*Final Harvest in the Garden State: New Jersey's Struggle with Suburban Sprawl - John Hasse*

In this essay, geographer John Hasse recounts the transformation of New Jersey from a primarily rural state to an urban and suburban state that is rapidly approaching "build-out." Against this background he introduces the idea of "smart growth", a strategy that attempts to limit growth, as well as to locate and direct it in ways that will preserve the maximum possible open space.

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Some questions of environmental ethics concern the direct and immediate impact of a proposed action on a particular environmental resource. For example, damming a river for electric and irrigation purposes will significantly alter the wildlife habitat within the river as well as in the flooded area. But what are the ethical implications of a single activity with negligible environmental impact, if the combined impact of thousands of similar activities over time is very large? Such cases (urban sprawl is one) can produce a *tragedy of the commons* (see chapter 10).

Urban sprawl has become one of the most important issues now facing many regions through the United States and the world. Housing developments and shopping malls infringe on lands that were formerly farm fields and forests (Figure 1-1). This urbanization is dramatically changing the physical as well as socioeconomic landscape with significant implications for quality of life, wildlife habitat, water quality, agricultural viability, taxation, social equity and many other

issues. However, suburban sprawl is a process that occurs one house at a time. Each homeowner strives to create his or her own American Dream, to live in a comfortable house, in an area with good schools and safe from crime. The impact of just one such suburban house is not great. Little thought is usually given by that land owner to the combined effect of millions of American Dreams. Undesirable landscape changes attributable to spreading developments and diminishing farmland are often seen as problems caused by others. Understanding the implications of sprawl poses a significant challenge even to professional land researchers, managers and planners. How fast and in what ways do landscapes change and what are the ecological and social implications of those changes?

Any analysis of sprawl must begin with a basic understanding of it. Is sprawl something unique or is it just a modern expression of the same urbanization process that has been occurring for millennia? If urban sprawl is indeed a uniquely distinguishable form of urbanization, the next question to be asked is "so what?" Isn't development an indicator of progress and economic growth? Isn't a larger house on a larger lot the essence of the American Dream? Or is there a dark side to the sprawling urban growth patterns? If sprawl is somehow more problematic, inefficient or dysfunctional than non-sprawling development, then how can the problematic characteristics of sprawl be meaningfully understood and potentially minimized? These are some of the ethical questions inherent in the phenomenon of urban sprawl.

*New Jersey: A Case-Study in Sprawl*

One of the states most pressured to address suburban sprawl is New Jersey. The "Garden State" seems an odd nickname for the nation's most densely populated state. Those unfamiliar with New Jersey will think of shopping malls, highways, industrial complexes and residential subdivisions. They are not wrong, but the New Jersey landscape is much richer than these stereotypes suggests. In spite of having a population density greater than that of Japan or India, New Jersey contains more ecological and environmental diversity within its relatively small area than many other states much larger in size. The "Garden State" still enjoys remarkably intact natural resources including the globally significant Pine Barrens, hundreds of thousands of acres of forest and wetlands on the Atlantic Flyway, the environmentally sensitive highlands and hundreds of miles of coastal and estuary ecosystems.

As the wealthiest states in the nation situated in the heart of the northeastern American core, New Jersey's social and economic landscape is equally as complex and dynamic as its environmental landscape. Tourism and agriculture, which depend on New Jersey's distinct natural resources, are the second and third most significant sectors of the economy. The state's historical significance and rich cultural diversity make it a microcosm of the country as a whole. With such ecological and social bounty New Jersey's landscape may indeed be more analogous to a managed garden than its "urban sprawl" stereotype might have one believe. This makes New Jersey an excellent case study for the process of urban sprawl and the anti-sprawl movements that are arising to counteract it.

Utilizing geospatial technologies including Geographic Information Systems (GIS) and remote sensing, land use researchers are beginning to document and analyze the landscape changes attributable to urban sprawl. The changes revealed in the analysis are remarkable. According to one study that measured land use change between 1986 and 1995, New Jersey annually added nearly 16,600 acres of new development while losing more than 9,600 acres of farmland, 4,200 acres of forest, and 2,600 acres of wetlands (Hasse and Lathrop 2001). Impervious surface is being created at the rate of 4,200 acres per year. The net new land developed during the 1986 to 1995 period of this analysis was 135,764 acres, an area equal to the total land area of New Jersey's Union and Essex counties combined. New Jersey is adding the equivalent of 2 counties worth of growth (and it only has 21 counties in total) to its landscape every 9 years.

Put on a more comprehensible scale, the urban growth rate in New Jersey was equivalent to adding 41 football fields worth of new urban land every day while losing 20 football fields of farmland, 9 football fields of forest and 6 football fields of wetlands. Impervious surface was created at the rate of 9 football fields per day. The pressures that suburbanization are imposing on the landscape have far reaching implications. In all likelihood, New Jersey is on-track to become the first state in the nation to reach build-out.

*Landscape Impacts of Urban Growth*

New Jersey's robust urban growth is a result of many factors including population growth and a vigorous economy. Indeed, many economic indicators

designed to show the health of the local economy, such as new housing starts, are based on land development growth. However, unchecked urban growth can also have significant undesirable impacts on the health of a landscape. Some of the most significant undesirable landscape impacts of unrestrained urban growth include farmland loss, habitat loss, wetlands loss, increased impervious surface and loss of open space. The following section explores these impacts.

*Farmland Loss* - Agriculture is a major activity in the Garden State. Cash sales of agriculture are estimated at $829.5 million. When all farming and food related activity is considered, agriculture is the third largest segment of the New Jersey economy contributing $56 billion annually (NJDA 2001). Despite the fact that in some ways New Jersey farmers benefit from close proximity to a large and wealthy population, the conflicts cause by encroaching urban development make it difficult to continue farming over the long term. Soaring land values and operating costs coupled with multiple conflicts stemming from the incompatibility of farming with new residences make it difficult to farm successfully in New Jersey (Adelaja and Schilling 1999). The result is that many farms discontinue farming activities and are eventually sold for development.

*Forest Loss* **-** The largest single type of landscape change that occurred in New Jersey over the last decade was the urbanization of forested lands. 67,108 acres of forested land were converted to urban land uses during the nine-year period of analysis. Much of the ex-urban growth (single rural units beyond the suburban fringe) occurred in forested lands as forested lots draw a premium price from new

homebuyers. However, such ex-urban development can lead to forest core area reduction and forest fragmentation, which may have significant implications for wildlife habitat sustainability and forest land management. Forest loss also has implications for soil erosion, flooding and air quality.

*Wetlands Loss* **-** One fifth of the New Jersey's land area consists of wetlands, a vital component of the landscape. Wetlands are important for wildlife habitat, flood mitigation, and water purification. Coastal wetlands have been protected since 1970. Disturbance of fresh water wetlands has been regulated since the 1987 New Jersey Freshwater Protection Act. While this regulation has reduced the magnitude of wetlands loss compared to pre-regulatory days, there has still been a significant continual loss of wetlands. 25,781 acres of wetlands were lost from 1986 to 1995.

Tidal salt marshes (i.e. coastal wetlands) comprise 20% of NJ's wetlands but were subjected to less loss and urbanization than non-coastal wetlands. Coastal wetlands lost 2,207 out of 192,051 total acres (a loss of 1.2%) where as non-coastal wetlands lost 22,809 out of 748,483 total acres (a 3.1% loss). There was also a significant difference in the urbanization of coastal versus non-coastal wetlands. Of the wetlands that were lost in each category, urbanization was responsible for 5.8% of coastal loss versus 45.5% of non-coastal loss. New Jersey's Coastal Wetlands Law of 1970 appears to have largely halted the loss of tidal salt marshes to human development.

*Habitat Impacts of Sprawl* **–** Thousands of wildlife species live in New Jersey's diverse landscape. They are rapidly losing their homes. The complexities of

ecological processes make it difficult to map and comprehensively quantify the loss of wildlife habitat because any change in landscape might be detrimental to some species while beneficial to others. Nonetheless, it is self-evident that unchecked urban growth is, on balance, detrimental to the habitat of most wildlife species.

Particularly important is the habitat of threatened and endangered species. As New Jersey continues to urbanize, wildlife habitat will continue to be irreversibly fragmented and lost. New Jersey is currently in the process of mapping which lands are most important for wildlife habitat conservation for threatened and endangered species.

*Impervious Surface Increase From Urban Growth* **-** In nature water continually cycles between the atmosphere, ground water aquifers, lakes and rivers. When open land becomes developed, a portion of the parcel is covered with impervious surface such as asphalt and concrete. Impervious surface changes the natural hydrologic cycle with significant environmental implications. Precipitation can no longer adequately infiltrate into aquifers, streams experience increased flooding, non-point source pollutant levels increase and biological activity is degraded.

Research has shown that the water quality and environmental condition of a watershed are significantly correlated to the amount of impervious surface within the watershed (Arnold & Gibbons 1996). Watersheds with less than 10% impervious surface cover are generally unaffected. When impervious surface is greater than 10%, watersheds show signs of impact. At 30% or above, water quality is usually seriously degraded, often irreversibly.

Impervious surface also has important implications for flooding and ground water recharge. The increase in impervious surface that has been occurring with urban expansion is substantially changing the natural hydrologic characteristics of New Jersey's streams and rivers. Ground water infiltration is reduced and surface runoff is increased. Storm peaks are amplified in magnitude and velocity within a stream channel, changing the load carrying and erosional characteristics. There is more flooding.

During 1986 to 1995 more than 38,200 acres of new impervious surface were added to the New Jersey landscape (think of a parking lot with 6 million parking spaces). Impenetrable ground cover is being created in New Jersey at the rate of approximately 8.8 football fields per day. Growth trends of the 1980 and 90's added one acre of impervious surface for every 4 acres of development. In other words newly developed land is, on average, 25% impervious surface.

*The Forces Behind Sprawl*

Many factors drive the type of growth that is taking place in New Jersey. Some of the more significant variables include: 1) strong local control over zoning and rejection of state "interference" in matters of development, 2) a municipal tax structure that encourages the pursuit of high ratable land uses, 3) a robust economy spurring housing upgrades, 4) geographic proximity of New Jersey to Philadelphia and New York, 5) a highway network spanning the state, 6) strong property rights and anti-planning ideology, and 7) a historical legacy in which patterns of urban and suburban development began long before systems of land management matured.

New Jersey's persistent urban growth is largely a result of its historical and contemporary geographical setting. Few locations in the state are more than 90 minutes commuting distance from New York or Philadelphia (the 1st and 5th most populated American cities). Wedged between these two business and cultural hubs, New Jersey has become the wealthiest state in the nation. It is home to millions of highly educated, highly paid residents looking for quality housing in communities with good schools.

Increasing numbers of employees need not even commute into a major city for employment. Many industries have located in suburban locations further spreading quality employment/housing options throughout the entire state. Global headquarters for a number of multinational corporations are now located on rural New Jersey campuses. An extensive highway network traversing the state and navigable waterways surrounding 2/3 of its territory make most areas readily accessible. New Jersey is the only state in the nation in which all 21 of its counties are classified by the Census Bureau as occurring within a metropolitan statistical area (US Census Bureau 2001). In other words there are no longer any counties considered solely rural in New Jersey. New Jersey's unique geographical setting has led to increased development pressure throughout every corner of the state.

This mix of economic vibrancy, geographic location and limited land area has resulted in a land development process that will inevitably lead to all lands "improving" to their "highest and best use". The question is not *if* New Jersey will reach build-out but *when.* The unavoidability of ubiquitous suburbanization

consuming the entire state is buttressed by real estate interests and consumer demand. Most lands are zoned for some level of development, creating landowners expectations of a financial return through development.

Furthermore, local governments in New Jersey rely on property taxes for municipal revenues; this provides an incentive to attract "ratable" development. Tax rates on vacant lands reflect their potential development value, creating a financial burden on landowners who don't develop. Builders' associations, real estate interests and the farming lobby wield powerful political influence to maintain the status quo. The trends of New Jersey's land use system will not easily change. Nevertheless, in the face of the suburbanization steamroller, a groundswell of change seems to be exactly what is happening in the Garden State.

*Attempting to Save the Garden*

Over the past several decades a number of substantial land management initiatives have resulted in the protection and preservation of nearly 1 million acres of open space, 1/5 of New Jersey's land territory. Many land management programs evolved in the state to address problems associated with urban sprawl, in order to protect recreational and open space, the Pine Barrens, wetlands, and New Jersey's farmland heritage. Many of these initiatives have been established by state agencies. Others have involved non-governmental organizations (NGO's) as well as the non-profit sector. Active citizens have also been key players in initiating and carrying through land preservation efforts. Here are some of the most significant land management programs that have developed in the last several decades:

*State Land Preservation Efforts*

*Green Acres* - The New Jersey Green Acres Program was created in 1961 to respond to land preservation and recreational needs. It has been funded through bonds approved by electoral ballot. Nine separate Green Acres funding initiatives have been overwhelmingly approved by New Jersey voters over four decades, spending over $1.4 billion to protect over 390,000 acres since its inception (NJDEP Green Acres Program 2000).

*Pinelands Comprehensive Management Plan* - The New Jersey Pineland Comprehensive Management Plan (PCMP) was created in 1979 in an effort to protect the unique ecosystem of the New Jersey Pine Barrens as well as the Kirkwood-Cohansey ground water aquifer that lies beneath it. The program designated over a million acres of land in southern New Jersey as falling under the management of a commission consisting of gubernatorial appointees, county representatives, and a member from the Department of the Interior (NJ Pinelands Commission 2000). The PCMP has not gone without controversy over takings issues and its designation as a *biosphere reserve* by United Nations. Nevertheless, studies have indicated that the PCMP has been effective in conserving land in the Pine Barrens (Walker and Solecki 1999, Luque et. al.

1995).

*Wetlands Protection* - Once viewed as wasteland, nearly half of wetlands that formerly existed have been drained and filled throughout the nation (USEPA 2000). In recent decades the importance of wetlands for habitat, breeding grounds, flood

mitigation and water purification has been realized by the scientific community. New Jersey began regulating destruction of wetlands at the state level through the New Jersey Freshwater Protection Act of 1987. While wetlands loss continues, the state requires that the destruction of significant wetlands must be compensated by the creation of new wetlands.

*Farmland Preservation* - As the state nickname indicates, farming has been a major part of New Jersey's heritage. The steady loss of farmland to urban growth led to the creation of the state's farmland preservation program. Under the program landowners are paid by the State to keep their property in permanent preservation. The program is funded through bond issues administered through the State Board of Agriculture, a commission consisting of gubernatorial appointees and farmers. The program's initial limited funding resources resulted in the ability to preserve only a few dozen farms per year leaving many applicants out of the program. In order to fairly allocate the public funds of the program to the most viable farms, a ranking system was developed based on the agricultural potential of each farm. As of Fall 2000 the program had protectied nearly 62,000 acres of farmland since its inception in 1981(NJDA 2001). A recent increase in funding has led to a marked increase in farmland preservation over the past 2 years.

*Coastal Areas Protection* – Millions of vacationers flock to the Jersey shore every year, making tourism the 2nd largest sector of the New Jersey economy. The pressure for residential development and the resulting impacts along New Jersey's bays and estuaries led to the passage in 1973 of the Coastal Area Facilities Review

Act (CAFRA), which regulates development within the coastal region. The program requires all development proposals that are on a beach or dune or within 150 feet of a waterway at high tide to go through a special permitting process (NJDEP 2002).

*State Development and Redevelopment Plan* - A statewide initiative to manage land and curb sprawl began in the 1980's with the creation of the State Development and Redevelopment Plan (SDRP). Initially intended to be a regulatory plan designating growth and preservation areas, political opposition mounted over perceived state interference with local land use regulation. This backlash resulted in a plan substantially weakened from its initial vision with virtually no regulatory control. The plan was generalized into suggested planning areas and designated community centers with local officials providing input through an iterative process call *cross acceptanc*e.

The five planning areas include 1) urban 2) suburban 3) fringe 4) agricultural and 5) environmentally sensitive.

While the plan only has the power to recommend suggested land use for the five generalized planning areas, incentives such as faster permitting turn around and favorable treatment for grant applications are offered to developers and communities that follow the plan. A recent study indicated that if the plan was followed, significant environmental and social benefit would occur over the next several decades in comparison to the current trends of development (Burchell 2000). Unfortunately the lack of regulatory control of the SDRP has resulted in limited success in curbing the previous trends of urban growth in New Jersey. While

incremental strengthening of the plan in recent years has begun to significantly influence land management policy, the NJSDRP is still a long way from the comprehensive and enforceable growth management plan as it was initially envisioned.

Through these programs and other efforts New Jersey has succeeded in preserving an estimated 970,000 acres of land to date. While this open space effort has been impressive and widely supported by the general population, the programs have suffered from a lack of consistent funding. Land preservation efforts did not keep pace with the increasing pace of urban growth on New Jersey's remaining non-protected open land. Many felt more needed to be done.

*One Million Acres of Additional Open Space: The Garden State Preservation Trust*

In the late 1990's a new initiative began in an effort to counter sprawl through another approach, purchase of additional open space. The Garden State Preservation Trust (GSPT) was created with the goal of preserving a million acres of additional open space from the remaining undeveloped land in New Jersey. The program was funded through a constitutionally guaranteed dedicated portion of the sales tax to ensure long-term success of the program. The GSPT is headed by a 9-member commission of executive and legislative government officials. The specific goal of the GSPT is to preserve a mix of open space lands including 500,000 acres of farmland, 200,000 acres of recreational lands, 200,000 acres of greenway corridors and 100,000 acres of watershed lands (NJDEP Green Acres 2000).

Rather than reinvent the land preservation wheel, the GSPT was designed to use the existing Historic Preservation Trust, Green Acres and Farmland Preservation programs to expedite land acquisition. To make the state funding go further most of the land acquisition requires matching funds from local, county and/or NGO entities. This partnering with community level organizations ensures that local knowledge and participation guides the process. Since the program began in 1999 two bond initiatives have passed through the process slating over $131,466,000 to preserve 19,700 acres of land.

*Grass Root Heroes: NGO's Involved in Land Issues*

New Jersey's land preservation efforts through the various state programs and initiatives have been impressive. However, the progress made over the past several decades in environmental protection and land management would likely have been far less successful without the participation of many non-governmental organizations (NGO's) and dedicated individuals. Some of the key NGO's involved in New Jersey land management issues include the *Association of New Jersey Environmental Commissions*, *New Jersey Conservation Foundation*, *New Jersey Futures*, *NJ Natural Lands Trust*, the *Sierra Club*, the *Nature Conservancy of NJ*, the *Trust for Public Land* and scores of smaller local, watershed-based and regional organizations throughout the state.

Many individual citizens have also participated in the land preservation process and are often the catalyst for preservation initiatives. For example the Great Swamp of Morris County, slated to be paved over for an international jetport, was

preserved in 1968 as the result of grassroots actions of local citizens and is now over 12,000 acres of preserved public land including the 7,410 acre Great Swamp National Wildlife Refuge and Wilderness Area. Countless other efforts by individuals and organizations alike have resulted in the preservation of hundreds of thousands of acres of open land in New Jersey through out the past several decades.

This accumulation of public and protected private land has been a remarkable accomplishment considering that New Jersey began as a proprietary colony where all lands were initially in private ownership (Stansfield 1998). Unlike many of the western states, which began with large areas of Federal public land, New Jersey's public lands have been acquired under the constraints of a market arena. Combined with population pressures, the high cost of land and the magnitude of urban growth experienced throughout the state over the previous 50 years, New Jersey's land preservation history by any measure has been extraordinary.

The multi-tiered efforts of state, county, municipal, non-governmental and private individuals have resulted in a substantial network of protected lands from High Point Monument in the northern corner of the state to the southern tip of Cape May. With the infusion of a stable source of funding through the GSPT and with increased public concern for preservation and participation in land management, the prospects for a substantial amount of additional new open space are strong. The dichotomy between the trends of growing land preservation and trends of growing asphalt will be played out between these two forces as they race for New Jersey's remaining open land.

*Shifting Sprawl into "Smart Growth"*

Patterns of dispersed development have been occurring in New Jersey for decades. However, only in the past several years have the negative consequences of sprawl become so problematic that they are generating a substantial political demand for redress. One of New Jersey's political solutions to address the perennial and difficult issue of sprawl was to look toward the anti-sprawl movements often labeled "Smart Growth." Smart growth is an attempt to create policies that guide new development into compact and mixed use patterns in order to avoid the undesirable costs and consequences of haphazard low density development. Smart Growth strives to make a higher quality, more efficient, and environmentally and socially responsible built environment. Smart Growth promotes urban revitalization and rebuilding existing communities while preserving important open spaces. Smart growth integrates multiple forms of transportation including pedestrian, bicycle and public transit.

New Jersey has fully embraced the concept of smart growth. The state's former Office of Planning was renamed to the Office of Smart Growth. The agency lays out a set of guiding principles for smart growth. They include:

- mixed land uses
- compact, clustered community design
- a range of housing choice and opportunity
- walkable neighborhoods
- distinctive, attractive communities offering a sense of place
- open space, farmland, and scenic resource preservation

• future development strengthened and directed to existing communities using existing infrastructure

• transportation option variety

• predictable, fair and cost-effective development decisions

• community and stakeholder collaboration in development decision-making

The promise of smart growth is that development need not consume such large quantities of land nor require large amounts of energy for transportation. Smart growth proponents point not only to the environmental benefits but to the quality of life benefits of walkable neighborhoods with a sense of place and community, where residents are able to talk to neighbors. The ideal smart growth communities are diverse in income and background.

The U.S. Green Building Council has jumped into the smart growth arena by creating a rating system called Leadership in Energy and Environmental Design for Neighborhood Development (LEED-ND). Instead of trying to impose smart growth through regulation, LEED-ND encourages smart growth through points and recognition for development projects that follow principles of smart growth. New Jersey will have some of the first LEED-ND rated developments in the country.

Whether or not the Garden State's smart growth initiative will make a significant shift in New Jersey's development patterns remains to be seen. The majority of development that has occurred even after the formation of the Office of Smart Growth is still characteristically sprawling. But smart growth practices continue to gain ground and hold the potential to be an important part of New Jersey's land management story.

*Conclusion*

The dynamics of New Jersey's present day land use situation are fascinating. The state's vibrant economy and central geographic location indicate powerful momentum for continued suburban development. At the same time the strong movement for environmental protection and land management make New Jersey an excellent case study for analyzing patterns and processes underlying urban sprawl. The state is in the midst of crystallizing a pattern of land use that will be imposed on its landscape for centuries to come with long-term implications for quality of life for many future generations.

New Jersey is obviously at a critical juncture. If development continues at current rates and if federal, state and local governments and non-governmental organizations continue their push to preserve an additional million acres of open space, New Jersey's remaining available land will be the locus of increasing conflict. Even if the exact date cannot be foreseen with certainty from this vantage point, it is likely that near total build-out will be approached in New Jersey sometime within the middle of this century.

The more important question to be asked from an ethics standpoint is not *when* build-out will be reached but *what* will New Jersey's built-out landscape look like and how it will function for both its human and nonhuman community? Will the built-out landscape be able to provide a high quality of life for New Jersey's citizens? Will New Jersey be able to sustain viable agriculture, wildlife habitat, water quality, coastal estuaries and wetlands? Will low-income areas continue to bear the majority

of the negative environmental consequences while high-income areas continue to consume the largest amounts of land?

Who will be responsible for the shape of that built-out landscape when it arrives? Corporate developers? Local planning board officials? Real-estate interests? State Government? New homebuyers? Environmental organizations? These and many other stakeholders are the major players in the process of urban sprawl. They all receive measurable benefits from influencing the development process. And eventually they (or perhaps their children) will all be saddled with the degraded landscape that will result from the haphazard patterns of urban sprawl – along with the benefits of whatever rural and wild land they have managed to preserve.

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*Questions*

1) What would it take to get New Jersey to “grow smart” instead of sprawling? Do you think this is likely to happen? What steps have been taken already?

2) Do you agree that we have an ethical responsibility to stop sprawl? If so, whose responsibility is this?

3) Is “smart growth” an example of what Herman Daly says is impossible, namely sustainable growth? Why, or why not?

4) What patterns of growth have you noticed in the places where you have lived over the years? How are they changing?