

State of the Environment

2009



Orange County
Commission for the Environment

Acknowledgements

Prior and Current Members of the Orange County Commission for the Environment who worked to prepare this report:

Chris Adams	William R. Kaiser	Bernadette Pelissier
Lucy Adams	Michelle Kempinski	Renee Price
Floyd Bridgwater	Hervey McIver	Johnny Randall
David Brower	Mike Nelson	Kirk Ross
Michelle Drostin	Tom O'Dwyer	Dawn Santoianni
Alice Gordon	Matthew O'Brien	Gary Saunders
Loren Hintz		Bryn Smith

Orange County Environment & Resource Conservation Department

The Board of Commissioners established the Environment & Resource Conservation Department on June 22, 1998 and authorized the Lands Legacy Program on April 4, 2000.

Staff Members

David Stancil, Director

Emily Ander, Research Associate

Tom Davis, Water Resources Coordinator

Margaret Jones, GIS Project Coordinator I

Carol Melton, Administrative Assistant II

Rich Shaw, Land Conservation Manager

Beth Young, GIS Project Coordinator II

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Printed copies of the 2009 SOE can be viewed at public libraries within the County or at the ERCD office.

For further information about the report please contact the ERCD at (919) 245-2590.

Cover photos by Rich Shaw. From left to right: Pickards Mountain, Eno River, Lewis' Heartleaf, Stone Currie Farmland on Old 86, Bolin Creek at Adams Preserve



Orange County Environment & Resource Conservation

306-A Revere Road / P.O. Box 8181
Hillsborough, NC 27278
Phone: (919) 245-2590 Fax: (919) 644-3351

Splendid Clubtail (Gomphus lineatifrons)

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What is the state of our environment?

Addressing this question from the global perspective, the Global Footprint Network (GFN) and the World Wildlife Fund report that *humanity uses the equivalent of 1.3 planets to provide the resources we use and to absorb our waste.*

Stepping down to the national level, we learn from the GFN that *if everyone lived the lifestyle of the average American we would need five planets.*

The *Ecological Footprint* was developed in 1990 by Mathis Wackernagel and William Rees at the University of British Columbia as a measure of humanity's demand on the planet's natural resources. It translates how much land area and water volume a human population requires to produce the resources it consumes and to absorb its wastes. The *Footprint* puts into simple terms the number of planets needed to support our activities and lifestyles.

For Orange County, this edition of the *State of the Environment Report (SOE)* provides a more detailed look at a variety of environmental indicators that are grouped into three key categories: Air Resources, Biological Resources and Water Resources. The indicators were selected to monitor and evaluate the progress the County and its citizens are making to protect, preserve, conserve and manage our environmental resources.

Both the *Ecological Footprint* and the SOE environmental indicators share the fundamental intent to assess our demands and impacts on environmental resources, inspire and inform public policy and practices to manage our ecological assets more efficiently and provide recommendations for personal and organizational actions that will lead toward a more robust environment.

This edition of the State of the Environment report continues the goals and format of the 2002 and 2004 documents, but with one key difference: this 2009 report is primarily a digital publication, accessible through the Orange County Website at http://www.co.orange.nc.us/ercd/2009_SOE_index.asp.

We encourage you to contribute to our local effort to conserve the Earth's resources by reading this report online. If you are interested in evaluating and decreasing the size of your own *Personal Ecological Footprint*, there is an interactive and informative quiz available at the Global Footprint Network website at <http://www.footprintnetwork.org>. You can find many other ideas on the final pages of this report.

Sincerely,

Michelle Kempinski and Johnny Randall, Co-Chairs
Commission for the Environment

PURPOSE

*The Orange County
Commission for the Environment
presents the
2009 State of the Environment to:*

- Describe the current status of Orange County's natural environment
- Provide measures to monitor and evaluate progress toward a cleaner, healthier environment
- Highlight the major environmental challenges facing the County
- Recommend actions to confront these challenges

Orange County's 2009 State of the Environment

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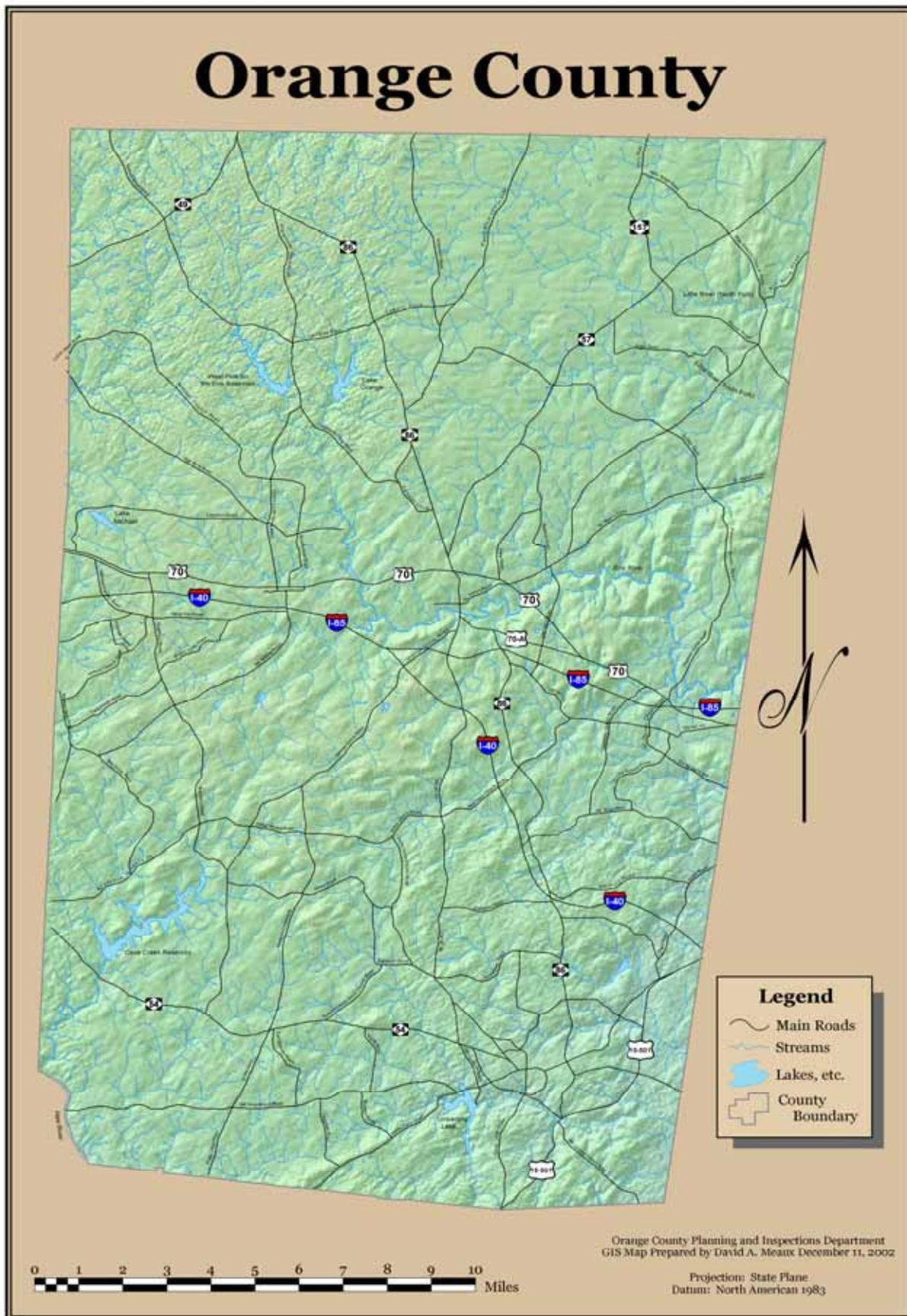
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Figure 1: Map of Orange County



Source: Figure 1— Orange County Planning Department, prepared December 11, 2002

Overview

The Orange County Commission for the Environment (CFE) and the Orange County Environment & Resource Conservation Department (ERCD) have created this report to provide an updated analysis of the County's natural environment and to make recommendations that will help the County create and implement effective environmental policies.

While Orange County has been foremost among the region's counties in promoting planned growth over indiscriminate sprawl, the County's natural environment remains susceptible to serious degradation from the steady, long-term conversion of natural land to urban and suburban infrastructure. The public needs to understand the strategies available to protect our water, air and biological resources while also planning for future growth.

In preparing this report, the CFE has used a set of key **environmental indicators** first adopted for the 2002 report¹. These measurable **indicators** reveal trends in the County's environment, alert us to potential impacts on human health and natural resources and suggest areas where additional information, research and monitoring are needed.

The environmental indicators are grouped into three categories: Air Resources, Biological Resources and Water Resources. CFE members with expertise in each of these areas formed separate committees to study the accumulated data. These committees have identified the critical issues listed on the next page followed by highlighted recommendations drawn from the body of the document.

The report also includes an overview of Orange County's land conservation efforts through its award winning Lands Legacy Program. Over the first eight years of the program, the County has been successful in working with landowners and other conservation partners to protect many special properties with a variety of important natural and cultural value.

And finally, the end of the report provides information to help those who want to play a role in protecting and improving the natural environment that we enjoy here in Orange County, North Carolina.

¹ Although the indicators remain largely the same since their introduction in 2002, this 2009 edition includes two additional indicators, combines two indicators, has removed three indicators altogether and has more accurately renamed seven indicators.

CRITICAL ISSUES

- **GREENHOUSE GAS EMISSIONS**

Between 2006 and 2007, Orange County conducted a Greenhouse Gas (GHG) emissions inventory. Despite the County's current and proposed measures for reducing its GHG emissions, emissions have only decreased by 3 percent since 2005. With projected population growth and land use changes, GHG emissions could increase by 53% by 2030.



Traffic congestion on I-40



Development in Chapel Hill

- **LOSS OF BIODIVERSITY**

Habitat for Orange County's native flora and fauna, ecosystems and natural communities continues to be destroyed or significantly degraded as a result of conversion of natural land cover to suburban, urban and transportation uses.

Protection efforts are not keeping pace with the loss of biological diversity associated with habitat loss and degradation.

- **LACK OF INFORMATION ABOUT GROUNDWATER RESOURCES**

While many residents of Orange County rely on groundwater, little information is available concerning groundwater quantity or quality across the county.

- **IMPACT OF DROUGHT ON WATER QUANTITY**

Water resources in the area can become threatened during periods of extended drought. The Orange-Alamance Water System is already dependent on purchasing water to meet their current customer demand.



Cane Creek Reservoir during the 2008 drought OWASA photo

HIGHLIGHTED RECOMMENDATIONS

AIR RESOURCES	Pages
1. Orange County should assess and implement the Greenhouse Gas Inventory and Action Plan targets for greenhouse gas reductions and create an action plan for ground-level ozone.	9-10
2. With the adoption and enforcement of new, tighter federal ozone standards by early 2010, the County will likely return to nonattainment status despite stringently following the NC State Implementation Plan (SIP) as recommended.	13-14
3. Orange County should work with nearby jurisdictions to integrate County plans with regional goals and objectives for an intermodal transportation system to meet projected travel demand that reduces congestion and reliance on single occupancy vehicles.	19-20
BIOLOGICAL RESOURCES	Pages
1. Orange County should re-visit the goal of permanently protecting at least 10% of the county's land area (25,600 acres) by the year 2010. This would require an additional 12,700 acres to be protected by year's end. New goals should be set for 2015 and 2020.	27-28
2. Orange County should continue efforts to protect significant natural areas, large tracts of "prime forest" (mature hardwood and mixed hardwood-pine forests) and remnant "Piedmont savannas" using a variety of voluntary conservation measures.	33-34
3. Orange County should develop a comprehensive conservation plan that addresses threats to natural areas and populations of rare species; connectivity among protected areas; and coordination with neighboring counties and conservation partners.	27-28
4. Orange County should incorporate the State's newly-authorized Wildlife Conservation category into the local Present Use Value taxation program.	35-36
WATER RESOURCES	Pages
1. While the per capita usage of potable water has decreased in recent years, overall water consumption has increased nearly 50% since 1985. Conservation of water resources should continue to be a priority for Orange County.	47-48
2. In order to monitor the effect of drought on local groundwater supplies, Orange County should create a network of observation wells. This would permit the dissemination of information concerning the quantity of groundwater present in storage in the County.	47-48
3. Efforts should be made to further the knowledge of residents about the quality of groundwater in the County. This could include information regarding the overall good nature of the groundwater, as well as the potential for naturally occurring concentrations of arsenic and radon in areas of the County. Additionally, citizens should be informed of ways to protect groundwater, including the need to properly abandon out-of-use wells, the appropriate use and maintenance of septic systems, the appropriate disposal of potentially hazardous material and the location of known groundwater contamination incidents.	53-54

DEMOGRAPHICS

Residential growth is the most fundamental factor affecting the pattern of development in Orange County. As has been the case for many years, the County continues to experience dramatic population growth (Figure 2). From 1980 to 2007, the County's population grew from 77,055 to 127,344, a 65.3 percent increase (2.4 percent average annual growth rate). In contrast, during the same time period, North Carolina grew by 54 percent and the United States expanded at a rate of 33 percent. Many people are attracted to Orange County for its central location in the Triangle region as well as its high quality of life.

All of the municipal and unincorporated areas report significant increases in population. The unincorporated population did decrease slightly between 2000 and 2007 but this is due to the loss of five square miles of unincorporated land area to annexations. Table 1 compares the populations throughout the County and the growth rates over time. The greatest rate of increase occurred in the Orange County portion of Mebane² with a 245 percent increase in population from 1980-2007 as well as the fastest rate of growth for 2000-2007 at 94 percent. Carrboro had the second highest rate at 144 percent over 26 years. Although Chapel Hill (41 percent) remains the dominant residential and commercial center in the County, unincorporated areas also contain a large portion of the population (38 percent). This rural population poses challenges in both the planning and provision of public services.

Figure 2: Population Trends in Orange County, 1930-2007

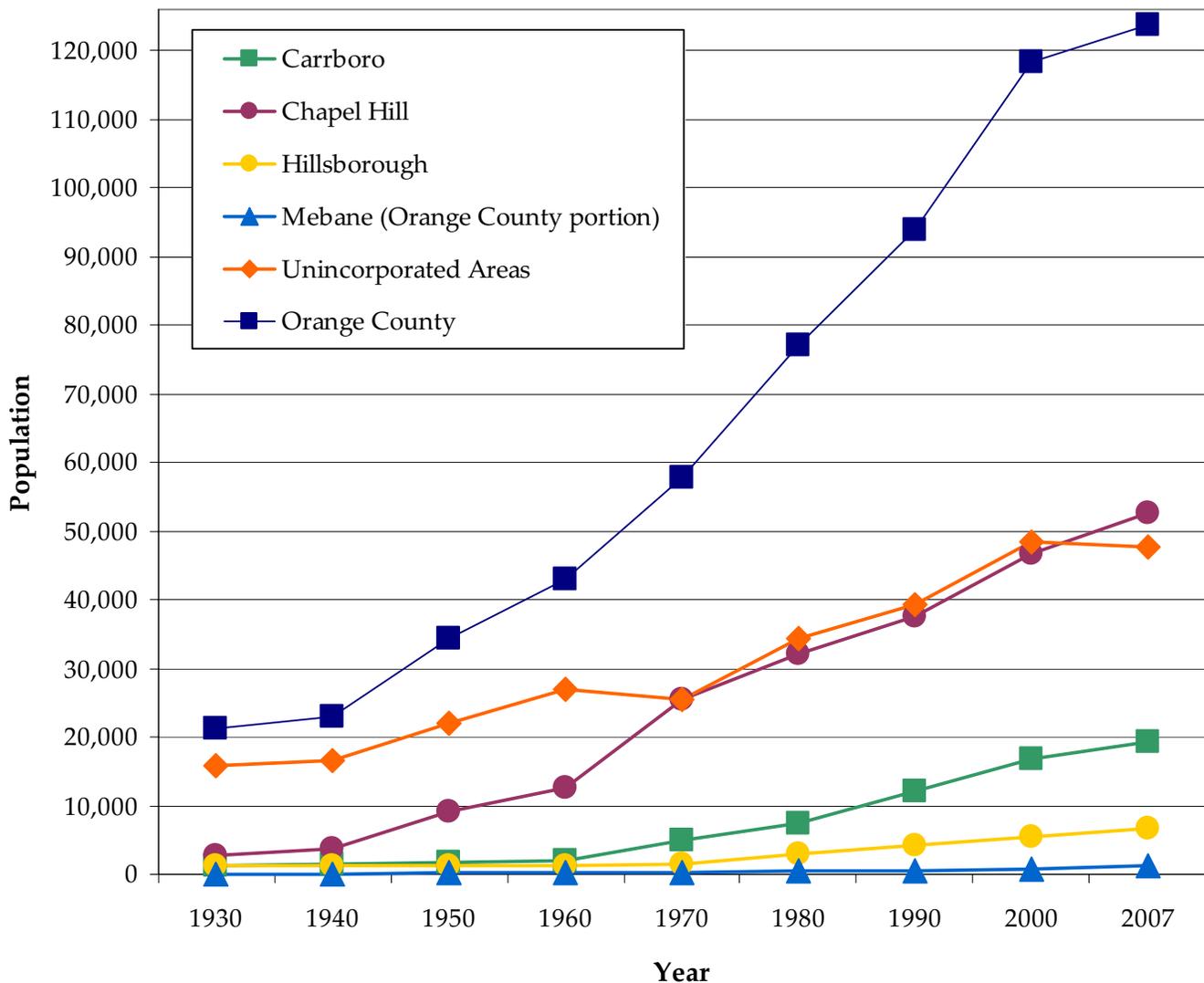


Table 1: Municipal and Unincorporated Populations, 1980-2007

	1980 Census	1990 Census	2000 Census	2007 Estimate	% Change 1980-1990	% Change 1990-2000	% Change 2000-2007	% Change 1980-2007
Carrboro								
Population	7,336	12,134	16,782	19,178	65.4%	38.3%	14.3%	161.4%
Land area (sq. mi.)	2.47	3.53	4.47	6.30	42.9%	26.6%	40.9%	155.1%
Persons per sq. mi.	2,970	3,437	3,754	3,044	15.7%	9.2%	-18.9%	2.5%
Chapel Hill (within Orange County)								
Population	32,038	37,596	46,798	52,668	17.3%	24.5%	12.5%	64.4%
Land area (sq. mi.)	12.37	15.98	18.37	19.53	29.2%	15.0%	6.3%	57.9%
Persons per sq. mi.	2,590	2,353	2,548	2,697	-9.2%	8.3%	5.9%	4.1%
Hillsborough								
Population	3,019	4,263	5,446	6,584	41.2%	27.8%	20.9%	118.1%
Land area (sq. mi.)	2.16	3.55	4.58	5.30	64.4%	29.0%	15.7%	145.4%
Persons per sq. mi.	1,398	1,201	1,189	1,242	-14.1%	-1.0%	4.5%	-11.1%
Mebane (within Orange County)								
Population	379	485	675	1,308	28.0%	39.2%	93.8%	245.1%
Land area (sq. mi.)	0.2	0.25	0.57	1.74	25.0%	126.0%	205.3%	770.0%
Persons per sq. mi.	1,895	1,940	1,184	752	2.4%	-38.4%	-36.5%	-60.3%
Unincorporated Areas								
Population	34,283	39,373	48,526	47,606	14.8%	23.2%	-1.9%	38.9%
Land area (sq. mi.)	382.80	376.69	372.01	367.13	-1.6%	-1.2%	-1.3%	-4.1%
Persons per sq. mi.	90	105	130	130	16.7%	24.8%	-0.6%	44.8%
TOTAL COUNTY								
Population	77,055	93,851	118,227	127,344	21.8%	26.0%	7.7%	65.3%
Land area (sq. mi.)	400	400	400	400	0.0%	0.0%	0.0%	0.0%
Persons per sq. mi.	193	235	296	318	21.7%	26.0%	7.6%	65.0%

²Note: Only a small portion of Mebane's incorporated area is located in Orange County.

Sources: Figure 2 and Table 1 – U.S. Census Bureau and North Carolina State Demographics