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INTEGRATED PLANNING

The most significant threat to America's biodiversity is habitat loss, and the greatest consumer of habitat is poorly planned, sprawling development. Low density, automobile-dependent development that spreads beyond the edges of existing communities and alongside highways devours and degrades the habitat that wildlife relies upon for its existence. The Natural Resources Inventory estimates that 2.2 million acres are lost to development each year.[1] In a recent study of listings under the Endangered Species Act, researchers found that urbanization endangers more listed species than any other cause.[2]

Roads and highways enable the mobility necessary for development, hence the transportation planning decisions that are made today will determine the location, direction and shape of the urbanization that happens tomorrow.

In order to stem the tide of sprawl, many local and state governments have undertaken land conservation efforts. State biodiversity plans, regional conservation plans, greenways and open space plans are becoming increasingly commonplace. "Smart growth" has become a priority in local governance. Between 1998 and 2002, voters in 39 states approved ballot initiatives that call for total expenditures of $23 billion to protect natural areas.[3]

These communities also want economic growth and improved road networks. Unfortunately, conservation and growth efforts often happen in isolation and can then confound one another. For example, transportation projects are often planned without detailed information on core conservation areas, sensitive resources or important habitat that might lie within the selected corridor. These conflicts do not come to light until the environmental review process, which then becomes more expensive and time-consuming as transportation and resource officials attempt to reconcile infrastructure and conservation activities.

If conservation efforts are taken into account at the earliest stages of transportation planning, both priorities can be realized, and at less expense of time and money.

STATE BIODIVERSITY PLANNING

Each state has jurisdiction over the wildlife that resides within its borders. However, when a species is officially listed as either threatened or endangered, it then becomes the responsibility of the federal government. To help avoid the listing of species, the federal government provides funding to states for conservation efforts.

In 2001, Congress created a new State Wildlife Grants Program that requires each

state to develop by 2005 a **Comprehensive Wildlife Conservation Plan (CWCP)**, which is intended to identify threats to wildlife and natural habitats and the measures that will be used to address these threats. The plans are expected to identify and map those habitats that are essential to the long-term conservation of a state's at-risk plant and animal species and natural communities. (See Appendix B for guidance on developing Comprehensive Wildlife Conservation Plans.)

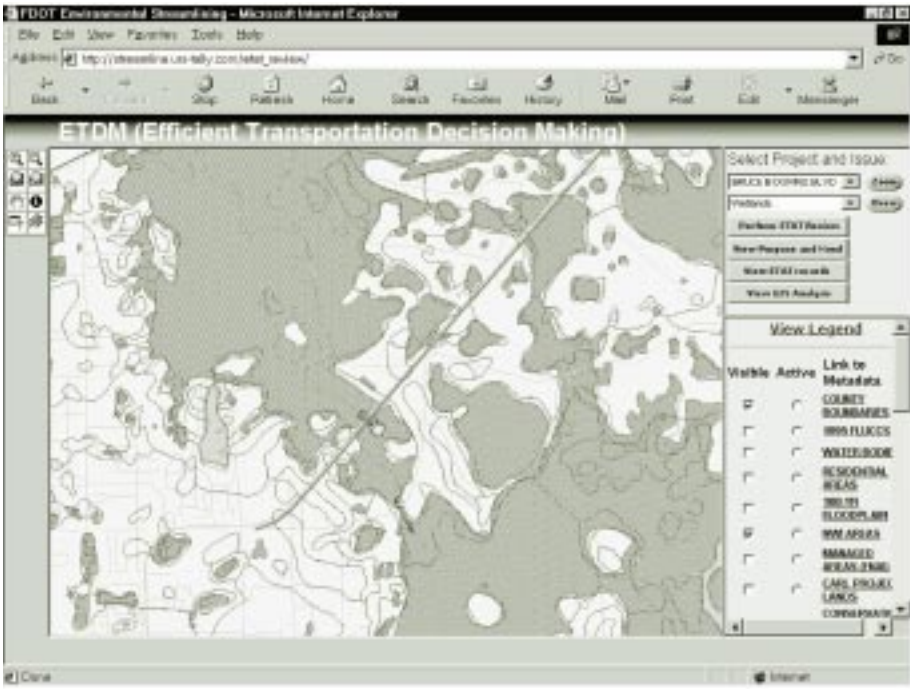
At present, few states have such general habitat conservation strategies, and those that do have little direct control over federally-funded road projects that might work against their conservation efforts. That problem could be addressed through early and informed coordination of federal expenditures on roadways with the Comprehensive Wildlife Conservation Plans. Utilization of the habitat mapping data included in those plans can serve as an effective early warning system to identify transportation projects that will have a major impact on wildlife. Planners can overlay conservation maps with anticipated transportation projects to discover potential conflicts before considerable resources are invested. Efforts to avoid sensitive areas are easier and less expensive during the planning phase than during permitting and construction.

FLORIDA'S PLANNING PROCESS

A decade ago, the state of Florida compiled a statewide plan which identified lands that must be conserved in order to sustain declining wildlife species and natural communities.

The report, *Closing the Gaps in Florida's Wildlife Habitat Conservation System*, assessed the status of species and habitat that encompass Florida's biodiversity. The project mapped two categories of strategic land: areas that were already under some form of conservation protection (20 percent of the state's area), and areas that needed additional protection (an additional 13 percent). *Closing the Gaps* was the first statewide conservation program of its kind, built upon a sophisticated process with a strong scientific approach. Notably, it included the assembly and analysis of numerous data sets and assessments of focal species and population viability. The project has played a key role in guiding land acquisition decisions. Since publication in 1994, the state has acquired 20 percent of the previously-unprotected strategic habitat areas.

Following the 1998 adoption of TEA-21, the Florida Department of Transportation (FDOT) began efforts to expedite projects without sacrificing environmental concerns. Building upon directives in TEA-21, FDOT teamed up with the Federal Highway Administration (FHWA) and other government agencies to develop a refined and improved methodology for making transportation decisions while complying with all federal and state environmental regulations. The result — **FDOT's Efficient Transportation Decision Making Process (ETDM)** — redefines how the state plans and builds transportation projects while protecting Florida's natural assets.



Each of the seven FDOT regions has an Environmental Technical Advisory Team (ETAT) composed of representatives from the relevant planning, consultation, and regulatory agencies. Proposed road projects are screened by the ETAT, based upon a checklist of criteria, including social and environmental impacts. Data from Geographic Information Systems (GIS) are used to perform evaluations, and are accessible to all agencies, as well as to the public through the Florida Geographic Data Library (FGDL).

One point of analysis is the compatibility of the proposed project with the state habitat plan. By overlaying maps of strategic habitats with FDOT's short- and long-range transportation plans, the ETAT can easily identify potential environmental concerns at the earliest stage of planning (see graphic). At that time, options for avoiding or minimizing environmental impacts are greatest and the costs of addressing conflicts are nominal.

As of early 2003, four other states had completed statewide biodiversity plans: Oregon, Maryland, Massachusetts and New Jersey. (See Appendix A for summaries.) However, those plans had not yet been incorporated into statewide transportation planning.

In 2002, the International Association of Fish and Wildlife Agencies (IAFWA) teamed up with the U.S. Fish and Wildlife Service, Defenders of Wildlife and several other organizations to develop flexible guidance for states to complete their Comprehensive Wildlife Conservation Plans.[4] Remaining states are expected to complete their plans by 2005, or risk losing eligibility for federal funding under the State Wildlife Grants Program.

While states are in the process of developing their conservation plans, transportation officials can look to other large-scale planning endeavors for information on ecologically valuable areas to be avoided. Due to development pressures and a need to address conservation issues, many localities have undertaken efforts to develop regional biodiversity plans.

SONORAN DESERT CONSERVATION PLAN

Pima County, Arizona, occupies six million acres of the Sonoran Desert; one of the largest stretches of protected arid ecosystems in the world. This unique and delicate ecosystem supports more than 2,500 pollinators, including invertebrates, birds, bats, and bees. The region also supports thousands of plant species in about 80 plant communities, such as ironwood-paloverde woodlands, saguaro cactus-mesquite scrublands, cottonwood and willow riparian forests, and California fan palm oases.[5] Pima County is also home to diverse cultures and interests, including the Tohono O'odham Native American Nation and an eclectic mix of urban and ranch communities that are growing at the rate of 20,000 residents per year. Residential growth in Pima County consumes seven to 10 square miles of the Sonoran Desert each year. This combination of unbridled development and sensitive environment set Pima County on a course for disaster.

In 1997, biologists found 12 Cactus ferruginous pygmy owls *(Glaucidium brasilianum cactorum)* in Pima County and soon thereafter, the owl was added to the endangered species list. Faced with a listing that would greatly affect development, Pima County could no longer ignore its growth problems. The county used the listing as an opportunity to establish a regional planning tool — the Sonoran Desert Conservation Plan (SDCP). The purpose of the current plan is "to ensure the long-term survival of plants, animals and biological communities that are indigenous to this county." The SDCP contains six areas of focus: Habitat, Corridors, Cultural, Mountain Parks, Ranch Lands, and Riparian. The Pima County Board of Supervisors is leading the SDCP effort in coordination with 12 major government land managers and a 74-person public steering committee that includes conservationists, developers, neighborhood groups, ranchers, and private landowners.

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In developing the SDCP, Pima County used the concept of "bio-planning," or natural resource assessment and planning, as a necessary first step in determining urban form. "We broadened the vocabulary of the growth debate to include biological and scientific concepts, and reframed the elements of regional planning to encompass the relation that the land has to natural and cultural resources," said County

COALITION FOR SONORAN DESERT PROTECTION

Administrator Chuck Huckelberry. "Our method assumes that urbanizing areas are endowed with certain natural, cultural and historical resources that should receive protection."

Based on the amount of acreage needed to stabilize and recover endangered, threatened and imperiled species, the plan outlines a conceptual biological reserve, which is combined with historic and cultural reserves. Areas identified as unique and ecologically or culturally sensitive are designated Environmentally Sensitive Lands (ESL).

In response to community concerns about potential conflicts between preserving ESLs and future roadbuilding, Pima County formed a panel of experts from multiple disciplines (roadway engineers, wildlife biologists, cultural resources experts, and a landscape architect) to develop guidelines that allow planners and designers to better account for biological, cultural and historic resources in the roadway corridor. Transportation projects occurring within designated areas are defined as Environmentally Sensitive Roadways (ESR), and are to be designed and constructed to minimize disturbances to natural resources.*

NATURESERVE AND HERITAGE PROGRAMS

NatureServe is a non-profit, non-advocacy organization that provides scientific information and tools to guide effective decisions in land use and conservation. NatureServe and its network of state biological inventories known as natural heritage programs are the trusted source for information about rare and endangered species and threatened ecosystems.

State DOTs routinely ask for information from over 90 percent of state natural heritage programs. Maine DOT employs information from the Maine Natural Areas Program (MNAP) to screen projects prior to implementation. Potential conflicts are identified and averted early. "When there is an overlap of our information with their plans, our ecologists travel to the site with their planners and engineers," says MNAP's Molly Docherty.

THE NATURE CONSERVANCY — ECOREGIONAL PLANS

Using a comprehensive and science-based approach to conservation, The Nature

Conservancy (TNC) has identified areas that need to be protected to ensure the survival of each ecoregion's biological diversity. Ecoregions are defined by their distinct climate, geology and native species. Conservation goals are set for each of the sites, and priorities are established for conservation action. The planning teams rely heavily on data on the location and status of species and natural communities and on local expertise for site selection. Eighty such plans are scheduled for completion by 2003, and are primarily intended to guide the land acquisition activities of TNC.

In addition to acquisition, TNC will join with communities, businesses, governments and other organizations to preserve identified conservation lands. Transportation agencies can contact TNC in their state for more information on incorporating ecoregional plans into local and statewide transportation planning.

KEY DEER HABITAT CONSERVATION PLAN

Long before the Florida Keys became a popular vacation destination and retirement haven, it was home to Key deer, the diminutive and endangered cousin of the Virginia white-tailed deer. Development has consumed all but six square miles of Key deer habitat, forcing many to cross US-1, a major highway that connects the Keys to the mainland. From 1970 to 1992, a total of 1,023 Key deer were killed on roads, with 526 occurring along US-1 on Big Pine Key.

Citizens of the Keys face growth-management issues, resource managers face endangered-species issues, and Florida DOT is in the middle, trying to provide adequate transportation facilities to the people of Florida, while reducing threats to the Key deer.

To address these issues, FDOT, Monroe County, the Florida Department of Community Affairs and the U.S. Fish and Wildlife Service are developing a Habitat Conservation Plan (HCP) for the Key deer which takes into account the impact of potential development over a 20-year period. The HCP will cover residential and commercial development, as well as transportation improvements to meet the community needs of Big Pine and No Name Keys. Concurrently, Monroe County is carrying out a "Livable CommuniKeys Program" (LCP)

USFWS/NATIONAL KEY DEER REFUGE

to determine the type, location, and amount of development that the community would prefer to see in the project area. The LCP and HCP will ultimately provide the basis of a Master Plan for future development and community facilities within the project area.*

* As of early 2003, the SDCP and Key deer HCP had not been finalized, and stakeholders had serious concerns about whether the final plans would have adequate habitat protections. Nevertheless, the processes are instructive for other state DOTs, because they included a regional conservation plan, extensive scientific studies and models, community involvement, and an important role for the state DOT.

Transportation planning that integrates existing conservation efforts will save money, protect resources and expedite project delivery.

CONCLUSION

Approximately 1,300 species are on the endangered species list and more than five times that number are considered vulnerable to extinction.[6] Many of these species are endangered because of the alarming rate at which wildlife habitat is being converted to suburban sprawl. Over the next few decades, decisions regarding further development will determine the fate of these species and America's biodiversity.

Since the enactment of the ESA in 1973, we have been able to stave off the extinction of the bald eagle and the whooping crane. We have preserved thousands of acres of designated critical habitat.[7] However, we have also witnessed the extinction of the dusky seaside sparrow[8] and hundreds more species have been added to the endangered list. In the past decade, at least 34 species of unique populations of plants and vertebrates have become extinct in the United States while awaiting federal protection.[9] Most important, we have learned that a species-by-species approach to conservation is costly, time-consuming and rarely successful.

Biodiversity conservation efforts will be more successful and less expensive if they protect adequate habitat before species become threatened or endangered. If this is done on a biologically comprehensive basis (all natural community types and all at-risk species), and in accord with emerging principles for the long-term viability of such systems, it is possible to avoid the future endangerment of thousands of species.[10] Designing and implementing such systems of habitat conservation would also provide opportunities for better addressing the habitat needs of currently listed species and would provide a common framework for recovery efforts on their behalf.

While maintaining a strong ESA is essential as a fail-safe mechanism, there are sensible ways to empower the states to play a greater leadership role in biodiversity conservation that, over time, could lessen the need for feder-

al regulation. Moreover, the traditional role of states with regard to wildlife and other public resources, and their role in land-use issues mean the states are essential players in habitat conservation efforts.

State and federal agencies spend considerable time and capital both protecting natural areas and building transportation infrastructure. While these sometimes conflict, they need not be antagonistic. Transportation planning that integrates existing conservation efforts will save money, protect resources and expedite project delivery.

Existing large-scale conservation plans should be used to guide long-term transportation planning. All levels of government — local, county, MPO, regional and state — can benefit from incorporating conservation planning into infrastructure planning.

RECOMMENDATIONS

- Transportation planners, at the state and MPO level, should locate and utilize existing landscape-level conservation plans in their own planning efforts.
- In those states that have yet to adopt a Comprehensive Wildlife Conservation Plan, individuals should contact the state fish and game agency and state environmental protection agency to offer support for such a plan. Using conservation plan mapping, transportation officials and MPOs can plan future road and highway projects that avoid sensitive and protected areas.
- Use conservation plans to identify mitigation sites or banks in advance of project impacts.
- Provide adequate training on the incorporation of conservation planning to field and administrative staff, as well as transportation planners.
- Sponsor pre- and post-planning monitoring to determine the effectiveness of planning initiatives.
- Inform and involve the public through communication and outreach tools.

CORBIS

RESOURCES

The Biodiversity Partnership http://www.biodiversitypartners.org/

National Wildlife Federation: Smart Growth and Wildlife http://www.nwf.org/smartgrowth/

Closing the Gaps report http://www.floridaconservation.org/oes/habitat_sec/Closing_Gaps.pdf

Florida Environmental Streamlining home page
http://fdotenvironmentalstreamlining.urs-tally.com/

Florida Geographic Data Library http://www.fgdl.org/

Sonoran Desert Conservation Plan http://www.co.pima.az.us/cmo/sdcp/

Pima County Environmentally Sensitive Roadway Guidelines:
http://www.dot.co.pima.az.us/docreview/envsens/

NatureServe on Biodiversity and Smart Growth
http://www.natureserve.org/conservation/smartGrowth.jsp

TNC Ecoregional Plans http://nature.org/aboutus/howwework

1. 1997 Natural Resources Inventory (updated 2000), Natural Resources Conservation Service, USDA, http://www.nrcs.usda.gov/technical/NRI/
2. Czech, B., P. R. Krausman, and P. K. Devers. 2000. Economic Associations among Causes of Species Endangerment in the United States. Bioscience 50(7): 593-601.
3. Land Trust Alliance. 2001. LandVote 2001: Americans Invest in Parks and Open Space, Washington DC.
4. IAFWA's President's Committee on CARA Implementation created a Working Group of State, Federal, and nongovernmental representatives to craft a guidance document that IAFWA encourages all States to consider as they implement the State Wildife Grant Program and create their required comprehensive wildlife conservation plans. The working group consisted of: State fish and wildlife agency staff from eight states (WA, GA, TX, NE, MT, WI, MO, VA, AZ), IAFWA staff, Federal agency staff from FWS, FS, and BLM, and NGO staff from 9 organizations (Defenders of Wildlife, TNC, NWF, ELI, NatureServe, WMI, Isaac Walton, Trout Unlimited, NRA). The final guidance document was produced in September 2002.
5. Piecing Together Wild Lands — The Sonoran Desert, National Geographic Magazine. Jennifer Fox. June, 2001
6. M.L. Shaffer, B. A. Stein, in Precious Heritage: The Status of Biodiversity in the United States, (Oxford University Press, New York, 2000)
7. As of January 31, 2002 critical habitat has been designated for 152 of the 1,256 U.S. species listed as threatened or endangered. Critical Habitat: What is it? USFWS, 2002. http://endangered.fws.gov/listing/critical_habitat.pdf
8. http://ecos.fws.gov/servlet/SpeciesProfile?&spcode=B00R
9. Species Extinctions: Causes and Consequences, World Resources Institute, http://www.wri.org/biodiv/extinct.html
10. M.L. Shaffer, B. A. Stein, in Precious Heritage: The Status of Biodiversity in the United States, B.A. Stein, L.S. Kutner, J.S.Adams, Eds. (Oxford University Press, New York, 2000), pp. 301-322

INTEGRATED PLANNING AND TEA-21

Under TEA-21, metropolitan and statewide transportation planning emphasizes the role of state and local officials in tailoring the planning process to meet local and state needs. Plans are fiscally restrained, with long-term planning horizons and provisions for public involvement. At both the metropolitan and state level, plans must consider the following seven objectives:

1. Support economic vitality, especially by enabling global competitiveness, productivity, and efficiency;
2. Increase the safety and security of the transportation system for motorized and nonmotorized users;
3. Increase the accessibility and mobility options available to people and for freight;
4. Protect and enhance the environment, promote energy conservation, and improve quality of life;
5. Enhance the integration and connectivity of the transportation system, across and between modes, for people and freight;
6. Promote efficient system management and operation; and
7. Emphasize the preservation of the existing transportation system.

OPPORTUNITIES FOR REAUTHORIZATION

- Add a planning objective for wildlife conservation that encourages transportation plans to identify and avoid impacts to natural areas in the earliest stages of planning.
- Provide support for state transportation agencies to acquire and utilize state and regional biodiversity plans.
- Incentivize the incorporation of conservation plans in transportation planning by rewarding states that improve project delivery and demonstrate ecological stewardship.
- Provide funding for scenario-planning technology to improve communities' ability to assess future transportation and land-development options and their impacts on natural areas.