

CHAPTER TOPICS

- 🌿 Agricultural Land Use
- 🌿 Soil & Water Conservation Districts
 - 🌿 ACSP
- 🌿 Animal Operations
 - 🌿 Recommendations

CHAPTER FIVE

AGRICULTURE

IN THE CATAWBA RIVER BASIN

AGRICULTURE IN THE CATAWBA

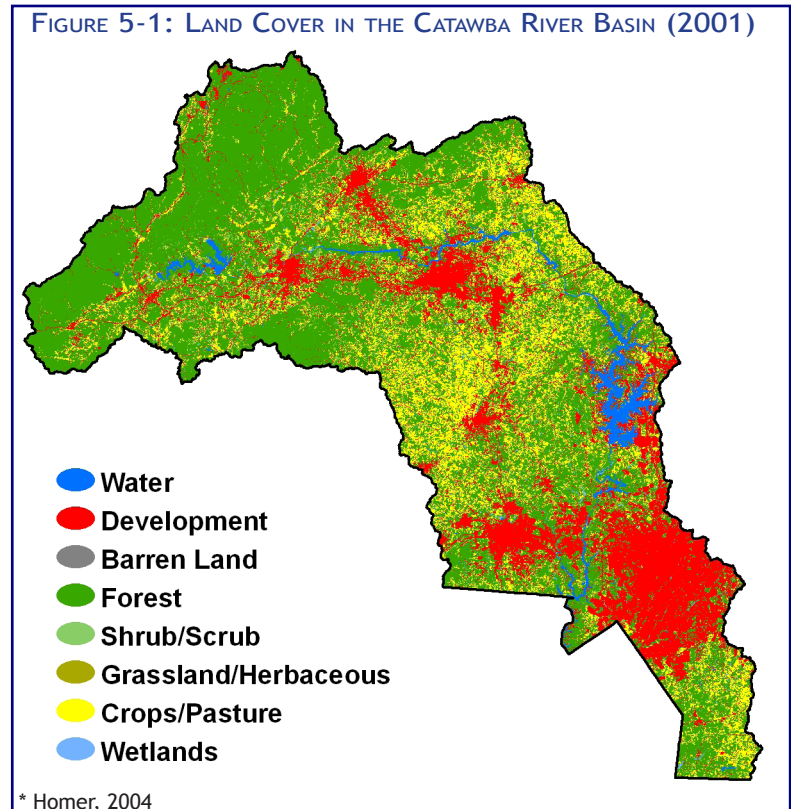
Agriculture has been an important part of the economic success and health of North Carolina for decades and provides countless benefits. Recently, much emphasis has been placed on the value of local farming in which DWQ supports. However, like many beneficial human activities, agriculture can have a large impact on water quality. Over the past decades, agricultural agencies and farmers have joined efforts to greatly reduce these impacts. This Chapter is focused on remaining impacts as well as activities to restore water quality or prevent habitat degradation during this cycle.

Many national, state, and local agencies are focused on these efforts. Specific restoration and preservation projects which were planned or implemented during this plan cycle are discussed in the respective 10-digit watershed write ups within the Subbasin Chapters.

Agricultural practices in the Catawba River Basin accounts for 18.9% of the land use activities; of that, 18.5% are estimated as pasture/hay land (Figure 5-1). This includes areas of grasses, legumes, or grass-legume mixtures planted for livestock grazing or the production of seed or hay crops, typically on a perennial cycle. Pasture/hay vegetation accounts for greater than 20% of total vegetation.

Confined animal operations, grazing, plowing, stream access, pesticide spraying, fertilizing, planting and harvesting are all agricultural activities that may impact water quality. The major agricultural nonpoint source pollutants that result from these activities are sediment, nutrients, pathogens (i.e., bacteria), pesticide and salts. Agricultural activities can also damage habitat and stream channels.

FIGURE 5-1: LAND COVER IN THE CATAWBA RIVER BASIN (2001)



* Homer, 2004

SOIL & WATER CONSERVATION DISTRICTS

AGRICULTURAL COST SHARE PROGRAM (ACSP)

During the six-year, six-month period (January 2003 - June 2009), 547 Best Management Practices (BMPs) were installed with just over \$2 million dollars of NCACSP funds equating total project costs of \$2.65 million. This equates to approximately 84 BMPs installed with just over \$310,000 of NCACSP funds per year, averaging \$3,691 per BMP. Total project costs would equal 84 BMPs installed at a total cost of >\$408,000/year averaging \$4,861 per BMP.

Of the 547 BMPs installed, 251 were implemented within water-supply watersheds (46%). Of the 547 BMPs installed, 178, or 33%, were installed within the 14 digit HUC's of 303(d) listed streams (the 14 digit HUCs were chosen to "scale-down" the watersheds of the 303d listed streams). Of the 547 BMPs installed, 342 were in either water-supply watersheds and/or 303(d) listed streams (63% of the practices). Funds expended in either water supply watersheds and/or 303(d) listed streams equaled 71% of the total funds expended (and the total project costs). Effective targeting of NC Agricultural Cost-Share Program funds was accomplished with 71% of the allocations being implemented in these important watersheds.

Tables 5-1 through 5-4 and Figure 5-2 provide additional information on practices installed, costs, locations and benefits. The following is a breakdown of the amounts and percentages of the totals of the practices installed:

TABLE 5-1: BREAKDOWN OF THE AMOUNTS & PERCENTAGES OF TOTAL PRACTICES INSTALLED

PRACTICE	\$ AMOUNT	% OF TOTAL PRACTICES INSTALLED
Stream Protection	\$794,258	39%
Waste Management	\$518,294	26%
Erosion/Nutrient Reduction	\$404,252	20%
*Community Conservation	\$104,810	5%
Sediment/Nutrient Reduction	\$67,508	3%
Agri-Chemical Pollution Prevention	\$65,179	3%
*Drought Response	\$61,134	3%
*Community Conservation is a new program and the Drought Response was a special one-time legislated program		

The Catawba Basin has three eight digit hydrologic units within the entire Basin Watershed, 03050101, 03050102, and 03050103. The breakdown regarding NCACSP funds expended based on these HUC's follows:

TABLE 5-2: BREAKDOWN OF NCACSP FUNDS EXPENDED BASED ON 8-DIGIT HUC'S

8-DIGIT HYDRO UNIT	FUNDS EXPENDED	% OF TOTAL FUNDS EXPENDED	DRAINAGE AREA	% OF TOTAL DRAINAGE AREA
03050101	\$1,297,781	64.4%	2218.68 square mile DA	67.5%
03050102	\$ 608,517	30.2%	660.74 square mile DA	20.1%
03050103	\$25,107	1.2%	405.99 square mile DA	12.4%

The total "Funds Expended" for these HUC's equals 96%, the remainder coming from anomalies within the dataset (data points that lie outside the watershed boundaries). The Watershed drainage areas equal 100%.

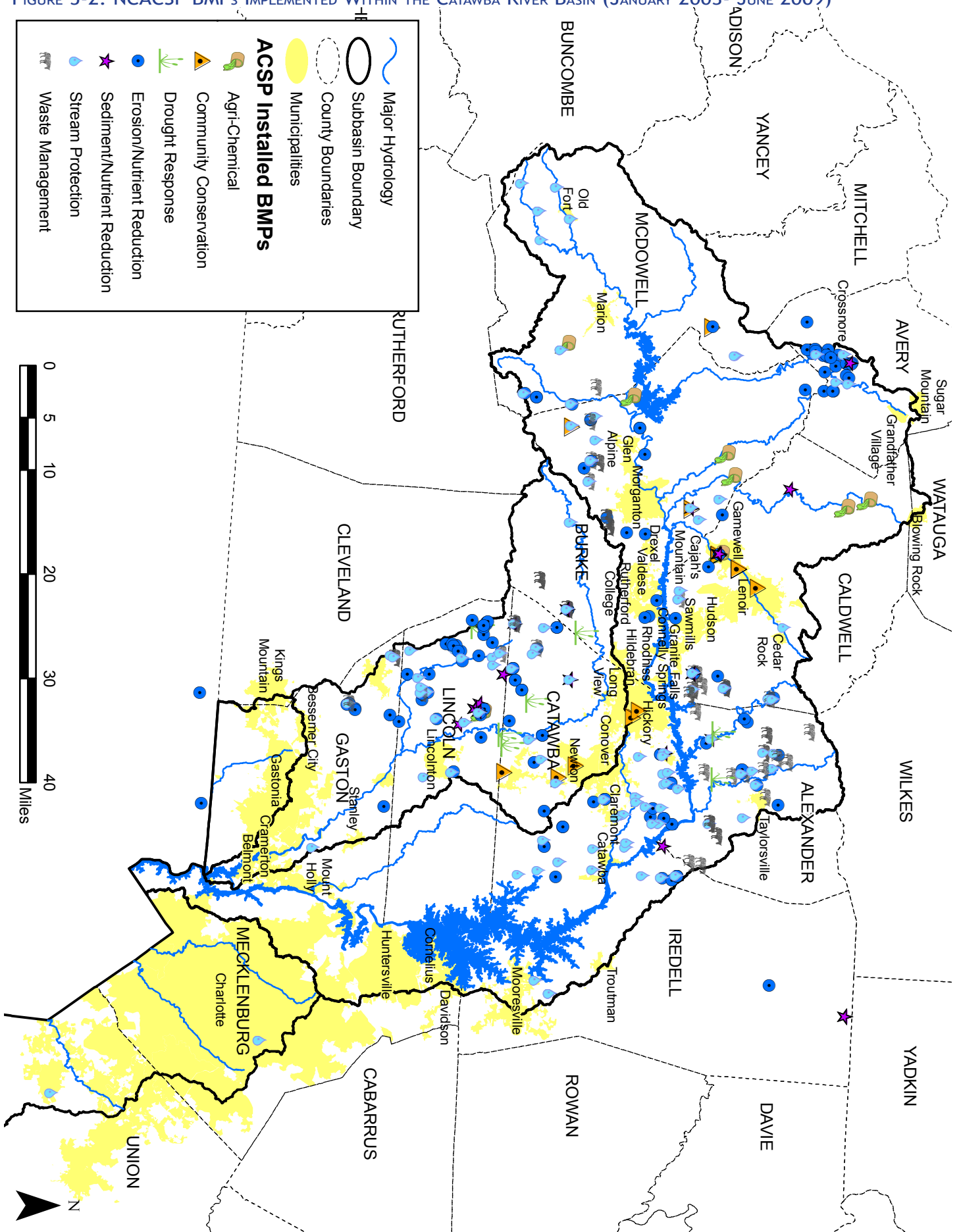
TABLE 5-3: NCACSP BMP IMPLEMENTATION DATA (JANUARY 2003 - JUNE 2009) BY 8-DIGIT HUCs

PURPOSE OF BMP	HYDROLOGIC UNIT 03050101			HYDROLOGIC UNIT 03050102			HYDROLOGIC UNIT 03050103		
	TOTAL IMPLEMENTED	COST-SHARED FUNDED	TOTAL PROJECT COSTS	TOTAL IMPLEMENTED	COST-SHARED FUNDED	TOTAL PROJECT COSTS	TOTAL IMPLEMENTED	COST-SHARED FUNDED	TOTAL PROJECT COSTS
Agri-Chemical Pollution Prevention	--	\$47,106	\$62,808	--	\$18,073	\$24,097	--	--	--
Number of Facilities	7	--	--	1	--	--	--	--	--
Drought Response	--	\$27,449	\$36,599	--	\$33,685	\$44,913	--	--	--
Well-Confined Supply	2	--	--	1	--	--	--	--	--
Irrigation Well	--	--	--	3	--	--	--	--	--
Conservation Irrigation	--	--	--	1600 ft	--	--	--	--	--
Erosion/Nutrient Loss Reduction from Fields	--	\$27,449	\$268,601	--	\$179,345	\$239,127	--	--	--
Acres Treated	3,848 ac	--	--	4,476 ac	--	--	--	--	--
Sediment/Nutrient Delivery Reduction from Fields	--	\$24,845	\$33,127	--	\$27,503	\$36,671	--	--	--
Stream Protection	--	\$541,211	\$721,615	--	\$182,526	\$243,368	--	\$25,107	\$33,476
Linear Feet Treated	87,009 ft	--	--	29,722 ft	--	--	11,875 ft	--	--
Waste Management	--	\$355,017	\$473,356	--	\$163,277	\$217,703	--	--	--
Number of Units Installed	47	--	--	14	--	--	--	--	--
Grand Total	--	\$1,297,781	\$1,730,375	--	\$608,517	\$811,356	--	25,107	\$33,476

TABLE 5-4: NCACSP BMP IMPLEMENTATION BENEFITS DATA (JANUARY 2003- JUNE 2009) BY 8-DIGIT HUCs

BENEFITS	03050101	03050102	03050103
Acres Affected	15,347	7,809	478
Nitrogen Saved (lb.)	27,797	177,361	--
Phosphorus Saved (lb.)	13,284	41,403	--
Soil Saved (lb.)	45,973	39,069	--
Waste-N Pounds Managed	709,923	444,523	--
Waste-P Pounds Managed	846,475	372,342	--

FIGURE 5-2: NCACSP BMPs IMPLEMENTED WITHIN THE CATAWBA RIVER BASIN (JANUARY 2003- JUNE 2009)



ANIMAL OPERATIONS & RECOMMENDATIONS

In 1992, the Environmental Management Commission (EMC) adopted a rule modification (15A NCAC 2H.0217) establishing procedures for managing and reusing animal wastes from intensive livestock operations. The rule applies to new, expanding or existing feedlots with animal waste management systems designed to serve animal populations of at least the following size: 100 head of cattle, 75 horses, 250 swine, 1,000 sheep or 30,000 birds (chickens and turkeys) with a liquid waste system. For key animal operation legislation between 1995 and 2003, see Chapter 6 of the *Supplemental Guide to North Carolina's Basinwide Planning*.

Even though the rules adopted by the EMC are focused on managing and reusing animal waste in an environmentally and economically feasible manner, animal operation facilities can have many other impacts on local and downstream water quality. Some of the major impacts on water quality are:

Streambank Erosion & Sedimentation: Livestock grazing with unlimited access to the stream channel and banks can also cause severe streambank erosion resulting in sedimentation and degraded water quality. Although they often make up a small percentage of grazing areas by surface area, riparian zones (vegetated stream corridors) are particularly attractive to cattle that prefer the cooler environment and lush vegetation found beside rivers and streams. This concentration of livestock can result in increased sedimentation of streams due to “hoof shear”, trampling of bank vegetation, and entrenchment by the destabilized stream. Despite livestock’s preference for frequent water access, farm veterinarians have reported that cows are healthier when stream access is limited (EPA, 1999).

Loss of Riparian Vegetation: As livestock gather near streams, the riparian zone becomes trampled and thinned out. The more frequent access livestock has to the stream, the less of a chance the vegetation has to grow back. Establishing, conserving and managing streamside vegetation (riparian buffer) is one of the most economical and efficient BMPs.

Excessive nutrients: Elevated nutrients levels from animal operations are not only from livestock within the stream excreting waste, but also from stormwater runoff which washes the waste deposited in the pasture into the stream. When these streams have healthy riparian zones or buffers, instream nutrients are greatly reduced. Once the storm flow reaches the buffer, it has a chance to filter into the soil and excess nutrients is taken up by the vegetation.

More specific information about these agricultural impacts can be found in *Chapter 6* of the *Supplemental Guide to North Carolina's Basinwide Planning*.

TABLE 5-5: PERMITTED ANIMAL OPERATIONS IN 03050101

TYPE	03050101			03050102		
	# OF FACILITIES	# OF ANIMALS	SSLW	# OF FACILITIES	# OF ANIMALS	SSLW
Cattle	12	4,713	5,714,950	11	5,115	6,746,350
Swine	1	260	368,420	0	0	0

*Steady State Live Weight (SSLW) is in pounds, after a conversion factor has been applied to the number of swine, cattle or poultry on a farm. Conversion factors come from the US Department of Agriculture, Natural Resource Conservation Service (NRCS) guidelines. Since the amount of waste produced varies by hog size, this is the best way to compare the sizes of the farms.

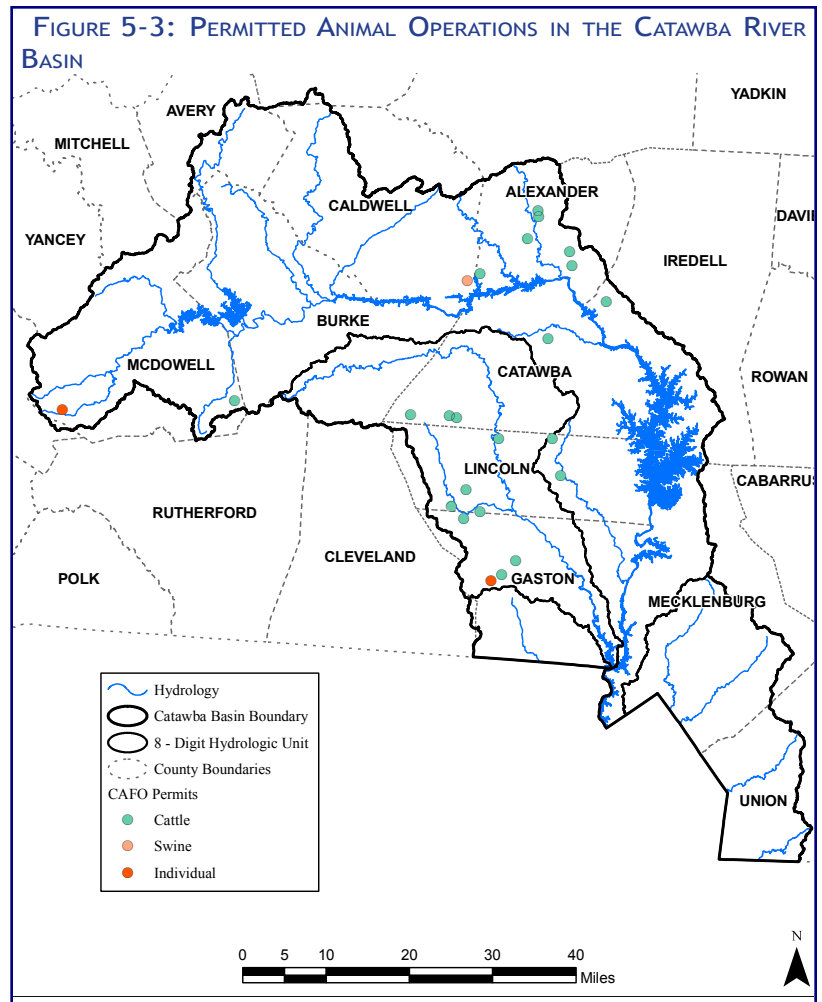
Water Quality Impacts in the Catawba River Basin

Between 2004 and 2009, the majority of habitat degradation and other impacts from animal operations were observed in the upper half of the basin. Even though almost all of the permitted operations are within the South Fork subbasin (03050102) and just northeast of Lake Hickory (Figure 5-3), there are many smaller farms scattered throughout the basin. As mentioned above, only facilities with animal populations of 100 head of cattle, 75 horses, 250 swine, 1,000 sheep or 30,000 birds (chickens and turkeys) with a liquid waste system must obtain a permit from the state.

There are a variety of programs available to and used by agricultural facilities throughout North Carolina. Many give incentives for protecting water quality including a variety of programs supported by the Federal Farm Bill. For more information on these programs see *Chapter 6* of the *Supplemental Guide to North Carolina's Basinwide Planning*. For additional information about the 2008 Farm Bill, see the *Conservation Practices brochure* on the National Resources Conservation Services website.

As seen in *Section A: Chapter 2* of the 2004 *Catawba River Basinwide Water Quality Plan*, there has been a shift in animal operations from cattle to poultry within the basin since the mid 1990's. Impacts being seen by biologist, environmental professionals and local citizens from this shift to poultry farms is sediment filling in nearby streams. Agricultural practices are exempt from having to complete a sediment and erosion control plan which is a state requirement for any land disturbing activity over an acre; however, if the operation participates in any federal farm government program, they may be required to meet soil erosion control goals or lose their program benefits. Poultry houses that are not participating in federal farm programs are not required to implement sediment and erosion controls and some are being constructed without proper controls in place to trap sediment on the property before it reaches the stream. Many of these poultry houses are located in the headwaters of the Catawba River Basin where high quality waters (HQW), outstanding resource waters (ORW) and trout waters (Tr) are also found. These water are usually very sensitive to the impacts of sedimentation.

At the urging of the NC Agriculture Task Force and NC Soil & Water Conservation Commission, the NC Poultry Federation is establishing operating guidelines and standards to address setbacks, site stabilization and other environmental concerns related to the construction of new poultry production facilities. It is recommended that poultry farmers voluntarily install sediment and erosion controls on the property during construction activities to reduce impacts from sedimentation.



REFERENCES

- Homer, C., C. Huang, L. Yang, B. Wylie and M. Coan, 2004. *Development of a 2001 National Land Cover Database for the United States*. Photogrammetric Engineering and Remote Sensing Vol.70, No.7, pp 829-840. www.mrlc.gov.
- U.S. Environmental Protection Agency (EPA). 1999. Watershed Academy Website: <http://epa.gov/owow/watershed/wacademy/> (accessed 2004).