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Sprawl and Wildlife
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Problem:

How Sprawl Threatens Wildlife

Sprawling patterns of development impact wildlife habitat by changing the land cover and altering the form of the natural landscape on a permanent basis. Native vegetation is replaced by asphalt or lawn and drainage patterns are altered to accommodate roads and building sites. Roads, buildings and parking lots divide the landscape and fragment plant and animal habitats, isolating certain populations from their original range by restricting or eliminating corridors or other critical elements of their habitat.

Human settlement and associated activities produce noise and introduce domestic and exotic animals and plants that may alter the ecological balance of an area. Development impacts to native plant and animal populations are most often incremental and cumulative. Road construction and residential and commercial development can chop up open spaces, disturb natural drainage patterns and affect wetland and surface water habitat. Areas of development also may have increased application of nutrients and toxics that can affect terrestrial and aquatic wildlife. Fragmentation of the landscape reduces the acreage of habitat available to animals that have large spatial requirements to sustain their populations. Buildings, roads and other man-made barriers can also alter or block essential wildlife travel corridors.

Sprawling development is recognized by the Wildlife Resources Policy Committee to be a priority issue in the future of wildlife in North America. Since the effects of sprawl are felt in a permanent way on a landscape scale, all wildlife can be affected. New approaches are needed to make progress in influencing landscape-scale decisions that will affect the presence and viability of many of our wildlife species.

What Causes Sprawl

The causes of sprawl are complex and interrelated, ranging from government policies to population growth, the conversion from an agrarian to a service economy, and

American preferences and attitudes. Government policies dictating land use and environmental regulation guide the placement of new development, often away from already developed areas. State traffic regulations may make it more costly to locate in an area that is congested, driving development to less crowded areas. Regulations requiring certain amounts of open space around new schools have been cited as promoting the construction of new schools in rural areas away from service centers. Local minimum lot sizes encourage the subdivision of land on the fringes into ample lots and spread out the impact of development, rather than promoting concentrated development and conservation of open space on large pieces of land. At times, efforts to protect valuable prime farmland for agriculture force sprawling development into less useful areas that cannot be farmed, but that may be the more important remaining wildlife habitats.

Tax policy also influences the location and pace of development. Capital gains tax on timber may encourage liquidation of timber assets, leaving forest land available for more intense development. High property values near urban areas often drive residential and commercial development to less expensive open lands in nearby rural areas. Since municipalities depend on property tax revenues to fund local services, there is an incentive to increase property values by promoting development, even though many studies show that development costs outpace short-term gains. Inheritance taxes may force heirs to subdivide family land. Rising property values encourage the subdivision of agricultural lands. Low federal and state gasoline taxes keep the costs of commuting low and effectively subsidize the separation of workplace from living space.

Infrastructure decisions by federal, state and local governments often promote sprawling patterns of development. Water and sewer systems are often expanded with federal and state grants without careful analysis of the long-term costs and consequences. Road developments and improvements are often made in reaction to the demands of developers to accommodate growth. Rather, officials could proactively choose the location of development consistent with the best economic advantage to the community and its budget. Highly traveled roads attract development seeking market access, resulting in the strip development lining many highways. As mentioned above, private roads and rights-of-way to off-the-road development often become accepted as town roads, increasing the overall tax burden of road maintenance.

The demographics of our growing society may help explain sprawl. As the population grows and household size shrinks, there is more demand for housing. The 'American Ideal' of a house on a large lot in a sylvan landscape contributes to market demand for homes in the suburbs, by the coast, or on the shore of a pristine lake or mountaintop. People are leaving the problems associated with big cities such as pollution and crime, and seek refuge in rural communities where they often find lower taxes and an improved quality of life.

Lack of coordinated land use planning between and within towns also contributes to sprawling patterns of development. Development happens incrementally over time; permits are issued piecemeal. Usually on the state level, there are no processes to adequately address cumulative impacts of individual developments.

Solutions:

The solution to sprawl's influence on the future of wildlife lie in 2 parallel tracks. First, a biological model is needed to describe how the landscape should look for it to remain functional for wildlife. Second, a variety of tools are needed to allow local entities help private landowners that provide wildlife habitat.

The Biological Model: A Landscape Approach To Designing Development

Historically, wildlife habitat conservation efforts have focused on specific known locations essential to the survival of species deemed rare, endangered or significant. This 'spot' approach to habitat protection fails to address the needs of more common (both game and nongame) wildlife species or to address the changing landscape outside the buffers around protected sites. A landscape approach to habitat conservation (that also accommodates appropriate development) takes a broader view.

This approach requires looking at a large area, a town, a group of towns, or a watershed; identifying the wildlife habitat resources, the existing and future land use patterns and given existing ordinances and land ownership configurations. Through a public process, the community will identify how it wants the landscape to function in the future and what kind of wildlife habitat it wants to sustain. Then, it can develop a course of action to achieve its vision. The need for this type of landscape approach for protection of wildlife habitat at the local level and the impacts of various development patterns on species diversity is outlined below.

Understanding What Wildlife Needs

In the simplest terms, the landscape can be broken into three categories. The first includes intensively developed areas with paved roads or permanent structures. These areas provide extremely limited wildlife habitat. The second category includes areas that require some special management consideration, either because they are locations of rare species, or because they are particularly vulnerable to outside impacts. The third category includes general open space; woods, fields, and undeveloped (or very sparsely developed) areas. This wildlife habitat, although by far the largest of the three categories, receives little public attention and, because of this, is at highest risk from unplanned development. It is this open space category for which a landscape approach to sprawl is most needed.

As discussed previously, sprawl impacts the open-space component of wildlife habitat by fragmenting the landscape into smaller and smaller blocks. As development along roads increases, movements between remaining adjacent blocks of open space become all but impossible for most wildlife species. If the remaining isolated blocks are not large enough or provide the habitat qualities to fulfill the needs of the species that live there, those species simply disappear.

A Continuum

The relationship between an area's level of development and its capacity to support wildlife can be thought of as points along a continuum. Development ranges from completely undeveloped, open landscape to environments dominated by paved surfaces

with permanent buildings, roads, sidewalks, and parking lots. Along this continuum, the suites of resident species gradually shift, from those that require larger blocks of open space, to species that can adapt to more developed or urban landscapes.

An undeveloped landscape can naturally support a broad range of species, including species with large spatial requirements. As this landscape becomes more fragmented (first by sporadic houses and commercial structures and then by strip development along roads) blocks of open space are reduced in size and the diversity of species supported by the habitat declines as the area becomes too small to support their needs. Point by point along the continuum, wildlife species drop off the landscape. In the completely developed landscape, the composition of species usually shifts to a suite of "urban" wildlife that are able to adapt, even thrive, where others can not. Often this shift also changes the species mix from native species to exotic/invasive generalists in the urban environments

In summary, habitat block size, fragmentation of habitat and barriers to movement are three key factors to consider when designing development to conserve wildlife habitat.

A Concept for Habitat Planning: The Tiered Landscape Approach

A landscape approach to habitat conservation is needed to provide the guidance necessary to make intentional and informed decisions about landscape impacts at the local and regional levels. This landscape model can be built on a system, or tiered approach, that recognizes 3 major habitat categories and their influence on wildlife species requirements. Together, the 3 categories can help wildlife biologists design a landscape, in conjunction with local communities, that functions for wildlife, even if remaining areas are built up completely.

1. Riparian Habitat

This provides habitat for many species that use the transition zone between aquatic and terrestrial habitats. It includes all areas adjacent to streams, rivers, wetlands, lakes and ponds, and can function also as travel corridors linking areas together on the landscape.

2. High Value Wildlife Habitats

These are the special habitats required by wildlife, such as nesting sites, special vegetation communities, deer wintering areas, locations of endangered, threatened, or rare species – any location or habitat that may require special consideration. These can often be conserved within riparian buffers or large habitat blocks, but must be present to serve the essential requirements of some species.

3. Large Habitat Blocks

Large blocks are relatively unbroken areas of habitat including forest, grasslands, and agricultural lands that are crossed by few roads and have relatively little development and human habitation. These areas are essential for wildlife species with large spatial requirements or that are

sensitive to human disturbance. Blocks may be thought of in several tiers that relate to the needs of different suites of species – from the small 1-20 acre blocks that support suburban species to blocks of several thousand acres that support larger predators, mammals, and interior bird species. A fragmented landscape can function as a larger block if suitable corridors are available that wildlife can use. In some instances, riparian buffers can function as travel corridors linking habitat blocks on the landscape.

The final functional landscape may be a system of High Value Habitats embedded in Large Habitat Blocks connected by corridors and Aquatic/Riparian buffers.

Tools For Conserving Habitat at the Landscape Scale

Open space planning, of which wildlife habitat is one component, requires a new level of cooperative planning between local governments, private landowners, and state agencies. Since the solution is at a landscape scale and large numbers of private landowners are involved, each with different needs, many different tools are needed to help landowners continue to provide the wildlife habitat benefits that are needed to ensure the future of wildlife. Some examples of tools that can help are outlined below:

1. Developing state-funded incentives for municipalities and conservation and recreational interests to cooperatively develop regional plans that provide open space for wildlife habitat. This recognizes that there is great public benefit – ecologically, recreationally, aesthetically, economically – provided by private landowners maintaining viable landscapes for wildlife.
2. Developing additional financial incentives for landowners (such as property tax relief) or disincentives to encourage land to remain undeveloped.
3. Develop model performance standards for development projects that protect important habitat areas.
4. Favoring land acquisition projects in areas that have exceptional wildlife resource values.
5. Revising state and local policies that encourage sprawl (including school funding, road construction, development standards, etc.) to reduce the unintended consequences of these policies.

Conclusion:

Sprawl is recognized by the Wildlife Resources Policy Committee to be one of the most pressing issues facing the future of wildlife because of its more permanent effects on the landscape – and also one of the most daunting. The solutions are not clear or easy to implement, but continued progress is essential to the distribution and viability of wildlife as a component of the landscape. The involvement of wildlife biologists in creating the atmosphere and tools for cooperative conservation efforts is paramount to the outcome of this issue. The effects may not be apparent in the next decade, but, most certainly, our efforts now will help define the presence of all wildlife species 100 years from now.