Abstract

Crimes against children are very disturbing and none perhaps more atrocious than child molestation. In the hopes of lowering the rate of recurrent offenses, society has turned to legislative solutions including residency restrictions for convicted sex offenders and predators. In 2006, six local municipalities in Bay County, FL, passed housing restrictions for sexual offenders and predators that extended the existing State of Florida 1000 foot residency buffer zones. These municipal buffers prohibit sex offenders from living within 2500 feet of schools, day care centers, parks, playgrounds, school bus stops, and places where children congregate.

Analysis from this study is designed to compare the spatial effects of sex offender residency in Bay County, FL from 2005-2007. Specifically the study asks, Has sex offender residency geographic distribution changed in Bay County, FL since the enactment of municipal sex offender residency restrictions? It was concluded that sex offender residency distribution has changed and that residency restrictions have contributed to these changes.

The mean center of the sex offender population shifted in a northerly direction away from municipalities with residency restrictions. Although marginally, the sex
offender population became less clustered. Overall, residency buffers blocked only 7.08% of the total area within the county; however, percentages within individual cites were very high. Cities with restrictions saw a reduction in the number offenders, and cities and areas without restrictions saw an increase in the number of offenders. The numbers of offenders excluded from the study due to absconding or transience was very low. Numbers of offenders incarcerated increased in 2006, then saw a decline in 2007. The rate of offenders leaving the state declined after enactment of the ordinances. The percentage of legally allowed residentially zoned area for sex offenders to establish residency was 64%.
Table of Contents

Abstract ........................................................................................................................................................................ iii
List of Figures .................................................................................................................................................................. vii
List of Tables ............................................................................................................................................................... viii
Acknowledgements ...................................................................................................................................................... ix

Chapter 1: Introduction .................................................................................................................................................. 1
  1.1 Overview ............................................................................................................................................................. 1
  1.2 Background and Rationale ................................................................................................................................. 1
  1.3 Research Question and Objectives ..................................................................................................................... 3
  1.4 Significance ......................................................................................................................................................... 4
  1.5 Definitions ........................................................................................................................................................... 5
  1.6 Study Area .......................................................................................................................................................... 6
  1.7 Limitations of the Research ............................................................................................................................... 8

Chapter 2: Literature Review ....................................................................................................................................... 9
  2.1 Sex Offender Laws ............................................................................................................................................. 9
  2.2 Legal Challenges .............................................................................................................................................. 12
  2.3 Risk Assessment .............................................................................................................................................. 14
  2.4 Factors That Influence Re-offense ................................................................................................................... 16
  2.5 Unintended Consequences ............................................................................................................................... 18
  2.6 Contributions of GIS ....................................................................................................................................... 20
  2.7 Limitations of the Literature ............................................................................................................................ 21

Chapter 3: Methodology ............................................................................................................................................... 23
  3.1 Study Issues ....................................................................................................................................................... 23
3.2 Data..................................................................................................................25
3.3 Data Compilation.............................................................................................26
3.4 Data Analysis...................................................................................................27
3.5 Relationship between Study and Research Objectives.................................29
3.6 Limitations and Problems................................................................................33

Chapter 4: Findings............................................................................................................36
4.1 Mean Center.....................................................................................................36
4.2 Spatial Dispersion............................................................................................38
4.3 Buffer Zones....................................................................................................42
4.4 Number of Offenders by City..........................................................................52
4.5 Offenders Excluded from the Study.................................................................54
4.6 Residential Area Legally Allowed for Residency...........................................55

Chapter 5: Conclusion........................................................................................................60
5.1 Restatement of Research Question and Objectives.........................................60
5.2 Conclusions......................................................................................................60
5.3 Contributions of the Research..........................................................................63
5.4 Suggested Areas for Future Study...................................................................64

References..........................................................................................................................66
# List of Figures

1. Map of Study Area...................................................................................................7
2. Map of Mean Centers ..............................................................................................37
3. Map of Sex Offender Spatial Distribution 2005....................................................39
4. Map of Sex Offender Spatial Distribution 2006....................................................40
5. Map of Sex Offender Spatial Distribution 2007....................................................41
7. Map of Combined Municipal Residency Restriction Buffers 2007.................44
8. Map of Callaway Residency Restriction Buffers 2007....................................45
9. Map of Cedar Grove Residency Restriction Buffers 2007..................................47
10. Map of Mexico Beach Residency Restriction Buffers 2007...........................48
11. Map of Panama City Residency Restriction Buffers 2007.................................49
12. Map of Parker Residency Restriction Buffers 2007..........................................50
13. Map of Springfield Residency Restriction Buffers 2007.................................51
14. Map of Combined Zoning in Bay County 2007...............................................56
15. Map of Combined Zoning in Bay County with Buffer Overlay 2007..............58
### List of Tables

1. Sexual Offender Residency Restriction Ordinances..................................................3
2. Dispersion R Values..............................................................................................38
3. NN Index Summary...............................................................................................38
4. Municipal Buffers..................................................................................................42
5. Offenders by City and Year...................................................................................52
6. Matched Pairs T-Test Results................................................................................53
7. Excluded Offenders...............................................................................................54
8. Zoning Analysis.....................................................................................................55
9. Percent Allowed and Prohibited Residential Area..................................................57
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Chapter 1: Introduction

1.1 Overview

This study examines spatial changes that have occurred from 2005 to 2007 in Bay County, FL since the enactment of municipal sex offender residency restrictions. The study is presented in the five chapters described below.

Chapter 1 defines the general purpose of the study and outlines its overall organization. The background, rationale, and significance for the research are discussed. The specific research question and objectives are given along with a definition of terms and a description of the study area. Limitations of the study are also discussed.

Chapter 2 discusses laws pertaining to sex offenders and reviews other relevant literature. An examination of the limitations of the literature is provided.

Chapter 3 defines the methodology of the study. A detailed discussion of the study issues is provided. Additionally, a description of the data sources, compilation, and analysis is given. The relationship between the study issues and research objectives is discussed. Lastly, limitations and problems of the study are given.

Chapter 4 presents the results of the analysis.

Chapter 5 provides the conclusions of the study and an interpretation of the analysis results with respect to the research objectives and study issues. The contribution of the study and suggested topics for future study are examined.

1.2 Background and Rationale

Crimes against children are very disturbing and none perhaps more atrocious than child molestation. In the hopes of lowering the rate of recurrent offenses, society has
turned to legislative solutions including residency restrictions for convicted sex offenders and predators. As of October 1, 2004, per Florida statute 794.065, anyone who has been convicted of any of the following sexual offense laws (794.011, 800.04, 827.71 or 847.0145) in which the victim of the offense was less than sixteen years of age cannot legally reside within 1000 feet of any school, day care center, park or playground (State of Florida 2007c).

Per Florida statute 943.0435, sex offenders and predators that had already established residency in these areas prior to passage of the ordinances were grandfathered in and excluded from compliance as long as they continue to follow reporting guidelines and do not have either a permanent or temporary change of residency. Temporary or permanent changes of residency must be reported within forty-eight hours to the proper authority. A change of address becomes permanent once the offender resides at the address five or more days. An offender that is unable to establish or maintain a residence must contact the local sheriff of the county in which they are located within forty-eight hours (State of Florida 2007d).

Furthermore, local municipalities, in a response to a perceived increase of child abductions, molestation, and murders, have passed housing restrictions for sexual offenders and predators that in some cases extend these buffer zones to 2500 feet and have added the additional qualifiers of school bus stops and places where children congregate. In Bay County (Table 1), six of the eight municipalities passed such ordinances during 2006 (City of Callaway, FL 2006; City of Mexico Beach, FL 2006; City of Panama City, FL 2006; City of Parker, FL 2006; City of Springfield, FL 2006; Town of Cedar Grove, FL 2006).
Table 1: Sexual Offender Residency Restriction Ordinances

<table>
<thead>
<tr>
<th>Municipality</th>
<th>Ordinance Num</th>
<th>Date Adopted</th>
</tr>
</thead>
<tbody>
<tr>
<td>City of Callaway</td>
<td>789</td>
<td>Feb-06</td>
</tr>
<tr>
<td>City of Panama City</td>
<td>2161</td>
<td>Feb-06</td>
</tr>
<tr>
<td>City of Parker</td>
<td>06-301</td>
<td>Feb-06</td>
</tr>
<tr>
<td>Town of Cedar Grove</td>
<td>383</td>
<td>Mar-06</td>
</tr>
<tr>
<td>City of Springfield</td>
<td>448</td>
<td>Apr-06</td>
</tr>
<tr>
<td>City of Mexico Beach</td>
<td>515</td>
<td>May-06</td>
</tr>
</tbody>
</table>

These municipal sex offender buffer zone ordinances passed at a local level with little or no challenge. To many it seems logical to assume that limiting residency in what are perceived as areas of temptation could result in creating a safer environment and prevent re-offense. However, at this time there have been no studies showing a relationship that residency restrictions for offenders actually achieves the goal of protecting the public (Levenson and Cotter 2005).

1.3 Research Question and Objectives

This study is designed to answer the following research question: *Has sex offender residency geographic distribution changed in Bay County, FL since the enactment of municipal sex offender residency restrictions?* Analysis from this study will be used to compare the spatial effects of sex offender residency from 2005 - 2007. Six research objectives are listed below:

1. To determine if there has been a shift in the mean center of sex offender population within the county.

2. To determine if there are indications that the sex offender population is becoming less clustered.
3. To determine the percent of area that is blocked by the residency buffers.

4. To determine if there has been a reduction in the number of offenders residing in cities with residency restriction ordinances.

5. To determine the number of offenders that was excluded from the study for the categories of absconded, incarcerated, moved or transient.

6. To determine the percentage of residentially zoned property legally allowed for sex offender relocation.

1.4 Significance

The results of this study will be an important tool in accessing the effectiveness of the residency restrictions. There has been little or no prior research on the effects of implementing residency restrictions in Bay County, Florida. The spatial impacts of sexual offender residency buffers in Bay County are important as other cities and communities are considering adopting similar ordinances. Following the initiation of this study, Lynn Haven and Panama City Beach adopted similar ordinances in September 2007, and the county government is considering extending to 2500 feet the 1000 foot state buffer (City of Lynn Haven, FL 2006; City of Panama City Beach, FL 2006).

Additionally, this study is important as it provides statistical analysis of the location of the offenders in relation to the buffer zones over a three year time period. Data generated from this study can be used to determine if patterns of dispersion can be established indicating a possible concentration of sex offenders in certain areas of the county. Currently, no quantitative data exists in a format that local community leaders and citizens may reference prior to considering the creation of additional restrictions. The
results of this study are important beyond the scope of Bay County, FL, as study issues raised in this research have both state and national implications.

### 1.5 Definitions

Per Florida law the designations of sexual predator and sexual offender differ based on the type and/or number of convicted offenses. In order for an individual to receive the designation of sexual predator, the individual must have been convicted of at least one first degree felony sex crime, or two or more second degree felony sex crimes within a ten year period. Additionally, the designation of sexual predator must be assigned through an act of the court and applies to convictions of sexual offenses as of October 1, 1993.

However, an individual may be designated as a sexual offender for the conviction of any listed sex offense regardless of the date the offense was committed. The designation of sexual offender is not required to be assigned by an act of a court, and the convicted offense does not have to be a first or second degree felony (Florida Department of Law Enforcement 2006a). In this study the designations of sexual predators and sexual offenders will be referred to jointly as sex offenders. Residency restrictions imposed by municipal ordinances in Bay County are applied equally for both designations.
1.6 Study Area

The study area for the project is Bay County, FL (Figure 1). Bay County is located in the panhandle of Florida on the Gulf of Mexico. As of 2006 the population was estimated as 164,559. Figures from 2005 estimate unemployment at 3.7% and the average per capita income is $29,515 (Bay County Board of County Commissioners 2006). The population of the county is centered in the southern urban areas of the county, which include the tourism area along the Gulf of Mexico.

The major industry is tourism as Bay County is an incredible vacation destination offering miles of white sandy beaches. With an average year round water temperature of 72 and an average air temperature of 78, Panama City Beach is a favorite place to visit and live on the Gulf Coast (Panama City Beach 2007).

The Bay County school system is comprised of 22 elementary schools, 7 middle schools, 7 high schools, 1 alternative school, 2 adult education schools and 1 special purpose school (Bay District Schools 2007). Haney Technical, one of the county's adult education schools, provides numerous vocational opportunities (Haney Technical High School 2007).

Two options are available in the county for those wishing to pursue a college education. Gulf Coast Community College offers a variety of AA, AS, and certificate programs (Gulf Coast Community College 2007). Upper level degrees may be pursued at the Panama City branch campus of Florida State University. The college offers nine undergraduate and graduate degree programs (Florida State University Panama City 2007).
Figure 1: Map of Study Area
1.7 Limitations of the Research

The primary limitation of this research is the amount of time since the enactment of the ordinances. Although the Florida 1000 foot buffer has been in place since 2004, the local municipal ordinances defining the 2500 foot buffers were not enacted until the first half of 2006. The study data covers a three year span from 2005 (pre-local ordinances), 2006 (local ordinances enacted), and 2007 (the first year following the ordinances). The results of the analysis will be restricted by the limited study period. A study period of three to five years or beyond would be more effective in the evaluation of trends. Within the research done for this thesis no literature has been found that defines the length of a study period necessary to establish a trend for this research subject.

Secondly, the analysis from this study will be based on the reported locations of the sex offenders. Conscientious efforts are made by the Florida State Department of Probation and Parole to ensure the accuracy of the location of the offenders. However, it is possible that a certain amount of error has been introduced into the data sets through the fraudulent reporting of addresses by the offenders.

Additionally, the data used for analysis reflects offender address by year and quarter. For this study, results from the second quarter 2005, 2006, and 2007 were used. Therefore a single address per year is used for each offender based on their reported address in the second quarter of the year. The data furnished by the Florida Department of Law Enforcement (FDLE) therefore assumes that the offender resided at only one address within that quarter, when in actuality, it is possible that the offender had multiple addresses or was incarcerated for sometime within the quarter. Therefore the study is somewhat limited by the available data sets.
Chapter 2: Literature Review

This chapter begins with a discussion of current laws pertaining to sex offenders and then moves to legal challenges to sex offender laws. A discussion of sex offender risk assessment follows along with factors that influence re-offense and possible unintended consequences. Lastly, contributions of GIS and the limitations of the literature are examined.

2.1 Sex Offender Laws

The creation of sex offender laws became popular legislation following a series of highly publicized high profile criminal cases involving child molestation, rape, and murder. Cases involving harm to children are enraging and thus create the desire to protect the public from the sex offender population. These various laws range from required registration, community notification, and laws that restrict personal rights, such as where paroled sex offenders may reside.

Registry laws have been adopted in all fifty states and are the most common of all restrictions required of a paroled sex offender (Towers 2007). In 1994 Congress passed the Jacob Wetterling Crimes Against Children and Sexually Violent Offender Registration Program (US Code 2007a). The bill was named after Jacob Wetterling, an eleven year old boy abducted in Minnesota in 1990. The case was never solved even though over 50,000 leads were investigated (Jacob Wetterling Foundation 2007). Although this bill required registration of sex offenders, it was not until 1996 that Congress updated the Jacob Wetterling bill requiring states to implement notification and public access to information on sex offenders.
The 1996 update to the Jacob Wetterling law is commonly referred to as Megan's Law (US Code 2007b). Unfortunately, it was so named after the rape and murder of Megan Kanka, a child who was lured into the home of her neighbor, a twice convicted sex offender, by the promise of a puppy (Megan Nicole Kanka Foundation 2007). Jimmy Timmendequas, who confessed to the crime and led the police to Megan's body, was on death row in New Jersey until December 2007. His sentence along with seven others was commuted to life in prison following New Jersey's 2007 ban on executions (Mears 2007).

Florida's legislature created the Florida Sexual Predators Act, statute 775.21 in 1993. This law was amended in 1995 requiring local law enforcement to notify communities of a predator's address, description, and crimes committed (State of Florida 2007b). In 1997 Florida adopted statute 943.0435 aimed at sex offenders who are not designated as predators (State of Florida 2007d). This legislation is similar to the Florida Sexual Predators Act, with the exception that community notification by law enforcement is not mandatory. Both laws require registration for life (State of Florida 2007d).

Once again following yet another brutal and horrific case of child abduction, rape, and murder, further legislation was introduced in 1998. Florida statute 394.910, authored and lobbied by the parents of the murdered child, is known as the Jimmy Ryce Involuntary Civil Commitment for Sexually Violent Predators' Treatment and Act (State of Florida 2007a). Nine year old Jimmy disappeared after being dropped off by his school bus and was kidnapped, raped, murdered, and dismembered. The bill allows for sexually violent predators that are determined to have a mental abnormality to be involuntarily committed to a secure treatment facility after they have served their full prison term. The term of commitment is for an indefinite period of time (Presley 1999).
Florida enacted additional sex offender legislation in 2005 with the passage of the Jessica Lunsford Act, Florida House Bill 1877 (State of Florida 2005). Jessica, a nine year old girl from Florida, was abducted, sexually assaulted, and buried alive by a sex offender. The law requires a twenty-five year prison term for certain types of sexual offenses followed by lifetime tracking by global positioning satellite along with twice yearly registration by paroled sex offenders. The bill also allows for tracking of all released offenders that violate parole (State of Florida 2005). Jessica's Law is well on its way to passage at a national level. Talk show host Bill O’Reilly, has led a national campaign encouraging every state to adopt Jessica's Law (O’Reilly 2007).

In 2004, Florida statute 794.065 was adopted requiring statewide residential restrictions which prohibit anyone who has been convicted of any of the following sexual offense laws (794.011, 800.04, 827.71 or 847.0145) in which the victim of the offense was less than sixteen years of age from legally residing within 1000 feet of any school, day care center, park or playground (State of Florida 2007c).

Following passage of the state's residency restrictions, numerous local municipalities throughout the state enacted even stricter laws creating residential restriction buffers that in some cases extended the distance to 2500 feet of schools, day care centers, parks, and playgrounds and added additional qualifiers such as school bus stops and places where children congregate. In Bay County, FL, six of the eight municipalities passed such ordinances (City of Callaway, FL 2006; City of Mexico Beach, FL 2006; City of Panama City, FL 2006; City of Parker, FL 2006; City of Springfield, FL 2006; Town of Cedar Grove, FL 2006).
2.2 Legal Challenges

As sex offender legislation swept across the nation so have legal challenges. In 2001, a case challenging the Alaska Sex Offender Registration Act questioned the legitimacy of the retroactive nature of the law (US Court of Appeals 2001). Although convicted of sex offenses prior to the passage of the act, the complainants were nonetheless required to abide by the registration requirement. The law was ultimately upheld by the US Supreme Court in Smith vs. Doe. It was the opinion of the court that the law is nonpunitive in nature and thus did not violate the rights of the complainants (US Supreme Court 2003).

At question was whether the legislation had violated the ex post facto clause of the US Constitution, Article 1, Section 10 (US Code 2007c). Encyclopedia Britannica Online (2007) defines an ex post facto law as a

"Law that retroactively makes criminal conduct that was not criminal when performed, increases the punishment for crimes already committed, or changes the rules of procedure in force at the time an alleged crime was committed in a way substantially disadvantageous to the accused".

Per legal research website, Onecle (2005), in the case of Smith vs. Doe, the court ruled that the ex post facto clause did not apply as the punishment imposed only civil and not criminal punishment.

In 2005, Iowa's sex offender residential restriction law was examined by the US Court of Appeals for the Eighth Circuit in Doe vs. Miller (US Court of Appeals 2005a). The court upheld the law was constitutional based on its findings that it was within the state's power to enact laws protecting its citizens. The court further answered by ruling
the law was not vague, did not infringe on one's right to privacy or right to travel, and
was not a form of banishment (Towers 2007). This decision by the US Court of Appeals
had overturned a previous decision by a lower court that the law was unconstitutional
(US District Court 2003).

A challenge to Florida's Sex Offender Act was answered by the US Court of
Appeals for the Eleventh Circuit in Doe vs. Moore in 2005. At a lower court level the
Florida law had been upheld and the US Court of Appeals concurred upon appeal (US
Court of Appeals 2005b). The court ruled that the law did not violate the appellants' rights to due process and that the law did not infringe on their liberty and privacy. Specifically the appellants had asserted that the Sex Offender Law infringed on their:

"Rights to family association, to be free of threats from their persons and members of their immediate families, and to be free of interference with their religious practices, to find and/or keep any housing, and to a fundamental right to find and/or keep any employment" (US Court of Appeals 2005b).

The court supported upholding the law stating "It had long been in the interest of the government to protect its citizens from criminal activity and we find no exceptional circumstances in this case to invalidate the law" (US Court of Appeals 2005b).

Roberts (2007), an attorney with Brown, Paindiris and Scott, expects that as the number of legislative solutions continues to rise, so will constitutional challenges. In particular, she questions the constitutionality of laws that bar sex offenders from entire cities. The rulings in the cases discussed above will no doubt be heavily relied on as basis for rulings in future challenges. However, as time since enactment of legislation
increases, so does the opportunity for empirical studies to be conducted and applied to rulings. Future rulings may in fact hinge on new quantitative data that either supports or refutes the legality and usefulness of sex offender legislation.

2.3 Risk Assessment

One area of concern that has been challenged in sex offender legislation is the scope of legislation as it applies to the individual members of the sex offender community. Following the completion of a sex offender's incarceration, should all offenders be assessed on an equal basis or should a more individual approach be taken? Conroy (2006) examines three models for sex offender risk management: sex offender treatment programs, medication, and the containment approach. Her analysis indicates that these models often overlap and all use a one-size fits all approach. Conroy refutes this approach and suggests a model based on individual assessment of offenders. She suggests that efforts should be concentrated on those in the high risk category. Additionally, she notes that studies point to a link between treating low risk offenders as high risk offenders and an increase in their likelihood of recidivism.

There are established risk assessment methods in place for evaluation of sex offenders. Harris (2006) compares two such methods: Rapid Risk Assessment for Sexual Offense Recidivism (RRASOR) and Sex Offender Needs Assessment Rating (SONAR). These are both actuarial tools derived from population based probabilities. Although useful in making overall predictions about the percentages of how many offenders will reoffend, Harris questions the validity of using specifically actuarial tools to correlate individual assessments. He presents the option of using an idiographic orientation in
which case decisions are based on individual circumstances. Harris proposes that case management should include accessing not only changes in the offender's psychological status but would also include an examination of social and environmental changes.

From the viewpoint of an official from an agency responsible for the placement and monitoring of sex offenders, Wing (1998), a senior probation officer with the West Sussex Probation Service, defends the argument that responsible agencies should have the say in where sex offenders are allowed to live. Wing (1998: 450), states that “As there is no such person as a typical sex offender, there is no one suitable form of housing”. It is his argument that each offender should be evaluated and placed in a situation that best affords protection to the community while contributing to their rehabilitation and return to society. He asserts that some offenders will need more stringent supervision and some less. He does not ascribe to the one policy fits all for housing considerations for offenders.

Evans, a representative to the Executive Committee of the American Correctional Association, gave an outline of the Offender Assessment System adopted by England and Wales in 2003. Per Evans (2003: 115-116), the following are examined when assessing sex offenders: "Offending information; analysis of offenses; accommodation; education, training and employability; financial management and income; relationships; lifestyle and associates; drug and alcohol misuse; emotional well-being; thinking and behavior; attitudes; and health and other considerations".

Officials in England and Wales adopted the Offender Assessment System with the understanding that numerous factors, actions, and approaches are necessary and propose that individual assessment is critical to reducing re-offense (Evans 2003). Using
information obtained from the offender's assessment, Evans (2003: 116) lists the following four risk categories:

**Low:** No significant, current indicators of risk of harm;

**Medium:** Identifiable indicators of risk of serious harm. Potential to cause harm but unlikely to do so unless there is a change in circumstances

**High:** Identifiable indicators of risk of serious harm. Potential event could happen at any time and the impact would be serious; and

**Very High:** Imminent risk of serious harm. Potential event is more likely than not to happen imminently. The impact would be serious.

Although there are some exceptions, primarily sex offender residency restriction laws in the US are not applied using a ranking or tiering system as above. These laws generally are drafted as equal punishment for all.

### 2.4 Factors That Influence Re-offense

Society should be concerned whether or not sex offenders are successfully reintegrated back into society. Jacobs (2003: 22) in an article rebutting the sex offender notification laws, states that "People who are the subject of notification lose jobs, get evicted, have threats made on their lives, and get harassed by neighbors". She suggests that sex offenders who have lost their support systems are more likely to fail. Jacobs (2003: 22) proposes that offenders who have lost everything, "job, home, and family"
will be more likely to reoffend because they feel they have "nothing to lose by offending again". She suggests the implementation of what some refer to as “feel good” ordinances is not an effective means of protecting children (Jacob 2003).

Another question is the role employment plays in the prevention of re-offense in sex offenders. Johnson (2006), reporting the results of a study aimed at examining the correlation between employment of offenders and re-offense, affirms that gaining and maintaining employment is a positive influence on reducing re-offense. In particular, the study found that employment contributes positively through creating productive social interactions, helping with financial obligations, and developing structured time.

A 2007 study of the recidivism of sex offenders in Minnesota 1990 - 2002 found that when compared to other offenders, sex offenders had a lower rate of recidivism. However, when re-offense did occur, it was more likely to occur as a sexual offense. The study found that 12% had been rearrested for a sex offense, with 10% being reconvicted. Furthermore, the Minnesota study revealed the following influences significantly contributed to the timing of sexual re-offense: "prior sex crimes, stranger victims, male child victims, failure in prison-based sex offender treatment, and a metro-area county of commitment". In the same study it was also determined that "intensive supervised release, supervised release, supervised release revocations, and successful participation/completion of sex offender treatment each significantly reduced the risk of timing to a sex re-offense" (Minnesota Department of Corrections 2007a).

Hanson and Bussiere (1998), in an earlier study conducted in Canada of 28,972 sex offenders, revealed an average sex recidivism rate of 13.4% (18.9% for rapist and 12.7% for child molesters). These figures were based only on sexual re-offenses. When
all offenses, sexual and non-sexual, were examined, the rate of recidivism was found to be 36.3%. Predictors of sexual offense recidivism were also studied, revealing that young age and single marital status were related to recidivism.

Further research by the Minnesota Department of Corrections examined the effect of residential proximity and its association to sex offense recidivism in Minnesota. The study was based on the 224 sex offenders who had committed a sexual re-offense from 1990 - 2002. Of the 224 re-offenses, none involved direct contact with a juvenile victim near the victim's residence or near locations that are assumed to be attractors for sex offenders such as schools, parks, playgrounds or other places where children congregate. From the study results it was further concluded that there was very little supporting evidence that residency restriction laws would lower the incidence of sexual recidivism (Minnesota Department of Corrections 2007b).

Intense scrutiny of the re-offenders in the Minnesota study did find that sex offenders were more likely to victimize someone they know. In particular the report cited that commonly offenders meet their victims by establishing a relationship first with an adult that has children. Examples were given such as the offender being allowed to babysit for an acquaintance or being allowed to move in with an adult that had children (Minnesota Department of Corrections 2007b).

### 2.5 Unintended Consequences

What are some of the possible unintended consequences of adopting sex offender residency restrictions? In an examination of Iowa's 2002 residency restriction law by Minnesota, evidence suggests that the residency restrictions correlate to fewer
employment options, a reduction in housing availability, and a weakening of the registry process as more offenders lost housing. Also revealed was an association between the failure of an offender to reintegrate with society and an increased potential for recidivism (Minnesota Department of Corrections 2007b).

Officials within the rehabilitation community contend that rather than deterring re-offense, residential restrictions for sex offenders worsen the danger through creating unintended consequences such as creating a move from urban to rural areas where there are less housing and employment opportunities (Levenson and Cotter 2005). Additionally, Hawkins (2007: 333), who questions the constitutionality of such ordinances, equates residential restrictions to "human zoning". He suggests such laws will result in offenders moving to rural areas, away from vital resources.

The Minnesota legislature rejected imposing residential restrictions following a study in part due to the report's conclusion that restrictions would create a move of offenders to less populated areas, where there would be less supervision and access to needed services (Minnesota Department of Corrections 2003). Residential mobility has been shown to be high for sex offenders with results from one study indicating that 64% of offenders had a change of address from the time of their arrest to when they registered as a sex offender. Results from this study also revealed that 50% of the moves were to less desirable areas (Mustaine, Tewksbury and Stengel 2006).

Another aspect of sex offender ordinances is the fear that if a city does not have a sex offender residency restriction, then sex offenders will flock to these communities as they are forced out of areas that have adopted restrictions. No city wishes to become a haven for sex offenders. However, examination of local municipal residency restriction
ordinances exposes that there are consequences from running offenders out of a town or jurisdiction. Towers (2007) suggests that offenders are merely being herded from one city to the next to prey on someone else's children in another area.

### 2.6 Contributions of GIS

GIS is an effective tool in the mapping and analysis of sex offenders. Parole and probation officials are enjoying the benefits of the deployment of GIS in their industry. Russo (2001) reports that GIS mapping and analysis tools are beneficial in the supervision of persons released under community control. Mapping of offenders allows for greater efficiency in case assignment and management and is useful for planning and allotment of resources.

With so many varying offender restriction laws, tracking of prohibited areas and the offenders would be all but impossible without GIS technology. A 2002 study conducted by professors at the University of Western Illinois plotted the addresses of sex offenders in Illinois and checked for those living within restricted areas. Of the 10,182 offenders studied, 361 were found to be in violation of offender laws placing them within the restriction area of schools. The study did note that some or all of these offenders were possibly exempt based on the grandfathering clause (Clontz and Mericle 2002).

During the process of conducting the previous study, the researchers had noticed what appeared to be a trend indicating a clustering of sex offenders. Further research was conducted in a 2004 study to analyze this trend. Using Grady County, Illinois as their study area, it was found that one-sixth of the offenders were found to live in the same city block. The researchers hypothesized that the clustering could be attributed to residency
restrictions. The study did note that due to the limited study sample, the results were only an indication that further research was warranted (Clontz and Mericle 2004).

A GIS analysis project of sex offenders, buffer zones, and housing rent in Wood County, Ohio found that the majority of offenders were located in urban areas. Additionally, the project mapped buffer zones around schools and identified offenders living within these prohibited areas. Further analysis was conducted using housing rent data that was collected from rental agencies in the area. Results indicated that of the offenders found to be living within the school buffer zones, the average rent was $525 - $570, which is a mid-range rent for the area (Xu and Zhou 2000).

A 2006 study used GIS to investigate impacts of sex offender residency restriction laws in Orange County, FL. Based on 1000 foot buffer zones around bus stops, daycares, schools, parks, and attractions, 95% of residential parcels were off limits. Legally allowed parcels were determined to be located primarily in low-density rural areas. Based on the results of the study, the researchers concluded there was evidence to support that residency restrictions are linked to the social and economic isolation of sex offenders (Zandbergen and Hart 2006).

### 2.7 Limitations of the Literature

The primary limitation of the available literature is based on length of time the issue has been studied. Although states had begun sex offender registration legislation in the mid 1990s, primarily, residency restrictions did not become popular into the 2000s. Furthermore, local municipal ordinances, which for most part are more restrictive in nature, have been in effect for an even shorter time period.
Although much public comment is available on the subject, few scientific studies exist. Scholars have only begun to examine if trends can be established linking effects to legislation. As this is a debate with clearly many geographic components, GIS analysis will be a key component in future research.
Chapter 3: Methodology

3.1 Study Issues

There is a growing concern that residency restrictions can actually contribute to the rate of recidivism and create unintended consequences. In reality buffers create barriers to public services, transportation, employment, housing, and separation from supportive family members, all of which are critical factors in an offender’s rehabilitation and community reintegration (Levenson 2007). In Bay County, if the residency restriction buffers are effective, it is possible that offenders will be faced with similar circumstances, assuming they remain in the county.

Also of concern is the police presence in the urban areas versus the rural areas. Each of the incorporated cities in the county has either their own police department or contract with the county for policing services within their city limits. This results in a highly visual police presence in the urban areas. The unincorporated areas are patrolled by the Bay County Sheriff's Department. Coverage is less visible in the northern rural areas due to a smaller concentration of population and a larger number of square miles.

If the ordinances do generate a northerly rural concentration of sex offenders, will the number of patrols by police be increased proportionality to ensure adequate monitoring of the sex offenders in the community? Or will offenders receive less supervision due to fewer police patrols? A report to the Minnesota Legislature found that residency restrictions would have the effect of moving offenders to areas of “less population and fewer supervising agents” (Minnesota Department of Corrections 2003).

It is important to consider the motivation behind the passage of local ordinances. There is concern that local residency restrictions for sex offenders are merely “feel good”
ordinances. Did the local officials feel pressured to pass the ordinances? No elected official wants to appear soft on protecting their constituents. According to Iowa Senator Jerry Behn, “He and most law makers can’t vote for any law that appears to give sex offenders a break, for fear of giving political opponents ammunition” (Gunderson 2007). If other neighboring cities have passed residency restriction ordinances, certainly no city wants to be the only one in the area without a similar ordinance. A city without residency restrictions could potentially become a sex offender safe haven (Hawkins 2007).

Each of the municipal ordinances in the study area used strikingly similar phraseology in their justification in the creation of the ordinances. In particular, one such statement is included verbatim on each of the ordinances as a justification for adopting the ordinance: "Whereas, the City finds from the evidence that the recidivism rate for released sex offenders is alarmingly high, especially for those who commit their crimes on children." (City of Callaway, FL 2006; City of Mexico Beach, FL 2006; City of Panama City, FL 2006; City of Parker, FL 2006; City of Springfield, FL 2006; Town of Cedar Grove, FL 2006).

What "evidence" is being referred to in the ordinances? No supporting documentation is offered. In fact the "evidence" in studies shows that only small groups of high risk offenders are likely to reoffend. It is true that the rate of recidivism in the high risk group is as high as 80 - 90% (Conroy 2006). However, offenders within these high risk subgroups are likely to reoffend regardless of residency restrictions (Conroy 2006).

It is not the intent of this research to in any way minimize the horrific and long lasting effects for children that have been the victims of sexual offenses or the importance
of finding ways to protect society. However, it is important to study the effects of the residency restrictions to ensure that unintended consequences are not created that actually worsen the situation to the detriment of the safety of children.

3.2 Data

The primary source of data for this study has been provided by the Florida Department of Law Enforcement. Current information about sex offender addresses can be obtained at Florida Department of Law Enforcement: Florida Sexual Offenders and Predators (Florida Department of Law Enforcement 2006b). Since current information was insufficient to conduct this study, a public records request was made to the Florida Department of Law Enforcement.

Datasets that were furnished include the following:

- Bay County Sex Offender Data, 2005
- Bay County Sex Offender Data, 2006
- Bay County Sex Offender Data, 2007

Included in these datasets are the addresses of the sex offenders and basic demographics including the offender’s sex, race, height, weight, and date of birth.

County and city data was provided by the Bay County GIS Department in the form of a standard layers disk. Layers used from this source include: county gulf layout, city limits for each municipality, parcels, roads, and natural features such as water bodies, parks, playgrounds, and schools. School bus stop data was provided by the Bay County
School Board. Day care center data for Bay County was obtained from Florida Department of Children and Families: Child Care Information (Florida Department of Children and Families 2006). Locations of places where children congregate were determined based on locations within each city limits. The coordinate system of all geographic data sets is State Plane, Florida North Zone, Datum NAD83, units are in feet.

### 3.3 Data Compilation

**First Step: Create geocoded address point file for sex offender locations by year.**

Data sets obtained from the Florida Department of Law Enforcement were used to geocode the addresses of the sex offenders by year based on second quarter data. The address data was received in the form of Excel files and was the reference table for the geocoding process. An address locator based on the county’s address layer, which is created and maintained by the Bay County GIS, was used to ensure the accuracy of geocoding.

A field was created for each of the Excel files that will note if the offender was incarcerated at the time the data was collected. Since the purpose of this study is to analyze the spatial effects of the buffer zones, offenders who were incarcerated were excluded from that year’s analysis as they had no choice in the selection of a residential address. Additionally, offenders that were listed as moved out of the study area, absconded, or are transient, were also excluded.
**Second Step: Create geocoded address point file for all restriction indices.**

Day care address data obtained from the Division of Children of Families were compiled into an Excel file and used to create an address point file using geocoding. Addresses of places where children congregate were also compiled into an Excel file and used to create an address point file using geocoding. Finally the point data of all other restriction indices was combined to create a single point file that consisted of the locations of schools, public school bus stops, day care centers, playgrounds, parks, and places where children congregate.

**Third Step: Create combined residential zoning layer**

Using zoning layers from all eight municipalities and the county zoning layer, categories were combined to create eight zoning types: Agriculture, Commercial, Conservation, Industrial, Mixed Use, Planned Development, Public/Institutional, and Residential.

**3.4 Data Analysis**

**Mean Center:**

The mean center of the sex offender population for the county was calculated for each year, 2005 – 2007, using each year’s sex offender address layer. A map was used to display the location of the mean center for each year in the study. Distance and direction of changes in the mean center over time are noted in the findings.

**Spatial Distribution:**

Using “average nearest neighbor” distance, spatial distribution was calculated for each year’s sex offender address point layer to analyze for patterns such as randomness,
clustering, or dispersion. Additionally, maps are included representing the residential addresses of the offenders for each year. A visual comparison of these maps is made to identify changes in the distribution pattern.

**Buffer Zones:**

State of Florida buffer zones were calculated based on the restriction indices and a 1000 foot radius. Combined municipal buffer zones were calculated based on each of the cities with ordinances by selecting out the restriction indices that are contained by each of the city limits and combining all indices. A 2500 foot buffer was calculated based on these restriction indices. Individual buffers were also created for each city that had adopted municipal residency restrictions. These buffers along with city limits were used to calculate the percent of land covered by the buffers.

**Offenders in Each City by Year:**

Using city limits and the sex offender address point layers for each year, the number of sex offenders residing within each of the eight cities was calculated. The results are presented in a table format, allowing for ease of comparing the number of offenders in each city for each year. Analysis was made to determine if the number of offenders residing in cities without ordinances has increased or decreased since the enactment of the ordinances and if the number of offenders living in cities with residency restrictions has decreased.

Where analysis indicates there has been a decrease in the number of offenders residing in cities with residency restrictions, a matched pairs t-test was performed to test for differences between the sample years (2006 - 2007) for these cities. Based on a comparison of the differences between the values, the matched pairs t-test was used to
determine if the decrease was significant or the result of random variability. The null hypothesis was that the 2007 values are the same as the 2006 values. The alternative hypothesis was that the 2007 values are less than the 2006 values. The test used a .05 level of significance.

**Offenders Excluded from the Study:**

Using the sex offender data since the ordinances have been enacted, analysis was performed to identify the number of offenders who were excluded from the study. The results are presented in table format with the following breakdown: absconded, incarcerated, moved, and transient.

**Residential Area Legally Allowed for Residency**

Using the combined zoning layer created in the data compilation stage, the percent of allowed land zoned for residential use within the county was calculated. There are two zoning types that were considered for possible residential usage: Mixed Use and Residential. In the cities where Mixed Use is a category, these areas are primarily located in residential areas and can be an indication of a home-based business. A combined municipal and state buffer zone was created using the Union tool available in Arc Tool box. This combined buffer layer was used along with the combined land use layer to determine the number of acres of Residential and Mixed Used zoning codes affected by the residential restriction ordinances.

**3.5 Relationship between Study and Research Objectives**

**Shift in Mean Center**

In relation to the study, analysis of the mean center of population for sex offenders in the county will be an indication of change in the overall sex offender
population's location. A concern raised in this study is that residency restrictions may increase the likelihood that residential restrictions will contribute to offenders moving from the urban population centers to more rural areas. It is theorized that moving offenders away from children will increase the safety of these children. However, it is important to note that moving offenders away from urban children ultimately results in moving them closer to rural children.

Even a minimal change of distance and direction will be an important tool in gauging if a pattern can be established. The study data begins in 2005 when only the Florida State 1000 foot law was in effect. The 2006 study data comes only one month after the enactment of three of the cities' ordinances. The 2007 study data has the greatest potential to have affected a shift in population. Variance is expected to be marginal due to minimal time since enactment of ordinances.

Change in Spatial Dispersion

Geocoding of offender addresses was expected to confirm that the distribution of the sex offender population is primarily clustered. This would be expected also to be true for the general non-offender population as well, due to housing, jobs, services, and transportation being clustered in urban centers. Additionally, large amounts of land within Bay County are planted timberlands in the rural areas reducing the amounts of available housing options for both offenders and the general population.

Based on nearest neighbor analysis, results will be used to establish the degree of clustering or dispersion of the sex offender population for each year. If there is an increase in randomness, this could be an indication that offenders are moving away from urban centers. If the spatial distribution remains the same or becomes more clustered,
this could be an indication that the ordinances have had little or no effect on the
dispersion of offenders in the county.

**Percent Land Blocked by Residency Buffers**

Buffer analysis is a critical component of the research as spatial changes in the
percent of area legally allowed correlates directly to the mandates of the sex offender
laws. Maps depicting the buffers will be used for visual analysis of the extent to which
buffers cover areas.

Is the intent of sex offender residency restrictions strictly to move offenders away
from the temptation of children or the complete eradication of the sex offender
population in entire cities? Results from the buffer calculations will reveal the level of
prohibition of new offenders in the cities that have enacted residency restrictions. As it is
possible to legislate offenders entirely from residing within a community, it is important
to this study to determine to what degree this has occurred within Bay County, FL.

**Change in Number of Offenders**

By calculating the number of offenders located in the cities and unincorporated
areas in 2007 and comparing to the number of offenders located in the same cities in
2006, changes can be analyzed. If the ordinances have been effective in reducing the
proximity of offenders to perceived areas of temptation, analysis should reflect a decrease
in the number of offenders living within the city limits of those cities that have enacted
ordinances. Little or no change in the number of offenders would be an indication that the
ordinances have had less effect on moving the offenders from cities with residency
restrictions.
The results of this analysis will be very relevant to the issues raised in this study. If it is found that the offenders were reduced in a city, then it must be asked, where did they go? Since they would be prohibited from moving to areas protected by residency restrictions, then the assumption could be made that they would relocate to an area that was not restricted. It is possible that some offenders may improve their situation by a change of location. However, as residential options become more limited, it becomes increasingly more likely that an offender's change of address may lead to reduction in needed support systems.

**Change in Excluded Offenders**

This analysis will be important to the study as the results will reveal further insight into the offender population. Number of offenders will be compared from 2005 to 2007 to reveal changes year to year. The number of offenders that were excluded because they were incarcerated and therefore had no choice in housing options will be determined. Also, the number of offenders that were listed as absconded or transient will be calculated. If high numbers of offenders are listed as absconded, this may indicate an increase of failing to comply with the registration and housing restrictions. Additionally, if high numbers of offenders are listed as transient, this may be an indication that offenders are unable to locate suitable housing.

Another aspect of this analysis will be the numbers of offenders that have chosen to move out of the study area. Although specific reasons for offenders leaving the study area are not available, one possibility is that with increased residency restrictions offenders may be moving to areas with fewer restrictions. In the cases of offenders that chose to move to areas with fewer restrictions, what are the consequences to the public in...
these areas? If as speculated, the sex offender population has no hope of rehabilitation, then is it justified that citizens in areas without residency restrictions bear the responsibility for those communities that have incorporated relocation legislation?

**Change in Legally Allowed Residential Area**

The amount of residentially zoned area of the county that is legally allowable for an offender to establish residency is important to this study as it can provide data on an effect that can be specifically linked to the residency restrictions. Prior to the state and city ordinances, there were no restrictions on where an offender could establish residency. Therefore results from this analysis will clearly define legally allowed and prohibited areas which are a direct result of the ordinances. The analysis will not determine the percentage actually available for occupancy, but will give an overall picture of areas blocked by the ordinances.

**3.6 Limitations and Problems**

**On-going Legislation**

In Bay County, six municipal ordinances were adopted over several months in 2006. This left two of the eight municipalities within Bay County, Lynn Haven and Panama City Beach, choosing not to adopt restrictions. However, since this study was initiated, both remaining cities enacted similar ordinances in fall 2007. At the time of this study, there had not been sufficient time since enactment of these two last ordinances to warrant inclusion based on the available study data.

Additionally, the county government is currently considering creating residential restrictions as a large portion of Bay County is unincorporated. The matter is under
review and the county is considering adoption of an ordinance. For the purposes of this study, the study data is based on where offenders were located the beginning of the second quarter of FY 2005, 2006, and 2007 per FDLE records. Therefore offender analysis cannot be attributed to any ordinances passed after the data was collected.

**Validity of Offender Addresses**

Also of concern is the limitations of the validity and timeliness of the study data. Offender data was obtained from the FDLE based on the offender's address of record on the first day of each quarter. Data for FY 2005, 2006, and 2007 were furnished broken down by 1st, 2nd, 3rd, and 4th quarters. At the time of the data request, FY 2007, the latest data was available only through the 2nd quarter. Thus the offender addresses used in this study are based on the offender's registered address as of April 1st 2005, 2006, and 2007. Therefore if the offender had a change of address or status, such as moving out of the county, absconding, becoming transient or incarcerated, the updated information was not available for consideration.

**Geocoding Issues**

Furthermore as this study moved to the analysis stage, it was determined that the files provided by the FDLE contained numerous typographical errors that initially resulted in a large number of addresses failing to geocode. The data errors were attributed to a lack of standardization by data entry personnel. Errors included incorrect zip codes and road types, invalid apartment and house number combinations, and most commonly road names were misspelled.

The data was reevaluated and analyzed for discrepancies. Each year's data was recompiled using a standard method of addressing. All incorrectly spelled street names
were corrected. All other addresses that failed to geocode were individually researched and corrected, i.e. zip corrections and road type, using the county's address layer in conjunction with the county parcel layer resulting in 100% geocoding.
Chapter 4: Findings

4.1 Mean Center

From 2005 to 2006 the mean center of the sex offender population shifted to the northeast approximately .67 miles. From 2006 to 2007 the mean center of population shifted to the northwest approximately .85 miles. By excluding the 2006 change of mean center, an overall analysis can be further made that the mean center of population from 2005 to 2007 shifted almost directly to the north approximately 1.4 miles (Figure 2).

The mean center for all three years fell within the city limits of Lynn Haven, which at the time of data acquisition had not adopted a residency restriction ordinance. Lynn Haven is also the most centrally located city within the county. As previously noted, the urban centers are located primarily in the southern areas of the county and the northern areas of the county are primarily rural containing large portions of timberland. Therefore the location of urban centers in the south, with their higher concentrations of the sex offender population, impacted the mean center.

The mean was also influenced by an extreme easterly outlier in Mexico Beach, in both 2006 and 2007. Another influence is the zero sex offender population located along the southeastern coastal region. The absence of offenders in this area is due to the location of Tyndall Air Force Base. Base housing is limited to active duty military and dependents and is subject to termination following a felony conviction (GMH Military Housing 2006). Also it is important to note that future changes in the mean center are likely to be influenced by the 2007 adoption of sex offender ordinances in Lynn Haven and Panama City Beach. Furthermore, passage of an ordinance by the county government would result in a future impact to the mean center.
Bay County Florida
Mean Center Of
Sex Offender Population

Figure 2: Map of Mean Centers
4.2 Spatial Dispersion

Spatial dispersion was calculated using a script created by Dr. Michael Sawada of the University of Ottawa, Canada (ESRI Support Center 2008). This analysis tool was applied to each year’s geocoding results (Figures 3, 4, and 5). Values (Table 2) obtained by the process are compared to the following standard taken from *An Introduction to Statistical Problem Solving in Geography* (McGrew and Monroe 2000).

<table>
<thead>
<tr>
<th>R Value</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>2.149</td>
<td>Perfectly Dispersed</td>
</tr>
<tr>
<td>1.5</td>
<td>More Dispersed Than Random</td>
</tr>
<tr>
<td>1</td>
<td>Random</td>
</tr>
<tr>
<td>0.5</td>
<td>More Clustered Than Random</td>
</tr>
<tr>
<td>0</td>
<td>Perfectly Clustered</td>
</tr>
</tbody>
</table>

It can be determined based on this analysis that the sex offender population of Bay County FL is “More Clustered Than Random” for all three years. Results (Table 3) indicate that for the study period, the studied population has marginally increased in randomness each year.

<table>
<thead>
<tr>
<th>Year</th>
<th>NN Index</th>
</tr>
</thead>
<tbody>
<tr>
<td>2005</td>
<td>0.45943</td>
</tr>
<tr>
<td>2006</td>
<td>0.47831</td>
</tr>
<tr>
<td>2007</td>
<td>0.50674</td>
</tr>
</tbody>
</table>
Figure 3: Map of Sex Offender Spatial Distribution 2005
Figure 4: Map of Sex Offender Spatial Distribution 2006
Figure 5: Map of Sex Offender Spatial Distribution 2007
In a comparison of Figures 3, 4, and 5, overall they appear similar. However, a closer look reveals an increase in offenders in the northeast corner of the county, particularly when comparing 2005 to 2007. An increase along the west coastal area, in Panama City Beach is also evident from 2005 to 2007.

4.3 Buffer Zones

State buffer zones (Figure 6) were calculated based on 1000 foot from daycares, parks, playgrounds, and schools. The state zones cover 2.73% of the county. Combined municipal buffer zones (Figure 7) are based on 2500 feet from daycares, parks, places where children congregate, playgrounds, schools, and school bus stops. Combined, the municipal buffers cover 7.08% of the county. The restricted areas from municipal buffers are a relatively low percentage of overall county acreage. However, an examination of the percentages of city acreage occupied by the municipal buffers (Table 4) reflects much higher percentages of restricted areas.

<table>
<thead>
<tr>
<th>City</th>
<th>% Blocked by Residency Buffer</th>
</tr>
</thead>
<tbody>
<tr>
<td>Callaway</td>
<td>71%</td>
</tr>
<tr>
<td>Cedar Grove</td>
<td>89%</td>
</tr>
<tr>
<td>Mexico Beach</td>
<td>97%</td>
</tr>
<tr>
<td>Panama City</td>
<td>56%</td>
</tr>
<tr>
<td>Parker</td>
<td>100%</td>
</tr>
<tr>
<td>Springfield</td>
<td>96%</td>
</tr>
</tbody>
</table>

Analysis of the City of Callaway's buffer (Figure 8) reveals that 71% of the city is restricted and off limits to sex offender residency. Much of the remaining available land in Callaway currently has no housing and is zoned for either agriculture (timberland) or is slated for future planned development.
Figure 6: Map of State of Florida Residency Restriction Buffers 2007
Figure 7: Map of Combined Municipal Residency Restriction Buffers 2007
Figure 8: Map of Callaway Residency Restriction Buffers 2007
An examination of restricted areas in the Town of Cedar Grove (Figure 9) reveals that 89% of lands are blocked. Similar to Callaway, the available land in Cedar Grove is for the most part planted pines for the timber industry. There are future plans to convert some of the timberland to residential development.

The City of Mexico Beach is a small beach community in the southeastern most portion of the county. The results from an analysis of this community's residency buffer (Figure 10) reveal that 97% of the city is unavailable for offenders for new residency.

A calculation of the Panama City residency buffer (Figure 11) shows that only 56% of the total area is blocked. However it is important to note that of the remaining approximately 8200 acres, 1500 plus acres are located in an industrial park and 6400 plus acres are currently timberland, some of which is in the process of development into residential communities. It is critical to recognize that as new housing developments are constructed, it is likely that families with children will occupy these areas resulting in an increase in bus stops, day cares, parks, and playgrounds. Residential opportunities will not necessarily increase for sex offenders as new developments are completed.

The City of Parker, encompassing only 2.5 square miles, has numerous parks and recreation facilities. Evaluation of the City of Parker's buffer (Figure 12) discloses that 100% of land in the city limits is blocked to offenders wishing to establish a new residence. The complete blockage of the city by the buffer zones can be attributed to its small size and its numerous parks, playgrounds, and school bus stops.

Finally, the City of Springfield's residency buffer (Figure 13) shows that 96% is the city is restricted. In addition to numerous parks and playgrounds, Springfield is also home to three schools, all of which contribute to almost complete coverage by the buffer.
Figure 9: Map of Cedar Grove Residency Restriction Buffers 2007
Figure 10: Map of Mexico Beach Residency Restriction Buffers 2007
Figure 11: Map of Panama City Residency Restriction Buffers 2007
Figure 12: Map of Parker Residency Restriction Buffers 2007
Figure 13: Map of Springfield Residency Restriction Buffers
4.4 Number of Offenders by Cities

As depicted in the summary (Table 5), cities with residency restrictions in place saw a decrease in the number of offenders from 2006 to 2007. A matched paired t-test was performed to determine if the decrease was significant or the result of random variability. The null hypothesis was that the 2007 values are the same as the 2006 values. The alternative hypothesis was that the 2007 values are less than the 2006 values. The results of the t-test (Table 6), indicate with a 99% certainty ($P = 0.0095$) there was a decrease. The t-statistic of -3.8 exceeds the critical value of -2.13 indicating the results are significant. Therefore the null hypothesis is rejected and the decrease was significant and not likely the result of random variability.

Table 5: Offenders by City and Year

<table>
<thead>
<tr>
<th>City</th>
<th>2005</th>
<th>2006</th>
<th>2007</th>
<th>%Chg 06 to 07</th>
</tr>
</thead>
<tbody>
<tr>
<td>Callaway*</td>
<td>21</td>
<td>18</td>
<td>14</td>
<td>-22.22%</td>
</tr>
<tr>
<td>Cedar Grove*</td>
<td>19</td>
<td>20</td>
<td>18</td>
<td>-10.00%</td>
</tr>
<tr>
<td>Lynn Haven</td>
<td>9</td>
<td>11</td>
<td>14</td>
<td>27.27%</td>
</tr>
<tr>
<td>Mexico Beach*</td>
<td>0</td>
<td>1</td>
<td>1</td>
<td>0.00%</td>
</tr>
<tr>
<td>Panama City*</td>
<td>72</td>
<td>68</td>
<td>59</td>
<td>-13.24%</td>
</tr>
<tr>
<td>Panama City Beach</td>
<td>11</td>
<td>8</td>
<td>11</td>
<td>37.50%</td>
</tr>
<tr>
<td>Parker*</td>
<td>17</td>
<td>8</td>
<td>3</td>
<td>-62.50%</td>
</tr>
<tr>
<td>Springfield*</td>
<td>23</td>
<td>33</td>
<td>30</td>
<td>-9.09%</td>
</tr>
<tr>
<td>Cities Total</td>
<td>172</td>
<td>167</td>
<td>150</td>
<td>-10.18%</td>
</tr>
<tr>
<td>Unincorporated Areas</td>
<td>103</td>
<td>111</td>
<td>154</td>
<td>38.74%</td>
</tr>
<tr>
<td>Total Countywide</td>
<td>275</td>
<td>278</td>
<td>304</td>
<td>9.35%</td>
</tr>
</tbody>
</table>

* Sex Offender Buffer Zones in place since 2006
Table 6: Matched Pairs T-Test Results

<table>
<thead>
<tr>
<th></th>
<th>Variable 1</th>
<th>Variable 2</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mean</td>
<td>24.8</td>
<td>29.4</td>
</tr>
<tr>
<td>Variance</td>
<td>458.7</td>
<td>544.8</td>
</tr>
<tr>
<td>Observations</td>
<td>5</td>
<td>5</td>
</tr>
<tr>
<td>Pearson Correlation</td>
<td>0.9964</td>
<td></td>
</tr>
<tr>
<td>Hypothesized Mean Difference</td>
<td>0</td>
<td></td>
</tr>
<tr>
<td>df</td>
<td>4</td>
<td></td>
</tr>
<tr>
<td>t Stat</td>
<td>-3.80699</td>
<td></td>
</tr>
<tr>
<td>P(T&lt;=t) one-tail</td>
<td>0.009495</td>
<td></td>
</tr>
<tr>
<td>t Critical one-tail</td>
<td>-2.131847</td>
<td></td>
</tr>
</tbody>
</table>

Mexico Beach had no change from 2006 - 2007, holding steady with its last remaining offender. If and when Mexico Beach's remaining sex offender relocates, they will be the only city with no offenders. Overall, all cities saw a 10.18% reduction in offenders.

Of the eight municipalities within Bay County, only two, Lynn Haven and Panama City Beach saw an increase in the number of offenders. There was also an increase in the number of offenders living in the unincorporated areas of Bay County (38.74%). Results reflect an increase only in areas of the county that did not have residency restrictions in place at the inception of the study.

Overall, the numbers of offenders within Bay County increased each year of the study; 2005 (275), 2006 (278), and 2007 (304). An inquiry to the Florida State Probation and Parole office located in Bay County revealed that these increases can be largely attributed to two scenarios (Windham 2008). The number of offenders has risen as offenders that previously lived in Bay County, who were incarcerated outside Bay County, complete their sentences and are returning to where they considered home prior to their arrest. Additionally, some offenders who are arrested do not serve prison terms.
and immediately enter the probation system. Offenders fitting this scenario who lived in Bay County at the time of their arrest, upon release on probation, often wish to remain in Bay County.

### 4.5 Offenders Excluded from the Study

Analysis of the number of excluded offenders (Table 7) reveals very low numbers of offenders that were listed as absconded or transient. There was a 58.8% increase in the number of offenders that were incarcerated in 2006 over 2005. However, the following year there was a 7.4% decrease in offenders that were incarcerated.

There was no data available for analysis from 2004 to determine if offenders had moved prior to their 2005 address. Therefore analysis was made based on 2006 and 2007 to determine the number of offenders that had moved. Of the offenders leaving the state, there was a 28% decline. Of offenders who had a change of address, yet remained within Florida, there was a 10% increase.

<table>
<thead>
<tr>
<th></th>
<th>2005</th>
<th>2006</th>
<th>2007</th>
</tr>
</thead>
<tbody>
<tr>
<td>Absconded</td>
<td>1</td>
<td>0</td>
<td>2</td>
</tr>
<tr>
<td>Incarcerated</td>
<td>17</td>
<td>27</td>
<td>25</td>
</tr>
<tr>
<td>Moved out of Florida</td>
<td>*</td>
<td>25</td>
<td>18</td>
</tr>
<tr>
<td>Moved out of County</td>
<td>*</td>
<td>10</td>
<td>11</td>
</tr>
<tr>
<td>(Still reside in Florida)</td>
<td>*</td>
<td>10</td>
<td>11</td>
</tr>
<tr>
<td>Transient</td>
<td>0</td>
<td>0</td>
<td>1</td>
</tr>
<tr>
<td>Totals</td>
<td>18</td>
<td>62</td>
<td>57</td>
</tr>
</tbody>
</table>

*First year of study
4.6 Residential Area Legally Allowed for Residency

Analysis of the combined county zoning (Figure 14) indicates that over half the land in Bay County is zoned for agricultural use (Table 8). In Bay County, Agriculture zoning primarily refers to the growing of trees for the timberland industry. It is important to note that in Bay County, it is not illegal to establish residency on property zoned for agriculture use. However, much of the land zoned as Agriculture is used in the production of timber, and housing is not the predominant use of these lands. Therefore Agricultural zoning classification was excluded in this analysis.

The second most common land use type is those areas designated for Conservation. These areas comprise approximately 25% of the county. Two zoning types, Mixed Use and Residential, were considered in the analysis of residential areas legally allowed for offenders to establish new residences. Mixed Use zoning does allow for the property to be used for both business and residential purposes and is a common designation for home based businesses. Combined Mixed Use and Residential zoned properties account for approximately 10% of the acreage in the county.

Table 8: Zoning Analysis

<table>
<thead>
<tr>
<th>Zoning Type</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Agriculture</td>
<td>52.30%</td>
</tr>
<tr>
<td>Commercial</td>
<td>2.42%</td>
</tr>
<tr>
<td>Conservation</td>
<td>24.75%</td>
</tr>
<tr>
<td>Industrial</td>
<td>2.41%</td>
</tr>
<tr>
<td>Mixed Use</td>
<td>0.67%</td>
</tr>
<tr>
<td>Planned Development</td>
<td>0.53%</td>
</tr>
<tr>
<td>Public Institutional</td>
<td>7.39%</td>
</tr>
<tr>
<td>Residential</td>
<td>9.53%</td>
</tr>
</tbody>
</table>
Figure 14: Map of Combined Zoning in Bay County 2007
Using the combined county zoning with buffer overlay (Figures 15 and 16), calculations were made by dividing the number of acres of Mixed Use and Residential land that fell inside the buffer zones (17,529.64) by the total number of acres of Mixed Use and Residually zoned land (48,234.13). It was determined that approximately 64% of acres zoned Mixed Use and Residential fell outside the buffer zones (Table 9).

Table 9: Percent Allowed and Prohibited Residential Area

<table>
<thead>
<tr>
<th>Buffers Intersection with Land Use</th>
<th>Acres</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mixed Use within Buffers</td>
<td>3,057.27</td>
</tr>
<tr>
<td>Residential within Buffers</td>
<td>14,472.37</td>
</tr>
<tr>
<td>Total Combined Mixed Use &amp; Residential Acres within Buffers</td>
<td>17,529.64</td>
</tr>
<tr>
<td>Total Combined Mixed Use &amp; Residential Acres</td>
<td>48,234.13</td>
</tr>
<tr>
<td>Percent Allowed Area</td>
<td>64%</td>
</tr>
<tr>
<td>Percent Prohibited Area</td>
<td>36%</td>
</tr>
</tbody>
</table>
Figure 15: Map of Combined Zoning in Bay County with Buffer Overlay 2007
Figure 16: Map of Residential and Mixed Use Zoning in Relation to Buffers 2007
Chapter 5: Conclusion

5.1 Restatement of Research Question and Objectives

Specifically this study was designed to answer the following research question: 

*Has sex offender residency geographic distribution changed in Bay County, FL since the enactment of municipal sex offender residency restrictions?* Analysis from this study was used to compare the spatial effects of sex offender residency from 2005 - 2007. The six research objectives are:

1. To determine if there has been a shift in the mean center of sex offender population within the county.
2. To determine if there are indications that the sex offender population is becoming less clustered.
3. To determine the percent of area that is blocked by the residency buffers.
4. To determine if there has been a reduction in the number of offenders residing in cities with residency restriction ordinances.
5. To determine the number of offenders that was excluded from the study for the categories of absconded, incarcerated, moved or transient.
6. To determine the percentage of residentially zoned property legally allowed for sex offender relocation.

5.2 Conclusions

Considering the horrific and long lasting effects of child abuse, it is natural that society should explore any and all options to protect children. Individuals who have crossed the line and chosen to sexually violate children should expect little sympathy
from the public. Although punishment to sexual offenders can do little to erase damage to victims, it is the responsibility of society to create and enforce laws ensuring there will be dire consequences for those who seek to harm children. Legislative solutions, both criminal and civil, can be appropriate courses of action.

As the ultimate goal is to protect children, it is imperative that all solutions, proposed or enacted, be closely evaluated and reevaluated for effectiveness. Although sexual exploitation of children is a highly emotional and charged issue, knee jerk reactions resulting in policy decisions should be avoided. While it is not possible to anticipate all potential consequences, the adoption and continuation of policies and/or laws with little or no study of their impacts would be unwise. This study has sought to explore the spatial impacts of one such sex offender policy and law, the application of residency restrictions in Bay County, FL.

In answer to the research objectives it can be concluded that:

1. There has been a northerly shift in the mean center of the sex offender population away from municipalities with residency restrictions.
2. Although marginally, the sex offender population has become less clustered.
3. Overall, the buffers blocked only 7.08% of the total area within the county; however, percentages within individual cities were very high.
4. Cities with restrictions saw a reduction in number of offenders, and cities and areas without restrictions saw an increase in the number of offenders.
5. The numbers of offenders excluded from the study due to absconding or
transience were very low. Numbers of offenders incarcerated increased in 2006, then saw a decline in 2007. The rate of offenders leaving the state declined after enactment of the ordinances.

6. The percentage of legally allowed residentially zoned area for sex offenders to establish residency is 64%.

Specifically, it can be concluded that sex offender residency geographic distribution has changed in Bay County, FL since the enactment of municipal sex offender residency restrictions. Clearly, residency restrictions have contributed to the spatial effects of sex offender residency. It is important to note that some effects, specifically the buffer percentages and percent legally allowed area, can be directly linked to the residency restrictions. Multiple factors, many of which were beyond the scope of this study, could contribute to all other results of the study.

Some of the factors not considered in this study that are likely contributors to changes in residency geographic distribution are related to personal motivation factors. An offender might experience a change in residency based on factors for reasons totally unrelated to the buffer ordinances. Examples include the offender's health, personal relationships, and financial opportunities. An offender might choose to reside outside a buffer area simply because they have the resources or opportunities to do so.

How do these conclusions relate to the overall study issues? The results indicate that buffers are highly effective in the reduction of offenders. Communities without buffers are likely to see an increase in offenders, when neighboring cities pass such laws. Enactment of the municipal ordinances has resulted in a reduction of housing options.
and, if trends continue, a shift in the sex offender population to the northern, more rural areas of the county.

Finally, are the results of this study an indication that residency restrictions for sex offenders have been effective in achieving the goal of protecting children? Or as Towers (2007) suggests, perhaps we are just herding sex offenders from one city to the next to prey on someone else's children. Clearly, further examination of re-offense by offenders, over a period of years, is needed to answer this question.

5.3 Contribution of the Research

The findings of this study add a quantitative resource that can be applied to future studies of residency restrictions for sex offenders. Prior to this research little or no empirical data existed on specific spatial effects of residency restrictions for sex offenders. Previous resources, although they offered substantive and logical arguments, were primarily qualitative in nature. Due to similar study issues in other communities, the research presented in this study has implications beyond the local study area.

During the course of conducting research for this thesis, several opportunities were presented that allowed for the sharing of knowledge gained from the study. In cooperation with the local Florida Department of Corrections, Probation and Parole office, findings pertaining to the residency restrictions were shared. Maps were created and furnished to the Probation and Parole office as preliminary guides indicating where the buffers were located. It is important to note that Probation and Parole use the maps as a general outline, and on-site field checks are required prior to the placement of offenders. Following the original mapping work for Probation and Parole, a request for
additional maps was received from court officials. Following completion of their sentences and prior to their release, sex offenders are required to furnish the court a legally allowed address for residency. The court officials are using these maps to assist in the initial determination if potential addresses are blocked by the residency buffers.

Most recently, the county government has been investigating the adoption of a sex offender residency restriction ordinance. As part of the process of compiling information on potential impacts of adoption of such an ordinance, county legal staff requested maps to be prepared as a graphic representation of possible scenarios. In particular, staff was interested in looking at the extent of coverage by municipal ordinances and how the addition of a county ordinance would increase this coverage depending on inclusion of various restrictions.

In addition to maps, findings from this study were offered along with research concepts derived through the literature review process. Based on the easy adoption of such ordinances at the municipal level, limited challenge was expected. However, during the first public hearing, one-hundred percent of the public participation was in objection to passage of the ordinance. A date has been set for an additional public hearing and the commissioners have requested county legal staff to research other alternatives, such as limiting the restrictions to include only sexual predators.

5.4 Suggested Areas for Future Study

One of the primary limitations of this study has been the length of the study period. Repeating this original study over a time series such as five or ten years could reveal trends which could not be established in this time limited study. The recent
passage of two additional sex offender residency restrictions also presents opportunities for further study of spatial change in Bay County, FL. Another area of study would be the follow up of sex offenders for a period of years to determine which offenders have committed a re-offense. Additionally a survey of offenders by mail out questionnaire to determine reasons for change in residency could give insight into multiple factors affecting spatial change.

Another area for future study would be to investigate if sex offender residency restrictions have affected economically disadvantaged areas to a greater extent. The proposed study could examine if reduced housing options for offenders in areas where restrictions exist have resulted in a higher concentration of offenders in economically disadvantageous areas. And lastly, the application of a ranking system for offenders based on seriousness of threat to society would be worthwhile of future research. The study could focus on impacts of the incorporation of a ranking system with housing decisions for sex offenders.
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