TAR-PAMLICO RIVER BASIN REGIONAL COUNCIL

Vernon James Research and Extension Center
HWY. 64
Plymouth, NC
252/793-4428

APRIL 9, 1999

AGENDA

10:00	Meet at Vernon James Center and tour the **Tidewater On-site Wastewater Demonstration Center**	
11:30	LUNCH (on your own)	
1:00	Welcome & Call to Order	Chairman Earl Bell
1:05	Introductions	ALL
1:10	Acceptance of Minutes from 2/26/99 Meeting in Tarboro	Chairman Bell
1:15	Consideration of CWMTF Resolution	Chairman Bell
1:30	Old Business:	
	1- Membership Vacancies Update	Joan Giordano
	2- Tar-Pamlico Basin Extension Env. Education Team -- Proposal for Coordinator	Mary Jane Jennings
	3- APNEP Newsletter	Guy Stefanski
1:45	New Business:	
	1- Appoint New Member to Coordinating Council	Chairman Bell
	2- GIS/RC Workshops in May	Joan & Guy
2:00	Report by the Demonstration Project Committee	
	1- Warren County Project -- Bruce Perkinson	
	2- On-site Wastewater Research, Demonstration & Management -- Dr. Lindbo	
	3- Others	
3:30	Open Discussion	
3:45	Plans for next meeting (develop agenda items)	Chairman Bell
4:00	Adjourn	

Tar-Pamlico River Basin Regional Council
Vernon James Research Center
Plymouth, North Carolina

April 9, 1999

Minutes

From 10:00-12:00, before the official meeting, a tour of the Tidewater On-Site Wastewater Demonstration Center was given by Dr. David Lindbo. Several different types of on-site wastewater disposal systems were observed and discussed, along with the pros and cons of each.

The meeting was called to order at 1:20 pm by Chairman Earl Bell, and the list of those in attendance is attached. A motion was made to accept the minutes from the February 26, 1999 meeting in Tarboro, seconded and passed.

The first item of business was the consideration of a resolution to Governor Hunt stating that this Council does not want funds from the Clean Water Management Trust Fund to be used for anything but its intended purpose (see attached Resolution). This Resolution was unanimously passed, with the direction to also send it to the Senate Pro Tem and the Speaker of the House.

Joan Giordano gave a membership vacancies update. Eleven letters were sent to municipalities and counties, and she has received responses from eight. The Council is lacking 7 county and 8 municipal representatives. We also need a commercial fisherman from Hyde and Dare Counties and a sivilculturalist from Martin County. Regarding new appointments, Gwen Newman replaced Joan Mullen from Hyde County, and Anita Huffman replaced Adrienne Hiner-Cole from Pamlico County. Last meeting, Cheryl Byrd was introduced as a new member from Dare County.

Mary Jane Jennings then updated the Council on the Tar-Pamlico Basin Extension Environmental Education Team. Senator Wellons told Mary Jane that it may be possible to fund the whole team, not just the coordinator position, so the proposal was re-written with help from N. C. State University. The new proposal was handed out, which calls for 5 positions and a permanent appropriation of $400,000/year. The Legislators who sit on Senate and House Environment, Education, and Appropriations Committees should be contacted to let them know our support of this item. A motion was made to accept the revised Tar-Pam Extension Team proposal, seconded and passed.

Guy Stefanski reported that the quarterly Albemarle-Pamlico National Estuary Program (APNEP) newsletter (the Beacon) should arrive in our mail in about 3 weeks. It will include updates on the Coordinating Council, other River Basin Councils, and outside items of interest.

Mary Jane Jennings began the New Business portion with information that WRRI is studying regarding the importance of algae in the Tar-Pamlico and Neuse Rivers. Each different kind of algae needs a different ratio of P:N, and that phosphorus is indeed important, not just nitrogen. That is why the forthcoming Tar-Pamlico rules are going to include P limits. She would like the council to hear more about adaptive management from WRRI, and possibly include Rich Gannon from DWQ and Joe Rudek from the N. C. Environmental Defense Fund.

Guy Stefanski then discussed the upcoming GIS Workshops for each River Basin Council, and passed out information regarding them. The Tar-Pam Workshop is scheduled for May 21 in Tarboro, and all Council members are encouraged to attend and bring an interested guest. There will be a short official meeting of the TPRBCRC during lunch at the GIS Workshop.

The final agenda item was the consideration of two Demonstration Projects for funding with the $26,000 that has been appropriated to the Council. The first was a project called Warren County Pasture Aeration and Precision Agriculture, submitted by Bruce Perkinson. The project is described in handouts that were available, and would involve using $10,000 of the grant money to purchase an aerator to conduct the study.

There were several questions by Council members regarding this study, and unfortunately Bruce Perkinson could not be present to respond because of a prior commitment. Questions involved the scientific soundness of the monitoring, the cost of the aerator, and the Roanoke Council funding part. Conditional approval of the project was given, with conditions that the Aer-Way Company be contacted to see if they would either donate or sell the aerator at a reduced cost, contact the Roanoke Basin Council to see if they would fund half the cost since Warren County is in both river basins, and to request a more detailed monitoring and research plan to be peer reviewed.

The second project involves on-site wastewater research, demonstration and management, by Dr. David Lindbo of the Vernon James Center. Dr. Lindbo gave a presentation on the subject and discussed research and demonstration scenarios. A 1-page summary on an Alternative Septic Systems project was handed out for the Council to review. The Council voted to endorse the concept of the project, and Dr. Lindbo was asked to prepare a proposal for the council to consider at our next meeting.

There being no further business, the meeting was adjourned at 4:30 pm.

4/9/99

Attendance
Tar-Pamlico R. C.
Plymouth

NAME	AFFILIATION
~~Carl Goodson~~	APNEP/DWQ Staff
Earl Bell	Agri / Wilson Co.
Cheryl Byrd	Dare County Board of Commissioners
~~Joe Hearon~~	Town of ~~Louisburg~~ NC Franklin Co
Paul Bloom	Rocky Mount, Nash County
Jesse A. Sollins, Sr	Oxford, Granville County
Larry S. Odom	Nash County
Jarahnee Bailey	Washington Co. / Mayor, Plymouth
Vince Bellis	Greenville, Pitt Co.
Mary Jane Jennings	(Franklin) Conservation
Tommy Thomas	Person County
Jim Stephenson	Pamlico-Tar River Foundation
Beth Chagaris	Pamlico Co Health Dept - Env. Health
Jeff Furness	Pitt County - Business & Industry
Gene Bagwell	Franklin Cty.
Owen Newman	Hyde Co.
Anita L. Huffman	~~[illegible]~~ Pamlico Co. Planner
Guy Stefanski	APNEP
Dorothea Ames	Env. Grp LWV

RESOLUTION OF THE TAR-PAMLICO RIVER BASIN REGIONAL COUNCIL

Upon motion duly made, seconded and unanimously carried, it was

RESOLVED, that this Council is aware of the current budgetary constraints on the State of North Carolina. The Council would like to go on record and petition the Honorable James B. Hunt, Governor of the State of North Carolina, that the funds currently held in the Clean Water Management Trust Fund remain in said Fund and not be used for any purposes other than those established by the Trust Fund.

This the 26th day of February, 1999.

_____
Chairman

Attest:

(SEAL)

_____
Secretary

Provided as HANDOUT
@ TPRBRC meeting
in Plymouth on 4/9/99

PROPOSAL FOR FUNDING APPROPRIATION FROM THE TAR-PAMLICO RIVER BASIN REGIONAL COUNCIL

Tar-Pamlico Extension Environmental Education Team

$400,000 per year to North Carolina Cooperative Extension Service

The Tar-Pamlico Extension Environmental Education Team will consist of five (5) new positions working in 16 counties:

- **Extension River Basin Education Coordinator**
- **Three (3) Area Extension Environmental Educators**
- **Area Extension Natural Habitat Educator**

These 5 new positions will be supported by existing campus and field faculty of the North Carolina Cooperative Extension Service. The support faculty will include North Carolina State University Extension Specialists in nutrient management, soil science, agricultural engineering, urban stormwater, and economics. Additional support will be provided by the Neuse Education Team currently working in 17 Neuse River Basin counties.

Annual program costs are as follows:

*	Salaries, benefits, travel for 5 positions	$ 300,000
*	Program Support	$ 100,000
	* Computer Equipment	
	* Supplies	
	* Publications	
	* Educational Resources	
	* Workshops, Tours, On-Farm Demonstrations	
*	Total Funding Requested	$ 400,000

The overall goal of the Tar-Pamlico Extension Environmental Education (TPEEE) Team is to help citizens and public officials improve environmental quality using science-based information. Education programs will focus on applying cost-effective, socially acceptable solutions to water quality problems. The Team will

for farmers and other landowners. These BMPs will support the goals of the Comprehensive Conservation Management Plan (CCMP) and Nutrient Sensitive Waters (NSW) strategies to reduce nonpoint source nutrient pollution in the Tar-Pamlico River Basin System. Target education audiences will include local government leaders, planners, engineers, developers, agribusiness, large and small farmers, homeowners, youth and urban residents. There will be an emphasis on interagency cooperation and a focus on both local and regional situations.

The North Carolina Cooperative Extension Service has a proven record of providing leadership, information, practical applications and support for solving complex problems. The citizens of the Tar-Pamlico Basin need and deserve more specialized help than what is now available. We must supplement the limited time and funding of the existing County Extension system with a focused team dedicated to addressing the serious immediate and complex long-term environmental issues of the entire Tar-Pamlico Basin and its people.

The water quality problems of the Tar-Pamlico are equally as severe as those of the Neuse, and include large fish kills attributed to the toxic dinoflagellate Pfiesteria. Meeting nutrient reduction goals in the coming years will be increasingly difficult. The proposed TPEE Team will collaborate with the Neuse Education Team established in 1997. The expertise and experience of the 5 Area Extension Agents in the Neuse River Basin and 5 campus faculty supporting this team will be valuable in developing new programs for the Tar-Pamlico Basin.

The success stories from the Neuse Basin offer us great hope and encouragement that user-friendly changes can be made, and that our river can be clean and productive again. The Extension Agents involved in the Neuse project have achieved results by working directly with people who have been unable to cope alone with mandated government rules and regulations.

The TPEEE Team will coordinate educational programs and serve as "contact

points" for counties in the upper, middle, and lower portions of the River Basin. Primary responsibilities are: (I) facilitate communications among citizens in the watershed, (2) assist county extension staff in organizing local education programs and activities related to reducing non point source (NPS) pollution, (3) identify local needs for implementing NPS reduction strategies and communicate needs to the Tar-Pamlico River Basin NSW Team, and (4) provide leadership for focused watershed projects to address local needs. The educational program will emphasize nutrient management, animal waste management, conservation tillage, urban stormwater runoff management, precision agriculture, pest management, riparian buffers, and water table management.

Proposed Position Descriptions

Extension River Basin Education Coordinator: This position will be responsible for coordinating and stewarding the comprehensive educational program throughout the Tar-Pamlico River Basin. The coordinator will initiate development of a comprehensive strategy with the team, and be responsible for coordinating programs, evaluations, impact assessments, and marketing of the entire basin. The position will implement and coordinate NPS environmental programs in the Tar-Pamlico River Basin. These programs will complement the state Tar-Pamlico River NSW management strategy plan.

Qualifications: MS Degree with at least five years in Extension or related experience preferred.

Area Extension Environmental Educators (3): These positions will be responsible for implementing and coordinating local NPS and NSW programs in various regions of the river basin. As members of the basinwide team, they will use a variety of activities and program projects to educate citizens, and implement the NSW Plan in their region.

Qualifications: MS Degree with at least three years in Extension or related

experience preferred.

Area Extension Natural Habitat Educator: Same as above with emphasis on the impacts of development, agriculture, and urbanized regions on natural forest, wetlands, and riparian zones. This position will design and implement projects and programs which focus on restoration, enhancement, and management of natural areas for nutrient filtration, recreation, fisheries, biodiversity, and wildlife/habitat protection.

Qualifications: MS Degree with at least three years in Extension or related experience preferred.

Thanking you in advance for any consideration that will be given for this proposal.

DEMONSTRATION PROJECT PROPOSAL

NAME OF PROJECT/PROGRAM: WARREN COUNTY PASTURE AERATION AND PRECISION AG DEMONSTRATION PROJECT

LEAD ORGANIZATION: WARREN SOIL AND WATER CONSERVATION DISTRICT; BRUCE PERKINSON; (252)257-3836; 133 1/2 SOUTH MAIN STREET, WARRENTON, NC 27589

COOPERATING ORGANIZATIONS: NORTH CAROLINA COOPERATIVE EXTENSION SERVICE, WARREN COUNTY; USDA-NATURAL RESOURCES CONSERVATION SERVICE; ROYSTER-CLARK

PROJECT/PROGRAM LOCATION: FISHING CREEK BASIN (03020102) PORTION COVERING WARREN COUNTY FOR THE FOLLOWING 14 DIGIT HYDROLOGIC UNITS: LEES BRANCH- 03020102010010, CABIN BRANCH- 03020102010020, LITTLE SHOCCO- 03020102010030, LOWER SHOCCO- 03020102010040, FISHING CREEK ABOVE US-401- 03020102020010, FISHING CREEK ABOVE NC-58- 03020102020020, FISHING CREEK @ SHOCCO CREEK- 03020102020030, LOWER FISHING CREEK- 03020102020050, REEDY CREEK- 03020102030010, BENS CREEK- 03020102030020, LITTLE FISHING CREEK @ REEDY CREEK- 03020102030030, LITTLE FISHING CREEK @ BEAR CREEK- 03020102030040, MARTIN-SANDY CREEK- 03020101130010, UPPER SANDY CREEK- 03020101130040: ROANOKE RAPIDS BASIN (03010106) PORTION COVERING WARREN COUNTY FOR THE FOLLOWING 14 DIGIT HYDROLOGIC UNITS: NUTBUSH- 03010102180010, SMITH CREEK- 03010106031010, HAWTREE CREEK- 03010106041010, SIX POUND CREEK- 03010106041020, HUBQUARTER CREEK- 03010106041030, BIG STONE HOUSE CREEK- 03010106041040, SONGBIRD CREEK- 03010106041050, PEA HILL CREEK- 03010106061010, MILL CREEK- 03010106061020.

PROJECT/PROGRAM OBJECTIVES: DEMONSTRATE BETTER UTILIZATION OF AVAILABLE NUTRIENTS FOR PASTURE PRODUCTION THROUGH THE USE OF A PASTURE AERATOR TO IMPROVE INFILTRATION, ENCOURAGING USE OF GRID SOIL SAMPLING, NUTRIENT MANAGEMENT, AND ROTATIONAL GRAZING, THEREBY REDUCING NUTRIENT LOSSES TO RUNOFF.

PROJECT/PROGRAM DESCRIPTION: PREPARE CATTLE PRODUCERS FOR COMING NUTRIENT SENSITIVE WATERSHED RULES IN THE TAR-PAMLICO AND ROANOKE BASINS BY ASSISTING INTERESTED PRODUCERS TO COMPLY WITH PROPOSED NUTRIENT MANAGEMENT REQUIREMENTS. BECAUSE OF EXTENSIVE SOIL COMPACTION PROBLEMS FOUND IN PASTURES THROUGHOUT WARREN COUNTY, THIS PROJECT WILL DEMONSTRATE TO PRODUCERS THROUGH THE USE OF A SOIL COMPACTION TESTER AND PASTURE AERATION EQUIPMENT HOW TO IMPROVE SURFACE WATER INFILTRATION, ENCOURAGE GRID SOIL SAMPLING, UTILIZE NUTRIENT MANAGEMENT, PEST MANAGEMENT, AND PRESCRIBED GRAZING TO REDUCE NUTRIENT LOSS TO RUNOFF. THIS PROPOSAL WILL ESTABLISH PAIRED FIELDS, ONE WITH AERATION AND ONE WITHOUT. IN ORDER TO IMPLEMENT THIS PROGRAM AN AERATOR WILL BE COST SHARED WITH PRODUCERS FOR USE ON DEMONSTRATION PLOTS. A SOIL COMPACTION TESTER WILL BE USED TO SHOW SOIL COMPACTION BEFORE AND AFTER THE USE OF THE AERATOR TO INCREASE INFILTRATION. PROGRAM EVALUATION WILL BE BY COLLECTING AND MEASURING SEDIMENT AND NUTRIENT RUNOFF AT THE FIELD EDGES. SAMPLES WILL BE COLLECTED BY USING COLLECTION BASINS TO CATCH SURFACE AND SUB SURFACE WATER. SAMPLES WILL BE TAKEN AT LEAST 4 TIMES DURING THE YEAR, GENERALLY FOLLOWING MAJOR RAINFALL EVENTS. THE INCENTIVE PAYMENT CONTRACTS WILL BE PREPARED BY DISTRICT AND NRCS STAFF ACCORDING TO NCACSP GUIDELINES AND RATES. CONTRACTS WILL BE DEVELOPED FOR A THREE YEAR PERIOD. NUTRIENT MANAGEMENT PLANS WILL BE DEVELOPED AND SUBMITTED TO THE DISTRICT OFFICE NO LATER THAN APRIL 30 OF THE CURRENT GROWING SEASON. PLAN REVIEWS WILL BE PERFORMED BY DISTRICT AND NRCS STAFF.

QUANTIFIED SPECIFIC OUTPUTS/DELIVERABLES: WORK WITH AT LEAST 25 PRODUCERS TO USE AERATION EQUIPMENT AND IMPLEMENT NUTRIENT MANAGEMENT PLANS ON AT LEAST 10,000 ACRES IN WARREN COUNTY. ANNUAL NUTRIENT MANAGEMENT CLASSES AND FIELD DAYS WILL BE HELD TO PREPARE PRODUCERS TO USE THEIR PLANS AND REVIEW RESULTS OF DEMONSTRATION PLOTS. AT LEAST ONE PRESENTATION WILL BE MADE TO THE BOARD OF COUNTY COMMISSIONERS TO INFORM THEM OF THIS EFFORT. USDA-NRCS'S FIELD OFFICE COMPUTING SYSTEM (FOCS) WILL BE USED TO PROVIDE NITROGEN AND PHOSPHORUS REDUCTION CALCULATIONS WHICH WILL DEMONSTRATE NITROGEN AND PHOSPHORUS USE AS A RESULT OF NUTRIENT MANAGEMENT PLAN IMPLEMENTATION. ENCOURAGE THE USE OF GRID SOIL SAMPLING ON 5,000 ACRES OF PASTURE.

REQUESTED FUNDING:

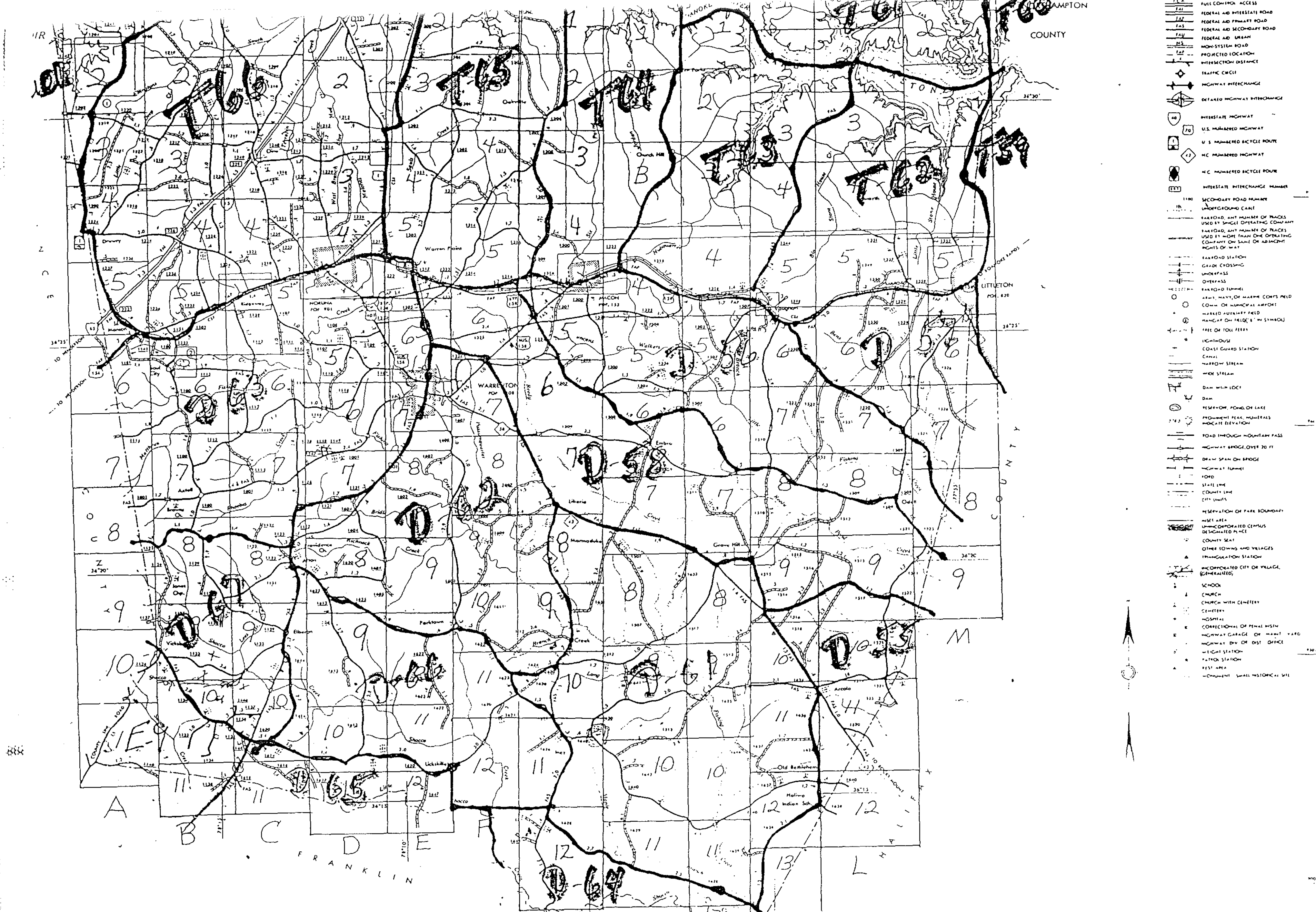
DESCRIPTION	RIVER COUNCIL GRANT	NON-FED MATCH	OTHER
STAFF	$0	$3,000	$1,000
EQUIPMENT	$8,500	$3,000*	$4,000*
SUPPLIES	$1,500	$0	$0
CONTRACT	$0	$0	$0
NCACSP	$0	$4,000	$0
NRCS	$0	$0	$1,000
FSA	$0	$0	$2,000
TOTAL	$10,000	$10,000	$8,000

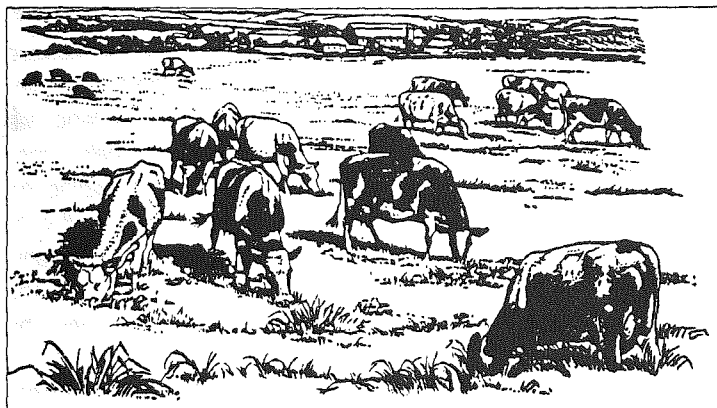
* NOTE: THIS FIGURE INDICATES EQUIPMENT (SOIL COMPACTION TESTER, GPS UNIT, SOIL SAMPLING KITS, APPLICATION EQUIPMENT) ON HAND THAT CAN BE USED WITH THIS PROJECT.

THIS PROPOSED DEMONSTRATION PROJECT IS A THREE (3) YEAR PROJECT. WE WILL CONDUCT A COMPARISON TEST PLOT ON SEVERAL FARMS FOR THE LENGTH OF THE PROJECT. WE RECOMMEND THAT AT THE END OF THE PROJECT PERIOD THE OWNERSHIP OF THE EQUIPMENT, RECOMMENDED TO BE PURCHASED, TO GO TO THE WARREN SOIL AND WATER CONSERVATION DISTRICT LOCATED IN WARREN COUNTY, NORTH CAROLINA.

Warren County

CO#	HU NAME	ACRES	HU CODE	CAMPS CODE
185	Nutbush	4,296.79	030101021800 10	U01
185	Smith Creek	35,453.02	03010106031010	T66
185	Hawtree Creek	17,091.28	03010106041010	T65
185	Six Pound Creek	12,720.39	03010106041020	T64
185	Hubquarter Creek	15,443.04	03010106041030	T63
185	Big Stone House Creek	16,031.62	03010106041040	T62
185	Songbird Creek	8,223.97	03010106041050	T61
185	Pea Hill Creek	272.71	03010106061010	T60
185	Mill Creek	382.11	03010106061020	T59
185	Martin-Sandy	26.59	03020101130010	E12
185	Upper Sandy Creek	4,275.58	03020101130040	E09
185	Lees Branch	10,036.53	030201020100 10	D67
185	Cabin Branch	15,535.56	030201020100 20	D66
185	Little Shocco	4,720.97	030201020100 30	D65
185	Lower Shocco	5,054.39	030201020100 40	D64
185	Fishing Creek above US-401	26,911.94	030201020200 10	D63
185	Fishing Creek above NC-58	20,713.78	030201020200 20	D62
185	Fishing Creek @ Shocco Crk	31,280.21	030201020200 30	D61
185	Lower Fishing Creek	1,327.29	030201020200 50	D59
185	Reedy Creek	21,923.02	030201020300 10	D58
185	Bens Creek	8,425.83	030201020300 20	D57
185	Ltl Fishing Crk @ jct Reedy	19,498.43	030201020300 30	D56
185	Ltl Fishing Crk @ jct Bear	6,492.18	030201020300 40	D55


COUNTY
WARRENTON
LITTLETON
MACON
NORLINA
FRANKLIN
COUNTY
FULL CONTROL ACCESS
FEDERAL AID INTERSTATE ROAD
FEDERAL AID PRIMARY ROAD
FEDERAL AID SECONDARY ROAD
FEDERAL AID URBAN
NON-SYSTEM ROAD
PROJECTED LOCATION
INTERSECTION DISTANCE
TRAFFIC CIRCLE
HIGHWAY INTERCHANGE
INTERSTATE HIGHWAY
U.S. NUMBERED HIGHWAY
N.C. NUMBERED HIGHWAY
SECONDARY ROAD NUMBER
SCHOOL
CHURCH
CEMETERY
HOSPITAL



PASTURES

The following article is published to answer the most commonly asked questions about the use of the Aer-Way with regard to Pasture Renovation.

Dick Psolla has worked as an Independent Brookside Laboratory Soil Consultant for the past 28 years. His experience covers applications in both Agriculture and Turfgrass related uses of the Aer-Way. His clients range from local farms to the top PGA golf courses in the United States. Dick has done extensive research using the Aer-Way in almost every type of application involving improvement of soils and plant growth. In this article, we will examine the most commonly asked questions about Pasture Renovation with the use of the Aer-Way.

PASTURE RENOVATION

Most pastures are pastures because that's all the land is good for. As long as land is subjected to the elements of weathering and traffic (from animals or machines harvesting the forage), the soils will develop problems which are essentially the same everywhere. The severity of a particular problem will vary according to the regional weather patterns, and agronomic and related management practices on a particular farm. In most cases it is not practical to keep the animals off pasture lands when weather conditions are undesirable and soil conditions are conducive to compaction.

We know that compaction is the biggest and probably the most important factor that limits high yield because of its effect on root growth, pore space, water movement and water holding capacity of a soil. The soil is no longer what nature originally gave us.

Regardless of where you farm, there are certain factors that are necessary to your business of farming. All would agree that first you must have a fertile soil on which to grow crops. But there are three other factors that must be present before crop production can be profitable on that fertile soil. We know 95% of what affects the growth of a plant is light, water, and air and only 5% is fertilizers, so the effectiveness of the fertilizers used which is the largest out of pocket expense in getting maximum yield is controlled by the 95%. By alleviating the compaction and allowing greater water absorption we automatically increase the amount of air brought into the root zone, because water movement is the primary vehicle to pull oxygen into the root zone.

Q. How does the Aer-Way help to manage pasture land?

Ans. Because of the shattering and fracturing action of the Aer-Way, we can cultivate the top 6 to 8" of the soil without destroying the existing cover crop. This relieves the compaction and increases the water holding capacity. Because of the unique design of the Aer-Way, you can accomplish this without creating soil surface conditions that are conducive to erosion.

Q. What do you mean by unique design?

Ans. Because of the alternating position of the tines on the roller, there is never a continuous furrow or grooves to channel water like most other pasture renovating equipment which use coulters or chisels all in a straight line.

Q. What other advantages do you see for pasture renovation and the use of the Aer-Way?

Ans. #1.The ability to incorporate lime and fertilizer.

#2. To create conditions more conducive to microbial activity which breaks down the dead plant residue and animal waste. The cultivating action incorporates large amounts of this residue into the top 4 to 6" of soil to raise the organic and humus levels of the soil.

#3. We can use the Aer-Way to renovate old pastures without plowing or using conventional tillage practices that are conducive to wind and water erosion.

Q. How does the use of the Aer-Way effect chemical use?

Ans. #1. By using the Aer-Way, you'll be speeding up the breakdown of toxic levels of chemicals used in the past.

#2. By shattering and fracturing the soil surface prior to chemical use, you'll enhance the effectiveness of the chemicals.

#3. Plants that are under stress are the most susceptible to disease and insects. By creating a better soil environment with the Aer-Way and producing a healthier plant, we've found we're able to substantially reduce chemical use.

#4. The Aer-Way creates a porous soil surface that will accept chemicals more rapidly and enhances the ability of the operator to comply with D. E. R. regulations concerning harmful run off into water sources.

Q. When do I use the Aer-Way?

Ans. #1. If we use it to eliminate compaction and increase water holding capacity, we need to do it early spring when soil conditions are not overly wet or extremely dry.

#2. If we use the Aer-Way for renovation and over seeding, we need to consider the regional weather conditions to germinate the seed. For cool season grasses, August and September are the best, because you have less broad leaf pressure in competition for moisture.

#3. Using the Aer-Way to alleviate compaction does not create conditions that cause the loss of soil moisture. The slit closes and fills with loose soil and brings capillary moisture to the surface to aid in the germination of the seed.

Q. What's the best procedure you've seen for pasture renovation?

Ans. #1. Use the Aer-Way and seeder attachment to apply seed the first time over. (If the seeder attachment is not available use broadcast seeder after first aerification.)

#2. Go over it the second time in a different direction with the Aer-Way pulling a chain harrow.

Note: Liming and fertilization should be done prior to using the Aer-Way.

Q. Why should I even consider using the Aer-Way tillage program instead of the conventional tillage methods I've been using for years?

Ans. Because you can accomplish the same goals without exposing your soil to excessive wind and water erosion, and keep the organic matter in the top 4" where nature intended it to be.

Q. Is it going to make me more money?

Ans. Our value system is controlled by dollars. Too many times, the individual will risk doing short term harmful practices to improve his profit position. I believe we need to have a philosophy and a level of respect for the soil that says I am going to leave my soil in a more productive fertile condition than when I got it. If I can show you that at the end of a growing season your soil is in better condition and you've reduced your input cost of tillage, fertilizers and chemicals so that your net income is greater, is that an asset? Yield increases will naturally follow providing we are managing our soil asset properly. But yield is relative to input cost. The bottom line is that I am improving my soil for the future and my net income is better.

Q. What will I be able to see the first year using the Aer-Way?

Ans. If you start out in the spring you should see an increase in yield and less heaving in the fall. But the biggest advantage is that you are creating a living soil by creating an environment that is more conducive to microbial activity.

Q. How do you respond to the people who want to wait to see if a conservation tillage program will work on their farm?

Ans. The Aer-Way and other conservation tillage methods have been in place long enough to show positive results. The land has been and is being abused by conventional tillage methods. It is imperative that as stewards of the land we start putting the land back into better condition. We need to start managing on land as an asset. Soils under good conservation practices improve. The organic levels increase, the microbial activity and release of natural nitrogen improves, the soil has a greater resistance to compaction, they resist wind and water erosion, soil water holding capacity increases, and they warm up faster in the spring. The soil only wears out under abuse.

Q. Is the Aer-Way the total answer?

Ans. No. The Aer-Way is a very effective tool to alleviate and control compaction in the top 6 to 8" without creating conditions that cause severe wind and water erosion.

Q. What other tool do I need?

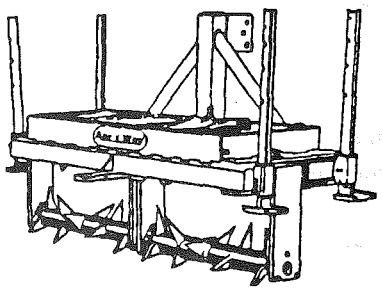
Ans. If the penetrometer shows that there is compacted layers on plow pans deeper than 8", it is suggested that the use of a deep tillage tool be used to break up the deep compaction. Doing this enhances the use of the Aer-Way.

Why does it enhance the use of the Aer-Way?

Ans. Because now you are creating a larger reservoir for air and water that encourages deeper root growth.

You may obtain more information about the Aer-Way Tillage Tool by writing:

Holland Equipment Ltd.
20 Phoebe St., Norwich, Ontario NOJ 1PO
(519) 863-3414
Holland Hitch Western Ltd.
17909 Roan Place, Surrey, B.C. V3S 5K1
(604) 574-7491
Holland Hitch Texas, Inc.
1301 Martinez Lane, Wylie Tx. 75098
(972) 442-3556



Every ranch's purchase must add to bottom line

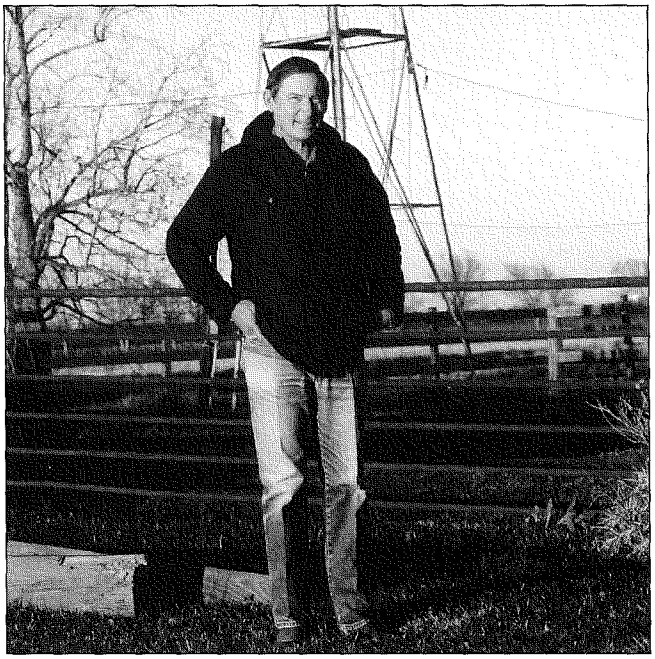
by Martha Hollida Garrett

Ranchers today are required to produce more on the same land and to do it with less. Each purchase has to be carefully weighed and the results must offset the costs and add to the bottom line.

In the past few years, cattlemen nationwide have learned and experienced that pasture aerating is an effective way to produce more with less and that the advantages far outweigh the costs.

Websters defines the word aerate this way, "to expose to the circulation of air for purification."

Cattlemen define it as a way to loosen the soil, and either increase moisture retention or improve drainage, increase hay production and increase grass production. All factors resulting in higher stocking rates and more calves to take to market.



Dr. Dick Sherron, Rancher, Beaumont, Texas
Chairman, Texas Animal Health Commission

Two such cattlemen can be found outside of Beaumont, Texas. Dr. Dick Sherron and Randolph Clubb jointly purchased an Aer-Way aerator two years ago and they couldn't be more pleased with the results.

"I can safely estimate that we have seen an increase in our grass and hay production in the range of 35 to 50 percent and we have increased our cattle units accordingly by 30 percent," said Dr. Sherron.

An aerating implement is a ground-driven, rolling tined aerator/cultivator. The degree of ground opening in different soil types and moisture

conditions can be varried. It helps fracture compacted soil without destroying root strurture and with minimal soil disturbance.

Sherron and Clubb, who are neighbors in Jefferson County, ranch about 15 miles west of Beaumont and north of Inter-state 10. Their soil types include predominately heavy, gumbo clay with some sandy loam. They receive 50 plus inches of moisture annually and that is their biggest problem. Sherron has mainly Bermuda and Bahia grasses and Clubb has Bermuda grasses and clover.

"We have too much rain in the winter and it doesn't drain. The soil just becomes packed with the grasses packed down under it, " described Clubb with Sherron adding that often as much as 70 percent of their winter grasses will be compacted into the soil and of no use for grazing.

Both ranchers had been hearing about pasture aerating for sometime, but were not sure they could justify the expense of another piece of equipment or the costs of operating it.

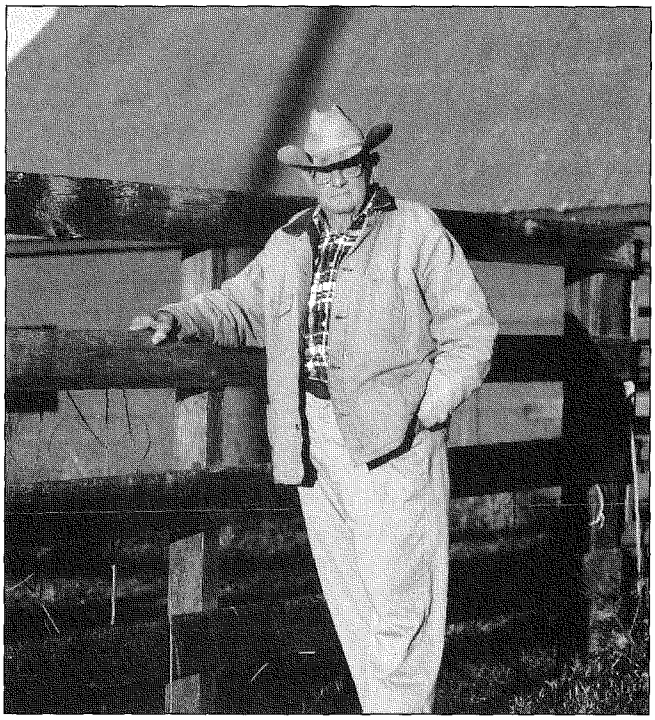
Sherron, first decided to borrow an aerator from a neighbor and just see if this piece of machinery could produce.

"I had made my first cutting on a particular hay meadow and had baled about 24,000 pounds. I borrowed the aerator, ran it over the meadow and fertilized. On the second cutting we baled 72,000 pounds and oh, by the way, I had wintered this meadow in the preceding winter. I was very convinced," he remarked.

While attending a trade show, Sherron saw the Aer-Way booth and began visiting with them about their particular grazing problems and was further convinced that aerating would pay for itself and add to his bottom line.

He went home with a 12 foot, pull type aerator that he and Clubb now share.

"I go over my pastures as early as possible in the spring and then come back in the fall and overseed. We go over our hay meadows every-



Randolf Clubb, Rancher, Beaumont, Texas

time we cut and we fertilize at the same time, "explained Sherron, who adds that he drags a chain link harrow behind it to complement the aerator.

Clubb makes it over his land once a year and also drags a harrow behind it. He finds it especially useful and productive in the hay meadows as the soils are extremely tight and the grasses are below the ground.

"We've used it extensively in old rice fields and that ground is about as packed and hard as it can be," described Clubb.

Both men are experiencing increased rotational grazing year round. They are extremely pleased with the amount of winter grazing that is now available to their cow calf operations because of their aerating system.

Sherron grazes one particular field in the winter that is wheat and clover. Last year on May 1st he ran the aerator over it and overseeded with Bermuda grass, then he turned cattle on it on July 1st.

"The great thing about this (other than the increased grazing) is that with the aerator the ground does not get torn up and my clover is left intact," said Sherron.

"In the past we could disc in the fall and plant winter grasses and everything would come up and look great going into winter. Then a two inch rain would arrive and because of little or no drainage here part of the grass would be underground. Then another rain arrives right behind that one and the rest of your grass would be gone and you'd be feeding hay," said Clubb.

Another thing that these cowmen like about using an aerator is that the labor costs are low.

"Because you're not tearing up the ground, you don't have to go over the land in first gear. You can move across the field at a pretty good pace, so labor is not really a factor. I feel that the cost of the labor and the diesel is easily offset, " said Sherron.

Clubb says that he feels that it only takes in the neighborhood of 200 acres to justify having an aerator and as he pointed out it is a very workable for ranchers to share the aerator. Sherron wholeheartedly agrees.

Cattlemen have long known that grass and hay production play critical roles in the success of their operation and can make or break the bottom line. These two southeast Texas ranchers are convinced that this one purchase and their joint use of the aerator is contributing greatly to their bottom line.

Sherron sums it up this way, "if you're a cattlemen depending on grass and hay, whatever it takes you need to buy an aerator."

Alternative Septic systems -

Dr. David Lindbo
NCSU / Vernon James Center
252/793-4428 ext. 166

Residential developmental pressures are being felt throughout the rural North Carolina. Due to limited resources and excessive distances to centralized wastewater treatment plants, most of the population relies on the use of on-site wastewater treatment and disposal systems. The soils in this eastern part of the state (coastal plain) are generally provisionally suitable or unsuitable for conventional systems, thus some alternative systems are required. In the case where a failing system has to be repaired, it is often difficult to assure that adequate soil based treatment is available. For this reason some type of advanced treatment is needed. The advanced systems that are available can significantly reduce the potential fecal coliform contamination as well as reduce the amount of N entering the environment. The first goal of this project is to demonstrate the effectiveness of an advanced treatment system for coliform and nutrient reduction. An innovative on-site wastewater disposal system will be installed and evaluated regarding nutrient contamination reduction. The installation will follow the rules and regulations set forth by NCDENR, OSWWS. Site selection would take into consideration the potential for public access to observe the technology. Monitoring of the system will be accomplished in accordance with NCDENR, OSWS guidelines. System monitoring parameters will include: BOD, TSS, pH, PO_4-P, Total-P, TKN, NH_3-N, NO_3-N, Total-N. Sampling locations will include: up gradient (minimum of 1 well), septic tank, after treatment modules as applicable, within/below nitrification trench (1-2 well), down gradient (minimum of 1 well), and adjacent surface water as applicable. Samples will be taken monthly during winter months (high water table periods) and every other month during the remainder of the year.

A properly sited, designed, installed and maintained system will safely treat and dispose of the bacterial component of the wastewater and reduce the nutrient component as well. An improperly sited, designed, installed and maintained system will do neither. Technology will only work if those using it are able to understand it and maintain it. A key to ensuring proper treatment capacity and effectiveness of the system is education and training of all people involved in the on-site wastewater industry. These people range from the site evaluators (both private and public) to the installers and ultimately to the homeowners. Additionally, public decision makers need to be aware of the choices they have available for on- and off-site wastewater treatment and disposal. The second goal of this demonstration project is to educate decision makers about risk management and alternative available to them in order to effectively treat wastewater onsite to reduce environmental health risks and NPS pollution. This can best be accomplished by upgrading and utilizing the existing training center throughout the state. These centers have proven to be an invaluable resource to EHS and NCDENR, and can be utilized by other decision makers and homeowners as well. Therefore some of the funding would be utilized for course and center development.

Cost of wells?
Need for this? Ext. work?

Tar-Pamlico Housing and Population Information - Census 1990

County	Land within Basin (mi^2)	Population			Total Hous. Units	Water Source			Sewer Disposal		
		Total	Urban	Rural		Public	Well	Other	Public	Septic	Other
Beaufort	827.608	42283	12960	29323	19598	6762	12740	96	5608	13317	673
Edgecombe	505.067	56558	28209	28349	21827	15413	6331	83	13789	7372	666
Franklin	477.956	35051	3122	31929	14363	3574	10571	218	2757	10878	728
Granville	311.451	22043	7913	14130	8462	3260	5109	93	3118	4890	454
Halifax	567.496	22606	5429	17177	8590	3192	5297	101	2346	5186	1058
Hyde	612.825	5411	0	5411	2905	1883	937	85	92	2624	189
Martin	153.486	8674	0	8674	3395	1528	1834	33	1104	2041	250
Nashville	474.112	71183	37331	33852	28718	17558	11018	142	16878	10491	1349
Pamlico	109.39	3202	0	3202	1439	1172	259	8	31	1371	37
Person	73.059	2727	0	2727	1052	0	1009	43	5	1000	47
Pitt	451.017	80397	51901	28496	31999	28212	3700	87	20541	10994	464
Vance	147.666	29665	12163	17502	11701	6672	4887	142	5586	5864	251
Warren	299.787	11486	0	11486	4703	1342	3266	95	1072	3248	383
Grand Total	**5010.92**	**391286**	**159028**	**232258**	**158752**	**90568**	**66958**	**1226**	**72927**	**79276**	**6549**

Percentage Housing Units with Septic Systems: **49.94**
Percentage Housing Units with Public Sewers: **45.94**
Percentage Housing Units with Other Disposal Means: **4.13**

Density (#/sq. mile) of Septic Tank Systems
Tar-Pamlico Riverbasin
1990 Census Data

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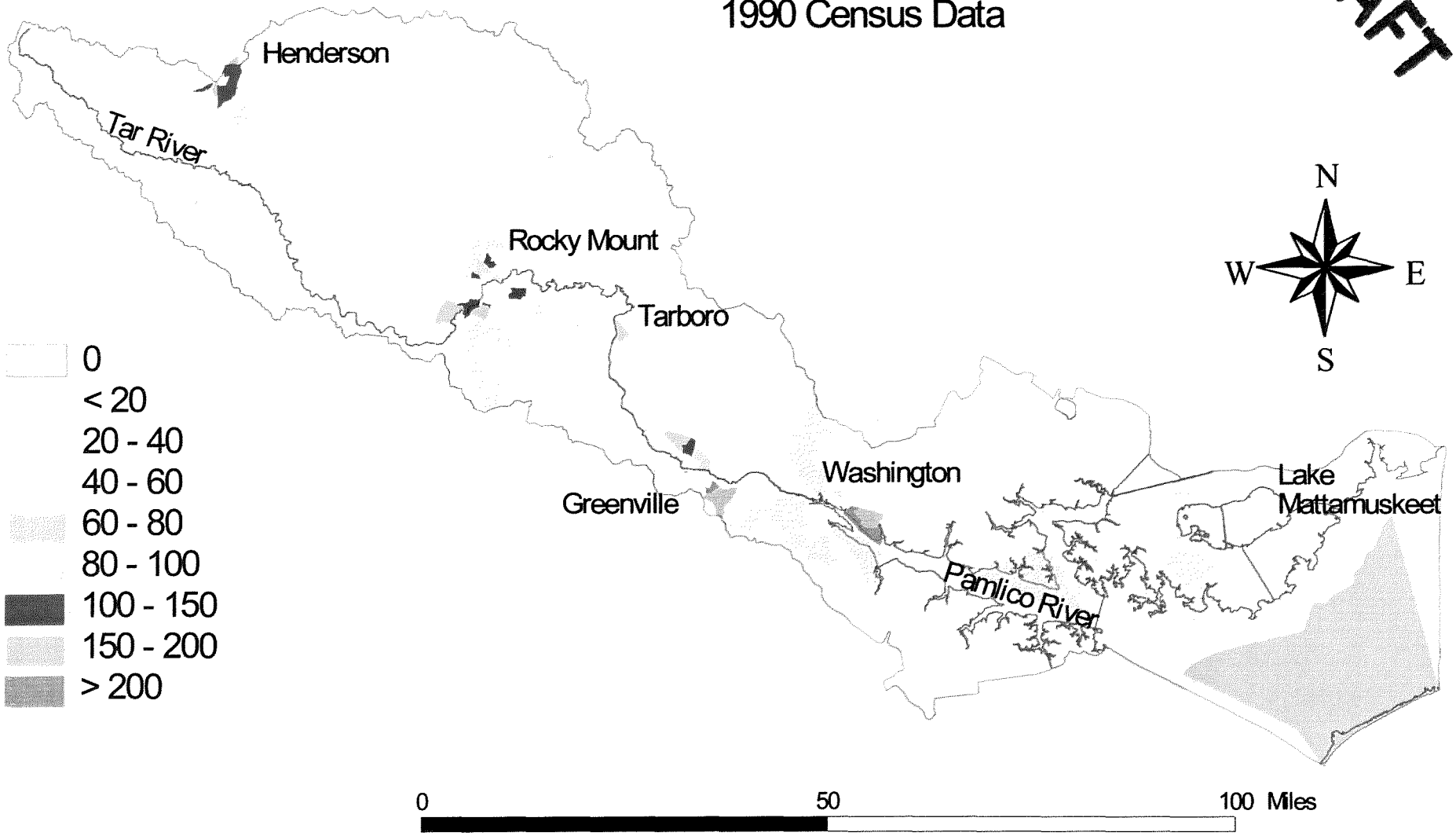

Percentage of Households with Septic Tank Systems
Tar-Pamlico River Basin
1990 Census Data

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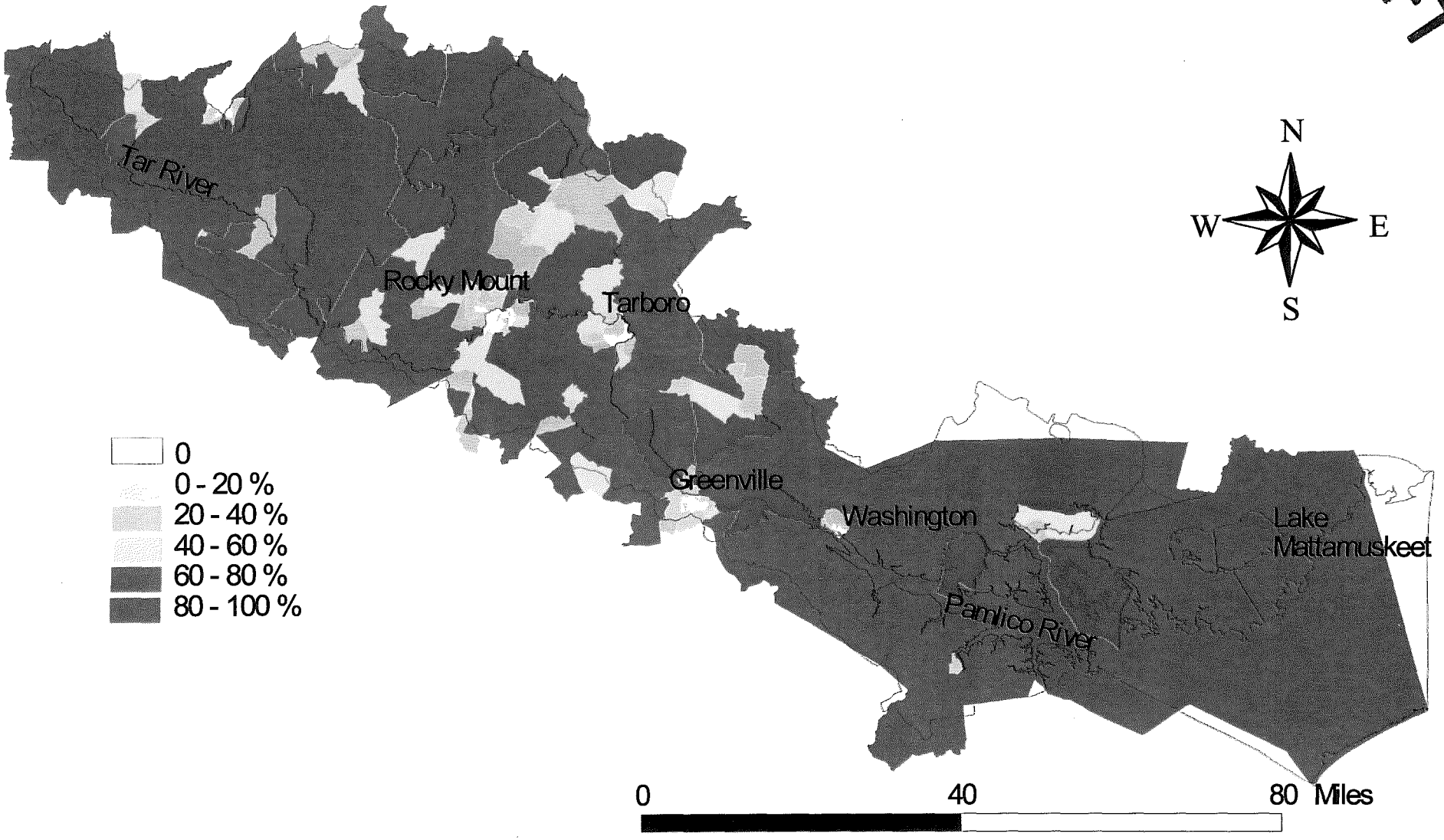

Septic Tank Systems Distribution
Tar-Pamlico River Basin
1990 Census Data

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