



# Executive Summary



Protecting the health of people begins with healthy air, water, land and nature. A healthy environment and rich history are part of who we are, our shared heritage, and our gift to future generations. Loudoun County is facing many environmental challenges at a time of extraordinary population growth. We must ensure that the County will have enough clean water, work to reduce pollution and improve air quality; and strive to protect the natural systems that support the County's long-term ecological health, economic vitality and sense of place. We cannot afford to lose the natural systems that sustain us or the heritage that defines us.

---

This report provides an overview of current and emerging environmental challenges facing Loudoun County today and for our foreseeable future. Loudoun must at least begin to mitigate these concerns over the next 4 years. The report is intended to provide a "layman's" introduction to Loudoun's air, water, land, living resources, cultural resources, climate change and energy. Supporting data has been compiled from various sources and is presented in the report. Analysis and recommendations are strictly the views of the author.



## **nutshell summary**

“Over the next 4 years we are expected to add nearly 15,000 more households, 40,000 more residents, and millions of new vehicle miles to our roads. Not only are we growing fast but vehicle ownership, miles traveled and land consumption are growing even faster than the population.”

Loudoun has experienced an era of unprecedented growth and development that has impinged on the County's natural systems - the “Green Infrastructure” that supports us with critical, yet often unnoticed, ecological services like cleaning our air and water, sustaining food production and other commercial products, and furnishing opportunities for recreation and spiritual renewal. While we must continue to provide housing and employment for County residents, growth must be accommodated in reasonable balance with protection of the County's natural and cultural resources.

## **Growing Pains?**

Loudoun County has been witness to exponential growth in the last few decades. From 1960 to 2006 we grew by over ten times (pgs 4-5). Forecasts predict another 200,000 residents by year 2030. Over 100,000 in just the next ten years. Over the next four years, from 2008 to 2012, the County is anticipated to add nearly 15,000 households and 40,000 residents to its already burgeoning population. What do these numbers mean to Loudoun's air, water, and nature? In a 2005 survey of Loudoun County residents, 90 percent cited growth related issues as the number one problem facing the County (pg 15).

## **Impacts are even outpacing population growth**

We are driving more than ever before (pg 6). Based on a recent study by the Urban Land Institute the rate of increase for motor vehicle ownership and Vehicle Miles Traveled is rising faster than the population. The Federal Highway Administration says while the U.S. population grew by 28 percent between 1980 and 2003, the number of miles people drove increased by 89 percent. Typical development patterns place homes far from jobs and we are making more trips over and above commuting. A recent survey determined that 86 percent of Loudoun residents drive to work in a car alone. Very few walk, bike, or use mass transit. In the next 4 years alone we are expected to add nearly 15,000 households. You can equate that to over one-quarter of a billion additional vehicle miles traveled every year, most of which will be on Loudoun's already congested highways. By 2030, Loudoun residents will be driving over a billion more vehicle miles each year.

## **We are consuming land faster than the population is growing.**

The Governor has said Virginia is on track to develop more land in the next 40 years than it has in the last 400 years. Studies show that the Chesapeake Bay Watershed is losing about 188 acres per day to development and, that in the Bay watershed land is being consumed at a rate approximately five times the rate of population growth (pg 9). Loudoun's population is expected to grow by 38 percent in the next decade and 66 percent by 2030. It is not physically possible for the County to sustain the “historic” level of land consumption. In any case it seems clear that “undeveloped” land will be converted to development rapidly within the next decade.



# Executive Summary



## nutshell summary

“Sustainable means meeting current needs **without** compromising our future.

Conserving energy and water , reducing waste and increasing recycling are sustainable practices that are not difficult and they save money.”

### Water consumption is also outstripping population

**growth.** Between 1950 and 2000, the U.S. population increased nearly 90 percent (pgs 10-11). However, according to the EPA in that same period public demand for water increased 209 percent. Loudoun’s water is principally supplied by the Potomac River, Goose Creek and groundwater. There is no apparent shortage of water for human use however, at the time of this writing Loudoun is in emergency drought conditions. Rainfall through early December 2007 is only a little over one-half of normal annual precipitation. Goose Creek Reservoir is below 15 percent of normal. LCSA and the County Board of Supervisors have imposed mandatory water restrictions. Without generous rainfall in Spring 2008, water availability in the coming year will be a very serious issue. It is also important to remember that groundwater pumping affects stream flow. We cannot deplete surface and groundwater to the extent that the health of our natural systems - wetlands, wildlife, stream ecology - suffer.

### Can we keep doing what we’re doing?

The web encyclopedia *Wikipedia* defines “Sustainability” as a characteristic of a process or state that can be maintained at a certain level “indefinitely” (pgs 9-14). In America’s history resources have been so bountiful that the supply seemed inexhaustible. Settlers exploited the new nation’s vast resources to fuel an expanding and robust economy that has endured for centuries. We now realize that many resources are finite and poor management of those resources can be detrimental. We depend on the availability of abundant and inexpensive energy and clean water, and a seemingly endless supply of raw materials for the manufacture of goods. The realization that the world cannot go on doing what we are doing indefinitely, is demanding a new look at sustainable materials, “green” building methods, innovative processes and practices.

Sustainable practices include measures like energy and water conservation, reducing waste and increasing recycling, protecting clean water and air, and valuing the role nature plays in furnishing ecosystem services. In many cases simple measures can improve a community’s sustainability. The way to success will be through education and by people taking small steps, every day, at home, at work, on the road, and in their neighborhood. By working toward more sustainable communities we build community resiliency. As County growth continues to strain our resources, nature, and sense of community, it is ever more imperative that daily decisions consider how we can meet today’s needs without compromising those of our progeny. We simply cannot afford to sacrifice our environmental underpinnings.



## nutshell summary

“No one  
**wants** to live  
with pollution.”

Surveys show  
that the public  
supports  
cleaning up  
pollution, pro-  
tecting open  
space and  
managing  
growth.

Americans  
want balance.  
They see the  
environment  
and economy  
as inter-  
dependent.”

## Does the public support protecting the environment?

According to surveys, most Americans are concerned about the environment and believe the environment is getting worse (pgs 15-18). Eighty-nine percent of Chesapeake Bay residents surveyed are either very or somewhat concerned about pollution in the bay as a whole and 85 percent are concerned about pollution in their local streams and waterways. Overall 94 percent of Bay watershed residents surveyed believe that restoring the waterways in the Bay region is important compared to other social, economic and environmental problems and 49 percent of watershed residents believe that current restoration efforts are too little. Among governmental agencies, state and local governments were ranked as the agencies that survey respondents felt should be most responsible for Bay restoration.

What about Loudoun County residents? In 2005, 90 percent of Loudoun residents thought growth and transportation were the biggest problems facing the County. Only 4.4 percent listed “Schools” and 7.3 percent listed “Taxes” as the single biggest problem. Loudouners also want outdoor recreation opportunities (pg 16). A recent survey by Loudoun County Parks, Recreation and Community Services found among the recreational facility needs listed by respondents, paved walking and biking trails, nature centers and natural areas, historical sites and museums, and unpaved hiking trails were high on the list. Survey respondents support purchasing land for open space and natural areas as the top action they would be most willing to fund with their tax dollars.

Surveys also show that Americans believe environmental protection and economic development must be achieved together to ensure a vibrant nation. When people were asked to choose between environmental protection and economic development, 71 percent said they would choose the environment. Americans want environmental balance. They see the environment and the economy as interdependent. Of those surveyed, 63 percent agree with this option, rather than the alternative — that one must be chosen over the other.

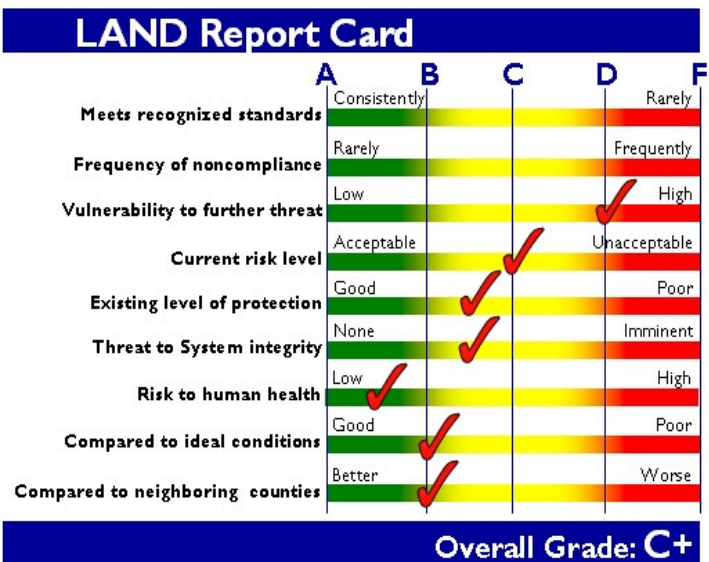
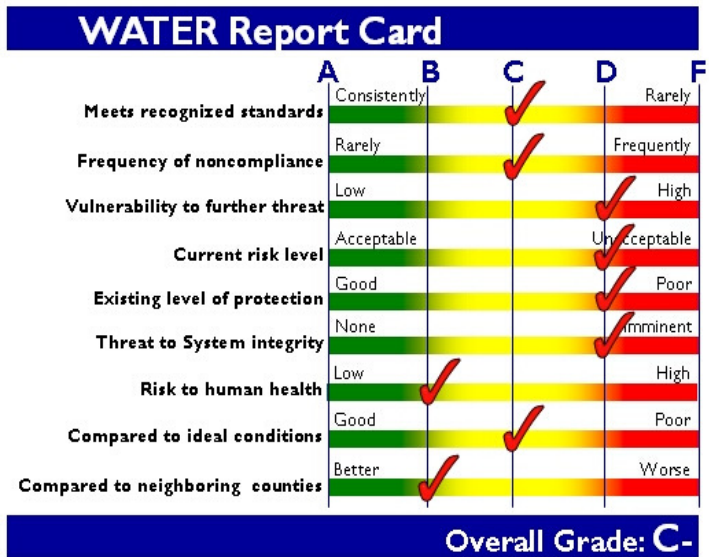
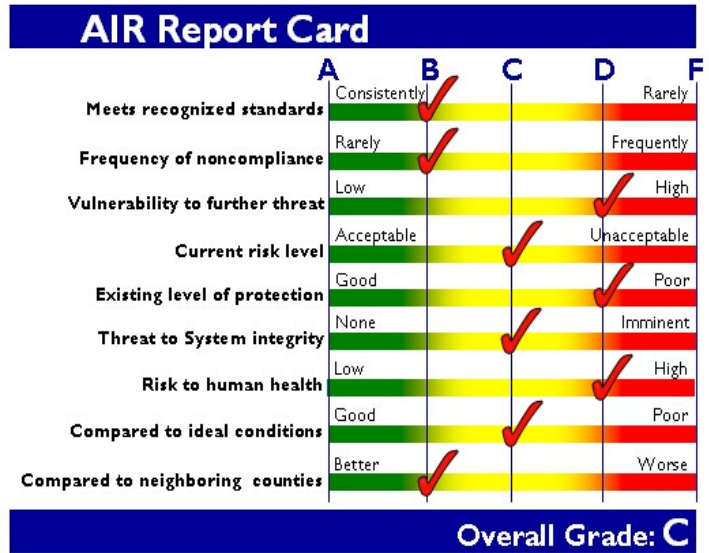
There is a need for environmental education nationwide and within our own communities. Local governments can serve an important role in helping citizens and businesses better understand environmental issues and how everyone’s daily decisions affect the environment. Environmental literacy is poor nationwide. National Education and Training Foundation research shows that about two-thirds of Americans do not have a basic awareness level of environmental topics. About 80 percent are influenced by myths or outdated information, often from unreliable sources. And, very few understand energy topics. Americans cannot be expected to help solve environmental problems without being properly informed.

# Loudoun's Environmental Report Card

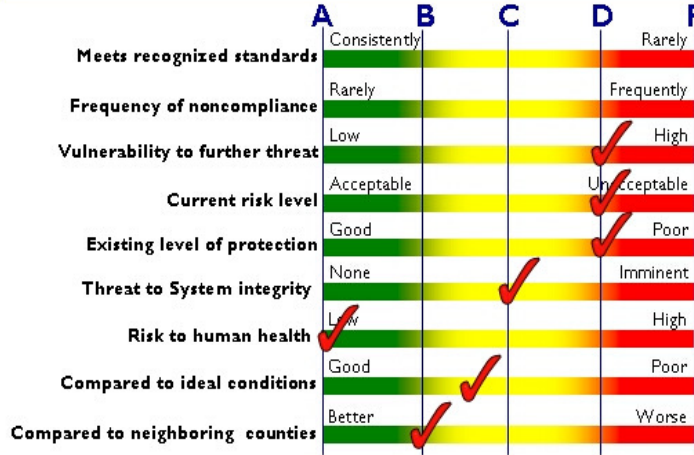
**Air.** Loudoun is within the Metropolitan-Washington nonattainment area for 8-hour ozone and fine particle pollution. Air quality is a regional, if not national problem. However, Loudoun's main contribution is tailpipe emissions from the growing number of vehicles and miles traveled. If current trends continue, technology gains from cleaner-burning fuel blends and more efficient vehicles will be overwhelmed by the region's growing population (pgs 21-24).

**Water.** Loudoun's water supply seems to be sufficient for our needs, providing drought conditions do not persist into 2008. Groundwater quality is generally good to excellent but can be at risk of contamination from polluted surface water. Many of our streams are unstable and eroding due in part to poor streamside buffers and in part due to the dramatic increase in storm flows from development. Many stream segments in the County are too polluted to meet state standards. Fecal bacteria counts are high and some streams have Fish Consumption Advisories for PCBs. In some cases, it is not safe to have bodily contact with the water. One symptom of stress on our streams and rivers is the loss of in-stream aquatic life and biodiversity. Put simply, only the most pollution tolerant aquatic life survives in some of the County's streams (pgs 25-34).

**Land.** The County scores a little better on protecting land. We have an excellent [General Plan](#) that provides a firm policy foundation for protecting sensitive areas. By plan policy, the Green Infrastructure "organizes the County's environmental, natural and heritage resources into a related system consisting of the Potomac River edge, stream corridors and scenic rivers, forested areas and tree stands, mountainsides, wetlands, limestone conglomerate areas, important plant and wildlife habitats, greenways and trails, scenic areas and corridors, historic and archaeological sites, and other open spaces (natural, eased and man-made) of special importance." Although Loudoun has protective ordinances for mountainsides,

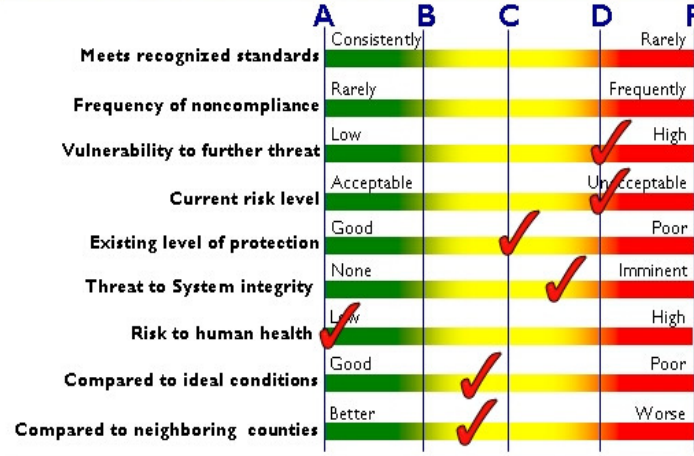


## LIVING RESOURCES Report Card



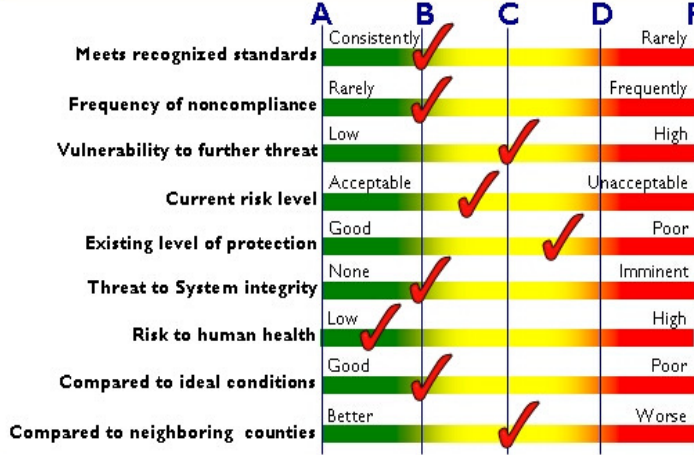
**Overall Grade: C**

## CULTURAL RESOURCES Report Card



**Overall Grade: D**

## CLIMATE CHANGE Report Card



**Overall Grade: B**

steep slopes, and floodplains, we could do better. The former River and Stream Corridor Overlay District (RSCOD) was designed to protect streams, floodplains, and adjacent slopes and wetlands. When the courts overturned that portion of the ordinance Loudoun lost the one protection that is most critical to protecting water quality, forest cover, wildlife habitat, and cultural resources. Two sensitive areas, stream valleys and the Limestone Conglomerate area (North of Leesburg) must be protected by an effective ordinance to protect the resource and safeguard human health (pgs 35-42).

**Living Resources.** Our biological resources - wildlife, plant communities, even human populations - are threatened by development and the byproducts of growth. Loudoun has the potential to be home to a wide number of different species, if varied habitats are allowed to remain. Human activities create a uniform landscape that supports only the wildlife that can successfully co-exist near humans. One obvious example is white-tailed deer. Virginia Department of Game and Inland Fisheries reported that 95 percent of Loudoun is still deer habitat and the herd is growing. Deer benefit when forests are fragmented and more “edge” habitat is created. Unfortunately the proliferation of deer is destroying native plant diversity from over-browsing. And, when deer meet humans, the interactions are not always pleasant as evidenced by the road kill on Loudoun’s highways. Loudoun scores a little better on biological resources because there is still opportunity to protect habitats through education and regulation (pgs 43-50).

**Cultural Resources.** Loudoun’s cultural resources - historic buildings, historic landscapes, roads, bridges, barns, and archaeological sites have been rapidly disappearing from our landscape. Although Loudoun requires an Archaeological Survey as part of development applications, identified resources are rarely preserved. The General Plan says “Abundant natural resources and a rich cultural heritage have defined Loudoun County’s unique sense of place for more than 240 years.” Loudoun is losing the heritage that has defined us. We



# Executive Summary

are blessed with an unusually high number of prehistoric and historic sites that help to preserve and tell the “Story of Loudoun”. Virginia’s Governor has said that Virginia has some of the most historic natural resources in the nation. Virginia and Loudoun were important settings for the birth of our nation. And, people care about that as evidenced by the vibrant Heritage Tourism industry in Northern Virginia. The understanding and appreciation of our history could be improved through education, action and incentives to preserve what remains of our historical record (pgs 51-56).

## Energy and Climate Change.

There has been lively political debate about Global Warming. Is it man-made, a natural earth cycle, or related to solar intensity? Regardless of the cause, climate change is occurring and organizations worldwide are beginning to seriously evaluate the potential impacts. Scientists warn of changing climatic patterns that will lead to gradual warming, changes in precipitation frequency, the potential for more intense storm activity and flooding, drought, and sea level rise. Scientists are also telling us that climate change will have adverse impact on human health, plants and wildlife. According to climate models the Mid-Atlantic region of North America will fare far better than many parts of the world. But in Loudoun, climate change will impact our human population, air, water, natural areas, and biological resources. Community planning for climate change may demand a new level of emergency preparedness to deal with major storms, drought, or threats to human health. Should sea level rise

displace millions along our coastlines, as some predict, will coastal populations migrate inland to Loudoun County seeking jobs, housing, and social services? The County does not have a climate change plan of action. Long range scenario planning, that considers potential climate change impacts, could position Loudoun to be more adaptable and resilient when changes do occur (pgs 57-62).

Loudoun's Environmental Report Card

|                         |    |
|-------------------------|----|
| Air.....                | C  |
| Water.....              | C- |
| Land.....               | C+ |
| Living Resources.....   | C  |
| Cultural Resources..... | D  |
| Climate Change.....     | B  |

Improvement needed

More effort Needed

Loudoun’s “Environmental Report Card” is based on the author’s assessment of current conditions. In the case of air and water, the County does not meet state and federal standards, which will likely become more stringent in future years. Another important consideration is the high risk of continued threat to our resources. While growth is necessary, its byproducts are polluted air and water, a compromised “Green Infrastructure”, forest fragmentation and loss, dwindling wildlife habitat, threatened cultural resources, and the unmanaged risks of global climate change.



## **nutshell summary**

“Loudoun is already doing something about air and water pollution, protecting wildlife and trees, preserving open space and history.

But, we could do more. Efforts need to be stepped-up to keep pace with the impacts of rapid growth.

Reaching out to landowners and business as partners in caring for our environment is a small investment that can yield big returns.”

## **Loudoun can meet the environmental challenge.**

The final section of this report lists a **9-point plan** to help the County begin addressing its most important environmental challenges. The proposed **4-year environmental plan**, beginning in 2008, includes the following:

1. **Strengthen protection of the County’s “Green Infrastructure”.** The Green Infrastructure is the backbone of the natural system that furnishes us “free” ecosystem services. The interconnected network of streams, rivers, mountains, wetlands, forests, and open space cleans our water, purifies our air, provides us sustenance and spiritual renewal. Affirm the policies of the General Plan then adopt and enforce ordinances that effectively protect sensitive areas and the interconnected green network (pg 65).
2. **Support programs that help ensure Loudoun will have enough clean water.** Support for continued water monitoring, mapping and data analysis will help us better understand and manage our resources. Support for long-range resource planning and management - independent of the land development process - will help ensure that we target cleanup actions where needed and maintain healthy watersheds, streams, reservoirs, and groundwater (pg 67).
3. **Implement a public outreach and environmental education program.** Public education and outreach is essential to our long term success in addressing air pollution, clean water, and healthy ecosystems. Although some outreach is currently being done by the County, there is no formal commitment and efforts are not coordinated. Establishing and funding education and outreach is a good investment that will make a difference. Working together we can eliminate pollutants at the source, which is a more cost-effective and ecologically sound strategy than treating pollution downstream. And, it makes economic sense, especially as government budgets are strained trying to stretch limited resources (pg 69).
4. **Engage citizens and businesses as active partners in environmental protection.** This recommendation is about forming cooperative partnerships. With the ever increasing pressure to sustain programs on tight budgets, cooperative approaches are going to have big impact for very little expenditure. Ensuring a safe environment will never be accomplished through government programs alone. We must work closely with residents, citizen groups, businesses, farmers, developers, regional organizations and other levels of government. Businesses and landowners can be effective partners in resource protection, pollution prevention and cleanup actions. The County should provide environmental stewardship education, technical support, incentives, support to volunteers, and recognition of outstanding environmental performers (pg 71).





# Executive Summary

5. **Establish a County tree-canopy goal and the tools needed to protect forests and trees.** A County goal to increase canopy by 5-10 percent would help restore forests and help address air pollution, wildlife habitat loss, and climate change. A stronger tree ordinance could focus efforts on preservation of existing forests, wood lots and specimen trees rather than new plant materials as replacements for mature woodlands. Public land, open space parcels, and stream valleys could be targeted for reforestation (pg 73).
6. **Implement Phase I of the Heritage Resource Preservation Plan.** A Citizen's Advisory Committee worked with County staff to develop the Heritage Resource Preservation Plan in 2003. As an initial strategy to improve protection of historic and archaeological resources the panel recommended creating a Heritage Commission, Loudoun Heritage Register, develop resource maps and inventories, develop stewardship plans for County-owned historic sites, and work to build awareness and tourism opportunities through public outreach and education (pg 75).
7. **Implement an Environmental Management System (EMS) to guide County operations, reduce waste and energy consumption, improve efficiency, and manage environmental risk.** An EMS is a set of problem identification and problem solving tools that local governments can use to save money, protect the environment, and reduce risk. An EMS can show an organization how to reduce waste, improve efficiency, and integrate environmental stewardship into everyday operations. An EMS would also help the County systematically bring focus to current and emerging demands of state and federal regulations. Success stories have shown that implementation of an EMS leads to a better bottom line for local governments through cost savings, avoidance of future legal liabilities, lower insurance premiums and potentially improved bond ratings (pg 77).
8. **Develop and adopt a County "Climate Action Plan".** A climate change initiative could be a rational framework for the County to reduce energy consumption, improve air quality, and plan for "community resiliency". Cleaner energy choices, more energy efficient buildings, clean fuel and more fuel efficient fleets, support for Green Building practices and reforestation would all add up to cost savings for the County while helping reduce greenhouse gases and pollution (pg 79).
9. **Protect open space.** Protecting open space should be a priority for the County. A countywide ecological assessment would help target important conservation areas. Open space can be protected through conservation training, incentives, gift, fee simple purchase, easements, or purchase of development rights. Open space protection should be one of the strategies used to mitigate environmental impacts, protect Green Infrastructure, and provide needed recreational space for our growing population (pg 81).

## A 4-Year Environmental Plan.

Addressing environmental challenges requires bold leadership and political will. And, in these times of budget shortfalls - a phased approach. A 4-year plan is included in this report (pgs 83-91). The Phased Implementation Plan on page 84 compares parameters such as time to implement, staff needed, new funding, urgency/need, and relative difficulty of implementation for each recommendation. Action items are prioritized in three-tiers, with action steps listed by fiscal year on pages 85 and 86.



### nutshell summary

“Implementa-  
tion begins  
with commit-  
ment.

Do we want  
to protect  
our natural  
and cultural  
resources?

If so, then we  
can begin  
to answer  
who, when,  
and how.”

To begin, two questions must be answered. First, as a County do we support protection of our natural and cultural resources? And second, what kind of organizational structure will serve the County’s needs and be able to successfully manage these environmental challenges? Environmental protection could be a priority, in balance with other critical needs. And, a multi-year phased approach to implementation can be accomplished with modest expenditures in the initial years.

Whatever form of organization is ultimately charged with implementation, it will need strong leadership with accountability to the Board and County Administrator. It will also need the following to be successful. First, the organization must have a clear mission and purpose with authority to address environmental issues. Second, the organization should be visible to County leaders, staff, and the public. The County needs a strong focal point for the environment that demonstrates the County’s commitment. Additionally, citizens, businesses, and organizations at all levels outside of the County should understand where environmental responsibility lives within the County government. Third, the organization should place strong emphasis on environmental education and engaging business and communities as stewards of our resources. Fourth, the organization should be forward thinking - able to ferret out emerging regulation and environmental concerns so that the County remains in a positive position to respond to new challenges. Finally, the successful organization should have three principal core services: 1) mapping, monitoring, assessing, and managing the County’s natural and cultural resources; 2) providing environmental review, permitting and compliance inspections as well as making sure the County is in compliance with its own environmental responsibilities; and 3) be committed to environmental education, outreach and stewardship training.

Although Loudoun is facing some sizable challenges, there is reason to be optimistic. However, an optimistic vision of Loudoun’s future must be backed by policy and investment. In spite of the enormous growth pressures that we have endured over the last two decades, there are still opportunities to balance the needs of the environment with other important demands. But as growth continues, the window of opportunity narrows. If we act now we can preserve Loudoun’s nature, history, and defining character and avoid the high cost of inaction.