

CONSERVATION OF LANDBIRD MIGRANTS: ADDRESSING LOCAL POLICY

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Abstract. Proactive conservation measures on behalf of neotropical migrants are gaining strength and legitimacy within government agencies and private conservation organizations throughout the Western Hemisphere. Most of these efforts focus on managing large tracts of public and private land or acquiring land for outright preservation. These strategies do little to confront threats facing the vast aggregate of relatively small, private land parcels. Taking conservation beyond the boundaries of public land requires the use of policy and management tools not conventionally tied to ecological issues. Northampton County, Virginia, located on the lower Delmarva Peninsula and home to large numbers of migrant landbirds every fall, provides an example of a local community testing the application of such tools to the global problem of migratory bird habitat protection. The county's Special Area Management Plan (SAMP), funded under the Coastal Zone Management Act, identifies protection of migratory bird habitat as an essential element in fostering a sustainable local economy and mitigating the secondary impacts of coastal development. The SAMP was designed to involve a diverse group of local, state, federal, and private partners and has included sponsoring a two-year research project on the local geographic and ecological distribution of fall migrants and recruiting public support through ecotourism initiatives. SAMP partners are currently applying the results of the migrant/habitat research to zoning ordinances and various memoranda of understanding that address local habitat protection. Based on the example of Northampton County, we suggest that local communities may be willing to apply land-use policy to stopover habitat protection if scientists provide them with information necessary for conservation planning.

Key Words: conservation, land use, landbird migrants, local policy.

The papers in this and other volumes (Hagan and Johnston 1992, Finch and Stangel 1993, Martin and Finch 1995) highlight the special challenges faced in understanding and conserving neotropical landbird migrants. Over the past decade, numerous state, national, and international migratory bird conservation programs have been established, many of which are coordinated through the National Fish and Wildlife Foundation's Partners-in-Flight initiative. These programs reflect current scientific knowledge and represent frontiers in conservation. Until recently, however, many of these programs have failed to fully incorporate issues related to stopover ecology and exploit possibilities for conservation initiatives at a local level (Greenberg and Lumpkin 1991, Johnson 1993, Mabey et al. 1993, Wigley and Sweeney 1993, Watts and Mabey 1994).

The challenge of conserving stopover habitat for landbird migrants differs from that of protecting breeding and wintering habitats in at least two critical ways: habitat heterogeneity and scale. Habitat heterogeneity poses an ecological and energetic dilemma for birds, whereas scale is a political and economic challenge for human conservation efforts. During the course of migration, an individual migrant moves through an extremely heterogeneous environment. The relative quality of habitats within that matrix will directly influence the bird's ability to complete migration (Simons et al. *this volume*, Parrish *this*

volume) and may indirectly affect its survival or breeding success. Although migration ecology is an expanding field (Crick and Jones 1992, Hagan and Johnston 1992, Moore et al. 1995; chapters in *this volume*), relationships between migrating birds and their environment remain inadequately understood.

The spatial scale of migration presents difficulties with respect to assigning responsibility for the protection of a population or species of landbird migrants; it would appear that federal responsibility is necessary. A well-coordinated policy might cover public land across the country, creating a continental safety-net. In fact, Partners-in-Flight has developed sound, science-based management objectives for public lands and created the coalition of governmental agencies necessary to attain those goals (Finch and Stangel 1993).

However, as Wigley and Sweeney (1993) have argued, a safety-net of public lands is insufficient to confront the two problems of habitat heterogeneity and scale. Within the United States, the Federal Government manages 649.8 million acres of land, nearly 29% of the country's land mass, over 56% (367.6 million acres) of which is maintained for forest and wildlife usage (US General Services Administration 1993). Federal lands are not, however, evenly distributed. They are highly concentrated in the western states and account for less than 5% of the area of the eastern states (Fig. 1). This is a

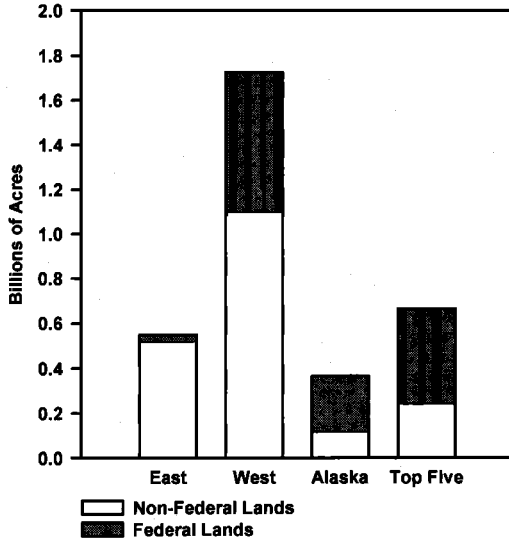


FIGURE 1. Distribution of federally managed lands within the United States. East includes all states east of the Mississippi River and West includes those to the west. Top Five includes the five states containing the largest acreage of federal lands (Alaska, Nevada, California, Arizona, and Utah) (US General Services Administration 1993).

potential problem as the majority of neotropical migrant species and individuals migrate east of the Rocky Mountains (Moore et al. 1995). Although a small percentage of the remaining land is held by state governments or private conservation organizations for the purpose of land protection, more than 90% of the land in the eastern United States remains in the hands of private landowners.

Unfortunately, it is within this expansive realm of private property that habitat degradation is most severe. Areas offering minimal stopover support to neotropical migrants are rapidly spreading across the continent with acute deterioration along the coasts. Few federal (e.g., the Endangered Species Act) or state laws regulate activities that affect natural resources on private property. The well-publicized controversy surrounding the Endangered Species Act (ESA) highlights some of the limitations to federal authority on private property (Dwyer et al. 1995, Bean and Wilcove 1997), particularly the tension between local and national public interests (Mangel et al. 1996, Press et al. 1996). However, since the law was amended in the early 1980s, effective applications of the ESA have begun to emphasize local, long-range planning involving both private landowners and surrounding communities through the use of Habitat Conservation Plans (HCPs). In most cases, landowners

now have the option of altering critical endangered species' habitat in a given area if it is possible to mitigate the effect of the development (Dwyer et al. 1995, Bingham and Noon 1997). Habitat conservation plans generally involve low-impact development designs that leave at least some critical habitat intact, or land trades requiring the purchase and protection of comparable habitat in another location. Although HCPs provide landowners greater flexibility in dealing with endangered species on private property, they are usually difficult to negotiate and offer only piecemeal protection of critical habitat (Bean and Wilcove 1997).

Despite the difficulties of protecting critical habitat for endangered and threatened species on private property through the federal regulation, the ESA and HCP process exists and can serve as a basis for discussion and compromise. There is no comparable regulatory protection process for migrant stopover habitat. Yet, decisions made by private landowners have a crucial impact on the future of neotropical landbird migrants and their habitats. In turn, such decisions are strongly influenced by the local economic, social, political, and regulatory climate. For this reason, local initiatives are imperative to the success of any comprehensive conservation plan for landbird migrants.

With this paper we call attention to the utility and strengths of applying local land-use policy and other locally-driven initiatives to the challenge of migrant stopover habitat protection. Although the unique aspect of local conditions limits the general relevance of a case study approach to understanding conservation through local land-use policy, there is value in examining the successes and difficulties of applying local land-use regulation to the protection of migrant stopover habitat in a real community. Local land-use regulations reflect immediate community standards and priorities. They represent small populations and, if approved, often have a better chance of success than federal or state level regulations. We present an overview of regulatory and voluntary methods frequently employed for the protection of natural resources on private property. A working example from Northampton County, Virginia, serves as an illustration of the value of community-based, community-focused initiatives for the conservation of neotropical landbird migrants.

PROTECTING HABITAT ON PRIVATE LAND

The problems involved in protecting resources for a dynamic, mobile, and somewhat unpredictable group like migrating landbirds run parallel to those encountered by the current

movement to protect entire ecosystems (Carroll and Hendrix 1992). Closing individual parcels of land to the public will not address all of the real and potential threats to the resource. Working within a broader context that includes human communities and individual private landowners has taken on a new importance (Soulé 1991, Endicott 1993, Press et al. 1997). There are a variety of approaches to protecting natural resources on private property. Most fall within one of two basic categories of action: voluntary or regulatory. Voluntary land protection tools can be divided into six main areas: (1) acquisition; (2) easements; (3) natural area dedication; (4) management agreements; (5) government or private economic incentives; and (6) independent actions related to use or design (i.e., creating a natural landscaping plan, initiating ecotourism ventures, or opting for no human use).

Although acquisition offers the highest level of protection and has been by far the most frequently used tool, there are two serious constraints to its practicality. First, money for purchase must be raised either through private donations or dedication of tax dollars. The dimensions of this obstacle are determined by land prices and the level of interest among the citizenry. Additionally, local resistance to land purchase for conservation can be strong because there is often confusion regarding how such action might affect the local tax base. In some situations properties strictly dedicated to resource preservation can be removed from the local tax base, even though this negative is usually counter-balanced by increases in surrounding property values. An example from Northampton County, Virginia, illustrates the financial limits of acquisition. On Virginia's Eastern Shore, the most recent public land acquisition is Kiptopeke State Park. The park encompasses three hundred and ninety-five acres that had been readied for private development and cost almost \$28,000/acre. While half of the area is designated a natural area, the other half is devoted to crop production and recreational use. The commonwealth paid \$11 million to protect a little more than 1% of Northampton County. For comparison, a 1992 bond initiative passed by Virginia voters allocated only \$11 million for natural area acquisition for the entire commonwealth.

The second main problem with conservation land acquisition is related to the issue of ownership. Even if the interest in the conservation goal is strong and money can be raised to purchase land, someone must also take responsibility for the maintenance and management costs of the property, which may include liability insurance, security patrols, access improvements, and property taxes. Occasionally, political bat-

tles erupt over land ownership because local communities resent the intrusion of "outsiders" or because of the difficulties in forging partnerships involving local, state, federal, and private entities.

In light of these budgetary and political restrictions on acquisition, conservation efforts increasingly focus on other voluntary land protection tools (Endicott 1993). Easements and natural area dedication are legally binding contracts that can offer protection in perpetuity. Easements involve the sale or donation of some or all of the development rights associated with a piece of land. The landowner and easement holder agree to general management guidelines and restrictions that are incorporated into the title of the land. The landowner is compensated either directly (purchased easement) or indirectly (tax benefits from donated easement) for accepting development constraints on the property. The easement holder, either governmental or non-governmental, accepts the responsibility for enforcing and defending the easement, especially when the property is transferred to a new owner. Natural area dedication is a variant of the easement process usually involving a governmental organization and donation, rather than sale, of all development rights. Management agreements, in contrast, are good faith agreements between the current landowner and a conservation organization. They do not remain with the deed of the property and compensation is limited to management advice and the personal rewards of doing a good deed. The implementation of such voluntary measures require that the individual landowner has a relatively strong understanding of the ecological value of the property and a willingness to sacrifice in some way for the preservation of that value. This is particularly true in the case of voluntary, ecologically-sensitive development design when the landowner is making decisions based solely on an assessment of personal benefit.

Despite the strength and frequent use of voluntary land protection tools, regulatory actions are often a necessary complement within a local conservation strategy. Local level natural resource regulation may be incorporated into an array of land-use ordinances (e.g., zoning, cluster development, transferable development rights) or tax incentive programs. A local community may recognize a conservation issue through confrontation with outside interests or it might surface as an area of concern during a community's planning process. Resource protection problems brought to the fore by outside interests are not necessarily doomed to failure but may take longer to resolve. Likewise, those issues identified from within are not necessarily

destined for successful resolution. However, conservation themes and specific problems incorporated into a community's comprehensive plan are certain to receive repeated attention until the plan's goals for protection are met. A comprehensive plan must be approved by voters and should represent the economic, social and aesthetic priorities of the local community. The comprehensive plan provides the fundamental justification for the creation of enforceable policy designed to protect resources. Development and implementation of resource conservation policies follow from the comprehensive plan. As with voluntary actions, the success of regulation relies heavily on two factors: the community's appreciation of and willingness to protect intact natural resources and its understanding of the economic implications of conservation.

In the United States, zoning is the most common form of directing different types of development to the most appropriate geographic areas within a community and controlling building density. Zoning is also used to formally express a community's common conservation and aesthetic values. Beyond zoning, local land-use ordinances can be designed to increase open space or protect special features of the landscape. Subdivision ordinances can promote cluster development by setting a low a maximum house lot size and maximum distance to nearest neighbors rather than a high minimum size and minimum distance while maintaining absolute housing density (number of houses per acre) allowed under the zoning law. This acts to group houses close together, leaving large areas of common open space.

Transferable development rights (TDRs) have a similar effect on a larger scale. In communities allowing TDRs, landowners may sell development rights for the maximum number and kind of building units permitted on their property. In doing so, the landowner erases these rights from the property title and they are added to the title of the buyer's property. Through TDRs, buyers can increase the maximum allowable building density on their properties but the overall community-wide density remains fixed. As with cluster-style development, use of TDRs may result in decreased demands on public services such as sewers and roads.

Unfortunately, the use of tax incentives for conservation of natural resources on private property is relatively rare at the local level. While some communities have special agricultural or silvicultural districts for the purpose of taxing land at current-use value, most local governments are uncertain of the economic and political repercussions of providing meaningful land tax breaks. As a result, the standard for

property tax values is generally set by locally-determined "highest and best use" of the land. In rural and suburban communities, the "highest and best use" often translates into the value of the property at maximum building density. This standard has a profound effect on natural resources because it means that undeveloped land is taxed out of the bounds of economic viability for the landowner, who may be forced to develop or sell the property.

Most communities choose their set of conservation tools largely on the basis of the source and strength of their motivation to preserve and protect natural resources. A community expecting direct economic benefit from resource protection (e.g., from ecotourism) may find implementation of incentive programs financially feasible and voluntary conservation actions relatively easy to initiate. Alternatively, an awareness of severe costs from inaction (e.g., consequences of noncompliance with federal or state regulations) may lead a local community to take proactive regulatory measures, especially if there is a choice between locally- or federally-controlled standards. This principle is well-illustrated by the case of the California Gnatcatcher (*Poliophtila californica*) habitat conservation planning process for San Diego and Orange counties, California. The California Gnatcatcher occupies coastal scrub habitat on some of the most expensive real estate in the United States and is listed as threatened under the Endangered Species Act. In this situation, either strict compliance or non-compliance with federal law would have translated into extreme costs for the local economy. Developers and local officials have had a strong inducement to face federal habitat protection regulations with a proactive compromise grounded in local priorities (Mann and Plummer 1995). The resulting Natural Community Conservation Plan combines voluntary and regulatory tools to protect coastal scrub habitat for the gnatcatcher and other rare plants and animals.

Occasionally, the local zoning ordinance process can work against habitat conservation. An example of a special feature ordinance inadvertently affecting stopover habitat recently occurred in Cameron Parish, Louisiana, where the Baton Rouge Audubon Society (BARS) manages the Henshaw Sanctuary. Henshaw protects coastal chenier habitat, and part of the BARS management plan for the property has been to allow for natural regeneration of native vegetation. Apparently in reaction to an unrelated conflict between sanctuary personnel and neighboring landowners, Cameron Parish decided to enforce a local weed control ordinance and, in the summer of 1996, ordered BARS to mow the

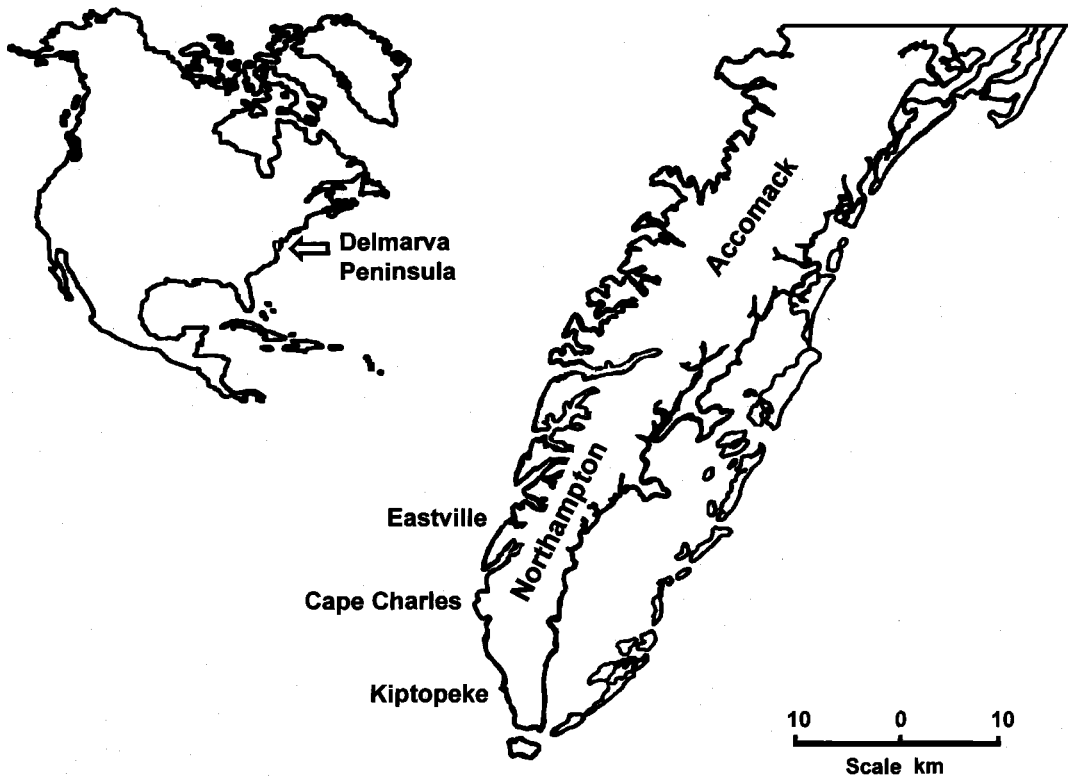


FIGURE 2. Location of Northampton County, Virginia.

sanctuary. BARS contested the order in court based on the vague language and arbitrary enforcement of the ordinance. BARS won their lawsuit in court and the sanctuary has been allowed a permanent exception to the ordinance (The Barred Owl 1996a,b). This case illustrates two important points: first, local land-use policy affects even those private landowners intent on habitat conservation; and second, land-use policy that is uninformed by science can be particularly dangerous to conservation efforts. The Cameron Parish ordinance made no distinction between good migrant stopover habitat and weeds. Such details are critical yet easily overlooked.

A WORKING EXAMPLE: NORTHAMPTON COUNTY, VIRGINIA

An on-going project from Northampton County, Virginia serves to illustrate the application of both regulatory and voluntary protection for migratory bird stopover habitat. Northampton County covers the southern 50 km of the Delmarva Peninsula, including the coastal barrier islands from the southernmost Fisherman's Island north to Hog Island (Fig. 2). Along the western coast, the landscape is dominated by

the tidal creeks, maritime forests, and dune grass and scrub communities of the Chesapeake Bay; to the east lies a vast coastal wilderness of marshes, lagoons, and undeveloped barrier islands. The mainland is covered by moderate-sized farm fields, many still separated by hedgerows, and fragmented forest. Forests are primarily mixed pine/deciduous, but bottomland deciduous forest and loblolly pine plantations are also common. Marsh/upland ecotones and wetland forests stretch along the seaside. The area has been designated a United Nations International Biosphere Reserve.

This thin strip of land and neighboring islands have long been celebrated for their great abundance of migrating shorebirds and wintering waterfowl. Through the late 1920s, sport and harvest hunting for local consumption and the millinery trade contributed substantially to the local economy. Migrating landbirds have received much less intense but more benevolent attention. Rusling (1936) was the first to scientifically document hawk migration on the lower Delmarva. Since the early 1970s a group of volunteers has maintained the Kiptopeke Hawkwatch, each fall counting many thousands of migrating raptors. The Virginia Society of Ornithology established

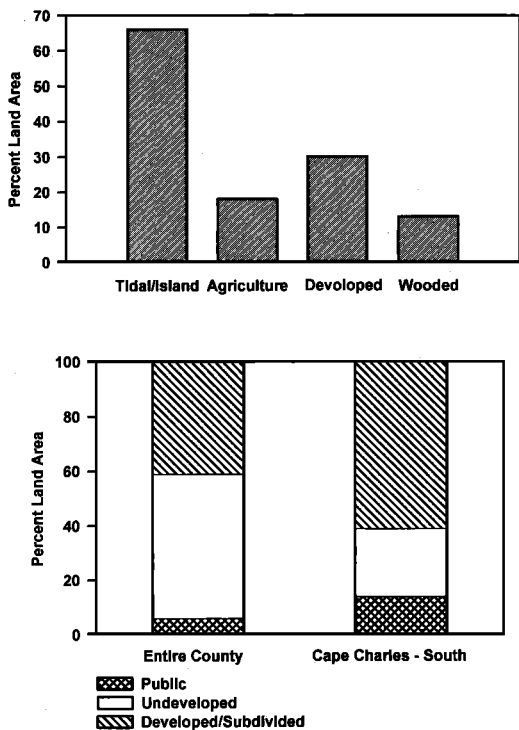


FIGURE 3. Land use patterns within Northampton County. A. Major land types and use in percent coverage, 1985. B. Ownership and use of bayside shoreline property for the entire county and the southern portion below Cape Charles, 1993 (Northampton County Department of Planning and Zoning, unpubl. data).

an "Operation Recovery" banding station at Kiptopeke in the early 1960s and continues to band thousands of south-bound migrants every year. Recent studies and reports further document the importance of this area for migrating landbirds (Armistead 1993, McCann et al. 1993, Mabey et al. 1993, Watts and Mabey 1994).

From the human perspective, Northampton County is a rural and economically depressed community of 13,000 residents. Northampton ranks 135th in poverty measures out of Virginia's 136 localities (Virginia 1990 Census Data). The largest town in the county, Cape Charles, has a population of under 1,500. Land-use patterns in the county have changed little in this century because much of the existing forest land is unsuitable for crop production. Farming is the dominant land-use, followed by silviculture, with relatively small areas developed for residential, commercial, or industrial use (Fig. 3a). Rapid change, however, is on the horizon. In the past eight years (particularly prior to the passage and implementation of the Chesapeake Bay

Preservation Act), there has been a rush to subdivide waterfront property, especially on the bayside (Fig. 3b). A real estate recession has slowed real development, however, and as of 1995, nearly 4,500 platted lots stood empty (Northampton County Department of Planning and Zoning data).

Northampton County has received substantial conservation attention, and local, state, federal, and private entities have collectively employed most voluntary methods of land protection available. The barrier islands constitute the most sensitive portion of the ecosystem and are protected largely through ownership by The Nature Conservancy, the US Fish and Wildlife Service, the Virginia Department of Game and Inland Fisheries, and the Virginia Department of Conservation and Recreation. The Nature Conservancy's Virginia Coast Reserve owns and manages the majority of the barrier islands as the core area of their flagship bioserve. On the mainland, land is protected by a US Fish and Wildlife Service National Wildlife Refuge, a state park and state natural area preserves, and wildlife management areas. Conservation easement activity is concentrated along the seaside of the mainland but can be found throughout the county. Regulatory measures are now being considered to fill in the gaps, especially along the bayside where the migrants concentrate, development pressure is high, and important areas are already heavily subdivided (Northampton County Department of Planning and Zoning 1989, Mabey et al. 1993, Watts and Mabey 1994).

Despite daunting socio-economic conditions and an already high degree of conservation activity, this community adopted a progressive comprehensive plan in 1990 that clearly states that the County must conserve its natural resources and specifically mentions migratory birds (Northampton County Joint Planning Commission 1990). Through its comprehensive plan and subsequent planning initiatives, Northampton County has demonstrated a commitment to taking a different direction from most of the rest of the Eastern Seaboard.

Northampton's primary motivation for accepting the challenge of stopover habitat protection is based on economic interests in the rapidly growing nature-based tourism industry (Citizens for a Better Eastern Shore Newsletter 1991). Birdwatching enthusiasts represent 14% of the American public and spend billions of dollars annually on birding excursions, equipment, memberships, and other related paraphernalia (Wiedner and Kerlinger 1990). Kerlinger and Wiedner's (1991) study of the economics of birdwatching indicates that birdwatchers spend over \$5 million a year in Cape May, New Jersey.

Current estimates for Cape May's annual avitourism earnings are greater than \$20 million (P. Kerlinger, pers. comm.). If Northampton County could build the eco-tourism industry to a similar level, it would place among the top five contributors to the local economy.

A regional study of migratory bird distribution along the coasts of the Cape May and Delmarva peninsulas demonstrated that the numbers of fall migrants in Northampton County were higher than those of Cape May (McCann et al. 1993). In light of the economic benefits bird-watchers bring to Cape May, this comparison drew the County's interest, and officials and citizens became receptive to the idea of sustainably capitalizing on migratory birds (Citizens for a Better Eastern Shore Newsletter 1991). In 1992 the opportunity to do so arrived in the form of a Virginia Coastal Resources Management Program grant funded by the National Oceanic and Atmospheric Administration (NOAA). This Special Area Management Plan (SAMP) grant has provided over \$1 million during a four year period to develop "new and enforceable policies to protect and enhance coastal resources" (emphasis added). Congressional authorization for the SAMP funding program (Coastal Zone Act §309A) explicitly states that SAMP strategies should promote intergovernmental cooperation and control impacts of coastal growth. As a Department of Commerce agency, NOAA is also charged with encouraging sustainable development where appropriate. These objectives of the SAMP program correspond closely with several key goals outlined in the Northampton County Comprehensive Plan, including the preservation of migratory bird habitat (Northampton County Joint Planning Commission 1990).

County, state, federal and non-governmental partners quickly joined together to create and support the SAMP strategy. Wildlife habitat, on the land and in the water, was identified as a valuable and threatened coastal resource and selected for protection and enhancement under the SAMP. Specifically, migratory birds, fin fish, and shellfish became the central themes for conservation and sustainable economic development in the county.

Although this discussion is concerned with landbird stopover habitat conservation, management plans become stronger and generate wider support if policies address more than a single issue. In the case of the Northampton SAMP, the distribution and health of coastal vegetation unites both water quality and stopover opportunities for landbird migrants, as well as rare plants and natural communities. These diverse yet related elements allow for a broader justification for preserving coastal vegetation (North-

ampton County Board of Supervisors and The Sustainable Development Task Force 1994).

The SAMP strategy set forth four main policy objectives for habitat protection. The first is to control the cumulative and secondary impacts of coastal growth and development by maintaining maximum vegetative cover on land throughout the county. The second is to steer development away from sensitive habitat and groundwater recharge areas. The third objective is to protect water quality, particularly in important fin- and shellfish nursery grounds and aquaculture grow-out areas. The fourth is to increase public access in appropriate times and places and promote nature tourism. This last objective recognizes that natural resources must be used and enjoyed to be valued, and seeks to insure that the pressure to do so is given a positive, non-damaging outlet. The goal for each objective is to take proactive steps rather than react after conflicts and problems have evolved. In developing and implementing the SAMP, Northampton County seeks to stimulate the local economy and protect sensitive resources at the same time. The task of creating these policies began with two very basic questions—one scientific, the other political. The questions are simply: (1) What *should* be protected? and (2) What *can* be protected?

Groundwork for the answer to the first question was laid in 1991 with a regional study of fall migrant landbird distribution on the Cape May and Delmarva peninsulas. Surveys conducted in New Jersey, Delaware, Maryland, and Virginia established that migrants concentrate within 1.5 km of the coast and that coastal areas on the Delaware and Chesapeake Bays support higher numbers of migrants than those on the Atlantic side of both peninsulas (McCann et al. 1993).

To determine in greater detail what should be protected within Northampton County, the Virginia Department of Conservation and Recreation's Division of Natural Heritage and the Virginia Department of Game and Inland Fisheries' Nongame and Endangered Wildlife Program began a cooperative research project in the fall of 1992. The focus of the study was to define the distribution of migrants in terms of geographic, landscape, and habitat factors. As the investigators for this project, we established a nested design that allowed data collection at several levels simultaneously: the geographic level, the landscape level, and two dimensions within forest patches (distance from edge and vegetational strata). For details of this study see Watts and Mabey (1994). Data were collected during the fall migration periods in 1992 and 1993. Based on nearly 15,000 point counts conducted at almost 200 points throughout the county, Watts

and Mabey (1994) estimate that between 6–7 million forest/scrub-dependent migrants pass through Northampton County every year. Further significant results were found at two levels (geographic and habitat) directly relevant to policy development. As a group, long-distance migrants are concentrated within the southernmost 10 km of the peninsula and are more abundant within the bayside coastal forest than seaside coastal forest. Short-distance migrants display a somewhat more even geographic distribution whereas residents are least abundant within 10 km of the peninsula tip. At the habitat level, Watts and Mabey (1994) found that forest patch size had no effect on the distribution of birds within this landscape. Within forests, however, many species of migrants exhibited strong associations with high density understory and sub-canopy vegetation.

Based on these results, the SAMP partners developed a conservation ideal for stopover habitat on the lower Delmarva. This ideal includes three parts: (1) a “no-new-development” overlay zone to cover the lower 10 km of the peninsula and extending up the peninsula within 1 km of the bay coast; (2) maintenance of vegetation throughout the rest of the county at 60–70% of its current coverage, allowing timbering if the forest regeneration that follows is natural; and (3) creation of an incentive program for habitat restoration that would encourage landowners to reforest and plant native shrubs in “dead space.” The ideal would serve as a guidepost for protecting the local habitat elements associated with high densities of migrating birds and could be further improved in light of any new research findings.

While our research began to answer to the question of what *should* be protected, the County faced the simultaneous political question of what *could* be protected. From the beginning, the SAMP partners were aware that to achieve even a fraction of the conservation ideal, community support must be cultivated; the citizens would have to care about migrants. The first task in this arena was to create a vehicle for generating that support and producing tangible economic benefits based on birds. The idea for a birding festival was developed under the SAMP as a positive demonstration of natural resource-compatible economic activity. The initiative for the birding festival originally came from the Virginia Coastal Resources Management Program, but the drive and action came from the community. On the weekend of October 9–10, 1993, nearly 1,000 people attended the First Annual Eastern Shore Birding Festival (ESBF) and spent over \$36,000 in Northampton County, contributing an estimated \$52,300 to local econ-

omy (Chazal 1993). Approximately 30% of the attendees were local citizens from Northampton or Accomack County, thus indicating that locals were interested in learning about migratory birds. The festival was linked to Birdlife International's first World BirdWatch, underscoring the international significance of Northampton County's natural habitats. The success of the ESBF is best illustrated by its continued existence and support within the County.

Many other means have been employed for generating community support for migratory birds. SAMP partners have used the local media as a platform for explaining the problems facing neotropical migrants, the migrant-habitat research project, and the concepts of sustainable development. Acting on the premise that every birdwatcher can be an emissary for migrant conservation, SAMP partners have taken the time to talk to anyone who would listen about migratory birds and why they are important, giving formal and informal presentations to local school children, birding clubs, and service clubs, among others. Birdwatchers were asked to do the same and encouraged to display their binoculars wherever they spent money. Perhaps most importantly, the researchers and coastal zone program personnel have been an active and nearly constant presence in the county offices. This has had the threefold benefit of reinforcing the partnerships, ensuring the County that they have dedicated state-level support, and providing the birds a place in policy decisions.

Three major road-blocks have stood between the conservation ideal and implementation. First, politics and science operate on different schedules. This means, in effect, that political decisions are often made without full scientific support. The original SAMP strategy indicated that the County would pursue changes in the zoning code to protect migratory bird habitat. Coincidentally, the zoning commission began revising the zoning code in late 1992. The SAMP interests were introduced into this process somewhat prematurely. Standards for habitat protection were based on the results of one year of research and only a preliminary analysis of the two years' combined data. However, we assumed that revisions later on would be easier than starting the whole process over after the research was complete. For us, it was an uncomfortable but necessary compromise in favor of the political time line.

The second block was that existing conditions imposed strict limitations on the proposed conservation ideal. The suggested “no-new-development” overlay zone was an impossibility. The bayside and lower peninsula are facing the greatest development threats and many large wa-

terfront lots are already sub-divided. Although the houses are yet to be built, prohibiting development in this area could open the door to property rights/takings lawsuits. Tax relief or other incentive programs that theoretically and intuitively would enhance private landowner involvement are currently beyond the capacity of the county budget. Additionally, Virginia state law prevents local regulations from being stricter than state regulations and many creative land-use tools used in other states, including TDRs, are not allowed under state law.

The last barrier to implementing the suggested protection measures involved trade-offs between enforceability and complexity. The more complex policies, regulations, or standards become, the more time and money that are required for enforcement. For example, overlay zones specifying prioritized levels of habitat value and corresponding levels of protection may have been the legally safest option for Northampton County. However, implementing such policy would entail tracking different standards for different areas. This in turn would demand valuable staff time. To the county's credit, they have recognized the limits of the personnel resources available for enforcement and have rejected meaningless paper policy that could never have been properly implemented.

Discussions between planners, biologists, administrators, and citizens involved in the SAMP have been directed toward necessary compromise. At this time, the proposed zoning code for Northampton County includes cluster development zones that apply to new subdivisions only. The purpose of this regulation is to control sprawl, direct development to existing villages and towns, and preserve existing land-use (i.e., agriculture and wooded habitats). The proposed code also contains a new design standard section that applies to existing and new subdivisions, individual lot owners, and new commercial developments. This section limits the percent and location of forest or shrub cover that can be removed from each lot; specifies standards for replacing vegetation if it must be removed beyond set limits; includes a list of native trees and shrubs, highlighting those that are particularly beneficial to wildlife/migratory birds; and prevents landowners from timbering wooded lots to avoid these standards. There is a small but secure victory for stopover habitat in a Memorandum of Understanding (MOU) with the regional power company to manage power line rights-of-way for the maintenance of dense and low native vegetation. As a voluntary conservation approach, the SAMP sponsored the preparation of a landowners' guide to migratory bird habitat management that is distributed through the

county planning office. The guide is designed to educate landowners about migrant ecology and habitat needs, as well as to provide a summary of results from the local migrant-habitat research project (Watts and Mabey 1994). It emphasizes the need to preserve dense understory vegetation by minimizing removal of existing vegetation and replacing trees and shrubs to maintain an average vegetation density. Vegetation density, removal and replacement standards recommended in the guide are specific and reflect natural densities in forest patches heavily used by migrants (20 canopy trees, 30 understory trees, and 30 shrubs per acre after development).

The final resolution remains open. The process of developing and implementing local policies is often slow. In this case, local elections changed the composition of the Board of Supervisors and a new set of officials had to be introduced to the history and rationale of the entire SAMP process. The new land-use policies contained within the zoning code have been presented in public hearings and await action from the Board of Supervisors. It remains to be seen if the Northampton community will act on their knowledge of the international significance of the county's stopover habitat and their aesthetic and economic appreciation of migratory birds. However, the success of the Northampton County SAMP project extends beyond the policy itself; it has helped shape the community's evolving attitude toward migratory bird conservation and other natural resources. The act of conducting research and sharing the results with local citizens has gone a long way toward expanding the local possibilities for conservation of migrant habitat. Ultimately, the citizens of Northampton County will have the opportunity to decide the fortune of thousands of acres migratory bird stopover habitat. If conservation is their choice rather than an external imposition, it will have a greater chance of surviving the inevitable land-use conflicts facing rural communities in need of economic development.

CONCLUSION

The critical interplay of unique details prohibits the experience of Northampton County from functioning as a replicable model. Nonetheless, the story illustrates several important points. Science can inform policy decisions and conservation planning efforts and provide legal insurance to local governments wary of property rights lawsuits and land-use conflicts. Scientists can educate a community and provide necessary information for reasoned decisions. Indeed, for conservation efforts to work in a comprehensive fashion, it is critical that scientists work toward

breaking down the barriers of language and approach that often separates us from planning and policy professionals.

It is unreasonable to expect most local communities to voluntarily consider habitat essential for migrants or other wildlife in their landuse planning. However, from our experience in Northampton County, we suggest this is a matter of lack of information rather than interest. By sharing our knowledge and concerns with the public, policy makers, and planners, we can contribute locally to the goal of migratory bird conservation. The reward for this effort will be the protection of stopover habitat beyond the reach of state and federal regulation, ranging from a few acres of voluntarily conserved habitat to thousands of acres protected within a well-planned community.

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