Chapter 11
Agriculture and Water Quality

11.1 Animal Operations

Over the years, key legislative bills were introduced and approved to regulate concentrated animal feeding operations (CAFOs) in the State of North Carolina. In May 2006, the Environmental Management Commission (EMC) adopted Title 15A Subchapter 02T. The subchapter replaced 15A NCAC 02H .0200 and Rules 15A NCAC 02H .0122 – Concentrated Animal Feeding Operations – and 15A NCAC 02H .0123 – Requirements: Evaluating Feedlot Permit Applications. The rules reflect current policy and provide routine consideration of an applicant's compliance status. Section .1300 of Subchapter 02T applies to all persons proposing to construct, modify, expand or operate an animal waste management system. Animal waste is defined as livestock or poultry excreta or mixture of excreta with feed, litter, bedding or other material generated at a feedlot. Animal waste management systems are defined as a combination of structural and nonstructural practices that collect, treat, store or apply animal waste to the land. An animal waste management plan is defined as a plan to properly collect, store, treat or apply animal waste to the land in an environmentally safe manner developed in accordance with the General Statute §143-215.10C (www.ncleg.net/EnactedLegislation/Statutes/HTML/BySection/Chapter_143/GS_143-215.10C.html).

Table 50 summarizes the number of registered livestock operations, total number of animals, number of facilities, and total steady state live weight. These numbers reflect only operations required by law to be registered, and therefore, do not represent the total number of animals in each subbasin. Several poultry operations that do not require permits exist within the basin; these facilities were noted in Onslow County near Richlands.

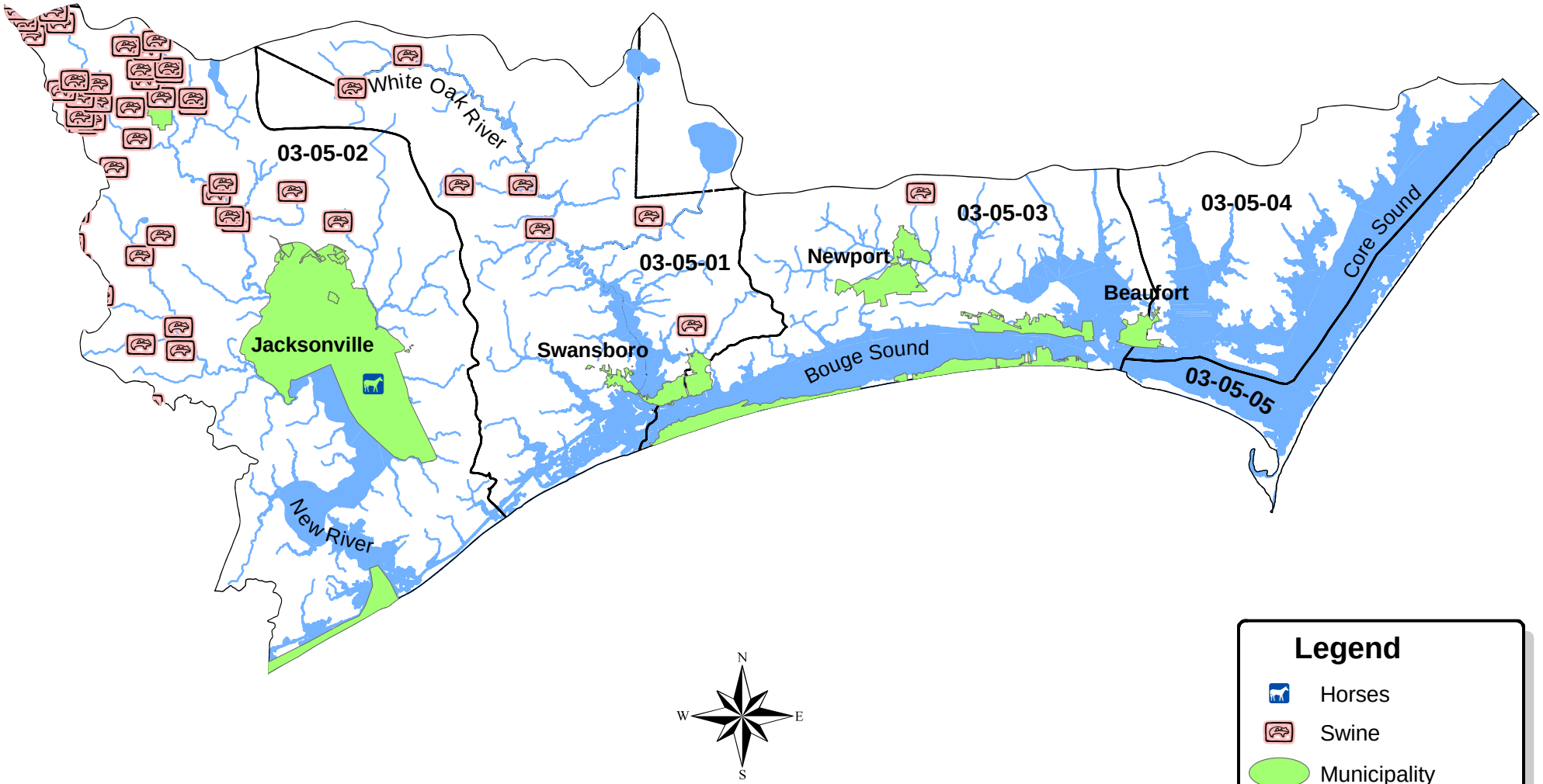
The White Oak River basin contains only 44 registered animal operations, all of which are swine operations. The majority of registered animal operations are found in subbasin 03-05-02. No violations or problems have been reported for any of the registered animal operations in the White Oak River basin.

Table 50 Registered Animal Operations in the White Oak River Basin (September 2004).

Subbasin	Swine		
	No. of Facilities	No. of Animals	Total Steady State Live Weight*
03-05-01	5	18,252	2,115,920
03-05-02	37	135,776	17,522,450
03-05-03	2	951	542,655
03-05-04	0	0	0
03-05-05	0	0	0
Totals	44	154,979	20,181,025

* 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.

Figure 18 Animal Operations in the White Oak River Basin



Planning Section
Basinwide Planning Unit
July 7, 2006

11.2 Agricultural Best Management Practices and Funding Opportunities

11.2.1 USDA – NRCS Environmental Quality Improvement Program (EQIP)

The USDA – Environmental Quality Improvement Program (EQIP) provides technical, educational and financial assistance to eligible farmers to address soil, water and related natural resource concerns on their lands in an environmentally beneficial and cost-effective manner. The program provides assistance to farmers in complying with federal and state environmental laws and encourages environmental enhancement. The purposes of the program are achieved through the implementation of a conservation plan that includes structural, vegetative and land management practices on eligible land. Two to ten-year contracts are made with eligible producers. Cost share payments may be made to implement one or more eligible structural or vegetative practices, such as animal waste management facilities, composters, filter strips, livestock exclusion and permanent wildlife habitat. Incentive payments can be made to implement one or more land management practices, such as nutrient management, pest management, grazing land management and long-term conservation tillage.

Sixty percent of the funding available for this program is targeted at natural resource concerns relating to livestock production. The program is carried out at the county level with base funding levels made available to each county. In North Carolina, EQIP was funded at approximately $14.0 million for 2005.

During this assessment period in Onslow County, over 1,213 acres were managed for nutrient and pesticides, 212 acres established permanent vegetative cover, 286 acres implemented long-term no-till management. An additional 5 acres will be established for wildlife habitat management, 4 waste storage facilities will be constructed, 1,550 feet of field borders and 2 grade stabilization structures will be installed. During the next few years allocation for Onslow County will include the following practices; waste storage facilities, fencing, cattle crossings, grade stabilization structures, critical area planting and long-term no-till practices totaling $128,088.00. Carteret County did not use any EQIP funds in the past five years.

NRCS district contacts for the White Oak River basin are provided in Appendix III, or information can also be found on NRCS website at http://www.nc.nrcs.usda.gov/programs/EQIP/index.html.

11.2.2 NC Agriculture Cost Share Program

The NC Agricultural Cost Share Program (NCACSP) was established in 1984 to help reduce agricultural nonpoint runoff into the state's waters. The program helps owners and renters of established agricultural operations improve their on-farm management by using best management practices (BMPs). These BMPs include vegetative, structural or management systems that can improve the efficiency of farming operations while reducing the potential for surface and groundwater pollution. The NCACSP is implemented by the Division of Soil and Water Conservation (DSWC), which divides the approved BMPs into five main purposes or categories.

- *Erosion Reduction/Nutrient Loss Reduction in Fields*
  Erosion/nutrient management measures include planned systems for reducing soil erosion and nutrient runoff from cropland into streams. Practices include: critical area planting,

cropland conversion, water diversion, long-term no-till, pastureland conversion, sod-based rotation, stripcropping, terraces, and Christmas tree conservation cover.

- *Sediment/Nutrient Delivery Reduction from Fields*
  Sediment/nutrient management measures include planned systems that prevent sediment and nutrient runoff from fields into streams. Practices include: field borders, filter strips, grassed waterways, nutrient management strategies, riparian buffers, water control structures, streambank stabilization, and road repair/stabilization.
- *Stream Protection from Animals*
  Stream protection management measures are planned systems for protecting streams and streambanks. Such measures eliminate livestock access to streams by providing an alternate watering source away from the stream itself. Other benefits include reduced soil erosion, sedimentation, pathogen contamination and pollution from dissolved, particulate, and sediment-attached substances. Practices include: heavy use area protection, livestock exclusion (i.e., fencing), spring development, stream crossings, trough or watering tanks, wells, and livestock feeding areas.

- *Proper Animal Waste Management*
  A waste management system is a planned system in which all necessary components are installed for managed liquid and solid waste to prevent or minimize degradation of soil and water resources. Practices include: animal waste lagoon closures, constructed wetlands, controlled livestock lounging area, dry manure stacks, heavy use area protection, insect and odor control, stormwater management, waste storage ponds/lagoons, compost, and waste application system.

- *Agricultural Chemical (agrichemical) Pollution Prevention*
  Agrichemical pollution prevention measures involve a planned system to prevent chemical runoff to streams for water quality improvement. Practices include: agrichemical handling facilities and fertigation/chemigation back flow prevention systems.

The NCACSP is a voluntary program that reimburses farmers up to 75 percent of the typical average cost of installing an approved BMP. The cost share funds are paid to the farmer once the planned BMP is completed, inspected and certified to be installed according to NRCS standards and specifications and SWCC policies. The annual statewide budget for BMP cost sharing is approximately $8 million. [Note: the annual statewide budget for ACSP cost sharing is $5.6 million; the additional $2.4 million is the annual statewide budget for technical assistance. All the counties in the White Oak River basin receive technical assistance funds to support a technician position for the N.C. Agriculture Program]. During the period from 1999 to 2004, $290,382 was provided for projects in the White Oak River basin. Table 51 summaries the cost and total BMPs implemented (i.e., acres, units, linear feet) throughout the White Oak River basin. No BMPs were installed in subbasin 03-05-05 through the NCASCP during this time period.

Table 51 Summary of NCACSP projects in the White Oak River Basin (1999 to 2004)

Purpose of BMP							
Subbasin	Erosion Reduction[1]		Sediment Reduction[2]		Animal Waste[3]		Total Cost ($)
	Total	Cost ($)	Total	Cost ($)	Total	Cost ($)	
03-05-01	329.7 acres	$34,741	0.21 acres	$541	3 units	$7,803	$43,085
03-05-02	721.2 acres	$74,311	24.44 acres	$17,565	22units	$115,878	$207,754
03-05-03	30.0 acres	$15,000	3units	$4,652	--	--	$19,652
03-05-04	127.7 acres	$20,862	--	--	--	--	$20,862
Totals	**1208.6 acres**	**$144,914**	**24.65 acres 3 units**	**$22,758**	**25 units**	**$123,681**	**$291,353**

[1] Erosion Reduction/Nutrient Loss Reduction in Field
[2] Sediment/Nutrient Delivery Reduction from Field
[3] Proper Animal Waste Management

Total Benefits					
Subbasin	Soil Saved (tons)	(N)itrogen Saved (lb.)	(P)hosphorous Saved (lb.)	Waste-N Saved (lb.)	Waste-P Saved (lb.)
03-05-01	936	2,184	66	152,839	133,240
03-05-02	3,129	9,440	578	1,546,382	1,391,557
03-05-03	60	10,367	--	--	--
03-05-04	209	1,663	--	--	--
Totals	**4,334**	**23,654**	**644**	**1,699,221**	**1,524,797**

* The North Carolina Agricultural Nutrient Assessment Tool (NCANAT) contains two field-scale assessment tools: the Nitrogen Loss Estimation Worksheet (NLEW) and the Phosphorus Loss Assessment Tool (PLAT). NCANAT is a product of the cooperative effort between the NC State University, NC Department of Agriculture & Consumer Services, USDA-NRCS and the DENR. The tool consists of a function that allows comparisons to be made before and after BMPs are installed. Gains and losses of nitrogen, phosphorus and sediment due to BMP implementation can be computed. The DSWC has adopted this program to calculate these losses for the NCACSP reporting requirements.

County Soil and Water Conservation District (SWCD) contacts for the White Oak River basin are included in Appendix III. BMP definitions and DSWC contact information can be found at www.enr.state.nc.us/DSWC/pages/agcostshareprogram.html.

11.3 SWCD Water Quality Strategy Plans

11.3.1 Onslow County SWCD 2007 Strategy Plan

The Division of Soil and Water Conservation in Onslow County notes 55.5 stream miles have some type of agricultural activities near or adjacent to the waters.

The New River is a coastal black water river with its watershed entirely within Onslow County. Not only does this make Onslow County responsible for its water quality actions, it also makes it difficult for the SWCD to manage for the reduction of soil loss, phosphorus loading and nitrogen loading in the large number of streams, creeks and branches that drain into the New River. A major portion the confined animal operations are in the Richlands area. There are approximately 104 confined animal operations (swine, turkey and chicken) that exist on the New River with 75

percent in the upper reaches. Vast amounts of working agricultural lands and animal operations put a unique strain on the watercourses draining to the New River.

Onslow County SWCD Water Quality Activities

1. Continue working with DWQ for stream classifications, mapping and strategies for improvement and protection.
2. During the 2006 Cost Share year, the district's accomplishments are as follows:

Activity	**Amount Contracted 2006**	**Goals for 2007**
Field Borders	4.33 acres	3 acres
Filter Strips	--	--
Waste Storage Structures	2 (EQIP)	1
Long-Term No-Till	56.3 acres	100 acres
3 Year Conservation Tillage	89.7 acres	--
Critical Area Planting	--	--
Livestock Exclusion System	--	--
Cropland Conversion	138.9 acres	100 acres
Composting Facility	--	--
Mortality Gasification System	--	1
Renovation of Expired BMPs Waste Application System	--	2
Lagoon Close-Out	--	1

3. Look for ways to conserve water quantity for future use.
4. Work with row crop farmers in the reduction of hoe drains for water quality concerns. Placement of BMPs on the land.
5. Waste storage structures to ensure waste is covered to reduce movement into watercourses.
6. Increase the awareness of the North Carolina Cost Share Program and the Federal Programs.
7. Reach the increasing number of small landowners who own or board horses. The horse population in Onslow County has increased with a number of horses on small tracts, increasing erosion and waste movement.
8. The number of goat farms has increased which may be causing waste to reach drainage areas.

As long as agriculture exists there will always be nonpoint source pollution. The SWCD would like to ensure that BMPs be placed for the most effective decrease in nonpoint source pollution. The SWCD would also like to ensure that the BMPs placed in Onslow County would be of the highest benefit not only to the agricultural community, but also to all Onslow County citizens. The district has identified the need to convert impervious surfaces, stabilize streambanks, and establish stormwater wetlands along the White Oak River and Hawkins Creek as BMPs the non-agricultural community can implement to help improve water quality. The SWCD hopes to play a major role with DWQ in the re-evaluation of streams. The SWCD believes its conservation efforts have made major improvements on water quality, but still need help identifying areas of concerns to concentrate cost share efforts.

11.3.2 Carteret County SWCD 2007 Strategy Plan

Throughout Carteret County more and more developments are being built and farmland is being converted to other uses. The Carteret SWCD will continue to become more involved with development issues, such as drainage related issues effecting storm water runoff. The SWCD will also continue to provide assistance with the county on a snagging project that started in 2005

in the Newport River watershed. The SWCD will also continue to help the Carteret County Environmental Health Department on drainage related issues, and provide educational materials and presentations to local schools and civic groups throughout the county. One of the main agricultural related water quality problems in Carteret County is runoff immediately following heavy rainfall because farms have extensive drainage systems which outlet into important fish nursery areas. Multi-agency and group collaboration efforts will continue to work with Open Grounds Farm, which consists of 44,000 acres and is surrounded by highly productive nursery areas.

Carteret County SWCD Water Quality Activities

One farmer farms the majority of land in the White Oak River basin from Stella to Pelletier. Over the years, the SWCD has worked with this farmer to install water control structures, and recently the farm has almost completely gone to a no-till operation.

There is very little cropland left in the Bogue Sound area. Most of the cropland is being converted to subdivisions. There are approximately eight farmers left in the Newport River area. In years past, the district helped these farmers install waterways, water control structures and encouraged conservation tillage.

There is one farmer in the Morehead City area. Most of this land is being converted over to development. There are approximately four farmers in the Beaufort area. They have installed water control structures and are practicing no-till. Recently, a 600-acre tract was sold for development and a golf course.

The area east of Beaufort has the largest agricultural impact and is in both the Neuse River basin and the White Oak River basin. These areas include: North River, Jarrett Bay, Nelson Bay, Core Sound and South River. Open Grounds Farm is located in this area. This farm consists of 36,000 acres of cropland. Open Grounds has implemented many BMPs over the years to reduce impacts from agricultural activities in this basin. The Carteret County SWCD has assisted with the implantation of water control structures. They are currently practicing no-till and have been for approximately 15 years. They also are practicing nutrient management, precision farming and have installed wetland filtration systems on the farm to improve water quality leaving the farm. Adjacent to this farm is North River Farm, which is currently being restored back to wetlands. This farm at one time had about 2,000 acres of cropland. The SWCD, along with NRCS, has helped establish part of this farm in the Wetland Reserve Program. Once this is completed it should improve water quality in North River and surrounding areas.

The Carteret SWCD has and will continue to work with the farmers, but with the county becoming more developed and high real estate values the number of farms and farmers are becoming fewer. With this taking place, the SWCD's role will be changing to more urban work and stormwater drainage related issues or community conservation. Implementation activities needed by the non-agricultural community include critical area plantings, streambank stabilization, impervious surface conversion, backyard wetlands, bioretention, grassed swales, and pet waste receptacles to help retain and filter runoff and improve water quality. The SWCD will continue to work with farmers, developers, and homeowners to help use our natural resources as wisely as possible.