344	Person	336-599-0284 x3	a second s
Gaston	704-922-2152	Pitt	252-902-3250	A The second sec
Gates	252-357-1400	Robeson	910-671-3024	
Granville	919-603-1350	Sampson	910-592-7161	BMAP professionals removed a total
Greene	252-747-3705 x3	Vance	252-438-8188	of eight beavers and five dams, allowing the landowner to harvest
Guilford	336-641-2440	Wake	919-250-1050	their corn crop.
Halifax	252-583-5161	Warren	252-257-3640	
Harnett	910-893-7584	Wayne	919-731-1650	
Haywood	828-452-2741 x3	Wilson	252-237-5147 x3	Photos: Joey Smith USDA Wildlife Services
	828-694-6627			1 USDA Wildlife Services



#### **Additional Information**

Learn more at www.ncwildlife.org/BMAP.

#### NORTH CAROLINA Utidulife RESOURCES COMMISSION

USDA Wildlife Services 6213-E Angus Drive, Raleigh, NC 27617 866-487-3297 todd.a.menke@usda.gov

Statewide Contacts:

NC Wildlife Resources Commission 1751 Varsity Drive, Raleigh, NC 27699 919-616-2208 falyn.owens@ncwildlife.org

Updated November 8, 2022