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USDA

United States Department of Agriculture
Rural Development

Rural Business–Cooperative Service • Rural Housing Service • Rural Utilities Service
Washington, DC 20250

August 20, 1999

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FEDERAL COMMUNICATIONS COMMISSION
OFFICE OF THE SECRETARY

Magalie Roman Salas, Esquire
Office of the Secretary
Federal Communications Commission
445 12th Street, SW
Washington, DC 20554

Dear Ms. Salas:

Enclosed are ex parte comments of the Rural Utilities Service in response to the Further Notice of Proposed Rulemaking, FCC 99-120, adopted May 27, 1999 (In the matter of Federal-State Joint Board on Universal Service and Forward-Looking Mechanism for High Cost Support for Non-Rural LECS, CC Dockets 96-45 and 97-160). An original and copy are enclosed for each Docket.

Any questions regarding this filing may be directed to Gary Allan at 202-720-0665.

Sincerely,

ANTHONY HAYNES
Rural Utilities Service

Enclosures

cc: Chairman Kennard
Commissioner Furchtgott-Roth
Commissioner Ness
Commissioner Powell
Commissioner Tristani

CCB: Keller, Zinman, King, Brown

Before the
FEDERAL COMMUNICATIONS COMMISSION
Washington, DC 20554

In the Matter of	)	
Federal-State Joint Board on	)	CC Docket No. 96-45
Universal Service	)	
	)	
Forward-Looking Mechanism	)	CC Docket No. 97-160
for High Cost Support for	)	
Non-Rural LECs	)	

Ex Parte Comments of the
Rural Utilities Service

Original and One Copy filed with:
Office of the Secretary
Federal Communications Commission
445 12th Street, SW
Room TW-B204
Washington, DC 20554

The Rural Utilities Service (RUS), a rural development agency of the United States Department of Agriculture, actively supports and promotes the universal availability of a broad range of telecommunications and information services in rural America. The RUS appreciates the opportunity to offer comment to the Commission on the Further Notice of Proposed Rulemaking on the Commission's Forward-Looking Economic Cost Model, the Hybrid Cost Proxy Model (HCPM) under CC Dockets No. 96-45 and 97-160 (Notice).

Our comments are intended to be helpful to the Commission in their efforts to develop the proper and most reasonable method for determining high-cost universal service support as part of the implementation of the Telecommunications Act of 1996 (Act of '96 or Act). Our Comments are in response to the paragraph numbers in the Notice and are based on RUS operation of the HCPM as analyzed by Orren E. Cameron, Gary B. Allan, and John L. Huslig. All previous RUS comments are available at our website: *www.rurdev.usda.gov/rus*.

Paragraph 29: Availability of Geocode Customer Locations

The RUS believes that the unavailability of rural customer locations by geocode is a temporary problem. Most rural local exchange carriers that receive RUS financing have converted their

system plant maps to computer-aided-design (CAD) technology, and customer locations, like other points on those maps, have geocode attributes. Surely the non-rural LECs are not far behind the rural LECs in this records modernization enterprise. While most LECs may not have specifically undertaken to extract customer location geocodes, the RUS believes those geocodes could be generated at a small cost.

Questions have been raised about privacy issues concerning these geocode locations. The RUS believes that customer location geocodes, if not associated publicly with names, telephone numbers, or mailing addresses, would not represent an invasion of privacy. Regarding the cost of generating the customer geocodes, the Commission could offset this cost by allowing a one-time payment through the universal service fund to those ILECs that generate rural geocode information.

The RUS has also introduced Commission staff working on the model to the Department of Agriculture's (USDA) Natural Resource and Conservation Service's (NRCS) mapping and geocode specialists. It is possible that the soil, structure and crop information collected by the NRCS could be adapted to provide useful customer location information and thus enhance the accuracy of the model. The RUS is enthusiastic about future collaboration among the Commission, RUS, and other USDA agencies.

Paragraphs 62-63: Distance Calculations and Road Factor

The RUS agrees with the Commission that rectilinear distances should be more accurate than airline distance for calculating cable routing distances. But cable routing is more complex than these paragraphs suggest, and the Commission does not raise several related issues in the Notice that will have a significant effect upon model outputs.

The RUS has found clustering errors in the HCPM. Customers are supposed to be clustered so that they are within 18 KF of some point within the carrier serving area (CSA). The idea is that copper loops of 18 KF between the digital point of presence within the CSA and the customer can migrate to providing advanced services by the addition of additional equipment, presumably Digital Subscriber Loop equipment (DSL, ADSL, HDSL). But the RUS has found that the HCPM will group into one CSA customers that cannot be reached by real world copper circuits of 18 KF or less.

The Commission has demonstrated the HCPM, including the current clustering method, to many audiences including the Rural Task Force and the National Association of Regulatory Utility Commissioners. This demonstration shows the HCPM operating on the Cambridge, Maryland, wire center. The RUS examined the clustering process in the rural portions of this wire center and found that customers separated by rivers, bays, swamps and marshes were clustered together. These customers were not located along the same roads, and road distances between all customers in a cluster were examined to see if there was a point within the cluster that was within 18 KF of all customers. Most rural serving areas in the HCPM could not be built as clustered without serious underwater construction, which from RUS experience is exceptionally expensive and is often unallowable under federal and state environmental laws and regulations.

The RUS redesigned the rural serving areas using the assumption that in clustering, customers had to be within 18 KF of a single point within the CSA with the distances measured along roads.[1] This redesign followed other design assumptions of the HCPM, such as designing only to existing customer locations, rather than following the established (and prudent) RUS practice of designing for future customer locations which might be a short distance down the road so as not to have to place a new CSA to serve that probable subscriber in the future.

Four diagrams are attached to illustrate the HCPM and RUS comparison. The first two diagrams are from the Commission's demonstration of the HCPM. The first diagram ("WIRECENTER CMBRMDCM, MARYLAND") shows customer locations in the Cambridge, Maryland, wire center. The second diagram ("CLUSTERS IN THE SOUTH-WEST PART OF CMBRMDCM") shows the HCPM clustering of customers. The third diagram ("9 SERVING AREAS") represents RUS work, where the customers in the second diagram were found and grouped on the map in the first diagram. Customer clusters have been circled with lines that are the same color as the customer dot colors in the second diagram. This third diagram shows that 9 serving areas are needed to serve those clustered customers. The fourth diagram ("13 SERVING AREAS") shows the RUS clustering, which differs from the HCPM clustering in that it can actually be built because its plant follows routes (roads) where cable can actually be constructed.

The RUS design required 13 serving areas, compared to the HCPM's 9 serving areas. This represents a 44% increase in fiber optic terminals and associated equipment. It requires feeder plant to be routed to 13 points rather than 9. It requires distribution plant emanating from 13 little wire centers rather than 9.

Many model clustering mistakes at Cambridge are due to water. However, unique, challenging geographic circumstances are a hallmark of rural telecommunications service. In West Virginia model error would be due to mountains. The HCPM would cluster customers who are separated by a few hundred feet of mountain, but who are many miles apart by road. This clustering of hollows that are separated by ridges would look on a map just like the clustering across rivers looks at Cambridge. In New Mexico, errors would result from the model's not accounting for tribal areas of archeological or religious significance. The HCPM clustering error is not unique to Cambridge. In its present state, the model does not address these types of challenges so model error persists.

When customers are clustered based on loops that cannot economically be built, the clustering algorithm has returned to the "as the crow flies" logic repudiated in footnote 141 of the Notice.

[1] This analysis was prepared by O.E. Cameron, PE, and presented at the 1999 RUS Rural Telecommunications Symposia held in March and April of 1999.

Concurrent Routing and Sharing of Feeder and Distribution Costs

It has come to the attention of the RUS that feeder and distribution cables are assumed by the HCPM to run along different routings, so that the costs of supporting structures, like plowing, trenching or pole lines, are not shared. When serving areas are contiguous, which is the normal case in most of the nation, this does not happen. Since all cables must in practicality be constructed along roads, feeder cables almost always run with distribution cables, in the same plow slot or trench, or on the same pole line. Where serving areas are not contiguous, such as in very low density areas in the western U.S., feeder cables will have to span them and will have unshared supporting structure. The effect of this error should be to increase the cost of plant in higher density areas but not in lower density areas. Since the HCPM has not behaved this way for RUS, we conclude that this error is masking other problems within the model, possibly the distance and clustering problems listed above.

Paragraphs 64-95: Explanation of the RUS Construction Cost Data

Throughout these paragraphs the Commission states its intention to adjust NRRI/RUS cost inputs based on a comparison of material costs paid by a non-rural LEC and those material costs found in the NRRI/RUS cost data. The RUS cautions that such a comparison may be meaningless and the suggested reductions in these cost inputs may be imprudent.

As a condition to borrowing funds from the RUS, LECs are required to build most outside plant under competitively-bid contracts. The plant is designed in detail by an engineer before the job is bid, including field design that indicates on construction sheets exactly where the facilities must be placed. All materials are included under the contract, so they too are competitively bid. The standard contract form, RUS Form 515, is maintained by the RUS so that contractors from across the nation perform under the same contract. The contract is revised periodically through a public rulemaking process and the RUS actively seeks and incorporates comments from contractors to ensure that the contract terms are equitable to all parties. Materials used in these contracts must have been accepted by RUS and listed on the RUS List of Materials. The construction is broken down into standard units and job-specific units are kept to a minimum. This process is intended to give the 825 RUS borrowers many of the advantages of a large LEC in terms of buying power (paragraph 78).

In paragraph 79, a discussion begins regarding material costs. *Comparing material costs from job to job does not yield meaningful results.* First, if materials are purchased by the owner, as is usually the case with non-rural LECs, the purchase cost is not comparable to the installed material unit cost in a labor and materials contract such as the RUS Form 515. For each 1000 feet of cable bought from a cable vendor, typically about 85% to 95% will become usable cable plant. Portions of the cable are lost to splicing, and cable is wasted at reel ends because it is not long enough to plow. Waste is greater in dense and rocky areas because more pedestals are installed. Whether the owner or the contractor buys the cable, some excess footage is always purchased in each cable size used because running out and halting a construction crew is costly, and if the owner is buying the cable, probably penalized under the contract terms. Therefore,

comparing the cost per foot of cable bought by a non-rural LEC to provide to a contractor with the cost per foot of installed cable from an RUS contract closeout is invalid.

Comparing material unit costs from RUS contract to RUS contract is also inconclusive because there is no way to know how the contractor has assigned his overhead costs and profit to labor and material unit components. Some contractors load their costs and profit onto material prices, and others load them onto labor. There are valid reasons for each strategy. This means the material costs, even those listed in contract closeout documents, have arbitrarily assigned cost components that render comparisons invalid.

The only comparison that is reliable is to compare the total labor and material price of a unit with the total price of the same units elsewhere. Before adjusting the RUS material costs to account for the assumed superior buying power of non-rural LECs, we suggest that the Commission make sure that non-rural LEC costs are strictly comparable. The RUS hereby offers to help the Commission evaluate the non-RUS costs used in comparisons.

Paragraph 132: Structure Sharing at 90% for Buried Plant is Unrealistic

In areas with an existing local service network in place, which leaves few unserved areas, the Commission's concluding that 10% of forward-looking cost will involve shared structure because of "new homes and businesses" is not realistic. New homes and businesses in most areas are built along roads that are already cabled. They result in new cable mileage only in areas that are unserved, hence uncabled. Rural areas in many parts of the country are not growing, and in some states, rural areas are losing residents. No new "regulatory climate", as envisioned by a previous commentor, can cause LECs to share structure if they are building no new plant. The customer growth rate in low density zones is typically below 7% and most of that growth is along cabled routes. Due to the lack of cable TV providers in the out of town areas and the pattern of most subscriber growth occurring along existing routes, RUS would estimate that only 1% or 2% of new cable mileage could be shared in the lower two density zones, 0 to 5 and 5 to 100 lines per square mile.

The HCPM Thinks Low Density Clusters Need High Density Plant

While running the HCPM, the RUS noted that the clusters with the smallest numbers of customers were reported by the HCPM to have very high densities. For example, clusters with a single customer are nearly always reported to have a density of 215 customers per square mile, but a one customer cluster is the lowest density possible. Based on the maximum area of a cluster, over 20 square miles, a one-customer cluster is equivalent to a density of 0.05 customers per square mile. This inexplicable result will have serious plant design implications. According to other HCPM decisions, this lone customer at the far end of the exchange would be served at least partially by a dedicated conduit system. Structure sharing rates would show high sharing by the electric provider and suggest that either other LECs or the CATV provider would decide to serve this isolated area, even though they declined to serve larger clusters closer to town.

The clustering and resulting density calculations seem to break down in clusters with about 5 or fewer customers. The RUS notes that the HCPM cluster area output in square miles does not ever approach the theoretical 20 square miles for 17 KF loops or 23 square miles for 18 KF loops. The RUS model runs occasionally showed serving areas with 14 to 15 square miles for 17 KF loop limits, but these are rare. While RUS recognizes that many clusters will be smaller than the theoretical maximum because of line counts, it is odd and not intellectually acceptable that RUS did not find any cluster in the HCPM output which approached the theoretical maximum.

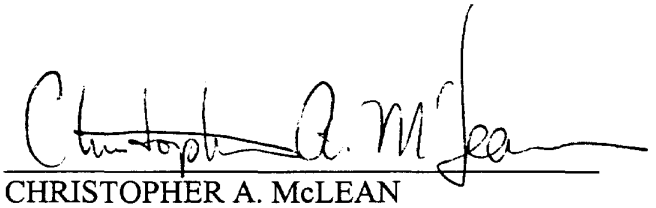
Conclusion

The RUS believes that the proxy model used to develop appropriate amounts of universal service support for non-rural LECs must be accurate in the lowest density areas of the nation if universal service support is to be effective in achieving the principles of Section 254.

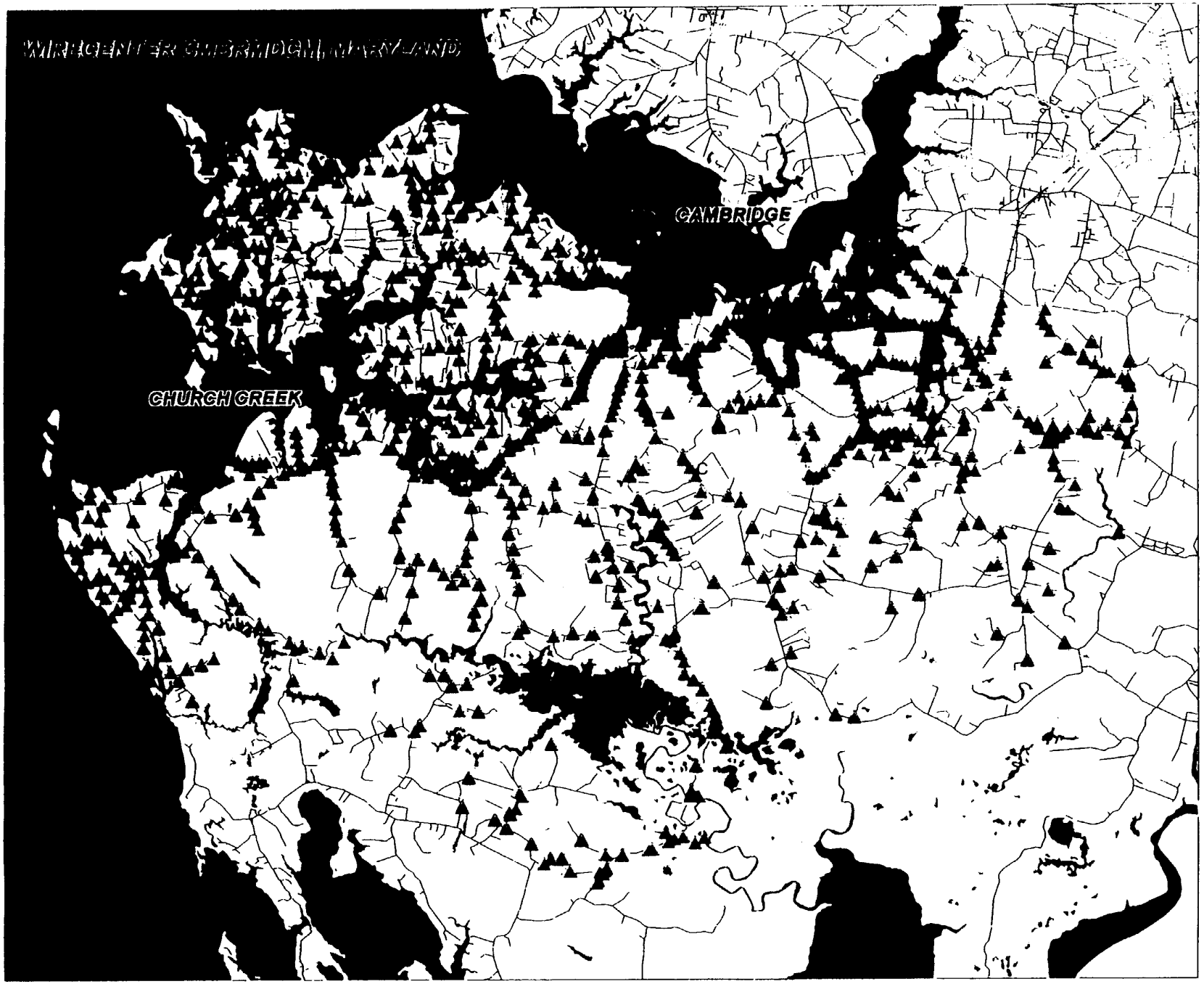
In its present state, the HCPM does not yet have an appropriate level of accuracy for this purpose. In a companion filing (CC Dockets 96-45 and 96-262), the RUS suggests that with some adjustment, the model could do an acceptable job of ranking the relative cost of loops within a study area. In that filing, the RUS suggests that the model's clustering function could be used as a disaggregator of a company's actually incurred forward-looking costs (or other appropriately calculated measure of cost) to allocate cost support among and between lines. This allocation is critical if the Commission is to pursue a portable system of support. Such an approach could dramatically simplify model use and refinement while reducing the effect of model error. Most important, such an approach would comply with the Act's mandate that support be used only for its intended purpose, that is, for infrastructure investment and services in high cost areas.

In addition to offering the above comments on how to improve the model, the RUS has offered to help the Commission staff evaluate HCPM performance and has provided preliminary information to the Commission staff to initiate that process. The RUS is committed to universal service and offers to assist the Commission in any way possible to help achieve and maintain it.

Dated: August 20, 1999



CHRISTOPHER A. McLEAN
Deputy Administrator
Rural Utilities Service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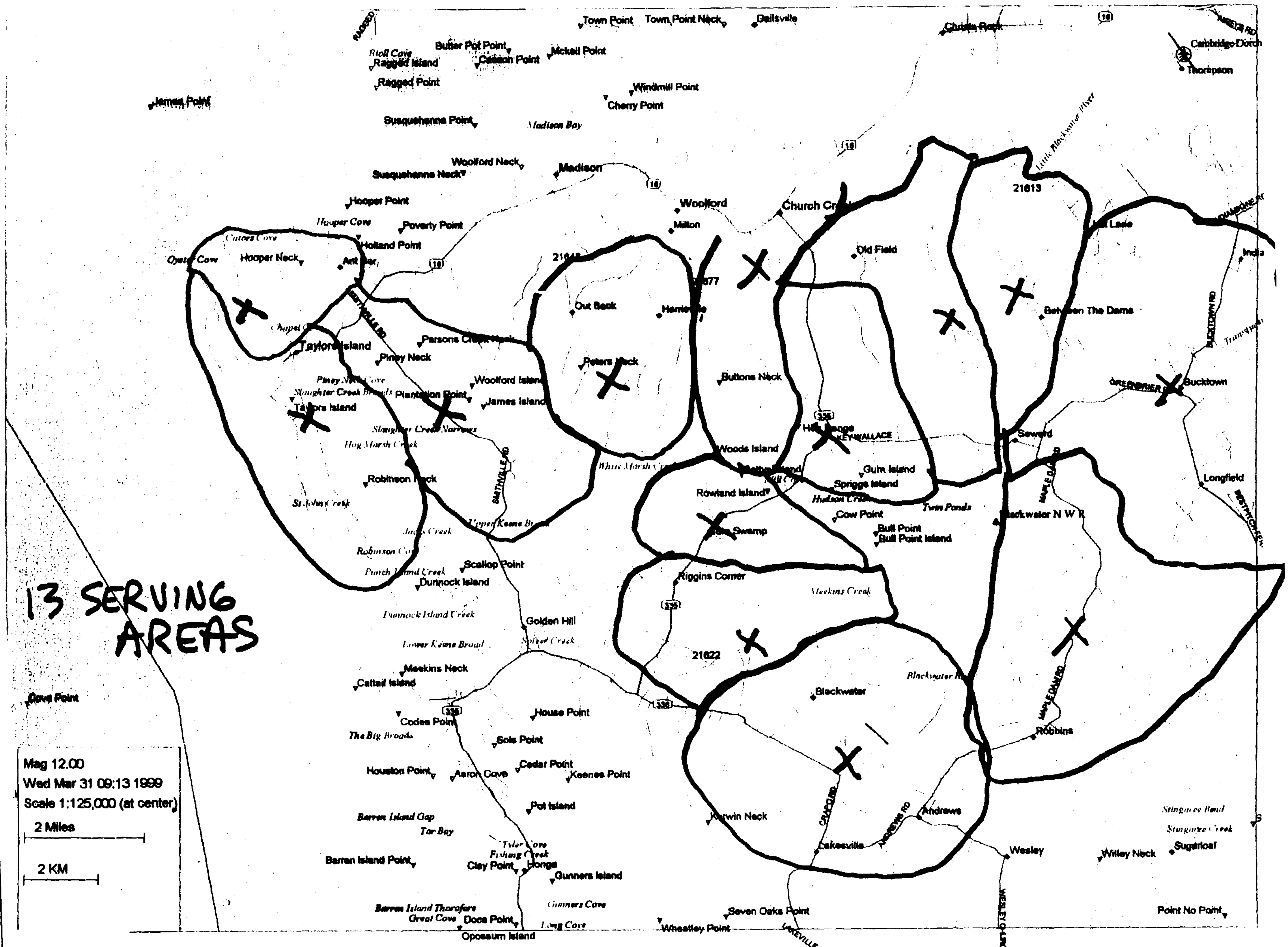
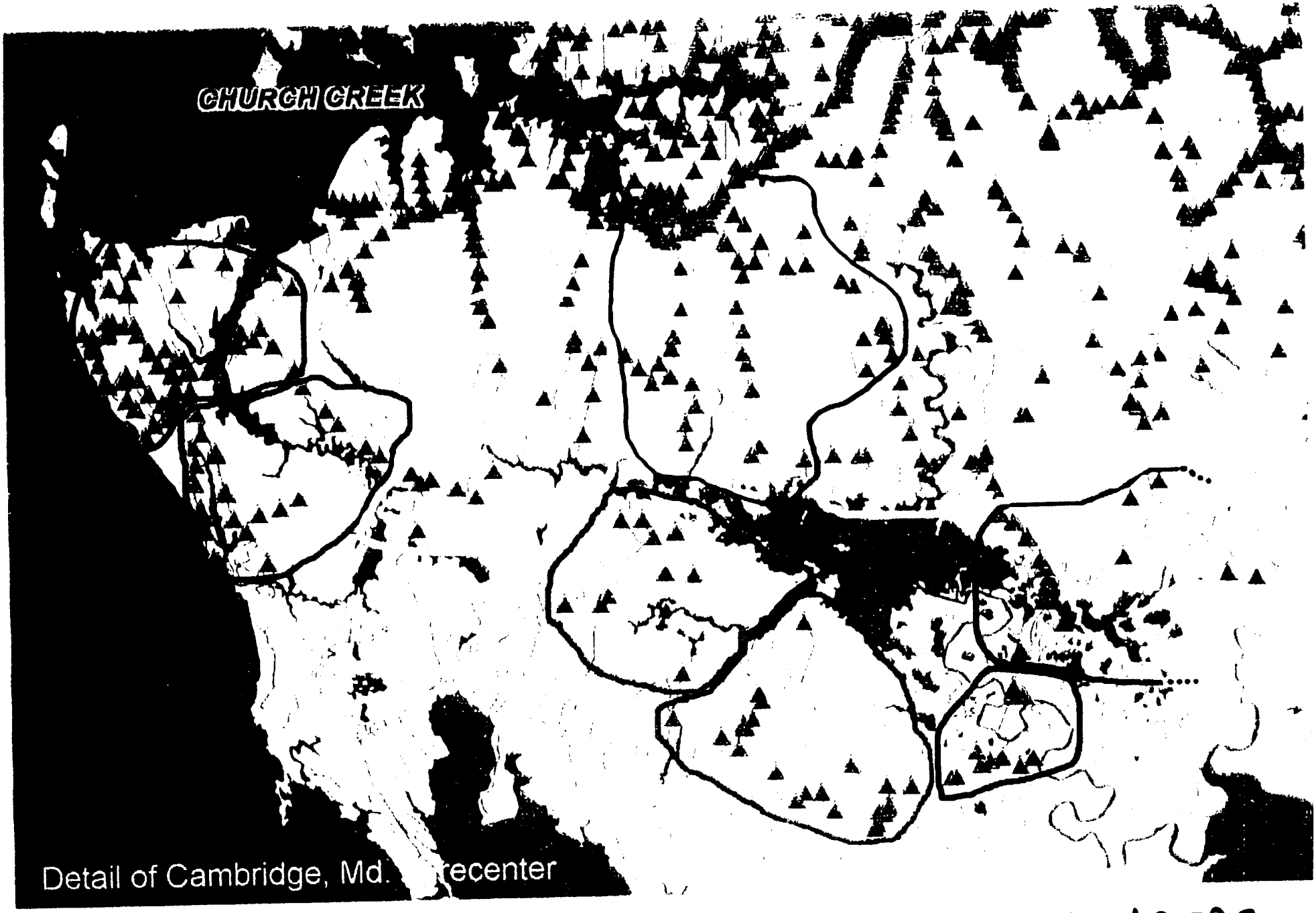
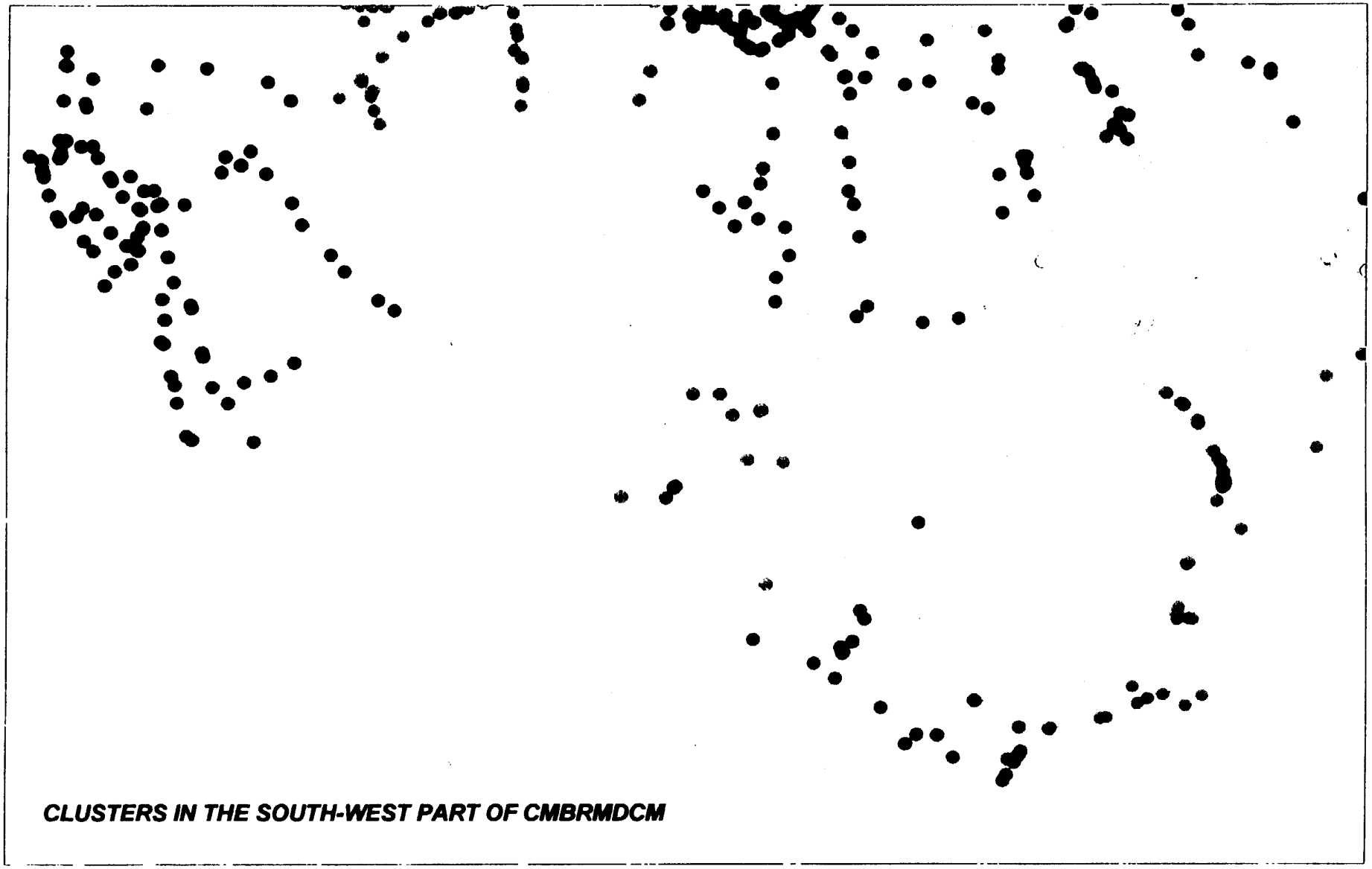
CHURCH CREEK


13 SERVING AREAS
Mag 12.00
Wed Mar 31 09:13 1999
Scale 1:125,000 (at center)
2 Miles
2 KM
Town Point
Town Point Neck
Bellsville
Christs Rock
Cambridge-Dorch
Thompson
Butter Pot Point
Ragged Island
Casson Point
Mckeil Point
Ragged Point
James Point
Windmill Point
Cherry Point
Susquehanna Point
Madison Bay
Woolford Neck
Susquehanna Neck
Madison
Hooper Point
Woolford
Church Creek
Milton
Hooper Cove
Poverty Point
Holland Point
Hooper Neck
Oyster Cove
21613
21648
Old Field
Out Back
Between The Dams
Taylors Island
Parsons Creek Neck
Piney Neck
Peters Neck
Buttons Neck
Woolford Island
Plantation Point
James Island
Bucktown
Taylors Island
Slaughter Creek Narrows
Hog Marsh Creek
White Marsh Creek
Woods Island
Seward
Robinson Neck
Rowland Island
Gum Island
Spriggs Island
Longfield
Hudson Creek
Twin Ponds
Cow Point
Blackwater N W R
Bull Point
Bull Point Island
St John Creek
Scallop Point
Dunnock Island
Riggins Corner
Meekins Creek
Dunnock Island Creek
Golden Hill
Lower Keene Broad
21622
Meekins Neck
Cattail Island
Blackwater Rd
Cove Point
Blackwater
House Point
Codes Point
The Big Broads
Sols Point
Robbins
Houston Point
Aaron Cove
Cedar Point
Keenes Point
Pot Island
Barren Island Gap
Tar Bay
Andrews
Stingaree Bend
Stingaree Creek
Fishing Creek
Barren Island Point
Clay Point
Hoopers
Gunners Island
Lakesville
Wesley
Willey Neck
Sugarloaf
Gunners Cove
Barren Island Thorofare
Great Cove
Docs Point
Long Cove
Opossum Island
Seven Oaks Point
Wheatley Point
Point No Point



9 SERVING AREAS



CLUSTERS IN THE SOUTH-WEST PART OF CMBRMDCM