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The Effect of Wal-Mart Stores on Southern West Virginia's Economy 1995-2001

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Abstract

Effects that the presence of Wal-Mart stores has had on fourteen Southern West Virginia counties as well as one bordering Virginia county are examined. The bases of comparison for these counties include population, number of retail establishments, employment, and wage data. The comparison for the years 1995-2000 shows the differences between those counties that do have Wal-Mart stores and those that do not.

The Effect of Wal-Mart Stores on Southern West Virginia's Economy 1995-2001

Introduction

One of the most successful discount retailers is Wal-Mart. The retail expansion by Wal-Mart accompanied by controversy over whether or not the chain helps or hurts local economies. The purpose of this essay is to examine the existing literature on this topic and to expand the analysis of Wal-Mart's economic influence within a specific retail trade area.

Research in this area has led to several approaches of measuring the overall impact of a Wal-Mart store on a community. The methods include: (1) Comparing pull factors of Wal-Mart areas to those of non-Wal-Mart areas, (2) Comparing retail wage levels of Wal-Mart and non-Wal-Mart areas, (3) Comparing retail employment levels of Wal-Mart and non-Wal-Mart areas, (4) Comparing the change in number of retail establishments prior to and after a Wal-Mart store enters an area, and (5) a combination of approaches. Usually, comparing retail wage levels and retail employment levels is done concurrently. The objective of this study is to measure the overall impact of Wal-Mart stores on Southern West Virginia's economy.

This study is based on research that was conducted by the Marshall University Center for Business and Economic Research. This study expands analysis because of the recent opening of a second Wal-Mart one-trade area. The new store is in Mercer County in the state of West Virginia, while the chain's first outlet in this area was in Tazewell County in the Commonwealth of Virginia. These stores are only approximately 20 miles from one another, and are both located on US Route 460, a major four-lane highway. There also exists a difference in the retail sales tax level between West Virginia and Virginia. West Virginia's retail sales tax rate is set at 6.0% and allows no local rate to be added to the rate. Virginia's retail sales tax rate is set at 3.50% with a

maximum state and local tax rate set at 4.50% (see Appendix I). Also important to note is that by looking at these two counties, movement of trade across state borders may be seen.

Previous Findings by Kenneth Stone

In 1988, Kenneth Stone, an economist from Iowa State University, was asked by local merchants to conduct a study to measure Wal-Mart's effect on Iowa communities (Stone, 1995). This was the first research investigation of the chain's economic influence.

Stone used retail sales data to measure Wal-Mart's effect via the pull factor approach. The pull factor approach is defined as follows:

$$PF = PCSc/PCSs$$

Where: PF = pull factor

PCSc = per capita sales for a community

PCSs = per capita sales for the state (Stone, 1995).

The rationale behind the pull factor states that by dividing the per capita sales of a community by the per capita sales of the state, it is possible to obtain a relatively accurate estimate of the size of the community's trade area (Stone 1995). If the pull factor equals 1.3, the interpretation would be that the community has a strong economy and is selling to 130% of the consumers in the trade area (Stone 1995). Conversely, if the pull factor equals to .70, it would indicate that the community had a weak economy, and thus sold to only 70% of consumers in the trade area (Stone 1995). Finally, if the pull factor was equal to 1.0, the economy was selling to 100% of the trade area consumers (Stone 1995).

An advantage that Stone found to the pull factor method was that the pull factor automatically accounts for price inflation, changes in the economy, and population changes because these pull factors were compared to the pull factor of a base year (Stone 1995). The year

prior to the entry of the Wal-Mart was chosen as the base year for each individual community (Stone 1995).

Stone compared the pull factors of those communities that had a Wal-Mart store to those communities that did not have Wal-Mart stores in several different categories of stores (Stone 1995). These categories were general merchandise stores, home furnishing stores, eating and drinking establishments, apparel stores, specialty stores, building materials stores, food/grocery stores, and finally total retail stores (Stone 1995). His results showed that when a Wal-Mart entered an area, businesses that sold similar products had a decrease in sales while businesses selling different products had an increase in sales (Stone 1995). Stone also found that total retail sales increased for those Wal-Mart towns in the following increments:

After 1 year: 5.6% increase

After 3 years: 4.8% increase

After 5 years: 6.0% increase (Stone 1995)

Stone also found that non-Wal-Mart towns suffered losses in retail sales in the following increments:

After 1 year: 3.7% decrease

After 3 years: 7.5% decrease

After 5 years: 10.4% decrease

After 10 years: 16% to 46%

Stone again provided important research in 1997. In this update on his Iowa research, he compared the 34 towns that had held Wal-Mart stores for a minimum of ten years to fifteen non-Wal-Mart towns with similar populations (Stone 1997). Again, these towns were compared based on several different categories of stores (Stone 1997). The updated findings were much

more varied: After two years there was a 6% increase in retail sales, which remained steady through seven years. By the eighth year, a decline had begun, and by year ten, sales had dropped an average of 4% below the pre-Wal-Mart level. Non-Wal-Mart businesses fared worse, for ten years there was a consistent loss, totaling decrease in retail sales to 15% below pre-Wal-Mart levels (Stone 1997).

Previous Findings by Marshall University

In the winter of 2000, Marshall University's Center for Business and Economic Research published its research on the overall impact that the entrance of a Wal-Mart store has on the levels of employment, number of retail businesses, and wages in the retail sector. The study compared fourteen counties in southern West Virginia. Half of the counties had a Wal-Mart within its borders, and the other half did not. The seven Wal-Mart counties had higher populations and close competitors, but employment levels varied. By using pooled linear regression the results indicated: (1) a one time increase of 350 in total employment within the Wal-Mart counties (of which 320 were classified as retail jobs), (2) a net increase of fifteen new retail businesses per Wal-Mart county, and (3) per capita wages that remained unchanged (Wilburn 2000).

Previous Findings by Others

Pull factors were again used in 1989 when Fayez Tayyem and David L. Darling began conducting research to measure the trade area of various communities in Kansas (Tayyem 1991). Three different classes of cities were identified based on the populations for the years of 1989 and 1990 (Tayyem 1991). The study determined the strength of various communities in Kansas based on pull factors and suggested what types of businesses would be successful in those communities (Tayyem 1991).

Brian Ketchum and James W. Hughes conducted research based on per capita employment and per capita wages in Maine from 1990 to 1994 (Ketchum 1997). They did not believe that Stone's research was complete, so they decided to isolate the chain's effects on employment and wage levels to determine whether or not Wal-Mart's entrance was solely responsible for the trends in retail sales (Ketchum 1997). Ketchum and Hughes data set consisted of the mean per capita employment for all 16 counties in Maine, as well as the mean wages for the retail, service, and manufacturing segments (Ketchum 1997). Their test group consisted of the 12 Maine counties that had Wal-Mart stores, and their control group was composed of the four remaining counties in Maine—which did not have Wal-Mart stores (Ketchum 1997). They found that the differences in the growth of Wal-Mart counties versus the lack of growth in non-Wal-Mart counties could not be attributed solely to Wal-Mart's inception due to a lack of sufficient data (Ketchum 1997).

David Broomhall and Eric King completed research in 1995 that showed Wal-Mart was having a greater effect on Indiana than other similar retailers (Broomhall 1995). They used the pull factor approach to measure the size of the trade area in Indiana's counties. They found that Wal-Mart towns had an average pull factor of .93, while non-Wal-Mart towns had an average pull factor of just .60 (Broomhall 1995). This meant that Wal-Mart towns had stable or growing trade areas, in contrast to decreasing trade areas for non-Wal-Mart towns (Broomhall 1995). Although Broomhall and King were unable to gather a concrete evidence to prove a direct relationship between Wal-Mart and a higher pull factor, they were able to determine that there was a correlation between the presence of the chain and an increased trade area (Broomhall 1995).

In 2001, David L. Darling and Sharon Combes released their report on county trade pull factors in Kansas for the year 2000. They divided the state into 6 regions and found the pull factors for each of the 105 counties. They were also able to identify three factors that cause a change in retail trade: (1) population, (2) income change, and (3) investments that improve the retail environment (Darling 2001).

Current Research Methodology

Existing research has raised, but not fully answered some of the questions regarding the effect of Wal-Mart stores in different economies. Stone's research served as the foundation for this research. To help facilitate comparisons the current study consists of the same fourteen southern West Virginia counties used in the Marshall University analysis. Because of recent changes in the market area, an additional county Virginia is analyzed. In the previous study seven counties were "Wal-Mart counties" and seven were "Non-Wal-Mart counties". In the Marshall study, Mercer County was one of the seven "Non-Wal-Mart counties". However, an additional feature of this study is the change that has occurred in Mercer County since the entrance of the Princeton Wal-Mart in 2000. For this study, the counties without Wal-Mart stores are Boone, McDowell, Mingo, Monroe, Summers, and Wyoming. The counties with Wal-Mart stores are Cabell, Fayette, Greenbrier, Kanawha, Logan, Nicholas, Raleigh, and Tazewell (VA). Mercer county will be a county without a Wal-Mart prior to 2000, and a county with a Wal-Mart post 2000. Each of the variables will be analyzed per year and per county. The years covered in this research are 1995-2001. The variables for this study are:

1. Employment Levels
2. # of Retail Establishments (Units)
3. Average Annual Wage per retail worker

4. Total Retail Wages
5. Total Population
6. # of Wal-Mart Stores

Data Collection

All population data was collected from the US Department of Commerce's Bureau of Economic Analysis. Employment levels, number of retail establishments, average annual wage per retail worker, and total retail wages were collected from the West Virginia Bureau of Employment Programs for the West Virginia counties and from the Virginia Employment Commission for Tazewell County in Virginia. The number of Wal-Mart stores in a county, as well as the year that the stores opened in each county came from walmart.com and this was confirmed by telephone calls to the individual stores.

Although the pull factor approach would probably be the most appropriate measure to use in this study, it is not possible because West Virginia does not collect per capita retail sales statistics. Even so, per capita sales data could possibly be skewed due to the fact that a great deal of Wal-Mart stores are located near interstates—which would draw in not only the consumers in the area, but also those travelers that might pass by the Wal-Mart store. Unfortunately, population data for 2001 was not available at the time of this study. Also, the Virginia Employment Commission collects the number of retail establishments on a quarterly basis; therefore, an average was taken for each year. Finally, Virginia Employment Commission collects the average weekly wage; thus the average weekly wage was multiplied by 52 (the number of weeks in a year) to calculate the average annual wage.

Data Analysis

The data was analyzed using both Pearson Correlation Coefficients as well as by time series trend analysis. A description of both types of analysis follows.

Data Analysis via Pearson Correlations

For each year, Pearson Correlation Coefficients were calculated for the relationships between the number of Wal-Mart stores and all other variables. The Pearson correlation coefficient is used to determine the strength of the linear relationship between two variables. An example of a Pearson Correlation Coefficient and description of the parts follows:

Sample Pearson Correlation Coefficient: $(r (14) = .806, p < .01)$

Description of Parts: 14 = the degrees of freedom, .806 = the value of the correlation, and .01 = the significance level. The strength of a correlation is determined as follows: Each correlation will be between +1.0 and -1.0. The closer that a correlation is to either +1.0 or -1.0, the stronger the correlation is. Also, a strong correlation is defined as a correlation of +/- .7, a moderate correlation is defined as between +/- .03 and +/- .07, and a weak correlation is defined as below +/- .03.

Data Analysis via Time Series Trend

The percent change in each category was taken for each county for each year. This type of analysis will also be useful in examining the Wal-Mart store's effect on individual counties.

The percentages are found by solving the following formula:

$$\frac{x}{100} = \frac{\text{1995 Statistic}}{\text{2001 Statistic}}$$

Explanation of Tables

For each year 1995-2001 Pearson correlation coefficients were calculated for the relationships between the number of Wal-Mart stores located within the county and all other variables. A table with the data in this paper for each year is provided. The complete correlation tables are available. The following is analysis of the data.

1995 Results (See Table 1)

A moderate positive correlation was found between the average annual wage and the presence of a Wal-Mart store within the county. No other significant correlations were found in 1995.

1996 Results (See Table 2)

No significant correlations were found in 1996.

1997 Results (See Table 3)

A moderate positive correlation was found between the average annual wage and the presence of a Wal-Mart store within the county. No other significant correlations were found in 1997.

1998 Results (See Table 4)

A moderate positive correlation was found between the average annual wage and the presence of the chain store within the county. Also, strong positive correlations were found between Wal-Mart's existence in a county and all other variables.

1999 Results (See Table 5)

No significant correlation was found between the presence of a Wal-Mart store within the county and the average annual wage. A moderate positive correlation was found between the average annual wage and the presence of the chain within the county.

wages decreased by 11.11%, number of retail establishments decreased by 24.58%, employment decreased by 29.02%, and finally population decreased by 13.39%.

Mingo: In Mingo County, between the years of 1995-2001 there were found overall percent changes for each category. Average annual wage increased by 25.94%, total wages decreased by 8.27%, number of retail establishments decreased by 15.82%, employment decreased by 27.15%, and finally population decreased by 12.08%.

Monroe: In Monroe County, between the years of 1995-2001 there were found overall percent changes for each category. Average annual wage increased by 10.04%, total wages increased by 24.49%, number of retail establishments decreased by 2.00%, employment increased by 13.13%, and finally population increased by 7.71%.

Summers: In Summers County, between the years of 1995-2001 there were found overall percent changes for each category. Average annual wage increased by 34.65%, total wages increased by 30.66%, number of retail establishments decreased by 1.79%, employment decreased by 2.96%, and finally population decreased by 5.41%.

Wyoming: In Wyoming County, between the years of 1995-2001 there were found overall percent changes for each category. Average annual wage increased by 19.39%, total wages increased by 10.92%, number of retail establishments decreased by 1.69%, employment decreased by 7.09%, and finally population decreased by 6.93%.

Totals: The average percent change in each category for the NWM stores is as follows: Average annual wages increased by 22.14%, total wages increased by 10.19%, number of retail establishments decreased by 8.92%, employment decreased by 9.90%, and population decreased by 5.30%. (See Table 8)

2000 Results (See Table 6)

A moderate positive correlation was found between the presence of the discounter's store in the county and the average annual wage. Also, strong positive correlations were found between the existence of a Wal-Mart in a county and all other variables. It is important to note that Wal-Mart opens a new Supercenter in Mercer County in 2000.

2001 Results (See Table 7)

No significant correlation was found between the existence of a Wal-Mart store within the county and the average annual wage. Also, the population statistics for these 15 counties were not available for 2001. Finally, strong positive correlations were found between the discounter's presence and all other variables. It is significant that the existing Wal-Mart store in Tazewell County relocates and opens as a Supercenter in 2001

Time Series Trend Comparison by Percentage Change in Each Category per County

The results of this analysis will be written for each county and then a summary table for Wal-Mart (WM) counties and for non-Wal-Mart (NWM) counties will accompany this section.

Non-Wal-Mart Counties (NWM): Boone, McDowell, Mingo, Monroe, Summers, and Wyoming counties were used as the NWM counties because these counties have not had a Wal-Mart store open within their respective borders.

Boone: In Boone County, between the years of 1995-2001 there were found overall percent changes for each category. Average annual wage increased by 22.21%, total wages increased by 14.47%, number of retail establishments decreased by 7.63%, employment decreased by 6.33%, and finally population decreased by 1.67%.

McDowell: In McDowell County, between the years of 1995-2001 there were found overall percent changes for each category. Average annual wage increased by 20.59%, total

Wal-Mart Counties (WM): Fayette, Cabell, Greenbrier, Kanawha, Logan, Nicholas, Raleigh, Mercer, and Tazewell counties were used as the WM counties because these counties have had a Wal-Mart store open within their respective borders at some time between the years of 1995-2001.

Fayette: In Fayette County, between the years of 1995-2001 there were found overall percent changes for each category. Average annual wage increased by 13.34%, total wages increased by 11.81%, number of retail establishments increased by 5.76%, employment decreased by 1.34%, and finally population decreased by 2.58%.

Cabell: In Cabell County, between the years of 1995-2001 there were found overall percent changes for each category. Average annual wage increased by 21.85%, total wages increased by 18.72%, number of retail establishments decreased by 2.30%, employment decreased by 2.56%, and finally population decreased by 1.97%.

Greenbrier: In Greenbrier County, between the years of 1995-2001 there were found overall percent changes for each category. Average annual wage increased by 19.58%, total wages increased by 19.84%, number of retail establishments decreased by 10.83%, employment increased by .22%, and finally population decreased by 2.13%.

Kanawha: In Kanawha County, between the years of 1995-2001 there were found overall percent changes for each category. Average annual wage increased by 21.90%, total wages increased by 18.85%, number of retail establishments decreased by 3.17%, employment decreased by 2.51%, and finally population decreased by 3.39%.

Logan: In Logan County, between the years of 1995-2001 there were found overall percent changes for each category. Average annual wage increased by 18.08%, total wages

increased by 33.47%, number of retail establishments decreased by 4.87%, employment increased by 13.04%, and finally population decreased by 8.93%.

Nicholas: In Nicholas County, between the years of 1995-2001 there were found overall percent changes for each category. Average annual wage increased by 21.10%, total wages increased by 37.72%, number of retail establishments decreased by 6.55%, employment increased by 13.71%, and finally population decreased by 1.86%.

Raleigh: In Raleigh County, between the years of 1995-2001 there were found overall percent changes for each category. Average annual wage increased by 25.94%, total wages increased by 31.42%, number of retail establishments increased by 6.42%, employment increased by 4.35%, and finally population increased by .34%.

Mercer: In Mercer County, between the years of 1995-2001 there were found overall percent changes for each category. Average annual wage increased by 30.04%, total wages increased by 31.41%, number of retail establishments increased by 1.33%, employment increased by 1.06%, and finally population decreased by 2.28%.

Tazewell: In Tazewell County, between the years of 1995-2001 there were found overall percent changes for each category. Average annual wage increased by 8.91%, total wages increased by 9.54%, number of retail establishments decreased by 10.37%, employment increased by 7.09%, and finally population decreased by 3.85%.

Total: The average percent change in each category for the WM stores is as follows: Average annual wages increased by 20.08%, total wages increased by 23.64%, number of retail establishments decreased by 2.73%, employment increased by 3.67%, and population decreased by 2.96%. (See Table 9)

Discussion Regarding Pearson Correlation Coefficient Results

1995-1997: As can be seen in the results, there is a lack of strong correlations between the number of Wal-Mart stores in a county and the other variables. Also, there are only 2 moderate positive correlations between the number of Wal-Mart stores in a county and the other variables. It seems that during these years, there is no relation between the existence of Wal-Mart stores and the other economic variables.

1998-2001: These years show a dramatic shift in the strength of the correlations. From 1998 until 2001 there were strong positive correlations between the number of Wal-Mart stores and the total wages, number of retail establishments, total retail employment, and total population. This indicates that as the number of Wal-Mart stores increases, so do the other economic indicators. A table showing whether or not correlations were present, as well as what strength of the correlations follows. (See Table 10)

Discussion Regarding Percent Change Comparison Results

There are some trends between the percent change in NWM counties in comparison to the WM counties. Of the five criteria, only the Average Annual wage increased more for NWM counties than for WM counties. All other criteria show that the counties that have Wal-Mart Stores either increase more or decrease less than the corresponding figures for NWM counties. The total retail employment category qualifies for some special mention. In this category, WM counties had an increase of 3.67% while NWM counties had a decrease of 9.90%. This is a total difference of 13.57%. It is also beneficial to note that although the total wages increased for both WM and NWM counties, WM counties had an average change in percentage that was double that of NWM counties.

Comparison of Mercer and Tazewell Counties via Percent Change

There are three significant results from comparing the adjacent counties of Mercer in West Virginia and Tazewell in Virginia:

(1) Although both the number of retail establishments and total population in Tazewell County decreased at larger levels than did Mercer County, the total retail employment increased within Tazewell County. There is an explanation for this odd discrepancy. The average retail employment between 1995 and 2000 was 4,162.5 in Tazewell County. In 2000, the total retail employment in the county was 4,182 people. However in 2001, the total retail employment for Tazewell jumped to 4,364. This is a one-year increase of 4.35%. The reason for this shift is that the Wal-Mart store in Tazewell, Virginia relocated and reopened as a Wal-Mart Supercenter in 2001. (See Table 12)

(2) The number of retail establishments in Tazewell County drops significantly from 1999 to 2000. The entrance of a Wal-Mart store in Mercer County also occurred in 2000. This second Wal-Mart store within the trade region probably contributed to a shift in the shopping travel patterns of consumers away from the Virginia County. Also during the same time frame, there were several different retail establishments in both Tazewell and Mercer counties that closed. All of the traditional grocery stores of the ACME chain shut down in the region. The large AMES discount store, located in the only mall-type shopping center in the area, also closed. Finally, among the large players, the older of two Kmart stores located in Mercer County was shuttered.

(3) The number of retail establishments in Mercer County increased from 1999 to 2000. At least part of this is due to the strategy of the new Wal-Mart store opening as a part of a strip

mall development. This center includes several new chain retailers to Mercer County. (See Table 13)

Conclusions

Overall the research that has been conducted shows that there is a strong correlation between a Wal-Mart store being located in a county and the strengthening of some of the economic indicators for that county. This research also supports the statement that a Wal-Mart store helps to increase the employment levels, increase total wages, and at least lessen the amount of retail establishments that close within the Wal-Mart trade area. Therefore, this study shows that the presence of a Wal-Mart store appears to be a positive factor for the economy of a given Southern West Virginia county. Nevertheless, further analysis needs to be made to correlate the data collected with the overall business environment that occurred during this time period.

The research illustrates a new phenomenon in its comparison of Mercer and Tazewell counties. The data indicates that Wal-Mart counties may be pulling business away from other counties. This study also shows that additional Wal-Mart stores may pull retail trade even from those counties that have an existing Wal-Mart store. This is supported by the decreasing number of retail businesses in Tazewell County that occurred from 1999-2001. At the same time, there was an increase in the number of retail businesses located in Mercer County. Nevertheless, this research shows that the overall impact of Wal-Mart operations within southern West Virginia's economy has been positive from 1995-2001. This is due to the relatively good effect that the stores have had on the general economic indicators within the Wal-Mart counties. However, further research needs to be conducted on the total effects that retailer's stores have on the business environment and local communities.

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Table 1**1995 Correlations**

		# of Wal-Mart Stores Located Within the County	Average Annual Wage	Total Wages	Number of Retail Establishments	Total Retail Employment	Population
# of Wal-Mart Stores Located Within the County	Pearson Correlation	1	.534*	.456	.512	.485	.457
	Sig. (2-tailed)		.040	.088	.051	.067	.086
	N	15	15	15	15	15	15

* Correlation is significant at the 0.05 level (2-tailed).

** Correlation is significant at the 0.01 level (2-tailed).

Table 2**1996 Correlations**

		# of Wal-Mart Stores Located Within the County	Average Annual Wage	Total Wages	Number of Retail Establishments	Total Retail Employment	Population
# of Wal-Mart Stores Located Within the County	Pearson Correlation	1	.513	.462	.509	.493	.460
	Sig. (2-tailed)		.051	.083	.053	.062	.084
	N	15	15	15	15	15	15

* Correlation is significant at the 0.05 level (2-tailed).

** Correlation is significant at the 0.01 level (2-tailed).

Table 3**1997 Correlations**

		# of Wal-Mart Stores Located Within the County	Average Annual Wage	Total Wages	Number of Retail Establishments	Total Retail Employment	Population
# of Wal-Mart Stores Located Within the County	Pearson Correlation	1	.492	.470	.515*	.504	.462
	Sig. (2-tailed)		.062	.077	.049	.055	.083
	N	15	15	15	15	15	15

* Correlation is significant at the 0.05 level (2-tailed).

** Correlation is significant at the 0.01 level (2-tailed).

Table 4**1998 Correlations**

		# of Wal-Mart Stores Located Within the County	Average Annual Wage	Total Wages	Number of Retail Establishments	Total Retail Employment	Population
# of Wal-Mart Stores Located Within the County	Pearson Correlation	1	.536*	.727**	.757**	.744**	.734**
	Sig. (2-tailed)		.039	.002	.001	.001	.002
	N	15	15	15	15	15	15

* Correlation is significant at the 0.05 level (2-tailed).

** Correlation is significant at the 0.01 level (2-tailed).

Table 5**1999 Correlations**

		# of Wal-Mart Stores Located Within the County	Average Annual Wage	Total Wages	Number of Retail Establishments	Total Retail Employment	Population
# of Wal-Mart Stores Located Within the County	Pearson Correlation	1	.470	.729**	.755**	.749**	.734**
	Sig. (2-tailed)		.077	.002	.001	.001	.002
	N	15	15	15	15	15	15

** Correlation is significant at the 0.01 level (2-tailed).

* Correlation is significant at the 0.05 level (2-tailed).

Table 6**2000 Correlations**

		# of Wal-Mart Stores Located Within the County	Average Annual Wage	Total Wages	Number of Retail Establishments	Total Retail Employment	Population
# of Wal-Mart Stores Located Within the County	Pearson Correlation	1	.559*	.773**	.801**	.794**	.7828*
	Sig. (2-tailed)		.030	.001	.000	.000	.001
	N	15	15	15	15	15	15

* Correlation is significant at the 0.05 level (2-tailed).

** Correlation is significant at the 0.01 level (2-tailed).

Table 7**2001 Correlations**

		# of Wal-Mart Stores Located Within the County	Average Annual Wage	Total Wages	Number of Retail Establishments	Total Retail Employment
# of Wal-Mart Stores Located Within the County	Pearson Correlation	1	.496	.772**	.803**	.796**
	Sig. (2-tailed)		.060	.001	.000	.000
	N	15	15	15	15	15

**Correlation is significant at the 0.01 level (2-tailed).

*Correlation is significant at the 0.05 level (2-tailed).

Table 8

Summary Table, Percent change in categories for non-Wal-Mart counties between 1995 and 2001

County	Average Annual Wage (%)	Total Wages (%)	Number of Retail Establishments (%)	Total Retail Employment (%)	Total Population (%)
Boone	+22.21	+14.47	-7.63	-6.33	-1.67
McDowell	+20.59	-11.11	-24.58	-29.02	-13.39
Mingo	+25.94	-8.27	-15.82	-27.15	-12.08
Monroe	+10.04	+24.49	-2.00	+13.13	+7.71
Summers	+34.65	+30.66	-1.79	-2.96	-5.41
Wyoming	+19.39	+10.92	-1.69	-7.09	-6.93
TOTAL	+132.82	+61.16	-53.51	-59.42	-31.77
Average (Total/6)	+22.14	+10.19	-8.91	-9.90	-5.30

Table 9

Summary Table, Percent change in categories for Wal-Mart counties between 1995 and 2001

County	Average Annual Wage	Total Wages	Number of Retail Establishments	Total Retail Employment	Total Population
Fayette	+13.34	+11.81	+5.76	-1.34	-2.58
Cabell	+21.85	+18.72	-2.30	-2.56	-1.97
Greenbrier	+19.58	+19.84	-10.83	+22	-2.13
Kanawha	+21.90	+18.85	-3.17	-2.51	-3.39
Logan	+18.08	+33.47	-4.87	+13.04	-8.93
Nicholas	+21.10	+37.72	-6.55	+13.71	-1.86
Raleigh	+25.94	+31.42	+6.42	+4.35	+34
Mercer	+30.04	+31.41	+1.33	+1.06	-2.28
Tazewell	+8.91	+9.54	-10.37	+7.09	-3.85
TOTAL	+180.74	+212.78	-24.58	+33.06	-26.65
Average (Total/9)	+20.08	+23.64	-2.73	+3.67	-2.96

Table 10

Presence and Strength of Correlations 1995-2001

Year	Average Annual Wage	Total Wages	Number of Retail Establishments	Total Retail Employment	Total Population
1995	Yes	No	No	No	No
1996	No	No	No	No	No
1997	No	No	Yes	No	No
1998	Yes	Yes	Yes	Yes	Yes
1999	No	Yes	Yes	Yes	Yes
2000	Yes	Yes	Yes	Yes	Yes
2001	No	Yes	Yes	Yes	Data Not Available

Yes -- means that the correlation is a moderate positive correlation

Yes -- means that the correlation is a strong positive correlation

No -- means there is not a correlation

Table 11**Comparison of Mercer and Tazewell Counties**

County	Average Annual Wage	Total Wages	Number of Retail Establishments	Total Retail Employment	Total Population*
Mercer	+30.04%	+31.41%	+1.33%	+1.06%	-2.28%
Tazewell	+8.91%	+9.54	-10.37%	+7.09%	-3.85%

*2001 population data was unavailable at the time of this research

Table 12**Tazewell County Data 1995-2001**

Year	Number of Wal-Mart Stores	Average Annual Wage	Total Wages	Number of Retail Establishments	Total Retail Employment	Population
1995	1	13,416.00	29,560,089.00	299	4,075	46,244
1996	1	13,520.00	30,547,451.00	296	4,228	45,960
1997	1	14,040.00	31,568,473.00	293	4,213	45,724
1998	1	14,976.00	31,277,307.00	287	4,029	45,433
1999	1	14,456.00	32,918,187.00	280	4,248	44,968
2000	1	14,976.00	32,162,701.00	269	4,182	44,465
2001	1	14,612.00	32,380,886.00	268	4,364	Data N/A

Table 13**Mercer County Data 1995-2001**

Year	Number of Wal-Mart Stores	Average Annual Wage	Total Wages	Number of Retail Establishments	Total Retail Employment	Population
1995	0	11,984.00	63,614,373.00	375	5,308	64,379
1996	0	12,140.00	64,732,111.00	383	5,332	64,170
1997	0	12,748.00	67,718,887.00	382	5,312	63,833
1998	0	13,600.00	74,502,752.00	387	5,478	63,426
1999	0	14,389.00	77,071,267.00	383	5,356	63,181
2000	1	14,698.00	80,387,806.00	387	5,469	62,908
2001	1	15,584.00	83,596,544.00	380	5,364	Data N/A

Appendix I

Comparison of State and Local Retail Sales Taxes

January 2003

State	Food Items [1] Taxable (T) Exempt (E)	State Rate	Maximum Local Rate [2]	Maximum State/Local Rate [2]
Virginia	T**	3.50	1.00	4.50
West Virginia	T	6.00	---	6.00

[1] Food purchased for consumption off-premises.

[2] Highest local rate known to be actually levied by at least one jurisdiction. Includes local taxes for general purposes and those earmarked for specific purposes (e.g. transit). Taxes applying only to specified sales (e.g. lodging or meals) are excluded.

** Food taxed at lower rate.

Source: Compiled by the Federation of Tax Administrators from various sources.

http://www.taxadmin.org/fta/rate/sl_sales.pdf (accessed on May 5, 2003)



**The Marriage of Skyscrapers and Mountaintops:
The Case Study of the Out-of-State Freshman
Black Students at West Virginia State College**

by
Mardis Hall

Introduction:

West Virginia State College (WVSC) was founded as a Land-Grant Institution in 1890. This Historically Black College is one of two in the state of West Virginia, with Bluefield State College being the other. These two institutions now rank number two and one, respectively, in terms of having the lowest percentage of black students enrolled in a Historically Black College and University in America (HBCU). Across the country, “the Blacks are the minority at four of the 106 HBCU’s in the United States and the number of White students at other Black colleges is growing steadily” (White students, 97).

The establishment of what is known today as the Historically Black College and Universities was born out of the federal mandate to provide a public education for the southern states’ citizens. This followed the aftermath of the civil war of the 1860’s. In order for the southern states to maintain their dichotomous racial makeup, a “separate but equal” policy was engineered into the system of public universities. This gave way to the creation of 17 land-grant institutions that were established in 1890. One of those established schools was West Virginia State College (WVSC).

With the 106 HBCU’s in the nation, their focus has thrived on the construction of quality education, while simultaneously giving its predominately black population of students the comfortable atmosphere to matriculate. After the landmark ‘Brown vs. Board of Education’ decision of 1954, WVSC, along with other schools began to experience an ever increasing reversal to its demographic of students, as more white students began to trickle into the schools. “Once there, they [white students] begin to discover what black families have known about for

several decades- that historically black colleges offer a quality education for about half the price of comparable mainstream schools” (Drummond, 155). This is the explanation that administrators of historically black schools readily give as to the rise of white students enrollment. As of current, the pendulum of color has now swung considerably to the white population of students at four HBCU’s. Eighty-six percent of WVSC’s demographic is composed of its Caucasian enrollment, ranking it second behind Bluefield State College and its ninety-two percent profile.

At the predominately black schools where this changing tide of student color has occurred, the widespread notion of “de- facto segregation” has been recognized (D’Souza, 17). One such instance involves the establishment of what is believed to be the only majority white fraternity located at a predominately black college. A chapter of Sigma Pi opened in 1999 at the campus of Tennessee State University, amidst the outrage from students that such action was “taking away our heritage” (Paige, 15). Conversely, there is the widespread phenomenon at predominately white Institutions of so-called “black tables, ... where groups of African-American students insist on eating meals by themselves and regard white students who join them with undisguised antagonism” (D’souza, 60). Both instances create the need to examine the believed progress that was supposed to have been occurring over the past 40 years regarding the seamless restructuring of America’s institutions of higher learning.

There are alumni of these HBCU’s that date their collegiate connections to three, four and five decades. As time passes and less black students are graduating from HBCU’s, their growing belief is that the “heritage and mission of Black schools may be jeopardized if fewer and fewer Blacks attend” (White students, 31). These fears aren’t restricted to just past attendees

of HBCU's. Significant numbers of blacks presently enrolled feel that their collegiate experience is dampened by the presence of a majority white population. As one student remarked: " My mother and grandmother both tell about how great the school [Bluefield] was when it was mostly black" (Roach, 14-15).

Central Objective:

The aim of this research was to focus on a specific black-urban demographic to determine their perceptions regarding race, social assimilations, expectations, etc. at WVSC. The studied sample was taken from inner-city locations. This ethnographic study targeted what these students brought with them in terms of their social perspectives into higher education, and what their expectations were of this school. The term "social" is defined as "of, relating to, or occupied with matters affecting human welfare" (American Heritage Dictionary 2000). The term 'inner-city' is defined as "the usually older, central part of the city, especially characterized by crowded neighborhoods in which low-income, often minority groups predominate" (American Heritage Dictionary 2000). The study was conducted on the impact of what coming from a uniform, homogenous racial climate had on these students within their first formative months in a multiracial college.

Why an Ethnography?

Ethnography is defined as a type of qualitative inquiry in which " the researcher studies an intact cultural group in a natural setting for a prolonged period of time by collecting primarily observational data" (Creswell, 1994).

Using this working definition, I accomplished two important objectives. The first was discovering patterns within the human behavior from this study group. In the case of this study, the behavior being studied was not from a specific people per se, but a specific snapshot of time that all of these students with similar backgrounds experienced. Secondly, I studied the natural settings that are responsible for manifesting this culture. This is vitally important; identifying the atmosphere around the subjects presented supporting credence for why their behaviors exist.

Materials and Methods:

Twenty-four Urban black students from major metropolitan areas, with a first time freshman status were targeted demographic. The primary method of inquiry was to interview a sample of this population, then compare their answers to my observations over the past four years as both a campus-residing student and a Resident Assistant. Additionally, every student that was interviewed lived on campus in the residence halls. This was important for it provides a common base of influence: the social experiences influenced by living on campus. The belief was that these interviews helped to draw lines of understanding as to why, for the most part, the urban black student has had difficulty adjusting to this unique collegiate environment for approximately the last decade or so.

Personal interviews were conducted during the 2nd week of the month of November 2000. By that time, the students had sufficient time to go through at least the rudiments of college in its various social contexts. The research gauged their views on various social aspects of WVSC.

Questions were open-ended in nature, although a list of structured queries was developed to give fluidity to the interview sessions (See Appendix).

Appendix Questions:

The questions were merely used as guidelines to allow the students parameters to expound on their thoughts about the subject matters. Of the twenty-four students interviewed for this study, 17 were male and seven female. Coincidentally, the freshman primarily came from different metropolitan areas along the Eastern seaboard of the US.

As for the observational part of the research methodology, my background gave me a good sense of understanding about the topic frame. I was born and raised in West Philadelphia, served as Resident Assistant for three semesters and have been a student at WVSC for 5 years.

For the sum of my undergraduate life, I have also lived in the campus residence halls, giving me realistic portrayals of patterns among my studied class of subjects. Additionally, living on campus allowed me much easier access to garner accurate and more truthful feedback from my interviews.

Results:

If there was one overriding theme that seemed to permeate through mostly all of the interviews, it was that there was not a sense of excitement of being apart of the student body at WVSC. That began as early as the selection process. Nearly all of those interviewed said that they selected WVSC either because it was the only school that accepted them, or because they had a contact at home; an alumnus, athletic coach or family friend recommended they apply. Not one person claimed to have chosen WVSC out of the want to be apart of something 'exciting.'

Over half of the students interviewed spoke about the "deceptive way" that they were recruited for school. One student said in particular, "When I came here, I was under the impression that this was a *Black* HBCU. That shit is crazy that all the time that they had the open houses and stuff, no administration people mentioned that the school is like almost all white. It's like they want to get people in here and then let them find out and figure it out for themselves once they got your money." Again, the understanding here was that the students were first neglected to be told about the updated history of the college, and secondly were left to make do however best they could with the school population. This alone poses for potential conflict, since approximately more than three quarters of the black freshman from metro areas are living on their own away from home for the first times.

When asked if they would have enrolled elsewhere if they knew in advance about the racial make-up of WVSC, only a few said yes. Most stated how they had to get an education and that State gave them that opportunity. Larry Lott from Jacksonville Fla. was one of those that said he wasn't originally satisfied with the racial composition at what he thought was a mostly Black HBCU. Ironically, Larry has become one of the twenty-something students that form the

resurrected track team. This team includes White West Virginian and Californian males and a Black female from Ohio as well as Black males; a culturally diverse oasis in a school that otherwise showcases rather monotonous racial structuring in its programs.

The natural reaction for most of these students, as it was for most of their predecessors, was to isolate exclusively into familiar groupings and remain in them indefinitely. The freshmen overall sought friendship and connection with other people of color, while maintaining a cordial yet distant and curt relationship with their Caucasian counterparts.

When the topic of interracial dating was posed, the responses were around a level that is a visible norm for the students at WVSC. The black females held almost consensus that they had no serious interest in dating white males in college, and those whom had done so previously did so sparsely. About a third of the males interviewed strongly opposed *openly* dating a white female. The number however, was substantially higher vs. the black females of those who would have other *private* types of sexual relations with white females. Those that answered in the affirmative gave one or both of two reasons for doing so. First, the fear of ridicule coming from openly dating a white female was too much to bear within their social circles. Secondly, they were simply curious of what was to have sex with someone other than a black female. However, there was one interesting side worth noting after the initial interviews were conducted. Landia, a freshman from New York, commented in her audiotape interview that since our first session, her divorced mother had “begun dating interracially herself.” Furthermore, because of this she decided that she was “open to date any race now.” This underscored how the average person, when transplanted from familiar environments, will lean on the learning from immediate family

and friends, however distant they are, for much of the formation of their beginning views and/or biases.

When the question of had these students found it easier or more desired to seek out friendships from black students or white students was presented, the majority of those interviewed really did not answer this head on. Instead, the general response went something like “ It really doesn’t matter, as long as that person treats me with respect.” Yet, some of those same students said that they do look to other blacks because “they can identify with what is to be black.” That seemingly falls in tandem with noted experts in psychology say should be expected when any group is transitioned to a setting that resembles little of what was familiar. Human nature is to first seek out the recognizable, and to then identify with newer, unfamiliar surroundings in varied degree.

The problem that has formed at WVSC is not within this initial period of bonding, but the *continuous way* that these students are left to remain clustered within limiting social parameters. How are they left to do this? The answer might be relatively easy to comprehend. Upon entering college, the leadership elements within the school do little to create synergy between the black urban pupil and their white rural counterpart. Urban Black students are not mentally coached and mentored to by campus leadership at any level that *specifically their situation*: metro-living blacks, with at best limited positive interaction with whites, in a rural Historically Black but predominately white college, that are on top of that... freshman. There are organizations, (Student Support Services, Collegiate Support & Counseling and The Leadership Program) which use students to peer tutor and look to expand the collegiate development of students past basic academics. Yet none of these programs fully deal with achieving a stimulation of intimate

cultural curiosity and appreciation that occurs when students, that were ignorant of each other, are properly groomed to understand their peers of the opposite race.

As for extracurricular activities, “there ain’t nothing to do here” and “I didn’t know they had that here” are two of the most popular phrases that circulate the campus and comparatively, these sessions. Like the majority of student body, the studied freshman group tended to be spectators, analyzers and critics of what is wrong with the campus, and not participators in areas of interest to that student that would deal with creating a solution. This was evident from my observations of the students through the academic years.

The results were too varied for me to establish any connection between the racial demographic of the high schools my students attended and their social adaptability to WVSC.

The black students were split on their judgment of their Black Appalachian counterparts. On one side were those that saw them as not being able to “really identify with what it is to be black.” This group seemed to structure their personal identity of being Black into a cultural guideline for all black people that they encounter in America. Blacks that function outside of this frame to them might be regarded as being “sellouts” or “fake”, regardless of achievements, because they resemble icons of what is associated with the White population. Some of these idiosyncrasies include proper diction, dress and topics of choice for conversation. The other group believed that besides the geographic differences, the Black Appalachian held a lot in common with them. The most common citing was identifying with a sense of struggle to progress despite representing a numerically minor percentage of the population.

All of the interviewed freshmen were paired together with roommates of the same race, as are mostly all of the residents within all of the residence halls at WVSC. Doing so creates subtle undertones of separation by race to be woven into the mindset of the incoming freshmen.

Not a single student answered that they experienced anything more than a casual, cordial acquaintance with the White members of WVSC, or the Appalachian community at large. In school, it seemed that nearly all my male subjects took a defensive stance with their white classes for most of their freshman year. Once more, these actions mirror the way that WVSC doesn't meld its various peoples together. They exist in functional clumps and sections, each grouping for the most part identifying with their idea of West Virginia State College collegiate meaning in a very small and narrowly framed view. The responses that were outside of this norm were all negative. One of the students spoke of introducing himself to a female peer in his class, who was older than he. "The teacher had us mix with the other students on the first day, so when I went to shake this one lady's hand, she was like, kind of [iffy] about it. Then when I was going away, I saw her quickly wipe her hand on her jacket. That got me hot for a minute... like this woman thought I was dirty or somethin'. I just left it at that, and said to [myself] that's her ignorance." That student from Queens, New York went on to say that this was one of the reasons that "he kept away from most of these white people out here." His mind was not offered a specific visual from the WVSC atmosphere to counter his general attitude of contempt for White people, leaving him further hardened by this occurrence.

About four-fifths of those questioned admitted that through time, they had "gotten used to being at State". These statements resembled tones of submission versus the application of effort to adjust positively to a new environment.

Conclusion:

This study found that the absence of one-on-one mentoring from returning students and administration began the creation of a passive freshman class, in particular for the urban-native Black student. Without this, new black collegians have no yardstick to measure themselves by, and would therefore revert back to “truisms” from home about how to deal with the new culture they were in.

It also found that because these students are not presented with the reality of WVSC’s demographics, there is a sense of distrust that forms from the outset when the truth is witnessed. Urban freshman enter expecting a mostly black school, basically a prototype of a Clark-Atlanta University or Morehouse College. When they don’t see that, a shutdown of cultural understanding occurs for the majority, along with a regression to “trustworthy” sources from home of how to operate around, but not with, their white counterparts. As the research evidenced, this leads to a further rift between student and school, causing at the least a momentary blockage of openness for the metropolitan Black in digesting their new environment.

Finally, based on what would seem to be a natural carry over of the Black freshmen who, as a group, had minute intimate social chemistry outside of their race, one would assume that a high percentage of my sample study of students would have reservations about having a white roommate. This however, was not the case. Only three of my students said that they would prefer having someone Black as a living companion. The resounding consensus was that as long as the person respected their personal belongings and space, color was not an issue.

To place the entire blame of student apathy on the school administration is not fair. Alumnus and Alumni chapters, save a handful, are not interwoven with the students, especially those that have graduated within the last 2 decades. I learned through my own observations during my five years that the way Residence Life formats how room assignments are decided plays into the equation. Instead of making a decided move and randomly pre-determining a percentage of students for interracial living, this seems to only happen when an odd number of white and black students are left over after segregated assignments are conducted. Actions like this put into motion the molding for how much of the campus living environment is carried out through the semesters.

In the end, it will always come down to how much that individual student, regardless of color, wants to take on new initiatives. That given, there currently just isn't enough leadership being demonstrated by returning students and salaried employees that creates a sense of desire and passion within the freshmen to intimately embrace this predominately white Historically Black College. Until this happens on a consistent and campus-wide basis, then WVSC's motto of being "A living laboratory of Human Relations" will be nothing more than a sterile experiment in pluralism, not integration.

Appendix

1. Will this three-month stretch of time (late August to Thanksgiving Break) be the longest time for you away from home?
2. Have you ever had interracial dating experiences before coming to college?
3. Did you consider dating interracially when you first came to college?
4. How would your family react if you were to tell them you were dating a person outside your race while in college? (If answer is negative) Knowing this, would you tell them any way?
5. Was the amount of Caucasian students in you high school?
 - a) Many (the majority of students were Caucasian)
 - b) Mixed-numbers (student's race population was about evenly divided)
 - c) Some (numbers of Caucasian students were in the minority but noticeable)
 - d) Few to none (hardly any Caucasian students or none)
6. Were you roomed together with a Caucasian student?

(Yes) Were you opposed to this living arrangement?

(No) Would you have been opposed to this if you had been?
7. How did you come to select West Virginia State College as the school to begin your college career?
8. Did you know that the majority of this Historically Black College's student body is comprised of white students before you accepted enrollment? Would knowing that in advance have changed your mind about enrolling at WVSC?
9. Did you visit WVSC before you came here?

10. (Mostly negative, Mostly positive, or mixed): How would you classify your personal experiences from interacting with the Caucasian individuals that you've encountered while in college:
- a. In the residence hall?
 - b. In the classroom setting?
 - c. From general social meetings (i.e. the mall)?
11. Have you found it easier or more desired to seek out friendships from black students or white students?
12. Do you view the black people from Appalachian WV as being any different from the black people from your hometown?
13. Do you think that you have adapted well to WVSC, particularly the lifestyle of West Virginia?
14. Where do you see yourself in terms of future schooling at WVSC, and why?

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White students outnumber blacks at some of nation's historically black colleges. (2000, February 28). Jet, 97, 31.

**Growth Politics, Environmental Justice and
The Colonias of El Paso**

Rachel Hanna

Growth Politics, Environmental Justice and The Colonias of El Paso

Growth Politics

Growth politics is rooted in the concept of "place.. [as] a market commodity that can produce wealth and power for its owners". Molotch describes growth as the centripetal force uniting elite urban actors and the fundamental purpose of government action. "The growth ethic pervades virtually all aspects of local life, including the political system, the agenda for economic development, and even cultural organizations..."(Logan and Molotch, 1987; 13.).

Molotch's "City as a Growth Machine" depicts a powerful pro-active coalition, a "rentier" class, who maintain a "vision" of the city that is accommodating to their interest and who utilize their considerable influence to realize the collective objective of "value free" growth. Value-free development places confidence in the power of the market to determine land use. According to value-free philosophy, growth provides jobs, broadens the tax base and supports services. This traditional wisdom dictates that local government should do its best to entice investors and increase population (Logan, 1997; 605, Logan and Molotch, 1987; 50-52, 32-33.).

Land interests are of primary concern and take precedence over the needs of others: "...we need developers for revenue and growth....but too often this is done on the backs of the poor" (Elkin, 1987; 46). City politics is preoccupied with providing political access for "elite" land interests, while disregarding public pressures that are in conflict with such policies. The existing "systematic bias" in city government accommodates and privileges the status quo and is portrayed as the "natural order" of things, "above reproach, beyond discussion" (Elkin, 1987; 85).

Elite advantages become institutionalized through practices that limit access to officials, control issues, restrict proposals and set the agenda for discussion in relative secrecy (Elkin, 1987; 4-5). In comparison to portrayals of developers as revenue earning agents of societal good, public service demands on city resources are treated as inconvenient drains on fiscal prosperity (Elkins, 199 ; 586.). Divergent ideas about the direction of city government or alternative blueprints for the community's future are seldom given credence. Disagreements are limited to strategic concerns and terms of success, the ultimate goal, growth,

remaining constant (Logan and Molotch, 1987; 51.).

Growth coalitions are made up of "rentier elites", real estate, business and political entrepreneurs, who are united in purpose, growth, and action, "value free city building", and whose futures are tied to the success or failure of land use decisions (Logan and Molotch, 1987: 87;51-53, 62.). Growth coalitions have an insatiable appetite for development, resist government controls and regulations, have no social concerns and sustain minimal internal dissension (Logan and Molotch, 1987;32-33).

Growth Coalitions and Regimes

Regime theory's focus upon local politics is its fundamental difference from Molotch's growth coalition (Logan et. al., 1997; 607.). Molotch's early conceptualization of the growth machine theme assumes pro-growth interests will eclipse political interests and essentially navigate government action. In comparison, regime theory acknowledges government as "*not only active participants...but mutual partners*" seeking political gain and benefiting from city revenues (Elkin, David; 199 586.). Regime theory recognizes the accountability of government leaders, their efforts to maintain electoral support, and their need to operate with and within coalitions in order to secure economic growth (Kantor, 1997; 348.).

Regimes embody the political environment in which growth coalitions and government operate and conflict. Tensions between market actors, community actors, local economic actors and changes in local politics define the regime (Sites, 1997; 540.). Regimes are catalysts for achieving objectives that are mutually beneficial to both government and business interests (Kantor, 1997; 348.). Regimes are intermediaries between economic prosperity goals of the public and specific development goals of private interests (Stone, 1987; 269.).

Kantor points out the influence of political and business climates, economic policy and "intergovernmental environments" on regime formation and activity. According to this framework, regimes act as "bargaining agents" for "the terms of cooperation between the public and private sectors"(Kantor et. al., 1997; 349.). Political climate is a measure of the degree of voter participation, strength of citizen mobilization and political competition. In cities with mature, progressive "democratic conditions" regimes are inclusive, accountable and dependent upon citizen support of elite initiatives and policy agendas. In less ideal political settings, there is diminished motivation "to promote policy agendas that will generate diffuse public benefits rather than only the distribution of selective rewards" (Kantor et.

al., 1997; 351-52.).

In any political setting, economic pressures and resource scarcity shape the agenda of governing coalitions. The city's position in regional, national and international markets and the strength of its business climate effect the ability to attract and produce capital. The amount of financial assistance available from federal and state sources calibrate the degree of dependency upon private resources and, consequently, the relative "bargaining advantages" of business. The extent of government restriction and regulation of capital movement and land use/development also effect the business climate and determine the leverage of elites (Kantor et. al, 1997; 352-53).

Development

Rosentraub presents an evolutionary theory of urban growth in which growth coalitions act to assure a certain level of growth and, as the public sector involves itself, a regime forms. According to his hypothesis, growth coalitions are formed to carry the community to a plateau of growth with "sufficient economic momentum and mass". Such alliances often develop around a central issue important to all members and give way to regimes with more specific political goals. Regimes are relatively sound and have substantial wherewithal in the form of government resources and connections that enable a sustainable role in policy making. Regimes/coalitions may then spin off still further into temporary, smaller, often ad hoc groupings united in response to common goals or crises. However, these smaller sub-groupings dissolve without a supportive growth coalition or regime in place. When new entrepreneurs and businesses enter the arena, "indigenous" interests may again consolidate around common issues and address "community" problems. (Rosentraub, 1996; 484, 502-504.). Another consideration is "*whether political (regime theory [Elkin]) or economic (growth coalition [Elkin]) actors initiate activity and the degree to which a relatively stable group (regime theory) has a sustained role in decision making as opposed to more episodic grouping of local economic actors to coordinate and sustain economic gain (growth coalition)*"(Rosentraub, 1996; 484.).

Types of Regimes

Elkin identified three types of "political economies"; pluralist, federalist and entrepreneurial. Pluralist regimes (of the 1950's) were primarily concerned with land-use patterns, specifically the economic strength and continued viability of downtown. Pluralist coalitions were inclusive, operating in ethnically and racially mixed cities. Pluralists sought to improve transportation to downtown business districts and increase the diminishing tax

base. In addition, Elkin emphasizes that although land interests were of great importance, bureaucracies maintained "functional autonomy". (Elkin, 1987; 55.).

During the 1960's. in the face of neighborhood protest resulting in federal assistance, federalist regimes recognized minority groups and resident concerns in order to survive politically. (Elkin, 1987;57-60.). Although Democratic leaders promised minorities that federal funding would benefit their communities, in reality inner-city, low-income neighborhoods were displaced, sacrificed for freeway construction and similar modernization in the name of "urban renewal"(Mollenkopf, 1983; 17.). The fragmentation and weakening of party power identifies federalist alliances as more volatile than pluralist associations. In addition, the influx of federal funding during this period resulted in less autonomous bureaucracies. (Elkin, 1987; 59-60.).

Elkin's third type, entrepreneurial regimes, is characteristic of southwestern cities of the postwar period. The operation of entrepreneurial regimes is almost entirely unobstructed. Business leaders, with an eye toward development, may become powerful public officials. Entrepreneurial regimes condition the city's political institutions to accommodate and favor economic growth (Elkin, 1987; 61.). Regimes of this type have little concern with constructing electoral organizations or satisfying constituencies and "subordinate" public officials to business leaders (Stone, 1987;269.).

Although motives may differ, all regimes create and support growth coalitions (Elkin, 1987; 81.). All three types exhibit growth coalition activity, the variable being the amount of power each possess and the relative degree of organization, support and influence anti-growth groups marshal in response. (Logan et. al., 1997; 607.). Molotch, Elkin, Stone, Rosentraub and Kantor assess/measure the balance of private and public interests and the equality of benefit distribution. A continuum of growth coalitions and regimes appears ranging from "growth machines" and "entrepreneurial", "mercantile", "corporate" regimes, business dominated alliances that provide individual benefits to elite actors, to, "pluralist", "dirigiste", "caretaker" regimes, public minded alliances that distribute benefits more equally throughout the community.

Anti-growth groups

According to Stone, regimes reflect a view of the public interest that patterns policy decisions. However, the governing coalition may create an operational definition of the public interest in conflict with the community at large (Stone, 1987; 271.). Public interest conflicts often spark the formation of growth opposition groups. Anti-growth members are usually highly placed and connected socio-economically and, accordingly, capable of constructing formal sustainable opposition (Logan, 1997: 607,613; Marston and Towers, 1991;6.) In contrast, low income residents are more engaged in daily livelihood and without contacts in business and government necessary to effectively oppose growth (Marston and Towers, 1991;6). In addition, poor and minority residents may seek business investments and ally themselves with them in order to bring capital to their neighborhoods (Logan, 1997; 607.).

Molotch defines two "values" of real estate, use and exchange. (Logan and Molotch, 1987;1-2). Regime theory recognizes the conflict between business and neighborhood needs, mirroring the use value exchange conflict (Logan et. al., 1997; 607.). There is a need for contextualization and elaboration on use vs. exchange, business vs. resident conflict apparent in both regime and growth coalition literature. Environmental literature is informative with respect to these conflicts.

The environmental movement seeks to preserve use values at the expense of profit or rents if necessary. (Logan: 1987: 215.). The movement began with efforts to preserve natural areas for recreational and aesthetic purposes. Grassroots groups organize around issues such as water and air pollution, waste facility siting, contamination and work place safety. (Bullard, 1997: 24). As with other anti-growth groups, the mainstream environmental movement is largely white and affluent (Adams, 1992: 26).

It has been argued that minorities were not as involved in the environmental movement because of their indifference to or lack of education about environmental issues. However, minority communities are increasingly involving themselves in an element of the movement labeled environmental justice, which draws upon the methods of the civil rights movement. (Taylor, 1992: 23, Bullard, 1997: 24).

Environmental justice is the equitable distribution of environmental costs and benefits regardless of race, culture and income. This includes the development, implementation and enforcement of environmental laws, regulations, programs, and policies. Specifically, no racial, ethnic or socioeconomic group should *"bear a disproportionate share of the negative environmental consequences resulting from*

the operation of industrial, municipal, and commercial enterprises and from the execution of federal, state and local, and tribal programs and policies".(Rajzer,1998).

Environmental injustice is linked with environmental racism, the belief that environmental hazards are less of a problem when the risks are sustained by poor or minority neighborhoods. Bullard charges that racism is a core determinant in exposure to environmental risks. Minorities face greater environmental challenges because their communities are more likely to be chosen for siting of potentially harmful facilities and to incur substandard air quality and other excess pollutants. (Bullard, 1997: 17.)

Bullard identifies three elements of environmental equity: procedural, geographic and social. Procedural equity is composed of rules, regulation and evaluation criteria. Examples of procedural inequity are pro-business interests dominating decision making bodies, hearings located in remote area to minimize public participation, and "*using English-only material to communicate to non-English speaking communities*".(Bullard, 1993.).

Geographical inequity is typified by communities which receive jobs and tax revenues, from industrial production (benefits) while costs, waste disposal for example, are sent elsewhere. "*Communities hosting waste-disposal facilities receive fewer economic benefits than communities generating the waste*". (Bullard, 1993.).

Social inequity is exhibited in decisions which reflect the power structure including an "ever present" racial bias in the United States. "*Institutional racism has influenced the siting of noxious facilities and has let many black communities become "sacrifice zones.*(Bullard, 1993.).

Pockets of environmental injustice exist in polluted, dilapidated areas of the city. Strikingly, seventy-five percent of toxic waste dumps are found in either African American or Hispanic communities. (Adams, 1992; 25). Even when income and home value are constant, race is the best predictor of hazardous facility siting location (Mahai and Bunyan, 1992: 7.). The "dirtiest zip codes", using determinates such as air, water and infrastructure quality, are usually those of Hispanic and African-American neighborhoods (Bullard, 1997: 17).

Logan suggests that the social cleavages resulting from development should be addressed. Logan further recommends elaboration on the consequences of pro-growth regime domination of cities, "*the distortion of development in the national urban system and the displacement of competing agendas*".

Specifically, *"the intensification of inequalities within cities and the preemption of political space by privileged minorities"*, *"deeper gaps between rich and poor neighborhoods"*, *"intense racial segregation"*, *"disparities in police and fire protection between residential and commercial districts"*, and *"local support for social welfare expenditures relative to infrastructure investment"* *"may turn out to be the most important consequences of the growth machine"*. (Logan, 1997; 626.).

Colonias of El Paso

The social cleavages resulting from development and as products of regime activity are exemplified by the colonias of El Paso. Colonias are underserved "shantytowns" populated by "underemployed, undereducated" Hispanics. These isolated impoverished neighborhoods are often referred to as "rural slums". Colonia subdivisions are located on forsaken agricultural land that lacks traditional infrastructure such as water and sewer service, proper roads and fire and police protection. (Towers, 1997:1) The living conditions in colonias, although presently improving, are essentially substandard (Martinez, Libby, Legislative Aide to Senator Shapleigh, interview, 9/11/1997; State of Texas, 1996: 3.).

Towers points to developers, city and county government and local utilities as entities responsible for the growth of colonias. Towers suggests that these categories often overlap effecting colonia residents, producing extra expense for city taxpayers, and resulting in consequences for the city as a whole (Towers, 1997: 13.) . Using this hypothesis, I will first examine the growth coalition in El Paso, it's members, philosophy, practices, goals and opposition. Second, I will consider the consequences of the growth machine, specifically El Paso's present position in the marketplace and the negative impacts of development which include environmental threats. Next, attention will be given to the current challenge to the regime that has appeared in the form of a strong antigrowth entrepreneur. Finally, I will reflect upon elite advantages, systematic bias and environmental racism in the context of the colonias.

Members

Developers

Colonia developers are typically owners, farmers and speculators of large tracts of agricultural

land outside the city limits who adapt property to residential use. Colonia developers make considerable profits while incurring only the minor expenses of surveying tracts and mucking out dirt roads. (Towers, 1997: 13&14; Martinez, interview, 9/11/97.) Lots are typically sold for as little as forty dollars down and forty dollars a month to buyers who may or may not be aware of the unlikelyhood that services will be extended to their neighborhood. Residents often pay developers extraordinary rates of interest in "contract for deed" arrangements and do not retain any equity in their homes regardless of improvements made. In addition, developers have created a "paper economy" where contracts for deed are sold and traded without the consent of lot residents. (Edmondson, Office of the Mayor, El Paso, TX, interview: 10/15/97; Martinez, interview, 9/11/97.). This relationship is comparable to "indentured servanthip" or a "company store" arrangement.(Earle, interview: 10/15/1997).

The practices of El Paso colonia developers are notorious. " *El Paso developers are worse than any other...colonias developers in the border cities*" (Trujillo, EPISO volunteer, interview, 9/05/1997.) "Some colonias developers were cold hearted and sold papers and walked away with the cash" (Edmonson, interview: 10/15/1997).

City and county government

Many colonias are located in El Paso's extra-territorial district, ETJ, a five mile expanse outside the city limits over which the city government has some control. The city is mainly concerned with lot dimensions and roads, elements necessary for orderly growth and ease of annexation. During the 1970s and 1980s the city failed to enforce zoning regulations that would have limited illegal growth in the ETJ. The filing of plats and lot size limitations were the only requirements the city saw fit to place on developers during this period. Although such provisions required public street access, space for sewer lines and adequate drainage, the ordinances did nothing to prevent the sell of parcels that lacked public water and sewer. (Towers, 1997: 16-17.).

During the 1980s, the city planning commission refused to use its powers to prevent ETJ subdivisions that lacked water or sewer claiming that the regulation of health and water provision were county obligations. Although El Paso county has jurisdiction over land outside the ETJ, it like all Texas

counties, has no zoning powers. Despite county passage of various ordinances meant to address the colonia problem, enforcement of such measures was inconsistent. (Towers, 1997:19) "*The verdict on development dominated policy is that they didn't initially control it. Elements in the business sector didn't want water and sewer, no extension.. onto their properties.*" (Edmonson, interview: 10/15/1997.)

Utilities

During the 1980's The El Paso Public Service Board, the primary water supplier in the county, refused to provide water to the colonias. Members of The Public Service Board include the mayor and are appointed by him. During the eighties three of five PSB members, including the board's chairman, were developers who had speculative interests in colonia properties (Towers, 1997: 30-33) . The PSB's position now is much the same as it was then: water service should solely benefit city taxpayers. "*Our main goal since we are a city department is not to incur any costs to the inside city rate payers.*" (Ramzi Skaffi, Public Service Board, interview: 10/22/97.).

The Public Service Board then and now bases decisions regarding water service extension on annexation possibilities and plans for "orderly development" "*We don't allow leap frog development.. we need to jump ahead and annex some areas because we don't want to see colonias development... inherited by the city.*" The agency also points to the need to conserve water throughout the region as an additional rationale for limiting service.(Ramzi Skaffi, PSB, interview: 10/22/97). Towers asserts that such policies do nothing to prevent colonia development and in fact, hinder standard growth (Towers: 1997,33).

Philosophy

Developers

Colonia developers subscribe to the free market philosophy of growth. Flip Lyle, colonias developer, remarks "*This is an economic and affordable housing issue.. colonias ...are the least expensive alternative*". Developers believe that they are providing property to those who can not afford traditionally serviced housing and would otherwise live in even less desirable circumstances. "*I've always felt like a piece of property without adequate utilities is one better than living in barrios, slums...obviously the people*

who buy the property without adequate subdivision infrastructure, they think that too." In addition, requiring developers to provide infrastructure would increase the cost of lots and price residents out of the market. " *There is no place for this buyer to go..to buy a piece of America, to improve his lot or situation in life. What's he going to do?*"(Flip Lyle, colonias developer, interview: 9/17/97.)

In the eyes of developers colonias are a win-win situation. Residents advance a "*rung on the economic ladder*", developers profit from otherwise useless land, city government collects taxes from lots at a higher rate than they otherwise would if the property were classified as undeveloped or agricultural land, and state and federal government does not incur the costs of construction and subsidization of public housing that is not cost effective. (Flip Lyle, interview: 9/17/97.).

Government and Public Utilities

During the 1970's and 1980's El Paso government was reluctant to interject itself into the colonia trade. Laissez faire philosophy is still present in the mindset of some government officials. "*[of developers] I don't really have a problem philosophically in what they're doing. Their intent is to sell it [land] to people that can afford \$30 down and \$30 a month. [Developers are] people that want to make money and I don't think its so much exploiting Hispanics...as it is just the way of doing business..They [developers] have the American dream also, to live in a great big house paid for buy lots of little people's money.*" (Dan Haggerty, County Commissioner, El Paso, TX., interview: 8/27/1997.).

Policy, or the lack of policy, is symptomatic of indifference to problems seen then and now as historically present, unsolvable and inevitably advancing. Dan Haggerty, El Paso county commissioner, says of colonia conditions "*That's the way we've been doing it for a hundred years here in El Paso.*" "*It is a vicious cycle that goes around and around. The more services we provide them..that only encourages them.*" "*And the more quality of life issues that are addressed and satisfied the more people we get to come in. There will always be the pathetically struggling and starving....it's a tolerable but a hopeless situation*" (Dan Haggerty, interview: 8/27/1997.).

Description of regime

Nineteen eighties El Paso is representative of an entrepreneurial regime. Developers, utilities, and government were acting as a coalition whose goals and philosophy were in sync. Land interests were paramount and developers membered agencies with decision making powers that effected their properties. Politicians were under little or no obligation to concern themselves with constituencies or the construction of electoral support outside the land use arena. Although opposition existed during this time period, specifically EPISO, a religious group opposed to colonia growth, no group marshaled enough support or power to impede the operations of the alliance.

By definition, entrepreneurial regimes foster economic prosperity for the city in which they operate (Elkin, 1987: 61.). The activities of El Paso's coalition have resulted in just the opposite. Growth in El Paso is defined by immigration and labor-intensive industry. A booming population of young, unskilled, undereducated immigrants are attracted to the city's labor-intensive, low paying job market. The Governor's office reports a population increase of 61023% from 1980 to 1997. El Paso's per capita income is \$14,420, 36.5% below the national average (Office of the Governor: 1997.) In addition, poverty rates are twice the national average (Simcox, 1995: 82.).

Population booms and the demolition of low income housing in the city have created a shortage of affordable housing for workers and a demand for cheaply constructed colonias type dwellings free from the urban expenses of taxes and zoning restrictions (Bette and Shettje, 1994: 68.). Racial discrimination plays a role in the housing crisis as well. "Dark skinned Mexican-Americans" have a 96% chance of being discriminated against, given false information about rental unit availability or total refusal of services, and their "light skinned" counterparts a 65% chance of receiving the same treatment. Moreover, Hispanics are twice as likely as whites to live in "inadequate or overcrowded" houses even when incomes are equal (Lopez, 1995: 51-52.).

Colonias are ethnic enclaves produced as a result of housing discrimination, the border's housing crisis and governmental indifference. Colonias have become a reservoir of cheap labor, primarily unskilled, female and non-union. Eighty seven percent of working colonias residents are employed in low wage manufacturing, agriculture, and services (Towers, 1997: 75, 78.).

Colonias El Paso Top Five Occupations

1. *Field Work* 41.5%

2. *Construction* 21.2%

3. *Factory Work* 17.3%

4. *Janitor/Maid* 13.4%

5. *Retail/Sales* 4.5%

Source: Carlos Carbo Interview

On average, low wage earners demand more social services from state and federal agencies and strain public assistance programs at a rate of 10% of households (Simcox 1995: 80-81). In addition, colonias residents are particularly at risk for unemployment, inadequate medical care, substandard housing, and hunger (Carbo, interview, 8/30/1997.).

Percentage of households currently receiving DHS services: El Paso Colonias

Food stamps 20.0

AFDC 4.3

Medicaid 10.4

HEAP 6.7

Source: Carlos Carbo

Colonias Residents at Risk

*65 % of colonia residents have no health insurance.
67% of those over 18 did not complete high school.*

*Unemployment is 41% among those over 16 who are not in school.
26% of households report inadequate heating.
44% report that flooding is a problem in their colonia.
15% of households report they do not usually have enough to eat. One third of those who report not enough
to eat do not receive food aid of any type.*

Source: Carlos Carbo

Simcox has described the situation in El Paso as a "treadmill". The combination of a low tax base and a growing population in need of public assistance have resulted in a net decline for El Paso. The labor force is comprised of immigrants and youth, primarily unskilled, female and non-union, who have little opportunity for advancement. Economically, the presence of cheap labor attracts labor intensive industries "dampening the hopes of attracting higher value-added industries" (Simcox, 1995, 83.).

In addition, unregulated patchwork infrastructure and cross-subsidizing of services has cost the city ten times more than customary, planned growth would have (Edmondson, 10/22/1997.). Politically, perpetuation of distributional inequalities continues to exacerbate the housing crisis and sustained social negligence places colonias residents at risk further taxing social services and necessitating additional administrative personnel (Simcox, 1995, 82).

Environmental Threat

El Paso government's "benign neglect" of colonias living conditions has fostered environmental hazards that affect the city's entire population (Towers, 1997). Water is hauled in containers discarded after industrial use and make-shift septic systems are located dangerously close to wells. Consequently, there are substantial health risks in the colonias which carry over to the population at large. Tuberculosis, shigellosis and salmonella, diseases usually confined to the third world, are occurring in El Paso county at rates from three to five times the national average (State of Texas, 1996; Towers, 1997).

The environmental impacts of regime activities have provided a catalyst for anti-growth groups to gain a foothold in an otherwise indifferent political setting. The broader appeal of environmentalism combined with collective health threats have undoubtedly bolstered anti-colonia growth opposition. The Texas governor's office describes colonias as "*illegal subdivisions where the living conditions create a*

public health hazard:" The attorney general's office claims "not only are colonia residents affected [emphasis added] *by the unsanitary conditions in illegal subdivisions, but all Texans, as well as many Americans in other states, would potentially be affected if a Third World epidemic spread to other cities.*" (Morales, April,1995.). Correspondingly, the media's newfound attention to colonia's activity is evidence of "mainstream" concern (Martinez, interview, 09/11/1997.). Speaking of the media, an EPISO, activist states: "*If we call them, they cover whatever is done*"(Trujillo, interview, 9/05/1997).

Challenge to the regime

Rapid population growth, recent environmental threat and a strong antigrowth entrepreneur are important elements that allow growth opposition groups to challenge the regime (Logan, 1997: 615-16.). According to the mayor's office, EPISO has "taken the lead" in the colonias struggle (Edmonson, interview: 10/15/1997.). EPISO has become a strong anti-growth entrepreneur and may have set the stage to alter the balance of power.

Their accomplishments include successful lobbying for House Bill 1001. Although the legislation has been described as somewhat "flawed", containing some "loopholes" and in need of "tightening", it essentially makes colonia type subdivisions illegal and effectively penalizes unlawful developers. In addition, EPISO has been instrumental in securing millions of dollars in funding for colonia improvement projects, the extension of water and sewer lines and expansion of other services such as transportation. Although "*very bad conditions*" persist in "*the newer colonias*" there is an overall pattern of improvement in living conditions. "*We have come a long way*". (Trujillo, interview: 9/05/1997.).

There is also a fundamental change in the political climate in El Paso. During the 1980s the El Paso Public Service board "*wouldn't even listen to the people*". A past chairman "*told a national magazine that they could bring us [colonia residents] water but that they could not make us bathe. But shortly after that he wasn't there anymore... things have changed.. We have been able to turn the board, we have worked with the mayor and chairman of the board because they're the ones that make recommendations as to who they are going to appoint, because the board is appointed and approved by city council. And we've been able to interview all the candidates and we make recommendations. .. And we've been able to keep*

developers form being members of that board."(Trujillo, interview: 9/05/1997).

EPISO has been vehement in their demands of the County Commissioners Office as well. *"They were all down here two weeks ago, yelling and screaming and jumping up and down.. demanding that they be on our water system now... they come in here and threaten us... We're gonna get you in the next election and they believe in the Sal Alinsky theory and woo a scary group sometimes.. everything is very scary"* (Haggerty, interview: 8/27/1997). In addition, EPISO describes their present relationship with county planners as "very good" and "cooperative"(Trujillo, interview: 9/05/1997).

Conclusion

The systematic bias of El Paso's growth coalition is being challenged. Clearly opposition groups have greater access to and more influence over government action than in the 1980s. In addition, because of strong antigrowth entrepreneur EPISO and in part increased media attention, there is greater accountability within the regime. Mrs. Trujillo, EPISO activist, asserts: *"We've been able to make the water companies accountable for what they are doing and we will continue"* (Trujillo, interview: 9/05/1997).

However, elite advantages are largely in tact as evidenced by significant campaign contributions by developers and their ability to form *"ad hoc associations and lobby in Austin"* (Edmonson, interview: 10/15/1997.). One government official states: *" Developers do have money, and do have opportunity to lobby in Austin to make sure these laws do not go through...by lobbying I mean they give us money or something either over or under the table"*.(Haggerty, interview: 8/27/1997.).

Most importantly, environmental racism still exists in El Paso government. In the words of County Commissioner Dan Haggerty: *" ..These people have become an eye sore for our society whereas it is acceptable in probably the third world to live the way they live.. You gotta get away from the idea that everybody wants what we have because they don't. They don't see the value in those things you take for granted and that you interpret as the American dream. It's not what they're thinking. They don't dream the same things..They don't put emphasis on things like the white picket fence and the grassy yard with rose bushes and flowers."*(Haggerty, interview: 8/27/1997.). However, Commissioner Haggerty expresses nervousness about using terminology, such as "Mexican" that may be seen as "not politically correct".

Although progress is being made, it should be noted that there is a difference between reforms that serve only as symbolic gestures with limited efficacy and those "*however, flawed or short-lived aggressively pursue social equity, community participation and democratic accountability*"(Logan, 1997: 551.)

This paper has addressed Logan's recommendation for elaboration on "*the intensification of inequalities within cities and the preemption of political space by privileged minorities*" (Logan, 1997: 626.). This paper has shown that the environmental impacts of regime activity, the environmental justice movement and environmental racism are missing links in growth literature's consideration of tensions between business and residents and use versus exchange conflicts. In addition, the negative consequences of the growth machine, often unintended and/or unplanned, which affect market position and the ability to attract and produce capital were addressed. In closing, when considering growth politics it is important to examine the type and pattern of growth created and supported by the regime and the possible negative repercussions of that growth including environmental impacts and distributional inequalities.

"The growth ethic pervades virtually all aspects of local life, including the political system, the agenda for economic development, and even cultural organizations..."(Logan and Molotch, 1987; 13.).

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That's the way we've been doing it for a hundred years here in El Paso." "It is a vicious cycle that goes around and around. The more services we provide them..that only encourages them." "And the more quality of life issues that are addressed and satisfied the more people we get to come in. There will always be the pathetically struggling and starving....it's a tolerable but a hopeless situation " (Dan Haggerty, County Commissioner, interview: 8/27/1997.).

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**MONITORING AVIAN PRODUCTIVITY AND SURVIVORSHIP
IN NEW RIVER GORGE NATIONAL RIVER, WEST VIRGINIA**

McNair Scholars Program

Amanda K. Hayes and Ronald A. Canterbury

25 April 2000

ABSTRACT

We report on a four year project investigating determinants of population demographics of birds in a riparian landscape in southern West Virginia. We used the continent-wide standard Monitoring Avian Productivity and Survivorship (MAPS) protocol to assess parameters, such as relative density and survivorship. We also measured species richness and vegetative structure, which are indicative of community structure and ecosystem viability. Collectively, these parameters are believed to be poorly understood in avian conservation and represent a missing link in songbird conservation. All of these parameters are important components of habitat and wildlife management plans. We captured 398 birds in 1996, 395 in 1997, 323 birds in 1998, and 328 birds in 1999. The total of 1,442 birds represented 62 species, but as many as 94 species were noted by standard avian point counts. We captured significant numbers of Carolina Wrens, Blue-gray gnatcatchers, American Robins, Gray Catbirds, Red-eyed Vireos, Yellow Warblers, American Redstarts, Yellow-breasted Chats, Northern Cardinals, Indigo Buntings, and Song Sparrows. The number of species tagged per year estimates species richness and did not vary across the four years of the study (Kruskal-Wallis test, $\chi^2 = 3.0$, $p > 0.39$). The number of birds captured per species varied with body size (ANCOVA: mass, $F = 17.3$, $p < 0.0001$; wing, $F = 33.1$, $p < 0.0001$), as well as date ($F = 8.73$, $p < 0.003$). However, the number of birds captured did not vary with age ($F = 0.19$, $p > 0.942$), sex ($F = 0.94$, $p > 0.392$) or fat ($F = 0.64$, $p > 0.698$). The number of individuals captured and species richness were usually not related to vegetation structure (e.g. canopy height of the most abundant habitat type, namely broadleaf forest), but there was a significant negative association between height of the second most abundant habitat (shrubland vegetative strata) and total number of captures per season ($r = -0.95$, $p < 0.05$). The number of recaptures during each year of the study ranged from 56-69. In 1999, we recaptured 3 birds banded in 1996, 7 in 1997, 17 banded in 1998. Population trends, productivity, survivorship, and recruitment will be computed for these target species in the fifth year of the study. Predictive trends for five species, however, are discussed in the paper. The project was funded by the New River Gorge National River (NERI) of the National Park Service, and the McNair Scholars Program of Concord College.

INTRODUCTION

Background

Numerous studies have strongly indicated that populations of many species of migratory birds in North America are declining. This has generated vigorous research on population dynamics among different species and determining the factors underlying these declines (Askins et al. 1990, Greenberg 1992, Hagan and Johnston 1992, Rappole 1995, Sauer et al. 1996). These studies are useful in providing population status or assessments for various species, monitoring relationships between population status and ecological and demographic patterns, and for identifying future directions

and conservation goals. Several approaches have been employed, which include breeding bird surveys (BBS), point counts of breeding populations, mist-netting of birds at migration stopovers, Christmas bird counts (CBCs), and studies of banded birds on both wintering and breeding grounds.

A relatively recent and robust protocol for assessing causes and consequences of avian species decline is the Monitoring Avian Productivity and Survivorship (MAPS) Program. MAPS is a continent-wide, constant-effort mist netting research project that started in 1989. The MAPS program provides long-term demographic data on landbirds and is sponsored by the Institute for Bird Populations, IBP (see DeSante et al. 1996). MAPS was initiated to help halt the decline of neotropical migrant landbirds and has obtained a reputable status as a robust conservation effort. MAPS has also been endorsed by the Bird Banding Laboratory (BBL) and the Monitoring Working Group of the Neotropical Migratory Bird Conservation Initiative, "Partners in Flight" (PIF). MAPS has grown to nearly 500 stations and the National Park Service (NPS) has been a major contributor to the program. Other federal agencies such as the USDA, BBL, Forest Service, and Department of Defense have supported MAPS projects across the country. This is because MAPS provides a feature not inherent in population-trend studies, such as point counts, the BBS, and CBCs. Specifically, MAPS provides demographic data such as productivity, survivorship, immigration, and emigration estimates. These latter four parameters shed information as to what stage(s) in the life cycle control(s) the population declines.

Objectives and Goals

DeSante et al. (1993a, b, 1995, 1996) describe the primary goals of the MAPS program. The objectives of MAPS are to provide **long-term** population and demographic data on target landbird species at various spatial scales by providing: (1) annual indices and long-term trends in adult population size and postfledging productivity from analyses of numbers and proportions of adult and young birds captured during the breeding season; and (2) annual estimates and long-term trends of adult survivorship, adult population size, and recruitment into the adult population from analyses of mark-recapture data. According to DeSante et al. (1996) these indices and estimates can be used to: (1) aid in identifying the proximate causes of population changes in the target species; (2) aid in identifying conservation and management actions to reverse the population trends of declining species, and (3) aid in evaluating the effectiveness of the conservation and management strategies implemented.

Objectives and goals of the Sandstone Falls MAPS station are: (1) to provide a baseline dataset on breeding bird population trends in a riparian habitat, (2) to estimate productivity of resident and neotropical migrant species, and (3) to assess recruitment and survivorship of breeding bird populations in a riparian habitat. All these objectives fit within the objectives of the continent-wide MAPS program, and provide landowners with background data necessary for management of important bird areas.

METHODS

The design and implementation of the Sandstone Falls MAPS station followed the standard MAPS protocol (DeSante et al. 1993a, b). The methods are similar to those recommended by Ralph et al. (1993). The study site is described in Canterbury et al. (1993). We ran ten mist nets typically from 0600-1200 h. Typical black, nylon, 12-m, 30-mm mesh nets were used and net localities were kept constant after the first year of the study. Data were collected once every ten days, which were kept constant during the study (May 21, 31, June 10, 20, 30, July 10, 20, and 30), except during the first year of the study when the MAPS protocol included data collection in August.

Each bird captured was marked with a uniquely-numbered aluminum leg band from the BBL. Band number, captive status (new or recapture), age and sex, aging and sexing criteria (extents of skull pneumatization, cloacal protuberance, brood patch, body and flight feather molt, primary feather wear, and juvenile plumage), date, time, and net number were recorded for each bird. Banding, identifying, aging, and sexing birds followed from standard protocols (e.g., see Pyle et al. 1987, Curson et al. 1994, Byers et al. 1995). Birds were assigned a status code (breeder, transient, non-breeder, and migrant) based on banding data and published literature (Hall 1983).

Net operation times (time of opening and closing net lanes) were used to standardize capture data. Vegetation analyses were performed by forestry and park personnel and followed from standard MAPS design and published protocols. Variables measured included percent primary habitat (dominant vegetation type at the study site) and percent secondary habitat (second most prevalent habitat at the study site). In addition, we measured plant height or vegetative stratification height, which included canopy, subcanopy, and shrub height, and percent and type of ground cover. Plants were identified to species (Strausbaugh and Core 1964) and classified as percent cover of broadleaf, coniferous, or both types present in each habitat type (primary and secondary). Annual reports were submitted to IBP in 1996-1998 and are on file at the NERI.

Banding and assistance with operation of the station were provided by Billie Jean Crigger, Geoff Elliott, Ann McRae, Jim Meyer, Janet Meyer, Dollie Stover, Robert Sullivan, Allen Waldron, and Mindy Waldron. Data were managed in SPSS and graphed using SigmaPlot and SPSS. Data were analyzed with analysis of covariance (ANCOVA), linear regression, Kruskal-Wallis test, and Pearson-product moment correlation. ANCOVA and linear regression analysis were used to predict variation in the number of captures due to date, body mass, age, sex, wing, and body fat. The Kruskal-Wallis test was used to test whether species richness changed across years.

RESULTS

Table 1 provides a summary of captures per year. The second year of operation produced the highest capture ratio per 100 net hours and the highest number of species. We captured 398 birds in 1996, 395 in 1997, 323 in 1998, and 328 birds in

1999 (Table 1). The number of species captured per year estimates species richness and did not vary across the four years of the study (Kruskal-Wallis test, $\chi^2 = 3.0$, $p > 0.39$). The number of birds captured per species varied with body size (ANCOVA: mass, $F = 17.3$, $p < 0.0001$; wing, $F = 33.1$, $p < 0.0001$), as well as date ($F = 8.73$, $p < 0.003$). However, the number of birds captured did not vary with age ($F = 0.19$, $p > 0.942$), sex ($F = 0.94$, $p > 0.392$) or fat ($F = 0.64$, $p > 0.698$). Multiple regression analysis showed similar results ($R^2 = 0.04$, $p < 0.0001$), where mass, wing, and date were significant predictors of captures ($p \leq 0.001$) and age, sex, and fat were unrelated to the number of captures ($p \geq 0.250$). Figure 1 shows the mean number captured for the 10 most abundant species, while Figure 2 displays how mass varies with age in the Gray Catbird.

The number of individuals captured and species richness were generally not related to vegetation structure ($r \leq -0.67$, $p > 0.05$), but there was a significant negative association between percent secondary vegetative strata and total number of captures per season ($r = -0.95$, $p < 0.05$). The number of captures is dependent upon weather and net hours (Stover et al. in press).

Many canopy species, such as the Cerulean and Yellow-throated warblers breed in the area, but were not captured. We captured individuals of 62 species during the four year study (Table 2). The species richness computed from point counts and singing male censuses disclosed about 94 species per year, which included 80 species of breeders (Stover et al. 1999). Some individuals were recaptured repeatedly. For example, a female Northern Cardinal (band number 0951-57330), a White-eyed Vireo (band number 1760-55305), and a Common Yellowthroat (band number 2070-16696) were recaptured on 5 of the 8 banding days in 1997, and similar trends were noted in subsequent years (Table 3). Twenty birds banded in 1996 were recaptured in 1997, while 11 birds banded in 1997 were recaptured in 1998 (Table 3). More importantly, however, 10 birds banded in 1996 were recaptured in 1998. In 1999, we recaptured 3 birds banded in 1996, 7 in 1997, 17 banded in 1998.

Significant number of Carolina Wrens, Blue-gray Gnatcatcher, American Robin, Gray Catbird, Cedar Waxwing, Red-eyed Vireo, Yellow Warbler, American Redstart, Yellow-breasted Chat, Northern Cardinal, Indigo Bunting, Song Sparrow, and American Goldfinch were captured in high enough numbers to warrant estimation of population size, recruitment, and survivorship. This will start in year five of the project and it is likely that additional target species can be added to the list. A sample of trends is shown for five focal species in Figure 3.

DISCUSSION

The total number of birds captured per 100 net h is exceedingly high when compared to 236 stations in North America (see DeSante et al. 1996). For example, only 24 of the 236 stations had a higher capture ratio. This is biased by yearly variation and habitat differences, but at least signifies that the riparian habitat of Sandstone Falls is an important area for breeding birds in West Virginia. The 62

species captured during the study is also higher than diversity noted at many other stations in the Northeast. We will be able to assess recruitment and survivorship in its fifth year of operation, because of substantial recaptures of some target species. Target species include neotropical migrants such as Gray Catbird, Red-eyed Vireo, and American Redstart, as well as resident species such as the Carolina Wren (Stover et al. in press).

A few species (e.g., Carolina Wren and American Goldfinch) were either captured in about equal numbers or increased in number (e.g., Song Sparrow) during the four years of the study, but others declined in capture ratio, e.g., Gray Catbird and American Redstart (Table 2, Figure 3). Declines in number of captures in these latter two species, for example, are probably due to different factors. For example, we believe we caught less Gray Catbirds in 1999 than 1996 because a snowfall decreased the amount of brushy cover used for foraging and hiding, and this species probably learns the positioning of net lanes. It must be pointed out that net lanes cannot be changed according to the standard MAPS protocol.

The American Redstart has declined in wintering areas, too (Faaborg and Arendt 1992). These data may suggest that resident species, such as the Carolina Wren and Song Sparrow, are maintaining relatively stable populations compared to the long-distance neotropical migrant songbirds, i.e., Gray Catbird and American Redstart. It is logical to question whether tropical deforestation, factors related to migration, problems associated with the breeding ground, or some combination of all of these are causing these fluctuations in populations of neotropical migrants (see Sherry and Holmes 1993, Rappole and McDonald 1994). Researchers have often argued whether tropical deforestation or habitat loss on the breeding grounds is the most important causal factor of songbird decline. It is difficult, however, to believe these changes are due entirely or mostly to tropical deforestation, since evidence suggests that weather-induced habitat changes on the breeding ground may play a crucial role. This is supported by additional data: First, the Red-eyed Vireo, a neotropical migrant with the most widespread breeding range, fluctuated in numbers in the present study (i.e., down one year and up the next). One would expect a declining trend like that of other neotropical migrants in our study (e.g., Gray Catbird, Yellow Warbler, American Redstart), unless the Red-eyed Vireo winters in areas where tropical deforestation is limited. Data indicate that the Red-eyed Vireo is increasing throughout much of its breeding range (DeSante et al. 1998, Sauer et al. 1999), and the species winters from Northern Venezuela to the Amazon basin (Peterson 1980), where tropical deforestation is limited (Sherry and Holmes 1993). Second, the Northern Cardinal, another shrub guild, berry-eating bird, showed a similar trend to that of the Gray Catbird (see Table 2). Third, some neotropical migrants that winter in areas devastated by tropical deforestation are possibly increasing in number in the Northeast, e.g., Yellow Warbler - 30% increase from 1995-1996 (DeSante et al. 1998).

Because many factors such as area covered during migration and food supply are involved in regulating population numbers, additional studies are needed before we can safely predict causal factors of avian decline. Mixed data on trend analyses also

compound the problem. Table 4, for example, shows variation in trend estimates for some of the focal species of this study. Clearly, mixed assumptions and interpretations can be drawn from this table during comparison with the present study. Therefore, the decrease in number of captures of some species in the present study is believed to be due to (1) colder, wet spring weather in 1996 and 1999, (2) a heavy snowfall in January 1997 that changed the landscape by reducing the number of shrubs and plants (e.g., multiflora rose and red cedar) that produce berries eaten by many species (note in Table 2 that berry-eating birds declined, e.g., Gray Catbird and Northern Cardinal), and (3) birds learning net lanes. The Northern Cardinal is probably relatively long lived compared to some neotropical migrants and smaller species and may experience slower recruitment rates. We did, however, recapture five Northern Cardinals that were marked in 1996 or 1997, but this species probably experiences high winter mortality due to starvation and predation by *Accipiter* spp. Decline in the capture of Indigo Buntings (see Table 2) can probably be explained by the fact that they occurred in low numbers in 1998 in the area and throughout the Northeast (Canterbury unpubl. data). For example, we found the same trend at our Northeast Ohio MAPS station (Fowler et al. unpubl. data).

It will be interesting to compare recapture data and recruitment on resident species such as the Northern Cardinal and Carolina Wren with long-distance neotropical migrants, such as the Gray Catbird (8 recaptures, see Table 3), Red-eyed Vireo (4 recaptures), and the American Redstart (7 recaptures). Species-specific trends must be interpreted in future analyses. For example, the Common Yellowthroat had a good year in 1997 (12 captures) but were in low numbers in 1996 and 1998 (see Table 2). These trends may be due to weather, where cold spring weather causes birds to breed farther south than during normal springs. This may explain why some neotropical migrants were high in numbers during 1997, e.g., Red-eyed Vireo, Ovenbird, Common Yellowthroat, and Indigo Bunting (see Table 2).

SIGNIFICANCE

The Sandstone Falls MAPS project has generated much interest in the state and has sparked the initiation of three additional stations by other investigators. Likewise, the Sandstone Falls project has been endorsed by the WV Partners In Flight (PIF) Working Group as a monitoring program that will aid in developing conservation plans for species of special concern or threatened. The tedious and time consuming work involved in running a MAPS station has prevented more stations from operating, but the project provides more information than current avian point counts being conducted in West Virginia. This has posed problems with development of conservation plans through PIF, while neighboring states with many stations (e.g., Ohio and Virginia) have the necessary demographic data needed for management practices.

In summary, we recommend continuation of the MAPS program at Sandstone Falls for at least one more year, so that estimates of recruitment may be obtained as well as better estimates of population trends. This station will eventually produce data

necessary for estimating recruitment and survivorship of the American Redstart and Yellow-breasted Chat, among other species, which cannot be done by a large majority of the other MAPS stations. Our goal is to keep the station operational for long-term (i.e., 20 years) to provide important demographic data on target species for the (1) NPS, (2) WV and Northeast PIF Working Groups, and (3) IBP. Operation of the station at Sandstone Falls is dependent upon assessment needs of the National Park Service and not of the birds. If we lose the station, IBP will lose an important station needed for assessment of demographics in the Northeast (see DeSante et al. 1998), and, more importantly, many bird species will continue to decline without our help. We surely cannot halt avian population declines without the necessary data for determining causal factors of decline.

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Table 1. Summary of captures per year.

Year	Days of Operation Total	Range	Total Net Hours	B ¹	U ²	R ³	TC ⁴	Number of species
1996	10	5/21 - 8/19	566.65	286	49	63	398 (70.24)	42
1997	8	5/21 - 7/30	456.67	292	34	69	395 (86.50)	47
1998	8	5/21 - 7/30	422.81	214	48	61	323 (76.39)	37
1999	9	5/21 - 7/30	441.84	239	33	56	328 (74.24)	43

¹ Banded birds, ² unbanded birds, ³ recaptures, and ⁴ total captures and total captures per 100 net hours in parentheses.

Table 2. Number of birds banded at Sandstone Falls during MAPS.

Species	1996	1997	1998	1999	Total
Black-billed Cuckoo	0	1	0	0	1
Eastern-wood Pewee	2	3	1	0	6
Acadian Flycatcher	1	1	3	0	5
Willow Flycatcher	2	0	0	0	2
Great-crested Flycatcher	1	0	1	0	2
Eastern Phoebe	1	0	0	3	4
Downy Woodpecker	0	3	0	3	6
Yellow-shafted Flicker	0	1	2	1	4
N. Rough-winged Sw.	0	0	0	2	2
Carolina Chickadee	3	4	1	2	10
Tufted Titmouse	0	3	3	0	6
Carolina Wren	15	11	12	15	53
Marsh Wren	1	0	0	0	1
House Wren	0	2	1	1	4
Blue-gray Gnatcatcher	13	4	7	12	36
Ruby-thr. Hummingbird	21	7	18	18	64
Wood Thrush	4	3	8	3	18
American Robin	5	11	8	8	32
Gray Catbird	48	37	20	8	113
Brown Thrasher	0	1	1	1	3
Cedar Waxwing	11	18	2	7	38
White-eyed Vireo	6	6	5	4	21
Blue-headed Vireo	0	0	1	0	1
Warbling Vireo	1	0	0	1	2
Red-eyed Vireo	10	18	11	9	48
Blue-winged Warbler	2	1	0	2	5
Golden-winged Warbler	0	1	1	3	5
Brewster's Warbler	0	0	1	0	1
Lawrence's Warbler	0	0	1	1	2
Tennessee Warbler	1	0	0	0	1
Northern Parula	1	0	2	2	5
Yellow Warbler	14	11	10	6	41
Chestnut-sided Warbler	1	0	0	0	1
Magnolia Warbler	0	4	3	0	7
Blackpoll Warbler	0	3	0	0	3
Black-and-White Warbler	1	2	1	2	6
American Redstart	49	39	36	25	149
Louisiana Waterthrush	2	1	6	2	11
Worm-eating Warbler	4	0	0	7	11

Table 2 Continued

Ovenbird	4	8	4	4	20
Mourning Warbler*	0	2	0	0	2
Canada Warbler*	0	1	0	0	1
Common Yellowthroat	3	12	3	4	22
Kentucky Warbler	1	1	0	1	3
Hooded Warbler	0	2	2	2	6
Wilson's Warbler*	0	1	0	0	1
Yellow-breasted Chat	9	7	6	3	25
Scarlet Tanager	1	2	1	2	6
Northern Cardinal	21	3	3	7	34
Rose-breasted Grosbeak	1	0	0	0	1
Indigo Bunting	9	13	0	3	25
Eastern Towhee	0	1	1	2	4
Chipping Sparrow	6	0	0	0	6
Field Sparrow	0	3	0	0	3
Song Sparrow	10	11	14	25	60
Brown-headed Cowbird	1	0	0	0	1
Common Grackle	2	2	8	2	14
Red-winged Blackbird	0	0	3	4	7
Baltimore Oriole	3	0	6	3	12
Orchard Oriole	3	4	3	9	19
House Finch	5	0	0	0	5
American Goldfinch	10	25	22	20	77

* = migrant

Table 3. Recapture data of birds banded in subsequent years.

Band No.	Species	SEX	Date Banded	Date Recaptured
1591-09710	Song Sparrow	U*	10-05-1996 ¹	05-21-1997
0951-57386	Gray Catbird	♂	06-30-1996	05-21-1997
0951-57334	Gray Catbird	♂	05-31-1996	05-21-1997 07-30-1998
0951-57330	Northern Cardinal	♀	05-31-1996	05-21-1997
2060-89875	American Redstart	♂	05-31-1996	05-21-1997
1760-55220	Yellow-breasted Chat	♂	05-31-1996	05-21-1997 06-30-1998
1571-39154	Carolina Wren	♂	05-21-1996	05-21-1997
1760-55244	Yellow Warbler	♂	06-21-1996	05-21-1997 05-31-1999
1571-43486	Orchard Oriole	♂	06-21-1996	05-21-1997
2060-89881	Yellow Warbler	♀	05-31-1996	05-31-1997
3111-79804	Red-eyed Vireo	♀	07-10-1996	05-31-1997
1571-39162	Yellow-breasted Chat	♀	05-31-1996	06-10-1997
2060-89883	Yellow Warbler	♀	05-31-1996	06-10-1997
0951-57370	Wood Thrush	♂	06-10-1996	06-10-1997
0951-57314	Gray Catbird	♂	05-21-1996	06-10-1997
2060-89867	American Redstart	♀	05-21-1996	06-10-1997
1760-55305	White-eyed Vireo	U*	08-20-1996 ¹	06-10-1997 05-21-1998 07-20-1999
0951-57374	Northern Cardinal	♂	06-10-1996	06-20-1997 07-20-1999
2080-92571	American Redstart	♀	06-30-1996	06-20-1997
8101-89924	Gray Catbird	♂	08-09-1996	07-20-1997 07-30-1998
0951-57382	Northern Cardinal	♀	06-30-1996	07-20-1997
2060-89865	American Redstart	♂	05-21-1996	07-30-1997
1551-04910	Red-eyed Vireo	♂	06-10-1997	05-21-1998
1760-55238	White-eyed Vireo	U*	06-10-1996	05-21-1998
1591-10258	Carolina Wren	♀	07-20-1997	05-21-1998
1760-55239	Chipping Sparrow	♂	06-10-1996	05-21-1998
0951-57385	Gray Catbird	♀	06-30-1996	05-31-1998
2090-95405	American Redstart	♀	05-21-1997	05-31-1998
2090-95415	American Redstart	♂	05-31-1997	05-31-1998 05-31-1999 06-20-1999
2090-95411	American Redstart	♀	05-21-1997	06-10-1998
3111-79832	Red-eyed Vireo	♀	08-19-1996	06-10-1998
2090-95158	Golden-winged Warbler	♀	08-31-1997 ¹	06-10-1998
1581-67812	Gray Catbird	♂	06-10-1997	06-30-1998
0951-57377	Gray Catbird	♀	06-21-1996	06-30-1998

Table 3 continued.

8101-89924	Gray Catbird	♂	08-09-1996	06-30-1998
1551-04923	Red-eyed Vireo	♀	06-30-1997	07-20-1998
1591-10012	Carolina Wren	♀	09-20-1997 ¹	07-20-1998
1581-67403	Northern Cardinal	♀	09-19-1997 ¹	07-20-1998
1551-04954	Ovenbird	U*	09-05-1997 ¹	07-20-1998
0902-64626	Northern Cardinal	♂	07-30-1996	07-30-1998
1641-77757	Song Sparrow	♀	10-24-1998 ¹	05-21-1999
				05-31-1999
1591-10270	Carolina Wren	♀	05-21-1998	05-21-1999
2070-16693	American Goldfinch	♂	05-31-1998	05-21-1999
				07-10-1999
2070-16689	White-eyed Vireo	♀	05-21-1998	05-21-1999
				06-30-1999
1591-10298	Song Sparrow	♂	07-20-1998	05-21-1999
1641-77338	Song Sparrow	♂	10-02-1998 ¹	05-21-1999
1591-10266	Yellow-breasted Chat	♀	05-21-1998	05-31-1999
				06-20-1999
				07-10-1999
2090-95482	American Redstart	♂	07-20-1998	05-31-1999
				06-30-1999
1162-12023	Northern Cardinal	♂	07-20-1998	05-31-1999
1581-67602	Eastern Towhee	♀	05-21-1997	05-31-1999
1162-12003	American Robin	♂	05-31-1997	05-31-1999
1581-67633	Northern Cardinal	♀	07-20-1997	05-31-1999
1581-67805	Wood Thrush	♀	05-31-1998	05-31-1999
1630-80864	American Redstart	♂	04-20-1996 ²	05-31-1999
1551-04913	Red-eyed Vireo	♂	06-20-1997	05-31-1999
2070-16700	Yellow Warbler	♀	05-31-1998	05-31-1999
1641-77417	Song Sparrow	♀	10-13-1998 ¹	06-10-1999
1631-07384	Northern Cardinal	♀	09-24-1998 ¹	06-10-1999
2070-16655	Yellow Warbler	♂	06-20-1997	06-20-1999
2160-03201	American Goldfinch	♂	09-11-1998 ¹	06-20-1999
				06-25-1999
2171-39521	Indigo Bunting	♂	08-21-1998 ¹	06-25-1999
1551-15816	Worm-eating Warbler	U*	08-02-1998 ¹	06-30-1999
1551-04985	Song Sparrow	♂	10-04-1998 ¹	06-30-1999

U* = unknown sex. ¹ = Banding during fall migration, which is a different project. ² = Bird banded before MAPS project started.

Table 4. Population trends of eight species of birds assessed in the present study and during other studies. Readings are percent change per year.

Species	Status	WV ¹	Northeast ²	Rangewide ¹
Carolina Wren	R / SDM	4.7	-	1.8
Blue-gray Gnatcatcher	R / SDM	-0.6	-	1.4
Gray Catbird	LDM	-0.4	-0.4	0.0
Red-eyed Vireo	LDM	0.9	1.7	1.3
Yellow Warbler	LDM	1.7	30.0	0.7
American Redstart	LDM	4.8	-1.8	0.0
Northern Cardinal	R/SDM	0.2	-6.0	0.7
Song Sparrow	R/SDM	-1.9	-15.5	0.4

¹ 1990 - 1998 from Sauer et al. 1999, ² 1995-1996 from DeSante et al. 1998.
R = resident species, SDM = short-distance migrant, LDM = long-distance migrant or neotropical migrant.

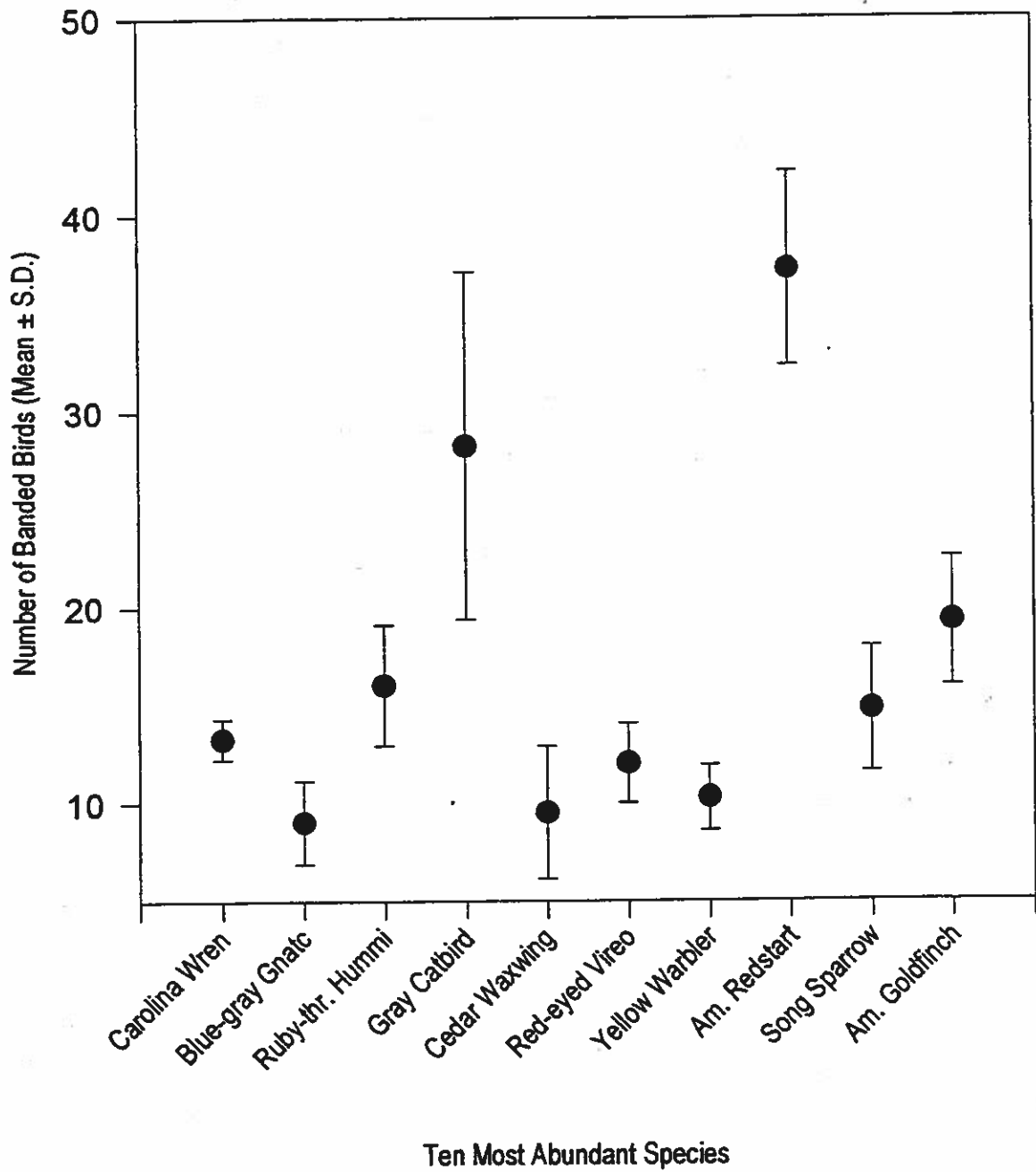


Figure 1. Mean \pm S.D. of birds banded for the 10 most abundant species from 1996-1999.

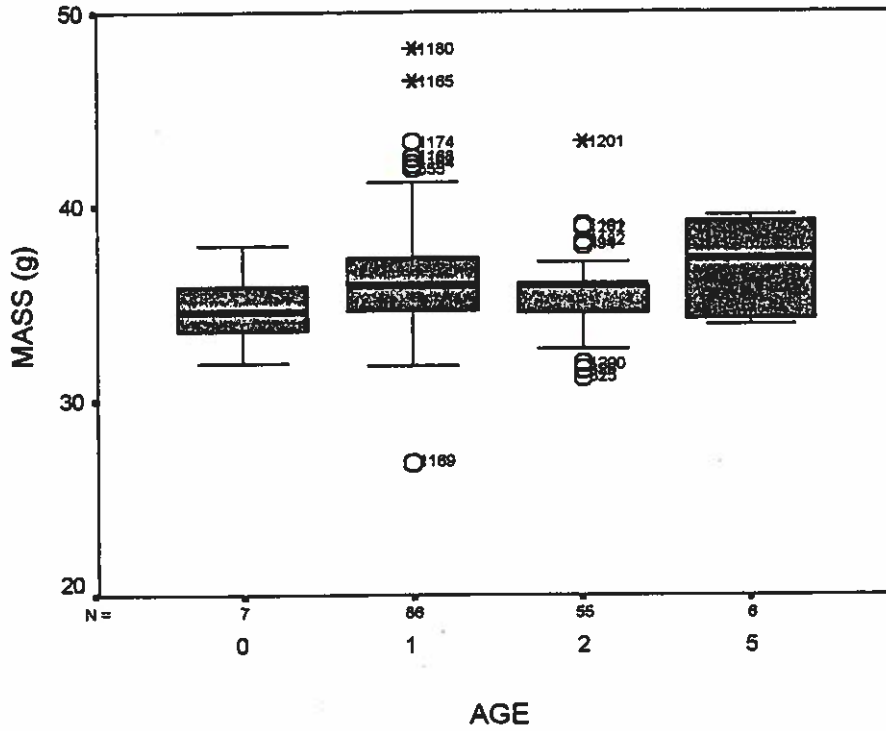


Figure 2. Box plots of body mass (g) of Gray Catbirds. Age codes correspond to unknown (0), after-hatch year (1), hatch-year (2), and second year (5) birds according to the MAPS protocol.

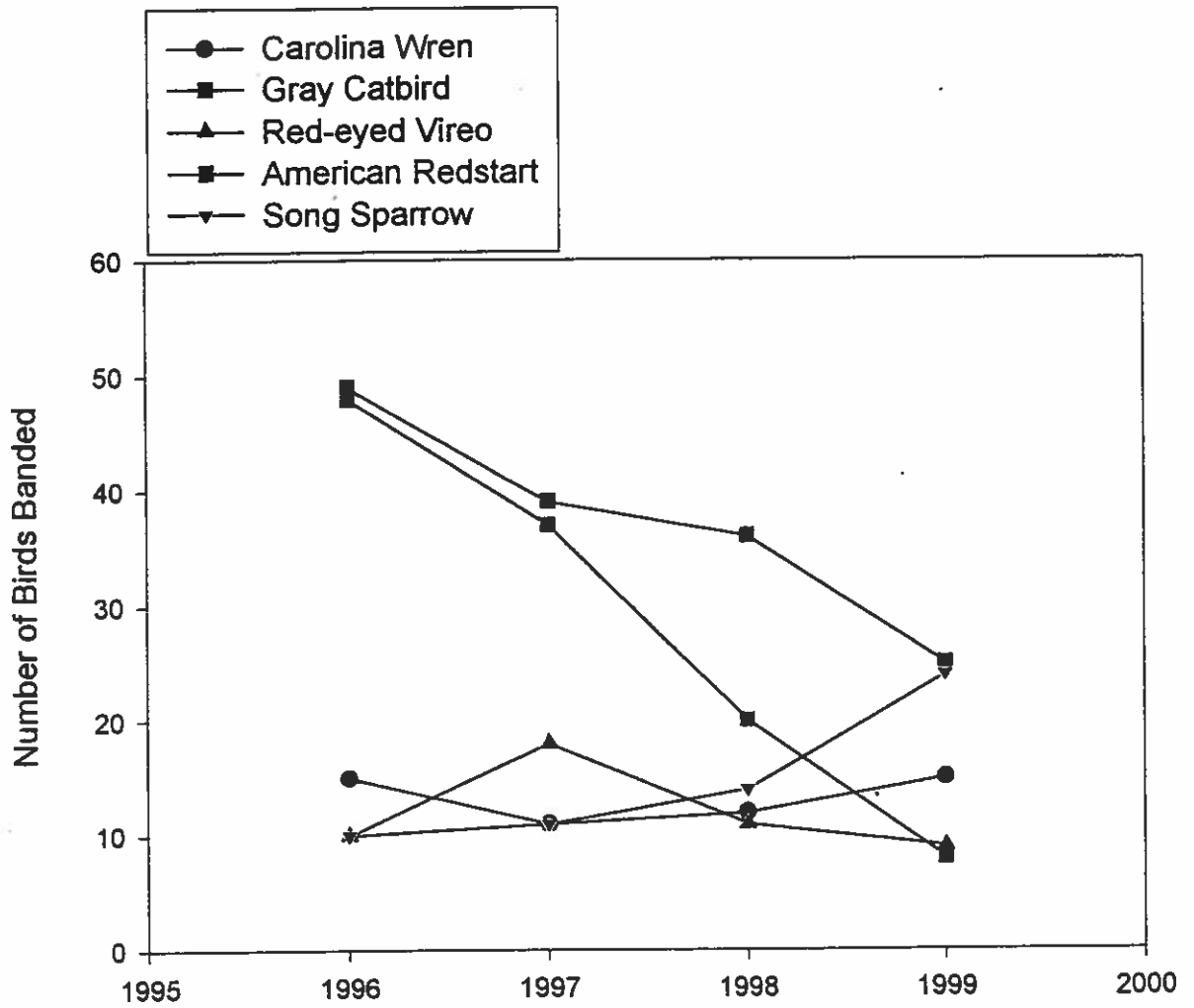


Figure 3. Population trends for five species during MAPS research

