HOW RUNAWAY DEVELOPMENT THREATENS AMERICA'S WILDLIFE

by Reid Ewing and John Kostyack
with Don Chen, Bruce Stein,

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About the Primary Authors

Reid Ewing is a Research Professor at the National Center for Smart Growth Research and Education and an Associate Professor in the Urban Studies and Planning Program, University of Maryland. The Center offers training and research opportunities and is a cooperative venture of the University of Maryland's School of Architecture, Planning and Preservation; the School of Public Policy; the College of Agriculture and Natural Resources; and the College of Engineering.

John Kostyack is Senior Counsel at the National Wildlife Federation. Based in Washington, D.C., he manages the Federation's Wildlife Conservation program.

About the Sponsoring Organizations

Protecting wildlife through education and action since 1936, the National Wildlife Federation is America's conservation organization creating solutions that balance the needs of people and wildlife now and for future generations. Visit www.nwf.org

Smart Growth America is a national coalition promoting a better way to grow: one that preserves open space and farmland, revitalizes neighborhoods, keeps housing affordable, and provides more transportation choices. Visit www.smartgrowthamerica.org.

NatureServe is a non-profit conservation group that provides the scientific information and tools needed to guide effective conservation action. NatureServe and its network of natural heritage programs are the leading source for information about rare and endangered species and threatened ecosystems. Visit www.natureserve.org.

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Mobc^`b

BY PARRIS GLENDENING, *Governor of Maryland, 1995-2003*

Any discussion of habitat loss always reminds me of the fate of the Maryland black bear. By the middle of the last century, human activities had brought the bear to the brink of extinction. It took tremendous effort and many years, but by the time I took office in 1995, the bear had been successfully reintroduced to wild parts of the state.

Today, however, those wild parts are giving way to subdivisions and shopping centers. Now that we humans have sprawled our way into bear habitat, many are regarding them as a nuisance and want the bears removed or destroyed. All across the nation, similar encounters—and debates—focus on deer, fox and so many of nature's other 'critters' that wander into our backyards, which were once their home. To my mind, though, it would be terrible public policy to punish the animals for our bad planning.

This report makes clear the degree to which we are punishing wildlife with sprawl from one end of the country to the other. It shows how fast we're losing the one-of-a-kind landscapes and critical ecosystems that support a vast array of wildlife – and ultimately, our own kind. Beyond that, though, the authors offer hope that people, intelligent as we are, can halt this trend, if we act boldly and quickly enough.

That was what we were trying to do in Maryland in the late 1990s, when we adopted a program called Smart Growth. We asked local governments to stop reckless, irresponsible development and set aside areas where growth should occur; and we said state money for schools, roads, sewers, and anything else would go only to those well-planned areas.

Being smart about growth means revitalizing existing cities and suburbs and making efficient use of land, rather than building in outlying farm fields and forests. It means making cities and suburbs affordable places to live, so that everyone can participate in and benefit from this revitalization. It means giving the "green infrastructure" of wildlife habitats and open space the same level of attention and concern as the "gray infrastructure" of roads, sewers and utilities. And it means giving citizens a meaningful say in how our communities change, using tools such as the Endangered Species Act. As this report explains, this law provides an important catalyst for important actions that protect wildlife from sprawl, but it is itself endangered, with Congress considering proposals to weaken it in the coming months.

Above all, smart growth is about making communities better as they grow so that they are not only more environmentally responsible, but also more vibrant, beautiful and fulfilling for the people who live in them. The best way to protect natural habitat is to become far more conscious and intentional about creating wonderful human habitat. Once you read this report, I am sure you'll agree.

Rapid consumption of land `lria qeob^qbk qeb prosfs^i lc kb^oiv **one out of every three imperiled species** fk qeb R+P++++Ork^t^v absbilm j bkq qeob^qbkp qeb sbov prosfs^i lc qebpb k^qflk^i qob^probp ^ka rkabop`lobp qeb rodbk`v clo `l j mobebkpfsb **habitat protection** pqo^qbdfbp ^ka mi^kkfkd clo **green infrastructure**+

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Over the next half century, up to one third of the world's plant and animal species may be lost forever. Conservation biologists regard this as the first mass extinction since the age of the dinosaurs.[1] In the United States alone, thirty percent of the nation's plant and animal species are at risk of disappearing, and over 500 species are missing or may already be extinct.[2]

For an estimated 85 percent of these imperiled species, the loss or degradation of their habitats is the principal threat to their continued existence.[3] The conversion of natural areas for homes, offices, and shopping centers has become one of the most serious threats to America's native plant and animal species. Indeed, by some estimates the amount of land covered by urban and suburban development has increased by nearly 300 percent since 1955 while population has increased by only 75 percent.[4] Furthermore, the pace of land development has been accelerating in each successive decade since the 1950s.[5]

As suburban development continues to sprawl outward, habitat loss and degradation are also likely to accelerate. This report estimates the pace of land consumption in the country's fastest growing large metro areas over the next 25 years, and investigates what those metropolitan areas are doing to protect their natural lands from overdevelopment. In this report, we sometimes refer to natural lands as "green infrastructure" because it carries the implicit message that these open spaces are necessities that play important functional roles (e.g. filtration of water, wildlife habitat, etc.,) and thus are deserving of serious public planning and investment.

Runaway Development will Deplete Natural Lands in Metro Areas

At the current pace of low-density development, the next 25 years of population growth will likely result in the consumption of between 6 and 60 percent of the remaining non-federal natural lands in the nation's fastest growing large metropolitan areas. However, these metropolitan-wide statistics, which are drawn from U.S. Census and U.S. Department of Agriculture databases, only tell part of the story because rural and urban lands are lumped together (see Box 1). In many of the 35 metro areas examined in this

Box 1: Metro Areas, Defined

In common parlance, "metro area" means a city and its surrounding suburbs. However, in this report we use the U.S. Census Bureau's definition, which includes cities, suburbs and sometimes farmlands, deserts, national forests, and other largely undeveloped areas.[6] Metro areas considered in this report range in size from Providence-New Bedford-Fall River, RI-MA (1,601 square miles) to Los Angeles-Long Beach-Riverside, CA (33,955 square miles).

study, the brunt of future growth will be borne by relatively few component counties. At

areas) found that local governments generally have not done enough to ensure that wildlife habitats and other aspects of green infrastructure are adequately considered when land use decisions are made.

That said, the outlook is not hopeless. Across the country, voters have demonstrated a willingness to devote public funding to land conservation. In 2004, voters approved 162 state and local ballot measures to generate $4.1 billion for the protection of natural areas. The federal Endangered Species Act continues to provide a safety net for many species threatened with extinction, although it is seriously underfunded and is at risk of being ruther weakened in the coming months.

Some local governments in the 15 metro areas surveyed have been innovative with green infrastructure tools (see Box 2). Leaders of these local governments used computerized mapping technologies to inventory natural resources and set priorities for protection. They overcame narrow parochial interests and cooperated with nearby jurisdictions to develop regional solutions. They adopted visionary green infrastructure plans, and then implemented protection strategies ranging from zoning and other traditional land use regulations to purchases of development rights and other financial incentives that steered development away from valuable natural areas. And many secured the funding needed to make all of this possible. These local stories, featured in this report, provide models for the rest of the country as communities grapple with the impacts of sprawling development on precious natural resources.

Finally, the task of protecting our natural habitats also relies on our ability to create quality human habitats. Smart growth approaches to development prioritize the enhancement of community livability, the efficient use of land, and the creation and preservation of parks and natural areas. They respond to increasing market demand for more compact and convenient communities, and are gaining momentum in many communities across the nation.

Box 2: Key Findings and Tools for Protecting Green Infrastructure

Sprawling development poses one of the most serious threats to America's wildlife heritage. Left unmanaged, sprawl could consume significant portions of the remaining green space in the country's fastest growing large metro areas and counties, which are home to nearly one-third of imperiled species in the U.S. Despite the threat, most local governments have failed to protect their open space from sprawling development. However, there are several exceptions across the country. This report compiles models of green infrastructure protection, and identifies six tools for successful programs:

- Create and maintain inventories of species and natural resources.
- Establish regional cooperation to protect natural areas and species.
- Develop green infrastructure protection plans, with performance goals and measurements.
- Establish urban growth boundaries or urban service boundaries.
- Protect critical natural habitats.
- Build reliable local funding sources for green infrastructure and species protection.

found that sprawl is the leading cause of species imperilment in that state (Box 3: *Paving Paradise: Sprawl's Impact on Wildlife and Wild Places in California*).

The leading demographics and economic forecasting firm Woods & Poole Economics, Inc., estimates that America's metropolitan population will increase by 29 percent between 2000 and 2025. New buildings, roads, sewers, and water systems will be built to accommodate these growing human needs. And if development continues at prevailing densities, land will be consumed at an even faster rate than population grows. The expanding footprint of development will put additional pressure on diminishing wildlife resources and their habitats, and has the potential to drive more plants and animals toward extinction. If the U.S. is to protect its current array of plant and animal species for future generations, the nation must plan carefully to guide development so that it leaves life-sustaining green infrastructure intact. In addition, the U.S. must maintain and strengthen key safeguards such as the Endangered Species Act.

Box 3: *Paving Paradise: Sprawl's Impact on Wildlife and Wild Places in California* (February 2001)

In this report, the first quantitative assessment of the causes of species imperilment in California, the National Wildlife Federation (NWF) found that sprawl is the leading culprit. Outranking 17 other factors including road construction and outdoor recreation, sprawl threatens 188 of California's 286 federally listed species (66 percent). NWF also found that sprawl has the highest incidence of association with other harmful factors, suggesting that many causes of species imperilment are closely intertwined with sprawl.

Source: Doyle, K., J. Kostyack, B. McNitt, G. Sugameli, C. Whitaker, K. Whitcomb-Blaylock, J. Byrd, G. Stull, and B. Czech, *Paving Paradise: Sprawl's Impact on Wildlife and Wild Places in California*, Washington, D.C: National Wildlife Federation, 2001.

Beyond safeguarding individual species, protecting natural areas from overdevelopment can generate major economic and environmental benefits, particularly with regard to protecting wate....Land conservation can help reduce the impacts of polluted

percent impervious (where water cannot penetrate the surface) will contribute to a dramatic degradation in the health of aquatic ecosystems. The best way to avoid such impacts is to steer development away from watersheds with little existing development (with more than 90 percent of the watershed's surface remaining permeable) and focus development into watersheds that are already degraded.[22]

Box 4: The Little Mouse that Could (and Did) Save a Community

In When Hurricane Ivan slammed into the Alabama coast in September 2004, entire beachfront communities were destroyed. However, the developments on the Fort Morgan peninsula were spared. Unlike everywhere else along the coast, the natural dune habitat on the peninsula had been protected from development and served as a vital buffer against floodwaters. Developers had undertaken this habitat conservation measure to protect the tiny Alabama beach mouse from extinction and thereby to fulfill their duties under the Endangered Species Act. The beach mouse not only helped save a community from a hurricane, but it also offered a timely lesson on how conserving healthy habitats for wildlife improves the quality of human habitats.

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In addition to providing environmental benefits, farmland and other open spaces

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What is Sprawl?

Despite these promising trends, sprawl remains the nation's dominant development pattern. Although definitions vary, sprawl is usually characterized by: (1) low-density residential development; (2) rigid and large-scale separation of homes, shops, and workplaces; (3) a lack of distinct, thriving activity centers, such as strong downtowns or suburban town centers; and (4) a network of roads marked by very large block size and poor pedestrian access from one place to another.[32] Compact development is the antithesis of sprawl, keeping complementary uses close to one another.

Recent studies have quantified the relationship between sprawl and a host of negative outcomes: high ozone levels, traffic fatalities, drive time to work, and even obesity.[33] This report relates sprawl (measured here as the drop in gross population density as rural lands are converted to development) to the loss of open space and natural habitats. The faster a metropolitan area or county grows in developed land area relative to population, the more sprawling the area becomes, and the more habitats on which rare species depend are consumed.

Runaway Development will Deplete Natural Lands in Metro Areas

In order to measure the potential impact of future development, we focused on the 35 large metropolitan areas (those with more than one million people in 2000) projected to grow the fastest between 2000 and 2025. Our basic units of analysis were Metropolitan Statistical Areas (MSA) and Combined Statistical Areas (CSA), as defined by the U.S. Census Bureau in December of 2003. We analyzed growth trends and rural-urban land conversion in these metropolitan and combined metropolitan areas and subsequently identified the constituent counties where open space is particularly threatened by the combination of high growth rates and low development densities.

Between 2000 and 2025, Woods & Poole Economics, Inc., projects population growth in these 35 metropolitan areas ranging from a low of 15 percent for Providence to a high of 86 percent for Las Vegas (see Table 1). For 31 of the 35 areas, urban land area expanded faster than population between 1982 and 1997, causing average population densities to decline. The estimated average density of new development during the period was less than 2,500 persons per square mile for all but seven metropolitan areas. This translates into *fewer than two dwellings per acre*. A few regions, including Las Vegas, Los Angeles, and Phoenix, experienced modest increases in density during this period. But even in

square mile) are low by historical standards. The net effect of such densities is the loss of more land to accommodate fewer people (see Table 1).

To estimate land consumption over the 25-year period, we divided the projected increase in population by the net density of recent development for each metro area. These estimates were then compared to the amount of land available ĉ سخي # b

square miles of open space remaining). The degree to which demand outstrips supply is dramatically illustrated by the amount by which "projected demand" for land exceeds 100 percent of available land base in the 18 counties. Development pressure from these counties would likely spread into adjacent counties, which would also lose open space. Another 19 counties will lose half or more of their green infrastructure lands.

Viewing the county-level data another way, 20 counties in the 35 fastest growing large metropolitan areas will each lose more than 200 square miles of open space to development if growth proceeds at the low prevailing densities of recent years (see Figure 2). Leading the pack is Harris County, TX, part of the Houston metropolitan area, whose population growth between 2000 and 2025 would use up a staggering 619 square miles of open land at prevailing densities. In fact, Harris County will run out of open land before the demand is fully met. Six other high-growth counties are in this same position. Collectively, the top 20 counties have projected land consumption of 5,815 square miles.

Finally, viewing county-level data from a third perspective, 20 counties in the 35 fastest growing large metropolitan areas each harbor upwards of 20 imperiled species (see Figure 3). These counties are concentrated in the West, particularly the San Francisco and Los Angeles metropolitan areas, and the Southeast, with two from the Birmingham metropolitan area. Collectively, the top 20 counties harbor 718 imperiled species, with many species appearing in multiple counties and 438 species that are unique to these counties.

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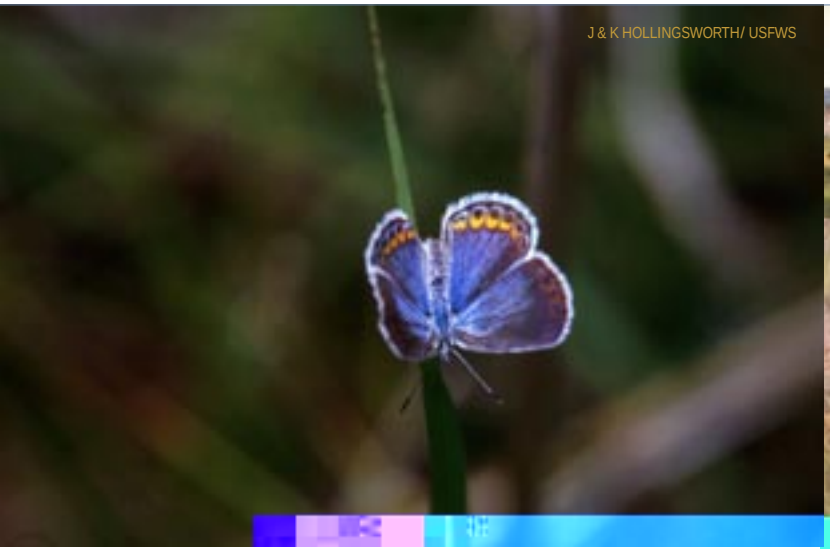
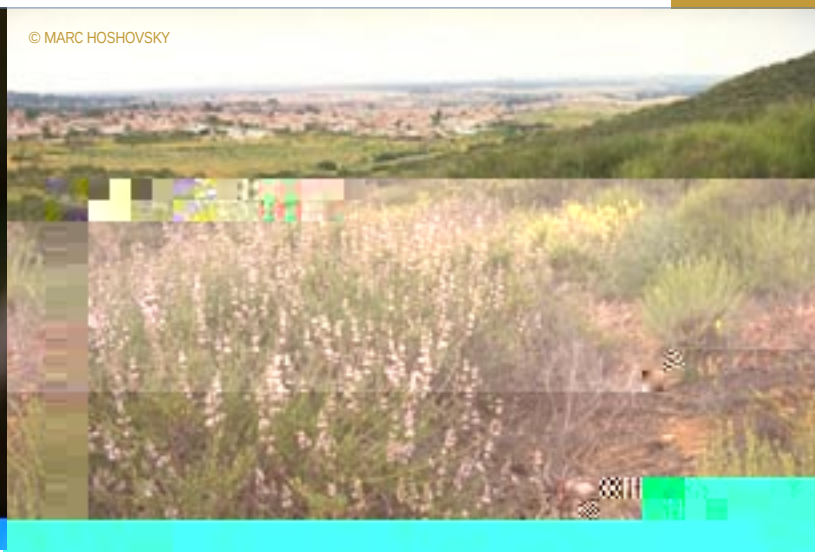
L:The endangered Karner blue butterfly is indirectly threatened by fire suppression efforts aimed at protecting encroaching developments; R: San Diego County sprawl is putting the squeeze on remaining wildlife habitat.





Regional Cooperation

Most decision making on land use issues in the U.S. is made at the local level (i.e. town, village, township, city, etc.) or, for areas not incorporated into a city or town, at the county level. Neighboring governments typically do not coordinate their land use strategies, and often unwittingly undermine each other's efforts. Under such circumstances, it is extremely difficult to protect and restore habitats and natural areas that cross jurisdictional boundaries. It is also difficult for citizens concerned about green infrastructure to influence policy because it is difficult for them to appeal to decision makers in multiple jurisdictions and at different governmental levels.

When the lack of coordination between jurisdictions is recognized, the most common solution is to form a regional council of governments.[43] These bodies typically play an important role by facilitating information-sharing, providing a forum for debate, and making policy recommendations to member governments. However, their greatest weakness is that they are often merely advisory bodies. Because of this, regional councils often find that their recommendations are ignored.

Three of the 15 metro areas surveyed, including Portland, OR, Minneapolis-St. Paul and a sizable portion of the Los Angeles metro area (Riverside County), have boldly addressed this problem by establishing regional governments with real decision-making power. Elsewhere in the country, there is little movement toward the establishment of regional governments with broad authority over land use.[44] Yet, despite the perceived barriers, regional governance is still one of the most effective tools available for the protection of green infrastructure.

Portland, Oregon

The Portland area's regional government, known as Metro, covers 24 cities (including the City of Portland) across a three-county area. Metro has received praise by land use policy experts for successfully addressing problems that would otherwise have to be dealt with

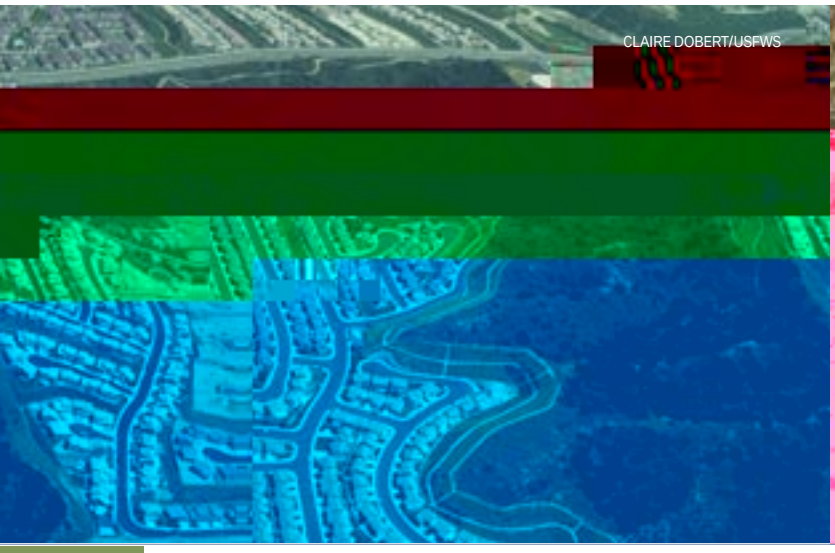
San Diego

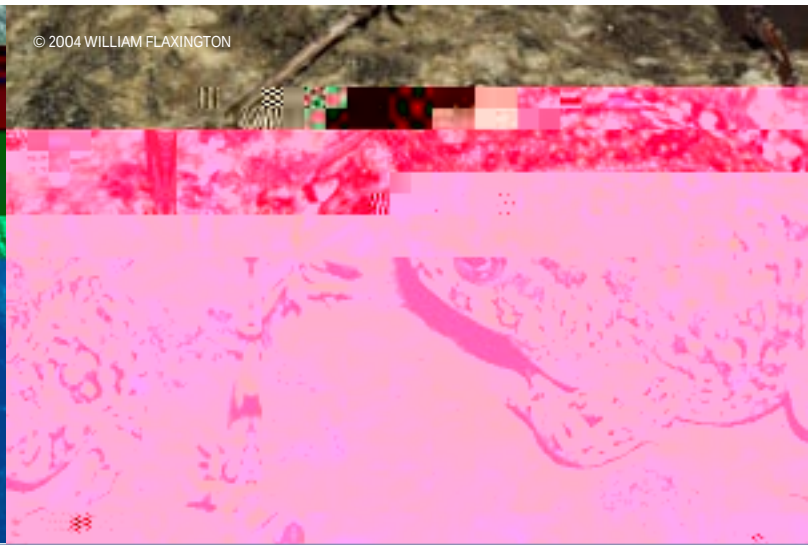
In San Diego, the San Diego Association of Governments (SANDAG) plays the more typical MPO role for the region: its transportation plans strongly influence the actions of local governments, but its views on green infrastructure and other non-transportation issues are frequently disregarded. The result is fragmented land use decisions that fail to add up to any kind of regional green infrastructure strategy. Meanwhile, the Quality of Life Coalition, a group comprised of environmentalists and economic development and business agencies, is working on an initiative that would require SANDAG to change this by making its distribution of transportation funds conditional upon satisfaction of certain green infrastructure criteria such as habitat protection and water availability.

Green Infrastructure Plans

To succeed in protecting green infrastructure, local governments must first have a plan. In some states, such as Washington, Oregon, California, Maryland, and Florida, a comprehensive plan is required by state law, and that plan must address open space. Local governments in these states typically perform far better in planning for green infrastructure than in other states, such as Texas, where open space planning is purely voluntary.

As discussed earlier, an open space plan by itself will not necessarily succeed in conserving habitats without coordination with neighboring jurisdictions. Other pitfalls that could befall an open space plan are the failure to address habitat needs as distinct from recreational, farmland and other open spaces needs; reliance on the "wish list" approach (merely laying out recommendations, rather than assigning clear responsibilities and priorities); and the failure to adopt specific goals and performance measures for tracking progress.





L: Fragmentation of California gnatcatcher habitat has led to the federal listing of this diminutive bird; R:The Arroyo toad has lost much of its habitat—typically streams and adjacent sandy terraces—to sprawl and other disturbances.

Portland, Oregon

In Portland, Metro's Greenspaces Master Plan goes even farther than the southern California HCPs in terms of breadth and accountability. Unlike in southern California, the Greenspaces Master Plan addresses more than just species and habitats. It also identifies a regional system of parks, natural areas, wildlife corridors and trails to address the full range of habitat and open space needs. In addition, while the HCPs in southern California bind only certain county and city permit holders, the Metro Greenspaces plan covers all 3 counties and 24 cities of greater metropolitan Portland.[48]

Chicago

The Chicago Wilderness coalition is an excellent example of green infrastructure planning

circumstances, local governments typically rely on one of two tools to maintain a "greenbelt" of undeveloped land: urban growth boundaries (UGBs) and urban service boundaries (USBs).

UGBs are a regulatory tool in which local governments, exercising their zoning authority, declare a specified area off-limits to development in excess of a certain density. In designing UGBs, governments typically provide a long-term supply of developable land within the boundary to ensure that the demand for new homes can be met. USBs are financial tools in which governments withhold development subsidies in areas deemed inappropriate for development. Both tools can help protect green infrastructure because they greatly dampen developer speculation on rural

San Diego

In southern California and a handful of other metro areas in the country, the Endangered Species Act mandates that local governments take action to protect critical areas. To avoid liability for facilitating the illegal taking of listed species, San Diego County and other nearby jurisdictions have developed Habitat Conservation Plans that call for the establishment of

FEDERAL RESOURCES

The Land and Water Conservation Fund (LWCF) is a federal program created in 1964. Congress is authoriz atee

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To assess the extent to which sprawling development threatens the nation's

Assessing the Threat to Biodiversity

7. Does your jurisdiction have dedicated funding (e.g., sales tax, bond money, real estate transfer tax funds, or mandatory developer impact fee) earmarked for purchases of environmentally sensitive land, either fee simple title or conservation easements?

   ___Yes. Local government's own sources of dedicated funds

   ___Yes. Dedicated state funds passed through to local government

   ___No

   ___If yes, approximately how much dedicated $ is earmarked each year for purchases of environmentally sensitive land? _____

U.S. State and Local GIS Data Resources: http://sunsite.berkeley.edu/smorris/gisdata.html.

USGS Geospatial Data Clearinghouse: http://nsdi.usgs.gov/.

USGS GIS Tools: www.absc.usgs.gov/glba/gistools/.

Green Infrastructure Plans

Chesapeake Bay Foundation and American Farmland Trust, *Conserving the Baltimore-Washington Region's Green Network: The Time to Act is Now*, May 2004. Available at www.farmland.org/greennetwork.

Chicago Wilderness: www.chicagowilderness.org.

[31] Professor Nelson derived this figure from a combination of sources, including Myers and Gearin, *op. cit.* and the American Housing Survey, which shows that about one third of households reside in rental housing (mostly apartments and attached units). See his forthcoming book, *ReShaping America*, Chicago: American Planning Association. Also, Nelson defines "higher-density housing" as 12 units per acre or greater.

[32] Ewing, R., R. Pendall, and D. Chen, *Measuring Sprawl and Its Impact,* Washington, D.C.: Smart Growth America, 2002. Available at www.smartgrowthamerica.org.

[33] Ewing, R., R. Pendall, and D. Chen, "Urban Sprawl and Transportation," *Transportation Research Record 1832* (2003): 175-183; Ewing, R., R. Schiever, and C. Zegeer, "Urban Sprawl as a Risk Factor in Motor Vehicle Occupant and Pedestrian Fatalities," *American Journal of Public Health*, 93 (September 2003): 1541-1545; and Ewing, R., T. Schmid, R. Killingsworth, A. Zlot, and S. Raudenbush, "Relationship between Urban Sprawl and Physical Activity, Obesity, and Morbidity." *American Journal of Health Promotion* 18 (September/October 2003): pp. 47-57.

[34] West Virginia covers 24,078 square miles.

[35] Fulton, *et. al., op. cit.* At the local level, various studies corroborate our estimate. One study sponsored by the Chesapeake Bay Foundation in 2002, research geographers at the University of Maryland examined the Washington, DC and Baltimore regions and concluded that the projected development through 2030 would be roughly 1,250 square miles. We estimated 856 square miles for just the Washington, DC region through 2025.

[36] Norris, S., "Only 30: A Portrait of the Endangered Species Act as a Young Law," *BioScience*, 54: 288-294.

[37] Scott, J. M., F. W. Davis, R. G. McGhie, R. G. Wright, C. Groves, and J. Estes, "Nature Reserves: Do They Capture the Full Range of America's Biological Diversity?" *Ecological Applications*, 11.4 (2001) 999-1007. See also, Scott, J. M., B. Csuti, J. Jacobi, and J.E. Estes. "Species Richness: A Geographic Approach to Protecting Future Biological Diversity," *Bioscience* 37.11 (1987) 782-788.

[38] Trust for Public Land, *LandVote Database* (www.landvote.org).

[39] *Getting to Smart Growth: 100 Policies for Implementation*, Washington, DC: U.S. EPA and the International City/Cerntty/C g D D n . γ ls¾l