

# **COVERAGE DIFFERENCES IN THE CENSUS OF A RURAL MINORITY COMMUNITY IN NORTH CAROLINA: THE LITTLE BRANCH AREA OF THE WACCAMAW SIOUX TRIBE**

by Patricia B. Lerch

## **INTRODUCTION**

This report describes the results of an ethnographic study of the census coverage problems in a rural minority community of North Carolina. The ethnographic site is referred to as the "Little Branch" area. The sample area consists of 3 census blocks coded as 18, 53, and 54. The ethnographic study resulted in an Alternative Enumeration (AE) of the site which was systematically compared to the results of 1990 Census of the same site. Differences emerged from this comparison. This report attempts to explain how these differences came about.

The underlying behavioral patterns behind coverage differences involve residential patterns and family relationships that confound the common assumption that addresses, such as those of rural route mail boxes, correspond to individuals forming a household living together under the same roof. "Family" in the rural community studied is defined by generational ties, including grandparents and grandchildren, uncles and aunts, nieces and nephews. For many housing units, mail for a number of family members is sent to the "address" of a family box on a rural mail delivery route. Households form and then regroup as family members move among housing units. Individuals may "stay" (i.e. eat, sleep, etc.) in one housing unit but be considered members of another household in a different housing unit. Similar behavioral patterns of flexible residence and interaction are described at two other sites, Aschenbrenner's (1991) urban racially mixed site and Bell's (1991) rural Black site.

In this report I present my study and findings of the Alternative Enumeration of the Little Branch area. I begin with a section on the background and history of this area. Next, I summarize behavioral observations made on the neighborhood. Following this section, the study methodology is described, my hypothesis is discussed, and my findings are explained. I have concluded with some suggestions pertinent to coverage in communities similar to the Little Branch area at the conclusions of my report.

## **SITE PROFILE**

The Little Branch area is part of a community which is recognized by the State of North Carolina as the Waccamaw Siouan Indian tribe. This tribe is one of several within North Carolina that have been given legal recognition as Indian by the state. However, the state recognized tribes do not necessarily have federal recognition as Indian tribes. If a state recognized tribe is not also recognized by the federal government -- the current case of the Waccamaw Siouan tribe -- then they do not receive funds or support from the Bureau of

Indian Affairs. In referring to the people in this community, I use the term Indian, which is their formal legal status in North Carolina. A brief history of the area follows.

### **Background and Early History \*1**

The following highlights events in Waccamaw Sioux history which are relevant to census coverage. Today's Waccamaw Siouan Indians descend from a population categorized in the earliest Decennial Census of 1790 as "All Other Free People." The Waccamaw families were set apart from others, both Whites and enslaved Blacks, in this fashion. This separateness was maintained throughout their history.

Towards the end of the nineteenth century, events brought the Waccamaw out of isolation into interaction with their White neighbors, primarily to provide public funds to support Indian education. The emergent leaders were the children and grandchildren of those categorized as "All Other Free Persons" at the beginning of the century.

In 1910, the Waccamaw leaders formed a governing council to press the counties for Indian schools. But it was not until 1933 that Indian families in Bladen County had an Indian elementary school for their children. In this county-funded Indian school, the quality of education suffered. Primary schooling, however inadequate, was more available than secondary. The Eastern Carolina Indian School accepted Waccamaw students but the financial burden on their families was enormous. As remedy for many of the inequities they suffered, the Waccamaw sought federal recognition in 1949-1950.

Federal recognition involved the Waccamaw in an effort to research their history. Based on anthropological sources such as that of anthropologists Mooney and Swanton of the Smithsonian Institution, a connection was made between the modern Indian community and those of the small tribes of Siouan speaking Indians once inhabiting the coastal plain during the historic period. Siouan is the name for a group of related American Indian languages which include some still spoken by tribes in the Western United States and spoken in North Carolina at the time of first contact with Europeans. Since the modern Indian community lies within the former territory and hunting grounds of the historic Waccamaw, and lies within a few miles of Lake Waccamaw, a connection was made between the two groups. Hence, from 1949 until the present, the Indian community has referred to itself as Waccamaw Sioux.

In November, 1949, members of the governing council traveled to Washington, D.C. to visit the Bureau of Indian Affairs offices to ask for advice on how to pursue federal recognition. Assisted by Oliver La Farge, then president of the Association on American Indian Affairs of New York City, and Alexander Lesser, then the association's executive director, both anthropologists, the Waccamaw submitted a bill to the U.S. Congress: H.R. 7153, H.R. 7299. The legislation proposed two steps: 1) to give the Waccamaw Indians protection regarding their lands and 2) to give them rights and privileges as a tribe under the Indian Reorganization Act of 1934. The bill was submitted to Congress in the spring of 1950 and was directed to the House Committee on Public Lands, which in April of that year referred the matter to the Bureau of Indian Affairs. In August 1950, the Bureau of

Indian Affairs returned a negative response to the House committee, recommending that the Waccamaw Bill be defeated.

The 1960's ushered in a new era of development for the Waccamaw and their leaders. Disappointed by their failure to secure federal recognition in 1950, Indian leaders decided to make the community more self-sufficient and less dependent on the need to be federally recognized in order to develop economically their communities. Thus, the Waccamaw Indian Improvement Club was formed, and it adopted a strategy of attracting outside investment and industry into the Indian community. Working closely with the new chief and his council, the club was instrumental in attracting a small audio device company into the community on the site of the former Waccamaw Indian High School, opened in 1955 and abandoned after school desegregation (1967). The club also pursued employment for Waccamaw people and sent representatives to the county seats to lobby for the hiring of Indians. In addition, the 1960's witnessed the expansion of a major paper company and a major utility company, both of which provided jobs for Indian people.

Publicly asserting their Indian status in 1970, the Waccamaw leadership was successful in securing five acres of land for the tribe from one of the paper companies. This acquisition had significance as a symbol of the tribe's progress in gaining wider recognition and became the focus of tribal events publicizing the community through such festivals as the annual powwow. State recognition as an Indian tribe was also granted in 1970. In the 1980's efforts to formulate a petition to gain federal recognition were mounted. Historical, social, and genealogical research was conducted between 1982 and 1985. Today, the community and tribe is organized under the Waccamaw Siouan Development Association (WSDA) which formally endorsed, co-sponsored and assisted the research presented here.

### **Behavioral Observations on Neighborhood and Households**

The Alternative Enumeration, May 2 to July 17, 1990, counted 128 households in the Little Branch area in research blocks 18, 53, and 54. The average household size was 2.8 persons (range: 0 - 7). Housing within the Little Branch community was not available to just "anyone" but only to Indian people or their non-Indian spouses and offspring. Indians comprised 87% of those living within the community. The remaining 13% were White spouses and children. (See Table 1.) During the three month observation period, I never saw any housing units advertised for sale. New housing units, trailers especially, appeared between Census Day and the Alternative Enumeration. However, in each case, the trailer or house was set up or built on land bought from either a family member or another Indian in the community. A local realtor, who was questioned about the availability of housing within the community, confirmed the fact that land and housing were difficult to obtain. He said: "That is a tight community of people."

Single family brick homes or trailers characterized the building types found in the Little Branch area. A majority of the households were owned privately. Family land pulled extended family members back home. A common pattern was for retired children to return to the home place and settle, either in a trailer or by building a brick home, on the land of

one of their parents. Families tended to spread out over the area, with grandchildren, especially granddaughters staying temporarily in the homes of grandparents. The community was very stable, with 91% of the people indicating no mobility between Census Day and the Alternative Enumeration.

The households were comprised of extended and nuclear families. Only one unit included people who were not relatives. The kinship terminology and language used was the standard American kinship system.

## **METHODOLOGY**

Little Branch represents a densely settled section where the ancestors of the contemporary residents have lived since before 1790 when the first federal census was taken. Land tenure patterns reflect family ties. In March 1990, Little Branch was chosen because it has always been central to the Indian community. The research block selection was concluded in November 1989 after a "quick count" of the area showed that there were approximately 100 households in the area identified. Research Block numbers 18, 53 and 54 were assigned to this area.

Meetings were held with WSDA in March to discuss the census process and the Alternative Enumeration. Census awareness was high because the director of WSDA and a staff person worked as follow up enumerators in the neighboring communities. The WSDA bulletin carried articles on mixed marriages and the race of children advising families to emphasize the Indian heritage of children. No one was sure how the community members would report race on the federal census.

Two research assistants were hired to work on the Alternative Enumeration. One was a community member, the other was a graduate student at the University of North Carolina at Wilmington with training in social science methodology. The two women became sworn employees of the Census Bureau by April 11, 1990.

After receiving the "1990 Guidelines for the alternative enumeration: part one geography and physical space," I began to think seriously about the mapping of the three blocks. Dr. E. Martin visited the site on April 16. With the tribal research assistant, we drove around the community noting the address characteristics of the housing units. In this rural area, we observed that mail was delivered along a rural route by a mail carrier who deposited the mail in numbered road side boxes. There were a few "P.O. Box" deliveries in the post office but there were no address numbers on the housing units. We noted that interspersed with brick housing units were trailers, some recently set up.

After receiving additional guideline materials from the Center for Survey Methods Research concerning the Alternative Enumeration and behavioral observations to be made, I decided to construct a set of informal observation check sheets to be used by myself and my two research assistants. These sheets were to be filled out after each household visit and interview was completed. I included a statement about the observations that were

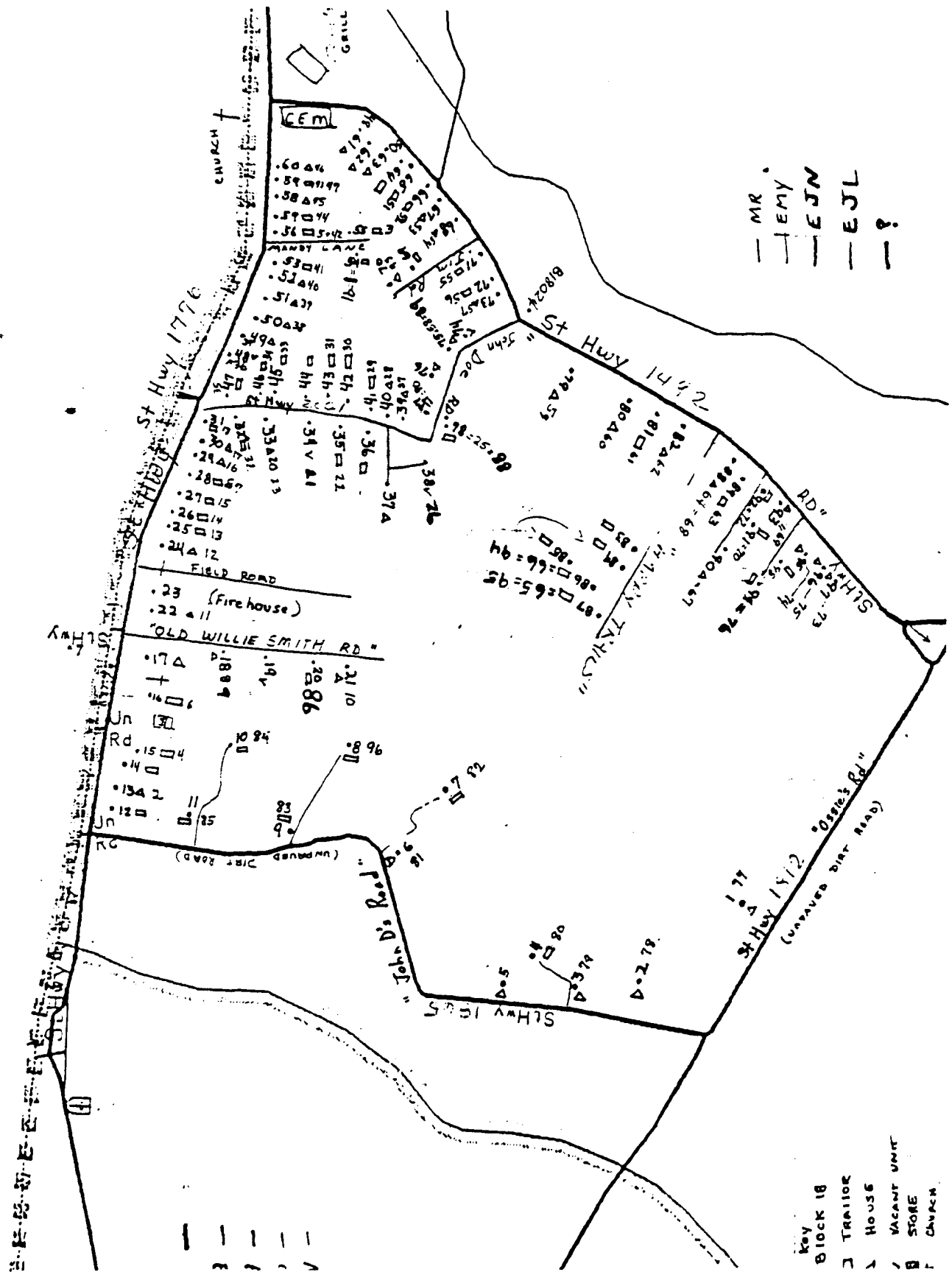
required for each household and a space where the date and time of each visit could be recorded. A one paragraph project explanation followed. I encouraged the two assistants to memorize this statement and required that they repeat it at each visit.

On May 2, 1990 I pretested the observation sheets by stopping at the home of two old friends of mine in the community. This elderly couple chatted for several hours with me about the Alternative Enumeration, mixed marriages, and the feelings of community members about the census. Based on this interview, I made some minor adjustments in the wording of the project explanation and the order of observations.

On May 9, 1990, my tribal community assistant and I mapped block 18. We also discussed the follow up enumeration process with an Indian woman who was working temporarily for the Census Bureau assigned to an all Black community nearby. She pointed out that her job was made more difficult because she had to make visits to housing units in neighborhoods and areas with which she was unfamiliar. Her words were to foreshadow a major problem that I discovered had occurred with the follow up enumerations that were conducted in the Little Branch community. The Census Bureau follow up enumerators assigned were unfamiliar with the community and they duplicated returns for households that already had been enumerated by mistaking housing units and totally missed many of the housing units that they were trying to find.

On May 15, public tax office records were collected for the research blocks. Using the addresses listed on these records, those from the WSDA and visits to units whose addresses were in doubt, we prepared an accurate address list in conjunction with the mapping of the blocks. Mapping of blocks 53 and 54 continued on May 16, 1990. We observed many people putting in gardens. "Garden time" begins in June and many people were preoccupied with their gardens, harvesting and putting up their vegetables. With this in mind, we were prepared to shift our observation and interviewing hours to late afternoon and early evening. We also noted that although this community was once a rural farming area, most people worked from 8 AM to 5 PM or other shifts at chemical, forestry, and textile plants surrounding the area. Work schedules, gardens, and recreational activities such as summer baseball were all going to affect who was and who was not at home.

### MAP OF THE NORTH CAROLINA SITE



— MR  
 — EMY  
 — EJM  
 — EJL  
 — ?

Key  
 □ Block 18  
 □ TRAILOR  
 □ HOUSE  
 □ VACANT UNIT  
 □ STORE  
 □ CHURCH

On May 23, we made our first household observations. Prior to going out into the community, I established what was to become a routine schedule for our research. I met with my research assistants and went over the observations guidelines and project explanations. We discussed census definition of "usual residence," "person one," and "Census Day residence." Since the observations made on each housing unit needed to reflect very specific information for the Alternative Enumeration, I decided to include all the variables on the check list. After each ethnographic interview, the researchers were advised to stop wherever they were -- in a car, outside on the road, or under a tree -- and fill out the check list. In order to be sure that all the variables were observed, I met again with my assistants either at the end of the day or the next morning to go over the observation sheets. At those meetings, we discussed which households needed a second or third visit, which variables/observations were yet to be recorded, and the quality of the data being collected. Since my tribal community researcher was intimately acquainted with the community, the data quality was checked with her during these sessions.

I discovered very early in the research project that trust was crucial to obtaining accurate observations on the housing units. Before visiting the home of a person in the community to whom I had not previously been introduced, I checked my family genealogies to discover in which major family they belonged. Then upon approaching the person, I introduced myself and mentioned that I knew one their relatives -- a sister-in-law, a cousin, a grandfather, etc. By making this connection, I could then proceed to explain the Alternative Enumeration project and why it was important for them to cooperate. Networking through genealogies allowed me to make it clear that I was not just another census enumerator but rather a researcher who had some previous familiarity with their history as an Indian community. In the case of my graduate student research assistant, on the few times that she worked in the community making observations on housing units, I had her explain her connection to either myself or to my tribal community researcher. The tribal community researcher did not have any outsider problems to overcome.

The research plan continued every day from June 1 until July 17, 1990. Hard-to-enumerate housing units were observed late in the evening, Saturdays, and occasionally on Sundays as well. Housing units that appeared to exhibit unusual patterns were subject to follow up visits so that both myself and my tribal community researcher had observed the household. In this fashion we were able to confirm or disconfirm our initial observations. On one occasion in a hard-to-enumerate family, the tribal community researcher invited the householder's mother along on the visit in order to gain entry into the unit!

Follow up visits to the research site took place on January 17 and 18, 1991, when Dr. L. Brownrigg, the Census Bureau Technical Representative for this study, and I met with my research assistant from the Indian community to consider the match report results. We discussed the address listing phase of censusing at that time. The Indian research assistant recalled that the two people who completed the Address Register for Block 18 were not Indian people and that they asked to see a copy of the WSDA mailing list.

During this site visit, Dr. Brownrigg and I discussed the boundaries of Block 53 and Block 54. Photographs and sketches were made in order to study the landmarks and relationship among three features which on the Census Bureau TIGER maps were graphically overlapped: the Address Register Area (ARA), political boundary of the county line, and a local highway. The graphic overlap on the TIGER map led to some confusion on where the boundary of census blocks and the ARA lay on the ground.

In the next month, using the match report sent by the Census Bureau, I reconstructed the order in which the Census Bureau had assigned map spot numbers to housing units. Two sets of evidence proved useful: the sequence of numbers corresponding to the map spots keyed from census forms recovered from the three blocks and numbers originally assigned to housing units on the 1989 Address Register for the same blocks. I compared map spots numbers we had assigned each housing unit for our Alternative Enumeration to those that matched with the census block and housing unit codes taken from the match report. The results were mapped together. (Please refer to the map.)

## **RESULTS**

### **Self Reporting Race**

The specific hypothesis I tested concerned how Indians in this community would self report race on the census. Simply stated my hypothesis was : self reporting race as Indian depends on age. I predicted that self identification as Indian race would vary in this community according to the historical experiences of certain age group cohorts.

My previous research on the history of the Little Branch community indicated that recognition as Indian played a significant role in relations between Indians and non-Indians (Lerch 1988, 1992). Therefore, I proposed that race would be problematic on a federal Census form. How would people respond? Would the many years of discrimination, prejudice, and resistance to their racial identity make them reluctant to say they were Indian on a federal document?

Age differences in reporting race would be evident, I thought, because members of the older generation, those whom either directly fought for recognition as Indian or who remembered their parents doing so, would be more secure in their racial identity. Young people who either participated in the annual powwows or who attended the segregated Indian schools, especially the high school that was opened in the Indian community in 1955, would also be secure in their identity as Indian. However, middle aged adults, those between 30 and 59 years of age, might be reluctant to report Indian as their race since they attended schools only sporadically and came of age during a time when their community suffered set backs and disappointment, such as the 1949-50 federal recognition effort.

There were 117 people in the middle age group and 185 people either younger and older. I found no significant difference between the two groups in reporting race. However, I did note differences in the race item comparing our Alternative Enumeration to the census results, both in the aggregate and for matched individual records.



**Coverage difference through reporting race and ethnicity**

A comparison of the racial categories reported on the Census and the Alternative Enumeration reveal some differences. The Census and the AE report Indian and White in almost the same percentages. (See Table 1) Black (2%), other (1%), and unspecified (1%) appear on the Census but not the AE. A similar pattern of non-identification of people in particular racial categories was observed by Strauss (1991) in her study of urban American Indians in Chicago.

**Table 1**

**RACE REPORTED FOR THE 1990 CENSUS AND  
ALTERNATIVE ENUMERATION**

<b>RACE</b>	<b>CENSUS</b>	<b>AE</b>
<b>WHITE</b>	<b>12.3</b>	<b>13.8</b>
<b>BLACK</b>	<b>2.0</b>	<b>0.0</b>
<b>INDIAN</b>	<b>81.8</b>	<b>85.4</b>
<b>OTHER</b>	<b>0.7</b>	<b>0.0</b>
<b>UNSPEC</b>	<b>1.0</b>	<b>0.0</b>
<b>MISSING</b>	<b>2.2</b>	<b>0.8</b>
<b>TOTALS</b>	<b>100.0</b>	<b>100.0</b>

The records of people whose race was reported as Black were censused during the follow up enumeration operation. The three matched people in the family living at map spot B 18 065 (=A 18 020) were enumerated by the census in June, and another three person family (B 18 086 01-03 = A 18 087 01-03) are July enumerations. The matched records on the AE were enumerated as Indian by the Indian research assistant. There is a chance that the Census Bureau follow up enumerators did not ask anyone in these two households what their own race self identification was but merely put down the category that they thought fit the case. Skin color is a primary indicator of race in the non-Indian community; however, within the Indian community, skin color is one component in a set of indicators including family background, residence, and participation in Indian cultural events.

In two individual census records where race was reported as "Other", the ethnic identification or specification of what other race was intended, is listed as WSDA, or Waccamaw Siouan Development Association. These cases (B 18 093-03), a four month old male, and his 29 year old father (B 18 093-02) both live with their respective

grandfather and father (B 18 093-01), whose race is reported to the census as Indian and ethnicity as "Indian (Amer)." .It appears that there is some confusion in this household about how to report race and ethnicity. This record is a confirmed census record but was not enumerated during the AE.

There were three cases where race was not specified in the records keyed from census forms: a two person household (B 18 089 01-02) enumerated without any information at all reported on race, sex, age, or ethnicity and an individual census report from a house (B 18 083) where a couple with a mixed race marriage (Indian and White) lived. It is their baby (B 18 083-03) whose race is left unspecified. This case may reveal some of the difficulties faced by couples formed by people from two different race groups in making a choice of what race they are to call their children.

Table 2 shows the population counted by the Alternative Enumeration by Ethnicity and Gender. In this table, I defined the Ethnicity of the Indians at the research site as the tribe in which they are enrolled and I call White people Anglo American. North Carolina state-recognized Indian tribes define their membership and compile their own rolls. The ethnicity at the research site is primarily Waccamaw, but Lumbee and Coharie also live there. Identified as Anglo American, some persons of White race are the spouses or the children of Indian people.

**Table 2**

**Resident Population by Ethnicity and Gender  
counted by the Alternative Enumeration**

	<b>MALE</b>	<b>FEMALE</b>	<b>N</b>	<b>% OF TOTAL</b>
<b>WACCAMAW</b>	<b>161</b>	<b>131</b>	<b>292</b>	<b>84.4%</b>
<b>LUMBEE</b>	<b>1</b>	<b>7</b>	<b>8</b>	<b>2.3%</b>
<b>COHARIE</b>	<b>1</b>	<b>0</b>	<b>1</b>	<b>0.3%</b>
<b>ANGLO AMERICAN</b>	<b>24</b>	<b>21</b>	<b>45</b>	<b>13.0%</b>
<b>N</b>	<b>187</b>	<b>159</b>	<b>346</b>	

Table 3 presents information on the ethnicity and gender of the records added by the Alternative Enumeration: residents within the sample area on Census Day and during the AE apparently missed by the 1990 Census. A comparison by ethnic groups reveals some interesting differences. As a group, those people identified on the AE as Anglo American of the White race experienced a higher undercount than did the American Indians as a group at the site, either Lumbee or Waccamaw. Whites form a minority in the Indian community and their status is marginal within this community. Until the 1960's, few Indians married Whites and even fewer brought them home to live. Social relationships between Whites and Indians have changed from earlier times when strict segregation prevented such easy relations between the two groups.

**Table 3**

**Individuals Counted in the Alternative Enumeration  
but not in the Census at the Research Site  
(by Ethnicity and Gender)**

	WACCAMAW	LUMBEE	COHARIE	ANGLO- AMERICAN
Male	19	1	0	9
Female	21	1	0	2
Total Missed	40	2	0	11
Total Counted in AE	292	8	1	45
% of Total Missed	13.7%	25.0%	0.0%	24.4%

**Other Types of Coverage Errors on the Alternative Enumeration and the Census**  
Four types of errors account for the differences in the count of population and housing between the AE and the Census:

- o duplications,
- o erroneous inclusion of housing units which were either misgeocoded and or were out of scope (outside the sample area),
- o misses of whole households and
- o misses of individuals within households.

Some background on the following topics will help explain how these errors occurred:

- o family living arrangements and residential patterns,
- o addresses and rural route boxes,
- o completeness of the address register,
- o residential arrangements,
- o ARA, block, and county boundaries.

### **Family living arrangements and residential patterns**

The households included at the research site in the Little Branch area are connected by overlapping ties of kinship. Each and every household is surrounded by kin and almost everyone is related to everyone else at the site through descent or marriage ties. Housing units are tied to a specific physical location but families organized into households are not bounded by these units. The typical residential pattern focuses on the "home place" which is an older, wood, brick or cinder block unit where an older family member lives. Surrounding this "home place" there are mobile home units and newer brick homes built to accommodate the adult children, who grew up at the "home place," and their families.

### **Addresses and rural route mail boxes**

One or two mail boxes, located along the road, are associated with each cluster of family housing units. The mail box rural route numbers remain stable over time but the units they serve are flexible. According to the post mistress serving the research site, rural route mail boxes have not been renumbered in twenty years. Therefore, in order to keep up with the expanding population, mail is delivered to several households at the same mail box. The mail carrier covering this area explained that up to five housing units may receive mail at the same box. Over time, new boxes appear and existing numbers are divided up by adding letters to them: 97, 97a, 97b, 97c. Generally, the number reflects the family and the letter reflects the unit. Despite this division, mail boxes are not allocated on a one to one basis giving each unit its own box. Individuals and households may, if they desire, sign up for a post office box number at the post office. In such a case, mail might be sent to two addresses--the rural route box number and/or the post office box number.

### **Completeness of the address register**

In 1989 the Census Bureau conducted a "Pre-list" in rural areas where it was unsure of questionnaire delivery by mail. According to a description of this procedure (\*2) provided by CSMR during a researchers briefing in December 1989, "census enumerators will list addresses and provide location information for housing units in their assigned areas." Following this prelist, in the Little Branch ethnographic site and in many other rural areas, the Census followed a procedure entitled the "update-leave / mail-back method of data collection." This method is described as follows:

We will compile lists of housing units before Census Day, enumerators will visit the housing units, leave questionnaires, and ask respondents to return the questionnaires by mail. The enumerators also will add housing units that are not on their lists and leave questionnaires with the residents. (\*3)

There is evidence that all or part of this method of data collection was used at the research site. Address Register lists for Block 18, 53, and 54 were compiled in August of 1989. The two enumerators assigned Block 18 were outsiders to the community. They asked for and were given the address list used by the WSDA during their visit to the community in August

of 1989. The task of developing an Address Register for Blocks 53 and 54 was assigned to a Census Bureau enumerator who was an Indian member of the community.

Not all the address characteristics were recorded for records on the Address Listing Pages completed in 1989. Address characteristics on these records can be categorized as complete or as partial. Address characteristics include the following elements: (1) block number; (2) map spot number; (3) house number, (4) street name, rural route and box number or post office box number; (5) unit designation; (6a) city, (6b) state, (6c) zip code; (7) last name, then first name of the householder -- if occupied; (8) road name and (9) description of the physical location of housing unit. (See Illustration 1.) Some records have all address characteristics relevant to the housing unit noted: these records can be regarded as complete. A partial address is one with most of these characteristics missing.

The Census Bureau's Address Register for Block 18 includes 85 numbered housing units, 16 of which have complete address characteristics described. The Address Register for Block 53 includes 20 numbered housing units 18 of which have complete addresses with all the elements listed above. Block 54 had 3 housing unit identification numbers with complete characteristics. (Housing units actually located in block 54 were listed under Block 53 in the Census Bureau register, but they were listed with complete characteristics). Follow up enumeration teams visited the research site in May, June, and July 1990.

### **Residential arrangements**

Some examples illustrate how family ties, residential arrangements and the mail addresses (in the form of rural route mail boxes) can complicate coverage efforts. In some cases, differences between the AE and the census relate to the dispersion of families, comprising several flexible households, across several housing units.

"Katherine" (A18 094 01) is a 94 year old widow living by herself in a trailer. Her trailer is set back three or four thousand feet from the highway, behind a vacant trailer. She receives her mail at the same rural route box where 16 other people receive mail. All of the 16 are either her children or her grandchildren who live in three other housing units (A18-090, A18-092, and A18-093) located in front of her trailer on the right and the left. We determined that her trailer corresponded to a unit reported on the census as vacant but that "Katherine" was missed by the census.

In another example, "Susan" (B18 008-4) is included in the housing unit/household group of her father, mother, and brother on the Census. During the AE she is described as "staying" in the housing unit/household of her grandparents. A similar situation occurred with "Patricia" (B53 925-4).

Housing unit and household definitions used by the Census assume that people within the same unit form the household that inhabits the unit and that, unless there are unrelated people, household is in some sense a family. The family model is the nuclear one. The family model for this research site is an extended one where members live dispersed in housing units with fluid household boundaries.

**Address Registers and Errors**

Table 4 entitled "Coverage Errors in Block 18 Related to Address Status" illustrates the association between Address Register status and several types of coverage errors. Housing units identified by their AE number ("A number") are tracked in this table to the Census Bureau Address Register showing a line number if any; and to census forms, giving the coded housing unit number, if any ("Match B number"). The status of each housing unit on the Census Bureau's Address Register is categorized as complete or partial (having complete or partial address characteristics as described above) or omitted. I determined several housing units did not appear on the Address Register, were never enumerated, and were not included in the census universe.

**Table 4  
COVERAGE ERRORS IN BLOCK 18  
RELATED TO ADDRESS STATUS**

HOUSING UNITS					COVERAGE ERRORS			
A NUMBER	MAP SPOT AR18	MATCH B NUMBER	M-R OR FOLLOW-UP	ADDRESS REGISTER STATUS FOR BLOCK 18 A-NUMBERS	DUPLICATION	B-FILE CENSUS ID.	OUT OF SCOPE	A-NUMBER WHOLE HOUSEHOLD MISS
18	9	8	JUNE	COMPLETE	YES	9		
75	57	89	JULY	COMPLETE	YES	58		
33	20	20	JULY	PARTIAL	YES	23		
36	24	NONE	NONE	PARTIAL				MISS
37	25	F 88	NONE	PARTIAL				MISS
44	32	NONE	NONE	PARTIAL				MISS
56	42	42	MAY	PARTIAL	YES	5		
59	43	43	MAY	PARTIAL	YES	47		
88	64	64	MAY	PARTIAL	YES	68		
NONE	NONE	24	NONE	OMITTED			YES	
NONE	NONE	85	MAY	OMITTED			YES	
11	NONE	NONE	NONE	OMITTED				MISS
12	NONE	NONE	NONE	OMITTED				MISS
14	NONE	NONE	NONE	OMITTED				MISS
17	NONE	NONE	NONE	OMITTED				MISS
36	NONE	NONE	NONE	OMITTED				MISS
44	NONE	NONE	NONE	OMITTED				MISS
54	NONE	1	M-R	OMITTED	YES	91		
62	NONE	NONE	NONE	OMITTED				MISS
69	NONE	NONE	NONE	OMITTED				MISS
76	NONE	F 58	NONE	OMITTED				MISS
78	NONE	25	MAY/JULY	OMITTED	YES	88		
83	NONE	NONE	NONE	OMITTED				MISS
84	NONE	F 66	JUNE	OMITTED				MISS
85	NONE	F 95	NONE	OMITTED				MISS
86	NONE	94	JUNE/JULY	OMITTED	YES	66		
87	NONE	65	JUNE/JULY	OMITTED	YES	95		

F = Housing units match but not people

Three types of coverage errors are shown: duplication of the same households/housing unit (i.e. the same household appears in the census under two different identification numbers), out of scope units (i.e. those erroneously included within the site), and whole household misses. The housing units on Table 4 account for 51% of the 41 housing units on the AE and the Census that were involved in a coverage errors.

An accurate address list is the basis of accurate censusing. The residential and living arrangements, rural route mail box numbering system, and partial or omitted address characteristics on the Address Register of 1989 affected the coverage of Block 18. Some examples will illustrate the difficulties.

We listed at our AE map spot 75 in block 18, the house of a 71 year male "John Doe" (A 18 075-01). This housing unit is on "John Doe's Road" which is a dirt road branching from the state highway. John Doe lives in the family home, surrounded by several trailers where his sons and their offspring live and a vacant house. We assigned map spot 78 to the housing unit where "Sam Doe" (John Doe's son) lives and map spot number 76 to the vacant unit. The family's mail box is located on the main highway. Ten people receive mail delivered to this box.

The census listed John Doe's housing unit twice and received two enumerations of the same person under two different census unit identification numbers. The first of these enumerations is a mail return from map spot 58; the second is a July follow up enumeration at map spot 89. The Census Bureau's Address Register gave complete characteristics for John Doe's place but omitted his son's next door housing unit which we assigned map spot 78. During census follow up enumerations in May and another pass in July, two housing units in this group were duplicated yet the vacant housing unit was omitted.

Interesting, and possibly related to the John Doe case is the erroneous inclusion on the census of an out-of-scope housing unit (B18 024) located on the opposite side of the highway from the research site. The insertion of this occupied housing unit into the research site census block (18) appears related to the John Doe case because the household associated with the house across the road uses a mail box located in a cluster of boxes along the highway near the box where John Doe and his family receive their mail. If an enumerator stood at the highway and looked up the dirt road, counted housing units and then tried to match them with mail boxes at the highway, errors in coverage such as those described here might result.

The combination of family boxes and branch roads characterized many units that were omitted from the Address Register. As in the John Doe example, coverage errors resulted: one out of scope unit (B18 024), two duplicated units (A18 086 and A18 087), and five whole household misses (in block 18 AE housing units 017, 069, 083, 084, and 085).

Illustration 1: CENSUS ADDRESS LIST (\*4)

1 PAGE NO.	2 CENSUS NO.	3 MAILING ADDRESS				7 CITY	8 STATE	9 ZIP CODE (5 DIGIT)	10 ROAD NAME	11 PHYSICAL LOCATION
		4 PREMIER, FORTITUDE, ROAD NO., or P.O. BOX NO.	5 APARTMENT NO., SUITE OR FLIGHT, or other	6 CITY	7 STATE					
1	17	FLY 01, 970		FLY	FLY	FLY	FLY	FLY	FLY	
2	18	FLY 47, 200		FLY	FLY	FLY	FLY	FLY	FLY	
3	19	FLY 2001		FLY	FLY	FLY	FLY	FLY	FLY	
4	20			FLY	FLY	FLY	FLY	FLY	FLY	
5	21			FLY	FLY	FLY	FLY	FLY	FLY	
6	22			FLY	FLY	FLY	FLY	FLY	FLY	
7	23			FLY	FLY	FLY	FLY	FLY	FLY	
8	24			FLY	FLY	FLY	FLY	FLY	FLY	
9	25			FLY	FLY	FLY	FLY	FLY	FLY	
10	26			FLY	FLY	FLY	FLY	FLY	FLY	
11	27			FLY	FLY	FLY	FLY	FLY	FLY	
12	28			FLY	FLY	FLY	FLY	FLY	FLY	
13	29			FLY	FLY	FLY	FLY	FLY	FLY	
14	30	FLY 98-6		FLY	FLY	FLY	FLY	FLY	FLY	
15	31	FLY 2001		FLY	FLY	FLY	FLY	FLY	FLY	
16	32			FLY	FLY	FLY	FLY	FLY	FLY	
17	33			FLY	FLY	FLY	FLY	FLY	FLY	
18	34	FLY 98		FLY	FLY	FLY	FLY	FLY	FLY	

ADDRESS LISTING PAGE  
21st Decennial Census - 1990

FORM D-101A  
(6-19-87)

(116) AREA NO. 4500  
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US DEPARTMENT OF BUREAU



In another example, a cluster of mail boxes, the side road "Happy Trails," partial addresses on the Address Register, and enumeration during the follow up are associated with the duplication of a unit and the complete miss of three others: those we numbered in block 18 as 033, 036, 037, and 044. The Census Bureau's Address Listing included a sufficient number of places to match the actual number of housing units on Happy Trails road. None had house numbers. For only 3 of the 16 housing units on this rural road did the census enumerator fill in the characteristics set forth on the Address Listing Page (see Illustration 1). For 13 units, no information was noted for either street name or householder or road name or physical location or else some combination of these characteristics was missing. Assuming that the "update/ leave/ mail-back method" was followed, the partial addresses appear to have resulted in some confusion during the follow-up enumeration in May.

Another variation was observed between the link between family boxes, dispersed family members in several housing units, and omission from the Address Register. Peter Jones (in A18 014) is a 46 year old single man. He receives mail at his parents' mail box but lives independently in a trailer located near his parents' home. He was missed by the census and added by the AE. A similar set of circumstances describe two other units (A18 011 and A18 012).

### Illustration 2: RURAL MAIL BOXES



### **Concealment of family members**

In three occupied housing units householders deliberately concealed the presence of family members by omitting them from their mail return census forms. In each case, interviews with the householder revealed fear of income loss if the presence of these family members were reported. For example, Paul (18 010-01), age 32, lives with his unmarried partner, their children, and her child. His partner received assistance for child support and, fearing the loss of this income if she reported Paul, she left him off the census return. Two cases (4 people of the household in A18 029, and four of the seven in A18 015) are similar, and a third (A18 004) in which two women are concealed by the unrelated owner of a rented trailer.

### **Misinterpretation of boundaries in census blocks 53 and 54**

The major difficulty in censusing these two census blocks concerns misunderstanding about where their boundaries lie. Three sides of the larger block, 53, are formed by a road that runs its perimeter but its fourth boundary was mapped along the overlapping confluence of a county line and the edge of an Address Register Area (ARA), near a state highway. (Please refer to map of Block 53 and 54 on Diagram A and to Illustrations 3 and 4). The way these overlapping boundaries features were represented on the Census Bureau map I used led me to include a series of housing units in my AE of block 53 which turned out to be "out of scope" and not within the boundaries of the blocks I selected as the sample area. These were errors in the AE.

All the units involved in this error were located along a state road, in a narrow census block sandwiched between the boundary of block 53 and the state highway that I originally took to be its border. On the TIGER map I used in the preliminary stages of the AE to identify the research blocks, I did not identify three such narrow census blocks because map features for these blocks were almost totally obscured by the broad, heavy grey hatched line symbol that denotes an ARA boundary on census maps. (See Illustration 4.)

The three census blocks obscured by the ARA symbol were each about 200 feet wide by 2/5 to 3/5 of a mile long. As it turned out, the boundary the census map intended for Block 53 was the boundary line between two different counties. This line, marked by road signs, was at least 200 feet away from the state road. This county line, symbolized on TIGER maps by a dashed line, was even less apparent than the thin solid lines that are used to show block boundaries.

It also turned out that the large block 18 was bordered by the other side of state road, in the same county as the three narrow blocks. These three out-of-scope blocks divided the sample area into two segments.

The housing units erroneously included in the AE fell into the boundaries of these narrow blocks. The following units were misgeocoded by the AE in block A53: 201 (occupied by 2 people), 202 (vacant); 212 (occupied by 3 people), 219 (with 2 people) 220 (with 6 people), 221 (with 4) and 223 (another vacancy).

**DIAGRAM "A"**  
TIGER LEGEND based on Guidelines One, Geography and Physical Space

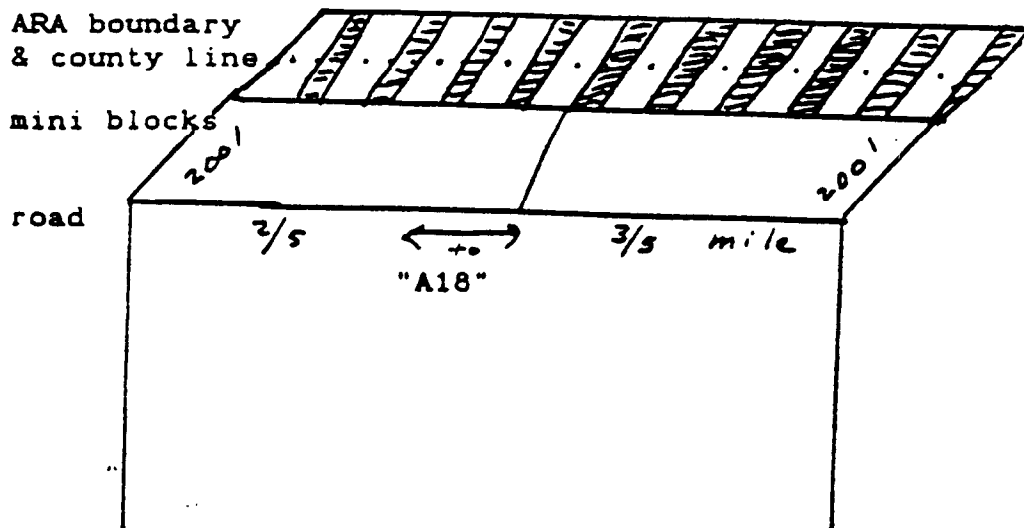
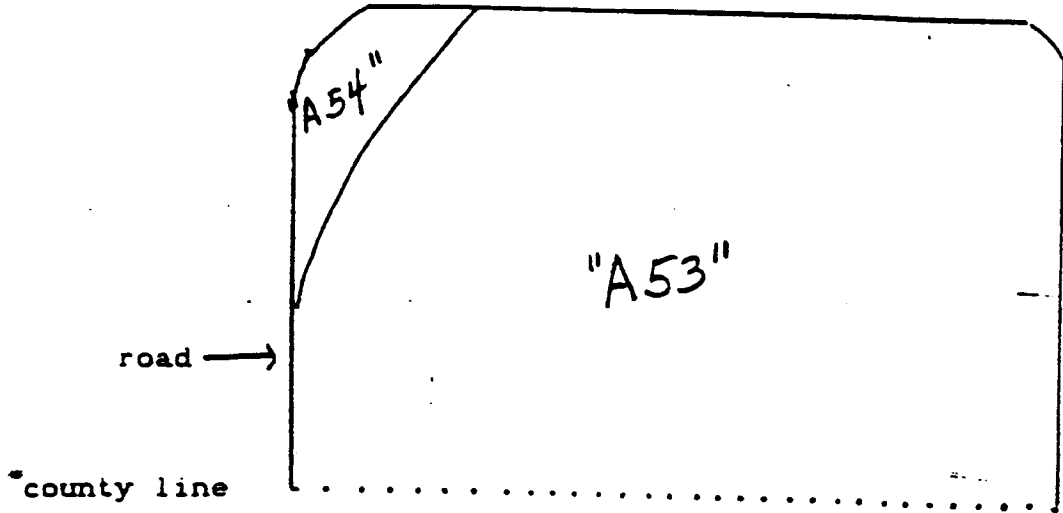


Illustration 3: "INVISIBLE" POLITICAL BOUNDARY



Block boundary  
on state road

LONG NARROW BLOCKS BETWEEN  
COUNTY LINE AND STATE ROAD SEPARATING  
BLOCKS 53 AND 54 FROM 18

Block 18



"Invisible" Political Boundary of County and ARA and blocks

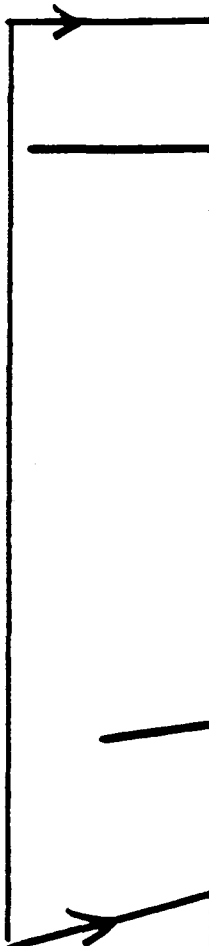
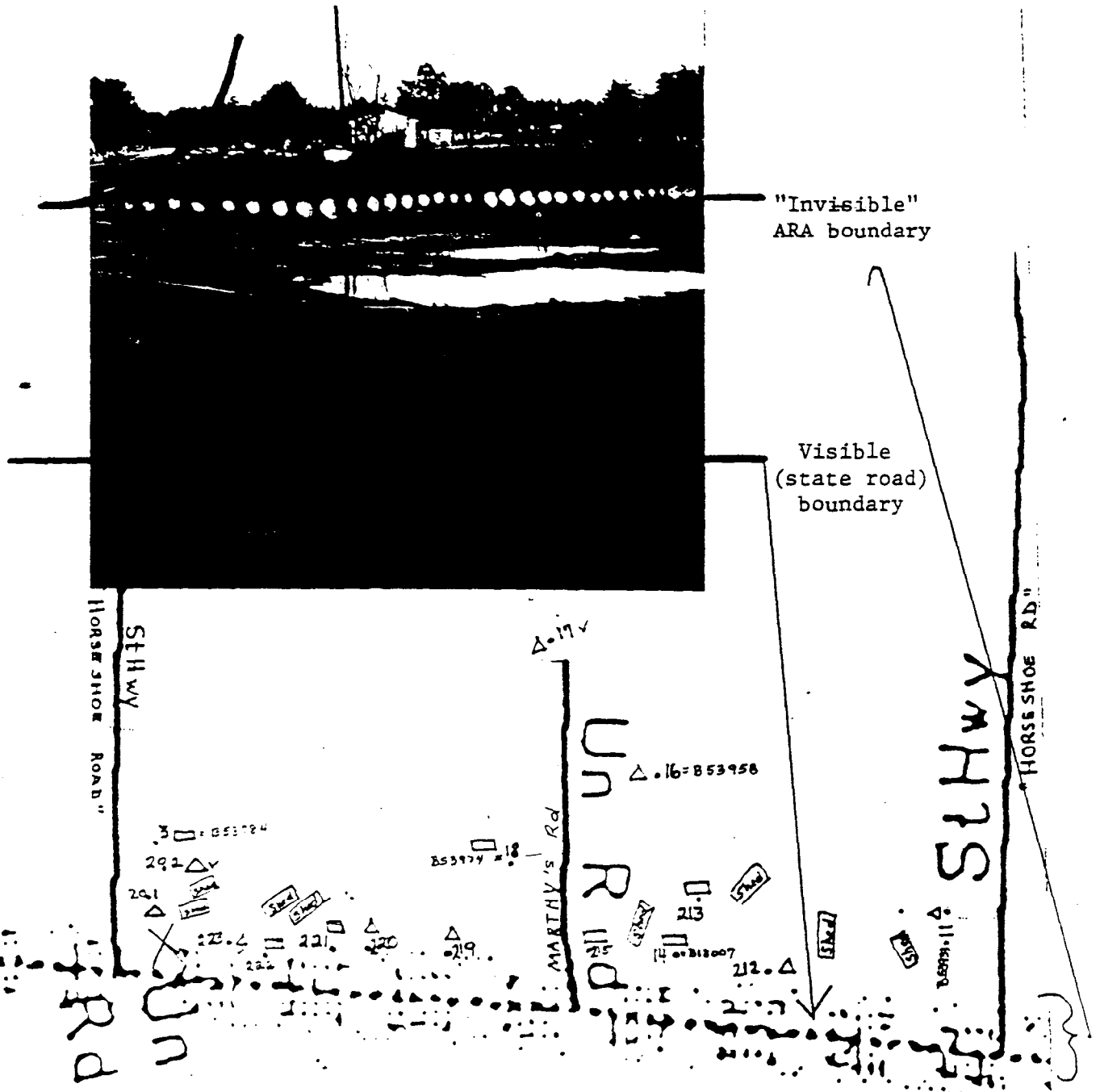


Illustration 4: "INVISIBLE" POLITICAL BOUNDARY



The boundaries of block 54 presented minor difficulties in geocoding (see diagram A). There appears to be no real reason why this small section is organized as a separate census block in the first place. My understanding is that the 1990 census block boundaries usually represent natural barriers such as roads, rivers, railroads, highways, etc. In this case, it looks as if an old road, that may have been a logical block boundary at one time, no longer exists today. During the pre-listing of addresses in 1989, the task of listing two blocks was assigned to an Indian man who knew all the residents personally. Even he failed to interpret the census block boundaries shown on the Census Bureau's TIGER map. The result is that where the AE listed 10 units in block 54, the census listed only two. This did not, however, result in any great coverage difference because the people and housing which should have been in census block 54 ended up enumerated in a misinterpreted block 53. Also, two housing units were duplicated : (the AE's A 54 105 was the same as the Census' B 54 401 and B 53 859) and (A 54 109 = B 53 867 = B 53 853). These errors appear related to the confusion about block boundaries.

## **SUGGESTIONS**

This report discussed the coverage differences observed based on a comparison of the 1990 Census and the Alternative Enumeration of blocks 18, 53, and 54. The errors have been related to behavioral patterns characterizing family living arrangements and residential patterns, family mail boxes and addresses, and the census procedures used in rural areas to compile an accurate address list of the housing units. Based on this comparison, the following suggestions are offered.

First, in rural areas, census officials should enlist the assistance of key people during the Prelist phase when the Address Register is composed. Partial and/or omitted address characteristics on this register are associated with 51% of the coverage errors described in this report. Key people are defined as those familiar with the living arrangements and residence patterns of the area and/or acquainted with the patterns of mail delivery and address assignment in the area. In the case of this site, staff people of the Waccamaw Siouan Development Association, the current tribal chief, or the staff of the post office constitute key people.

Second, minor problems with coverage resulted from ARA boundaries that no longer reflect actual physical barriers between communities. Revision of the maps drawing these lines is recommended.

Third, the census should continue to educate the public about the confidentiality of its data. Fear of loss of income appears linked to lack of faith in census confidentiality.

## NOTES

Final Report for Joint Statistical Agreement 89-25, Principal Investigator: Patricia B. Lerch, Department of Sociology and Anthropology, University of North Carolina at Wilmington, Wilmington, North Carolina 28403

\*1. For a more complete description of the Waccamaw Sioux, please see Lerch 1988 and 1992.

\*2. Bicentennial Census Facts. 1990 Decennial Census. U.S. Department of Commerce, Bureau of the Census. Revised February 1, 1989, page 5. Mimeograph copy.

\*3. Ibid., page 3.

\*4. Names and addresses have been changed on the illustration.

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**Disclaimer:** This is the final report for one of the 29 independent Joint Statistical Agreement projects which conducted an ethnographic evaluation of the behavioral causes of undercount. All 29 studies followed common methodological guidelines. This report is based on an analysis of the results of a match between the author(s)' Alternative Enumeration to data from the 1990 Decennial Census forms for the same site. Each ethnographic site contained about 100 housing units. Information was compiled from census forms that were recovered through October 10, 1990. The data on which this report is based should be considered preliminary for several reasons: Between October 10, 1990 and December 31, 1990, additional census forms MAY have been added to or deleted from the official enumeration of the site as a result of coverage improvement operations, local review, or other late census operations. Differences between October 10, 1990 and final census results as reported on the Unedited Detail File were incorporated in later analysis of data from this site. The consistency of the authors' coding of data has not been fully verified. Hypothesis tests and other analyses are original to the author. Therefore, the quantitative results contained in this final JSA report may differ from later reports issued by Census Bureau Staff referring to the same site.

The exact location of the study area and the names of persons and addresses enumerated by the independent researchers and in the 1990 Decennial Census are Census confidential and cannot be revealed until the year 2062. The researchers who participated in this study were Special Sworn Employees (SSE) or staff of the Census Bureau.

To request copies of this report, contact Statistical Research Division, Room 3133-4, Bureau of the Census, Washington, D.C. 20033.