

A Context for Bird Conservation in México: Challenges and Opportunities¹

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Introduction

With over 1,060 species of birds, México is among the most important countries for the conservation of birds in the world. Within the American continent it harbors the highest wintering diversity and abundance of Nearctic-Neotropical migratory land birds that breed in Canada and the U.S., as well as an exceptionally high number of endemic species (Hutto 1986 1992; Escalante et al. 1993, Howell and Webb 1995, Stotz et al. 1996, Hernandez-Banos et al. 1995). México suffers a rapid rate of environmental degradation that consists of problems such as of the loss of forests and wetlands, desertification and soil erosion, invasive species in islands and freshwater systems, overharvesting of wildlife by hunting or capturing animals for the pet trade, and environmental pollution (Simeon 1995, Challenger 1998). These problems contribute to the endangerment of bird populations. About 180 species are considered endangered, threatened or fragile, and some 20 additional species or endemic subspecies are considered extinct or extirpated from the country (Arizmendi and Valdermar 2000, Cevallos and Marquez 2000, DGVS 2003).

Avian conservation in México, as elsewhere, is much more than just researching the ecology of bird species and monitoring bird populations. It involves social and political processes at local, national, and international scales that influence people's behavior. Effective resource management (harvesting, preserving, and restoring) occurs at the interphase between ecosystems and social systems, and understanding one type of system is as relevant as understanding the other (Gallopín 1994, 1997). Changing people's behavior is the name of the game in conservation; from that of the politician who drafts environmental laws and sets aside protected areas, to those of the local peasant or housewife who manages an agricultural plot or the consumption of household non-recyclables. People's behavior changes when a concept either touches them in an ethical-emotional way, or they see a personal or collective benefit from their change in behavior, or they are

coerced into behaving differently by social or legal pressure. All three methods must be promoted to achieve conservation, and their application falls in the realm of the social sciences, which need to be understood by ornithologists who are concerned with conservation.

There have been various analyses of the problems and solutions of bird conservation in México. México's largest ornithological organization, CIPAMEX ("Consejo Internacional para la Conservación de las Aves") held a workshop in 1998 to identify and propose solutions to the most urgent problems relating to bird conservation (CIPAMEX 2003). The main problems identified in the workshop were these:

1. Lack of general information about the Mexican avifauna
2. Lack of information about population abundance, trends, and distribution
3. Lack of information about species conservation status
4. Lack of information about the status of bird habitats
5. Lack of local and regional field research
6. Lack of communication among ornithologists
7. Lack of regional opportunities for ornithological work;
8. Lack of communication of research results
9. Lack of funding
10. Lack of trained researchers, managers, and educators in bird conservation
11. Lack of information on the use and management of wild birds in protected areas
12. Lack of organization and planning for bird conservation at the national level

Some of the problems in the list are strategically important to achieve conservation objectives (e.g., lack of information about bird populations), whereas others seem to be more related to the dynamics and condition of the Mexican academic ornithological community (e.g., lack of communication among ornithologists). Key issues such as those pertaining to the socio-economic and institutional structures and mechanisms for

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land resource management, although recognized, were not discussed in detail.

One of the most dynamic bird conservation processes in the country revolves around the North American Bird Conservation Initiative (NABCI 2003). NABCI is a result of the environmental programs promoted by the trilateral Commission for Environmental Cooperation (CEC; Berlanga 2001a). The CEC was created as a side agreement of the North America Free Trade Agreement (NAFTA), and despite NAFTA's negative effects on various sectors of Mexican development (Arroyo Picard 2003, Nader 1993, RMALC 2003), positive outcomes have come out of the CEC program. In the process of designing a continent-wide bird conservation strategy, Mexican ornithologists and government administrators began to evaluate and systematize the existing bird conservation programs and the knowledge of birds in the country. This same process also occurred within the U.S. and Canada. Thus, NABCI has not only served to coordinate bird conservation programs among the three countries, but it also has served to catalyze new bird conservation initiatives *within* each individual country and formalize short, medium, and long-term national bird conservation strategies.

México's NABCI coordinating committee developed a preliminary national bird conservation strategy building on CIPAMEX's and other national conservation diagnoses (Berlanga 2001b). This preliminary document describes nine strategic lines of action:

1. Develop demonstration sites for bird conservation
2. Promote field research and the generation of knowledge for priority conservation actions
3. Contribute to the consolidation of México's Natural Protected Areas System
4. Promote communication, environmental education and dissemination of bird conservation information among professionals and among the general public
5. Promote training and educational opportunities
6. Promote bird conservation actions
7. Develop financing schemes for bird conservation
8. Strengthen and improve environmental legislation
9. Promote institutional strengthening activities

This essay attempts to contribute to understanding some of the limitations for implementing effective bird conservation programs in México and suggests possible strategies and actions. This non-exhaustive analysis is based mostly on the day-to-day experiences encountered while creating and consolidating the Sierra de Manantlán

Biosphere Reserve, a complex project that integrates research, conservation, education, and local development. It is complemented with analyses conducted with colleagues from the ornithological and natural resource management sectors (Santana C. et al. 1987, 1996, 2002a; Jardel P. 1992, 1995; Graf et al. 1995, 2001; Jardel P. et al. 1996, in press a; Santana C. 2000).

Lack of Understanding Complex Ecosystems

México harbors extraordinarily complex and species-rich ecosystems that are the product of ecological, biogeographical, and historical natural and human-induced processes (Challenger 1998). We have inadequate knowledge of how to model and manage complex systems in general, and this limitation is compounded when, as in the case of México, there is a paucity of information on the basic aspects of the functioning of the system as a whole, the species present in system, and their population dynamics. The lack of knowledge of the population status and trends of most bird species, as well as of their basic natural history and ecological needs for survival, do not allow us to evaluate the impact of environmental disturbances on bird populations, provide adequate management recommendations, and prioritize among species to address their conservation needs (Villaseñor G. and Santana C. 2002). In some cases valuable information is presently being generated on long-distance migratory birds through bilateral and trilateral projects with financial input from the U.S. and Canada. However, many non-migratory endemic species seem to be more vulnerable to habitat alterations, and the absence of information on these native species is greater than for migratory species (Stotz et al. 1996, Rappole 1995). Thus, a priority area in the ornithological research agenda of México should be the description of the status, trend and natural dynamics of non-migratory as well as migratory bird populations, monitoring the demographic responses of birds to habitat modifications, and characterizing their most important survival requirements.

In addition to academic research institutions, two government institutions have played and are playing, an important role in the generation of knowledge for the conservation and management of biological diversity: the Comisión Nacional para el Conocimiento y Uso de la Biodiversidad (National Commission for the Knowledge and Use of Biodiversity, CONABIO 2003) and the Instituto Nacional de Ecología (National Institute of Ecology, INE 2003). They are young (not much more than a decade old) and their work contributes to the development of various knowledge areas such as the functioning of ecosystems, biological inventories, environmental risk assessment, endangered species recovery plans, trends in ecological restoration and degradation processes, effects

of global climate change, and identification of priority conservation areas and ecoregions, among others.

These two organizations should be strengthened so that they may have greater national impact. However, they also need to have a more focused approach on how to link their work to on-the-ground land resource and ecosystem management. The National Commission of Natural Protected Areas (CONANP 2003) is responsible for managing protected areas in the country and has initiated monitoring programs that should be generating valuable information on bird and other wildlife populations. Although research is not part of its management objectives, it is clear that for the CONANP to evaluate whether it is achieving its conservation mandate it must generate information on the status of natural resources in protected areas over time.

The Dirección General de Vida Silvestre (General Directorship of Wildlife, DGVS 2003) is an older agency directly responsible for wildlife management. This agency should be playing a national leadership role in bird conservation. Unfortunately, it has not lived up to expectations, having a “business as usual” approach toward wildlife conservation. This has limited its effectiveness and estranged it from more dynamic agencies and social stakeholders. The DGVS, being responsible for granting harvesting and import/export permits, has suffered from economic and political pressures that have limited its abilities to adequately perform its duties. Recently there has been an administrative turnover, and positive changes are expected. Support and reengineering of this agency to provide more dynamism to its programs are needed.

Lack of Trained Professionals to Meet the Conservation Challenge

The generation of knowledge described above requires a cadre of qualified vertebrate biologists and ecologists that can tackle the large diversity of bird species found in Mexican ecosystems. Despite the recent increase of trained ornithologists in the country, present numbers are insufficient to cope with the information demand. This can be exemplified by comparing an indicator of the number of ornithologists available to study birds in México with those in the U.S. The largest ornithological society in the U.S. is the American Ornithologist’s Union (AOU 2003), which has some 3,500 resident members. Considering that the U.S. harbors about 800 species of birds, there are at least 4.4 ornithologists per bird species in that country. In México, CIPAMEX (2003), with 350 members, is by far the largest ornithological organization. México thus has a ratio of about 0.3 ornithologists per bird species. The difference between the two countries is even more dramatic when considering that the AOU has existed for over

120 years and CIPAMEX has operated for only 15 years as an active national organization.

From a conservation perspective, even more dramatic than the lack of researchers is the lack of trained managers/administrators of natural resources. México harbors some of the best ecological and biological university-based educational programs in Latin America. However, the lack of job opportunities in resource management and the type of academic professional advancement incentives that stimulate basic, specialized and rapidly publishable research over management-oriented research are some of the reasons for the paucity of natural resource management educational and training opportunities in the country’s universities. Managers are a crucial link between researchers and the other social and political actors that define a nation’s conservation agenda. Thus, educational programs are not only insufficient, but they also are not producing the type of professionals needed to meet the conservation needs of the country (Graf M. et al. 2001, in press; Jardel P. et al. in press a; Santana C. 1995).

There is a general need to strengthen and devote a greater share of México’s gross national product towards advanced education and research. Additionally, international financial support for natural resource educational programs can have a multiplier effect throughout the country. Due to México’s great ecological complexity, natural resource management/research programs should specialize in different ecosystems (e.g., lowland tropical rainforest, montane mixed coniferous forests, arid vegetation, etc.) and should integrate basic ecology with applied management, framed by an “adaptive management” approach. The focus should be directed toward “research for conservation and not conservation for research” (Santana C. and Jardel P. 1994). Achieving interdisciplinary integration in natural resources and linking basic science to its immediate application is a challenge in both developed and developing societies (sometimes more so in rich, developed societies). This can best be achieved through the participation of researchers, managers, and resource-owning stakeholders in the design and implementation of research/training agendas around a commonly defined problem in a specific ecosystem (Jardel P. et al. in press a). This is not something that should be left to individual researchers to decide; there must be formal institutional mechanisms in place to promote these types of interactions and insure that they occur. Support for new and established natural resource management educational programs is urgently needed in universities throughout the country (Santana C. 1995).

Lack of Employment Opportunities and Adequate Institutional Arrangements for Natural Resource Management at Local Levels

Analyzing the dynamics of some early NABCI meetings helps illustrate the differences in natural resource institutional arrangements between Canada, the U.S., and México. During various NABCI meetings the U.S. delegation usually took much longer to agree among themselves on policies and proposals than was the case for the Canadian or Mexican delegations. I don't believe this has to do with any cultural disabilities among our U.S. colleagues to achieve consensus, but was rather a result of the much greater number of participating stakeholders (NGOs, foundations, professional organizations, academic organizations, state agencies and federal agencies) from the U.S. whose opinions and interests needed to be heard and taken into account. With many fewer stakeholders, the Canadian delegation, and to a much greater extent the Mexican delegation, had briefer internal negotiations and could achieve consensus much faster. Differences among the countries were also reflected during NABCI discussions of ways to initiate bird conservation programs across North America. The U.S. proposed a continent-wide evaluation of the status and trends of all bird species in order to select the most threatened ones for "priority" action. México proposed a different scheme based on selecting species-rich ecosystems in pre-existing natural protected areas and Important Bird Areas (known as IBAs or AICAs for their Spanish acronym, Arizmendi and Valdemar 2000) to start conservation programs. The reasons for the different strategies became clear as the three countries deliberated on the best course of action.

The U.S. and Canada have various institutional tiers in their national natural resource management bureaucracy. At the top is the federal level, which covers the whole country and manages very large extensions of federal lands in national forests, wildlife refuges, parks, grazing lands, territories, and military bases. The second management tier administers resources at the state or provincial levels. Provinces and states can control large expanses of territory and directly regulate and manage natural resource harvesting and conservation programs. In many cases provincial/state conservation initiatives are much more important and have much greater impact on natural resources than do federal initiatives. Additionally, some private companies and NGOs control large expanses of land. There are numerous universities, NGOs, and environmental firms that hire large numbers of professionals in the field of natural resources. Thus, most management-oriented job opportunities occur not only at the federal level but also at state and provincial agencies or departments and are complemented by the academic and private

sectors. Many discussions within the Canadian and U.S. delegations involved resolving differences in perceptions on the regulatory and implementation roles of the federal vis-a-vis the state/provincial levels of the resource management bureaucracy in those countries. The Mexican delegation had no such problems reaching internal agreements; state representatives have never actively participated at NABCI meetings. In fact, there are no state government representatives in the Mexican NABCI coordinating committee.

The Mexican constitution stipulates that natural resources, including birds, are the property of the nation. The federal government has the responsibility of managing these natural resources, and this responsibility has historically been centralized at that level. At the state level natural resource management programs are either very small or non-existent. Additionally, state governments do not own much land and, thus, have little direct land stewardship responsibilities. States do not manage wildlife resources, evaluate population levels, nor establish harvest quotas for hunting or capturing cage birds. These are all federal responsibilities. There are however, mechanisms (albeit at very early stages of implementation) in which these responsibilities can be delegated to the state governments as part of a nationwide drive towards decentralization and democratization. States are increasingly involved in managing local protected areas. The municipal level of government also can have an important role in promoting nature conservation. However, this has generally been ignored in governmental and NGO conservation initiatives. Since the municipality is the government level closest to its citizens and the one that must respond more immediately to their demands, new and innovative municipal conservation strategies (linked mostly to water/watershed management and solid waste recycling programs) are now being explored and developed as part of the national decentralization process (García R. and Santana C. 2003, Martinez et al. 2002).

These differences in institutional arrangements and financial and human resources among the three countries explain the contrasting approaches toward bird conservation. For example, when a priority species for conservation in the U.S. or Canada is selected, it should be relatively easy to identify 5 to 20 researchers who have already studied the species, one to five NGO's that are concerned with its protection, and various provincial/state and federal government agencies that have the legal responsibility to assure its survival within dozens of parks, forests, and refuges in which they have on-site management operations. If you had a map of the U.S. where bulbs light up at sites where there was information, projects, or personnel that could attend to the selected bird species, you would get bulbs lighting up all over the map within the species range. That means that you may start working almost immediately for its conservation. However, in

México, the map would remain almost totally dark, and only a few bulbs would light up for only a few species. Large expanses of México are devoid of conservation/management/research initiatives as a result of the lack of state-level programs, the paucity of ornithological research in academic institutions, the low number of conservation NGOs in the country and the low funding priority for conservation.

Unlike the U.S. or Canada, México cannot tailor a management/conservation program for each species, especially in regions where there are neither institutions nor personnel to implement them. Scarce resources cannot be diluted over the landscape, but should be directed towards strengthening those sites with many bird species and existing conservation programs and towards creating new areas that can be adequately attended to. That is why programs that deal with the recovery of endangered species (“Programas de Recuperación de Especies Amenazadas” PREPS) are few in México (INE 2003). It is expensive to manage a single species, and the government has promoted species-specific conservation plans for only a few species or groups of species like the Golden Eagle, the Psittacines, and the California Condor. Thus, México’s strategy has been directed toward developing bird conservation programs with a habitat or ecosystem perspective. It has centered on natural protected areas or AICAs where an institutional and sociopolitical commitment already exists and where human and financial resources that provide assurances of success are in place.

This is a logical and strategically important approach, considering that México’s present National Protected Areas System (“Sistema Nacional de Areas Naturales Protegidas” SINAP) is only 8 years old and the federal National Commission of Natural Protected Areas (CONANP) which administers it was created only 3 years ago. The SINAP (CONANP 2003) has been the most effective conservation program in México’s history. Previously, only a handful of protected areas in the country had any type of on-site management administration, and the national park “system” was used internationally as a prime example of a dysfunctional conservation program. Presently over 60 natural protected areas count with on-site administration and personnel (CONANP 2003). In some regions the CONANP works jointly with other programs like the Temporary Employment Program (“Programa de Empleo Temporal” PET) and the Regional Sustainable Development Program (“Programa de Desarrollo Regional Sustentable” PRODERS) to implement agriculture, forestry and conservation projects that, in addition to the benefits created by the projects themselves, also provide employment opportunities to rural communities within and adjacent to protected areas as part of an integrated regional conservation and poverty

alleviation strategy. However, the CONANP can still be further improved, as it is understaffed, poorly financed, and its protected areas are implemented with a weak legal and institutional framework.

In general, the present scheme of centralization at the federal level, although more decentralized than in the past, is very ineffective, and this is recognized by México’s conservationist community. Many resource management responsibilities are and should continue to be directed at the federal level, because this level is (somewhat) immune to the arbitrary effects of local political special interests. The federal government can assure that the benefits and values of protected areas to society at large are recognized and protected. This is more difficult to achieve at the state and municipal levels of government. However, to meet the magnitude of the conservation challenge the Mexican government should increase the financial and institutional commitment towards constructing not only national, but also state- and municipal-level natural resource management arrangements, and establish new protected areas that can achieve, through clearly established institutional mechanisms, their conservation goals. Each state should have its own specific legislation on protected areas and its own state systems of protected areas. México’s recent Program of Areas for Sustainable Management of Wildlife (“Programa de Áreas de Manejo Sustentable de Vida Silvestre” PAMS) was created in 2001 as a new strategy to engage state and municipal governments in wildlife management and conservation (see below, DGVS 2003). Although, positive in contemplating the lower levels of government, it is presently being evaluated and might be dismantled due to denunciation of widespread corruption in its application and illegal structure.

Land Tenure Conflicts and Deprived Socioeconomic Conditions in Wilderness Areas

Some 80 percent of the forested lands of México as well as the areas that might be described as “wilderness” (meaning large expanses of forested lands, although in the case of México not necessarily devoid of people) fall within one of two types of communal tenure regimes: indigenous community or ejido (Perez 1995, Toledo et al. 2002). State and private lands constitute a smaller, less significant proportion of the forested area of the country. These tenure forms were created in the aftermath of the Mexican Revolution of 1910, when indigenous communal lands were “restituted” to ethnic groups that had been recognized as such since the days of the Spanish crown, and when ejidos were created by “endowing” land to peasants to foster the creation of economically viable, self-

sufficient communities (Merino and Segura 2002, Pederson and Lloyd 2002). However, many ejidos are, in reality, indigenous communities whose members have lived on their territories for centuries. Ejidos stress the collective use and benefit from the land, and decisions of land allotment and use are made by the ejido assembly, which is its highest level of community-level government.

Changes in the Mexican constitution now permit communally owned agricultural or grazing lands to change into private ownership through an assembly-approved process of land parceling and registration. This does not apply to forested lands (coniferous and humid tropical forests), which are held in common, but does affect tropical deciduous forests, which are legally considered “agostaderos” (grazing areas), and are important habitats for the conservation of Mexican endemic bird species. This change in the property laws should be monitored for its effect on the rate of deforestation of dry forests. Overall, the tenure situation is an aspect that affects the conservation of forests. Most wilderness areas are plagued with conflicts of overlapping land claims and undefined ownership, as well as by dysfunctional ejido governments that have been shaped by a paternalistic relationship with the state whose objective was creating a political clientele to win periodic elections (Merino and Segura 2002). These conditions obstruct the development of permanent conservation arrangements in most wilderness areas of the country. However, the situation is not hopeless, and there are many examples of local organization initiatives, sometimes linked to protected areas, that implement projects that favor the conservation of habitat and wildlife, as well as local development (Graf M. et al. 2001, in press; Jardel P. et al. 1996, in press b).

These rural communities own the land that holds most of México's valuable biodiversity, yet they have historically lived isolated and forgotten by governmental development programs that include health, educational and other social services. Additionally, corrupt and technically deficient schemes of natural resource exploitation have denied them the natural wealth of their own lands. They harbor few employment opportunities and suffer from the highest levels of poverty, illiteracy and infant mortality rates, undernourishment and violence in the country (Álvarez-Icaza et al. 1993, Perez 1995, Toledo et al. 2002). In these communities there is a long history of subsistence hunting and the use of birds as pets and ornaments. These communities also store the last vestiges of indigenous languages, traditional culture and knowledge about natural resources, and of techniques of managing them that can contribute to more sustainable strategies of natural resource use (Aguirre B. 1967, Toledo et al. 2002).

As a result of the Zapatista guerilla uprising in Chiapas in 1994, which forced the whole country to evaluate the situation of the indigenous people and devote more resources and attention to their socioeconomic and political demands, new democratization and socioeconomic development initiatives have been implemented by federal and state governments (Ramonet 1999, Russell 1995). But this sector of society remains the most vulnerable to the adverse impacts of macroeconomic policies and trade agreements (e.g., NAFTA) that exacerbate problems of production and commercialization of natural resources, having received little governmental attention toward long-term development and consolidation of their agriculture and natural resource production organization. It is precisely the poorest municipalities of México which have the biologically richest ecosystems, where economically induced changes in the pattern of land use can cause the most damage to bird habitats. Aside from the social or ethical considerations, there are pragmatic reasons for investing in co-management arrangements for conservation and development programs in communally owned lands wildlife (Graf M. et al. 2001, in press; Jardel P. et al. 1996, in press b).

In this general context any bird or wildlife conservation program that is intended to be implemented in these communal forested areas, must be part of a wider initiative that contemplates, in addition to conservation actions, socioeconomic development alternatives and environmental education/communication. Many protected areas in México, such as biosphere reserves, are in reality zoning regulations set upon a pre-existing tenure regime where the original owners retain land title. These reserves impose stiff controls on the use of natural resources by the landowners, but since the land is not bought or expropriated, the challenge is to provide “compensatory benefits” to the owners. (Expropriating the land does not automatically traduce to protecting it, since in many cases the state does not have the ability to manage it, and illegal activities, poaching, logging and production of drugs for the U.S. markets, begin to erode its conservation value.) Unless the process of creating and/or managing the reserve is participatory, and the reserve provides tangible development options that benefit the local communities, the conservation programs will be unstable and will be vigorously opposed and even sabotaged by local stakeholders. These are some of the reasons why integrated conservation and development projects are seen by many in México as the only way to achieve some level of protection in those areas where the state is unable achieve exclusive control of and adequately manage the land and its wildlife resources (Graf M. et al. 2001, in press; Jardel P. et al. in press b, Santana C. et al. 2002b).

Recognizing that the law governing wildlife (dating from 1955) was terribly obsolete because it dealt only with wildlife as it related to sport hunting and ignored the social context described above, and acknowledging that wildlife conservation in México must be an integral part of rural development and that state and federal governments have serious institutional and economic limitations to manage wildlife populations, the federal government created in 1996 the Program for Wildlife Conservation and Diversification of Productivity in the Rural Sector (“Programa para la Conservación de la Vida Silvestre y Diversificación Productiva en el Sector Rural”) as well as México’s first wildlife law in the year 2000 (DGVS 2003). This law enacted by congress is the first to deal explicitly with the conservation of México’s biological diversity.

Under this new legal and institutional framework, rather than having the state evaluate wildlife populations and establish harvesting quotas, the state transferred this responsibility to the individual landowners. Wildlife harvesting programs can only be implemented in sites that have a formal, federally approved management plan that includes demographic information on the species population. With the authorization of a management plan the federal government approves the creation of Unit for the Conservation Management of Wildlife (“Unidad de Manejo para la Conservación de Vida Silvestre” UMA) where hunting, capturing birds for the pet trade, and other extractive and non-extractive activities are permitted (DGVS 2003). The animals harvested from UMAs must have special bands or markings that show they have been taken legally. Another recent initiative, targeted towards managing wildlife over wide landscape areas (from 20,000 hectares to over 12 million hectares per management area) is known as the Program of Areas for Sustainable Management of Wildlife (PAMS). It promotes wildlife management plans for large regions supervised by municipal and state governments, and in the absence of interest from these entities, by NGOs (DGVS 2003).

These programs have been initiated by providing, on a competitive basis, federal funds to help private land owners, ejidos, indigenous communities and municipal and state governments pay certified technical personnel to develop their wildlife management plans and monitor populations. State and municipal levels of government are increasingly participating in the establishment of these management units. As of April of 2003 some 5,135 management plans had been drafted in the UMAs and PAMS programs, covering an area of over 68 million hectares across México (DGVS 2003). Basically, the governmental bureaucracy that was previously responsible for managing wildlife populations (but could not actually do it) ceded that responsibility to the civil sector, and redirected its efforts towards supervising, monitoring and auditing

the permit program and the management plans. This is an interesting social experiment, which in the short term has served to spark nation-wide interest in wildlife management, generated large amounts of field-based information on harvestable wildlife species, and has stimulated new, somewhat regulated, wildlife-based economic activities. Since all landowners must have a minimum of understanding of the management plan for the wildlife in their land, it has also served (perhaps unexpectedly) as a massive environmental education program by creating orientation and discussion opportunities for understanding the basic principles of ecology, population dynamics and wildlife management over a wide section of society.

However, since the system depends on population evaluations conducted by private companies or individuals whose salaries depend on there being high wildlife population numbers, various corruption related problems have emerged such as falsified data on wildlife populations, the use of federal funds to develop bogus management plans that will never be implemented, and the use of UMAs as “fronts” to sell species poached from the wild (personal observation and interviews with natural resource practitioners, Lopez-Medillin and Iñigo Elias 2003). UMAs seem to be more effective in Northern México where there is a greater tradition of sport hunting (of mostly doves, waterfowl and deer) and greater proximity to the U.S. hunting market than in tropical Southern México, where some conservationists believe that they might actually be doing more harm than good. The PAMS have lacked rigorous validation of the correlation between habitat parameters and the assumed wildlife population levels, and they are presently under scrutiny due to administrative and legal irregularities in their implementation. They seem to have an unrealistic expectation of the ability of private natural resource specialists to adequately monitor wildlife populations over large expanses of landscape. Ultimately the UMAs and PAMS systems will need to be objectively evaluated to determine whether it is more effective for the government to manage wildlife directly or try to do so indirectly as is being attempted under these new programs.

Participation of the Civil Sector in Policy and Funding of Nature Conservation

Mexican society has a rich history of linkage and appreciation of birds that spans thousands of years. Many species were and still are, considered valuable from a religious or magical perspective, others are used in traditional medicine, birds are highly valued as pets for their song and beauty, and they are also used as food, being an important dietary component in poor

rural communities (Perez Gil et al. 1995). In spite of this long tradition of valuing birds, especially in rural areas, modern Mexican society as it became evermore urban, steadily became estranged from nature in general and from birds in particular.

Due to economic, cultural, and educational factors linked to the availability and forms of leisure, the new emerging society does not have a tradition for outdoor activities like camping, bird watching, sport fishing, hunting and ecotourism. Although these activities are increasing and NGOs and conservation organizations are beginning to make inroads in Mexican society, until recently there has not been a critical mass of constituents, at either national or state levels, that could generate the social and political pressure necessary to induce government administrations and political parties to enact environmental conservation policies with adequate funding. The Mexican Green Party is not recognized as a political institution with expertise in environmental affairs (for example, although it won the last presidential elections in an alliance with Vicente Fox's Partido Acción Nacional, it was not granted any responsibilities in administering the country's environmental sector, and the votes it gathers seem to be more related to decisions based on "political balances" among parties than on its environmental platform). Those sectors that do have direct linkages to natural resources and have environmental awareness, like indigenous groups, are also marginalized and disenfranchised from political power and cannot exert political influence corresponding to their population numbers. NGOs and academic institutions have played and continue playing an important role as catalysts of conservation projects, but they do not have the resources or legal authority to conduct the large-scale conservation efforts needed to prevent the loss of bird species at a national scale. Successful conservation programs tend to be those that combine the collaboration of government agencies, conservation or development NGOs, academic institutions, and agrarian and social community organizations around commonly defined problems in forested areas.

Missing from the country is also a philanthropic "donor" culture. There is not much participation of the private sector in financing conservation in a significant way, either directly or through foundations and NGOs. The situation, however, is improving with the creation of the Fondo Mexicano para la Conservación de la Naturaleza (FMCN 2003), the growth of influential NGOs, and professional organizations like PRO-NATURA (2003) and CIPAMEX, and the inclusion of environmental components in the agenda of political parties. Recently private groups like the Bimbo Bakery and Fundación Gonzalo Río Arronte, among others, have donated millions of dollars toward management

of natural protected areas, thanks to the work of committed conservationists in key government posts.

Final Considerations

The challenges confronting bird conservation in México are daunting. They include taking actions such as creating whole conservation bureaucracies at the state level, resolving historical land tenure problems, providing enough educational and training resources to academic institutions, and generating enough financial resources toward land acquisition and the creation of natural resource management projects that either directly or indirectly provide employment for the rural population associated to priority conservation habitats. Bird conservation initiatives in México will more likely be successful if they are implemented with a clear understanding of the socioeconomic and environmental context in which natural resource management develops, and if they integrate (or are integrated into) social and outreach programs. National analyses of bird conservation requirements superficially skim the issue of developing strong resource management instruments and institutions at state and municipal levels, yet these are strategic problems that need to be adequately addressed. Local municipal governments have a yet unrecognized importance in implementing conservation projects. But this importance cannot be detected if those promoting conservation have no real links to local government dynamics or to local citizen education/ participation processes. Universities have played and can continue to play an important role in promoting bird conservation, but the academic-professional incentive mechanisms, based on the accumulation of peer-reviewed publications, actually work against university participation in conservation. Linking academic institutions to effective on-the-ground conservation programs that include incentives for all involved will be elements for success and continuity in local conservation projects (Santana C. et al. 2002b).

Despite the challenges and the magnitude of environmental deterioration in México, it is clear that institutional conditions for bird conservation are improving. As part of this process there has been a steady professionalization of those working in the environmental sector and an increase in the number and quality of protected areas and conservation programs. The crucial question remains whether these positive changes are occurring fast enough to overcome the loss of habitat and the extinction of bird species (answer: they are not). "Context conditions" set the stage for local conservation actions, and the Mexican ecological and socioeconomic contexts require the generation of effective and particular conservation strategies that, although internationally compatible at a North American scale, will differ from those developed in the U.S.A. or in Canada. These strategies must be inclusive

of all the stakeholders in the country who affect and are affected by birds and their habitats. “Political will” and cooperation at national as well as international levels are essential to address the complex issues involved in the conservation of avian diversity. However, to adequately address this complexity at different scales, conservation efforts will have to be constructed by a community of people representing an equally complex array of places, races, cultures, religions, nationalities, disciplines *and* economic and sociopolitical systems. Thus, México is not alone in facing the daunting challenge of bird conservation.

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Literature Cited

- Aguirre B., G. 1967. **Regiones de refugio**. Instituto Nacional Indigenista. México DF: American Ornithologist’s Union (AOU) 2003. Web page. <http://www.aou.org/>.
- Alvarez-Icaza, P., G. Cervera, C. Garibay, P. Gutiérrez and F. Rosete. 1993. **Los umbrales del deterioro. La dimensión ambiental de un desarrollo desigual en la Región Purépecha**. México D.F.: Universidad Nacional Autónoma de México- Fundación Friedrich Ebert Stiftung.
- Arizmendi, M. C. and L. Marquez Valdelamar, editors. 2000. **Áreas de importancia para la Conservación de las Aves en México**. México D.F.: Consejo Internacional para la Preservación de las Aves en México (CIPAMEX); 440 p.
- Arroyo P., A. 2003. **El TLCAN: objetivos y resultados 7 años después**. <http://www.rmalc.org.mx/libros.htm>
- Berlanga, H. 2001a. **Conservación de las aves de América del Norte**. *Biodiversitas* 6: 2-8.
- Berlanga, H. 2001b. **Estrategia y bases para establecer un plan de acción preliminar: México**. Iniciativa para la Conservación de Aves de América del Norte (ICAAN-NABCI). Unpublished document.
- Cevallos, G., M. C. Arizmendi, and L. Márquez Valdelamar. 2000. **La diversidad y conservación de las aves en México**. In: G. Cevallos, G. and L. Márquez Valdelamar, editors. *Las aves en peligro de extinción*. CONABIO-IEUNAM - Fondo de Cultura Económica; 23-68.
- Challenger, A. 1998. **Utilización y conservación de los ecosistemas terrestres de México: pasado, presente y futuro**. México DF: CONABIO.
- Comisión Nacional de Áreas Naturales Protegidas (CONANP). 2003. <http://www.conanp.gob.mx/>
- Comisión Nacional para el Conocimiento y Uso de la Biodiversidad (CONABIO). 2003. http://www.conabio.gob.mx/institucion/conabio_espanol/doctos/biodiversitas.html.
- Consejo Internacional para la Preservación de las Aves en México (CIPAMEX). 2003. Homepage Publication. <http://www.iztacala.unam.mx/wwwcampus/cipamex/principal.html>.
- Dirección General de Vida Silvestre (DGVS). 2003. <http://www.semarnat.gob.mx/vs/attrib.shtml>
- Escalante-Pliego, P., A.G. Navarro and A. T. Peterson. 1993. **A geographic, ecological and historical analysis of land bird diversity in México**. In: R. Bye, E. Lot and J. Fa, editors. *Biological Diversity in México: origins and distribution*. Oxford University Press; 281-299.
- Fondo Mexicano para la Conservación de la Naturaleza, A.C. (FMCN) 2003. <http://www.fmcn.org>.
- Gallopín, G. C. 1994. **Impoverishment and sustainable development: a systems approach**. Winnipeg, Canada: International Institute for Sustainable Development.
- Gallopín, G. C. 1997. **Commentary on Gordon Baskerville’s perspective**. *Conservation Ecology* [online]1(1): 12. Available at <http://www.consecol.org/vol1/iss1/art12>.
- García R., S. and E. Santana C. 2003. **Community organization and the municipal solid waste recycling program at El Grullo, Jalisco**. In: *Crossing water thresholds: Future challenges of managing threatened global resources, Site A: green water and environmental services*, LEAD International Session, Guadalajara, Jalisco, México, 30 April-10 May 2003; 49-51. Available at <http://myleadnet.lead.org/repository/499.pdf>.
- Graf M., S., E. J. Jardel P., E. Santana C. and M. Gómez G. 2001. **Instituciones y gestión de reservas de la biosfera: el caso de la Sierra de Manantlán, México**. In: A. E. Toribio and C. Soruco, editors. *La investigación interdisciplinaria en las reservas de la biosfera*. Buenos Aires. Argentina: Comité MAB Argentino - Secretaría de Desarrollo Sustentable y Política Ambiental; 93-108.
- Graf M., S., E. Santana C., E. Jardel P., M. Gómez and S. García R. [In press]. **Vinculación social y arreglos institucionales para la gestión de las áreas naturales protegidas: el caso de la Reserva de la Biosfera Sierra de Manantlán, México**. J. Carabias, editor. IUCN Vth World Park Congress, September 2003.
- Graf M., S., E. Santana C., E. Jardel P. and B. F. Benz. 1995. **La Reserva de la Biosfera Sierra de Manantlán: un balance**

- de ocho años de gestión. Revista Universidad de Guadalajara, Mazo-Abril: 55-60.
- Hernández-Baños, B. E., A. T. Peterson, A. G. Navarro-Sigüenza, and P. Escalante-Pliego. 1995. **Bird faunas of the humid montane forests of Mesoamerica: biogeographic patterns and conservation priorities.** Bird Conservation International 5: 251-277
- Howell, S. N. G. and S. Webb. 1995. **The birds of México and Northern Central America.** Oxford: Oxford University Press.
- Hutto, R. L. 1986. **Migratory landbirds of Western México: a vanishing habitat.** Western Wildlands 11: 12-16.
- Hutto, R. L. 1992. **Habitat distributions of migratory landbird species in western México.** In: J. M. Hagan III and D. W. Johnston, editors. Ecology and conservation of Neotropical migrant landbirds. Washington DC: Smithsonian Institution Press; 211-239.
- Instituto Nacional de Ecología (INE). 2003. <http://www.ine.gob.mx/>
- Jardel P., E., Coordinator. 1992. **Estrategia para la conservación de la Reserva de la Biosfera Sierra de Manantlán.** Universidad de Guadalajara, México; 312.
- Jardel P., E. 1995. **Las áreas protegidas en la práctica: una discusión sobre conservación biológica y desarrollo sustentable.** Revista Universidad de Guadalajara, Número Especial, Conservación Biológica en México; 23-36.
- Jardel P., E., E. Santana C., and S. Graf M.. 1996. **The Sierra de Manantlán Biosphere Reserve: Conservation and Regional Sustainable Development.** Parks 6: 14-22.
- Jardel P., E., E. Santana C., S. Graf M., L. Iñiguez, O Robert and L.Rivera C. [In press a]. **Investigación científica y manejo de recursos naturales en la Reserva de la Biosfera Sierra de Manantlan.** In: A. Castillo and K. Oyama, editors. Manejo, Conservación y Restauración de Recursos Naturales en México (UNAM y SIGLO XXI).
- Jardel P., E., S. Graf M., E. Santana C. and M. Gómez G. [In press b]. **Managing core zones in mountain protected areas in México: The Sierra de Manantlán Biosphere Reserve.** Mountain Protected Areas Workshop, IUCN Vth World Parks Congress, September 2003; Durban, South Africa.
- Lopez-Medillin, X., and E. Inigo Elias. 2002. **The passeriform trade in México: A challenge to conservation.** Oral presentation in the North American Ornithological Congress, New Orleans. http://www.tulane.edu/~naoc-02/NAOC02_Program-16Sept.pdf.
- Martínez R., L. M., E. Santana C. and S. Graf M. 2002. **Una visión del manejo integrado de cuencas.** Curso Manejo Integrado de Ecosistemas. 25 Febrero - 1 Marzo; 26 p.
- Merino, L. and G. Segura. 2002. **El manejo de los recursos forestales en México (1992-2002) Procesos, tendencias y políticas públicas.** En La transición hacia el desarrollo sustentable. Perspectiva de America Latina y el Caribe. INE/UAM/PNUMA
- Nader, R., W. Greider, and M. Atwood. 1993. **The case against free trade: GATT, NAFTA, and the globalization of corporate power.** San Francisco and Berkeley, CA: Earth Island Press and North Atlantic Books; 230 p.
- North American Bird Conservation Initiative (NABCI). 2003. <http://www.nabci.org>
- Pederson, S. and A. Lloyd. 2002. **The ejido land tenure system. Our future with (out) water.** The Sustainable Management of Common Pool Resources. Session Workbook for the LEAD International Session. Guadalajara Nov-Dec 2002.
- Perez. M. 1995. **Perfil de las selvas altas perennifolias de México y sus habitantes.** Conservación Biológica en México. Revista Universidad de Guadalajara. Marzo-Abril 1995.
- Pérez-Gil Salcido, R., F. Jaramillo Monroy, A. M. Muñiz Salcedo and M. G. Torres Gómez. 1995. **Importancia económica de los vertebrados silvestres de México.** CONABIO, PG7 Consultores, S. C.
- PRONATURA 2003. <http://www.PRONATURA.org.mx>.
- Ramonet, I. 1999 **América Latina; del Che a Marcos. Geopolítica del Caos.** Le Monde Diplomatique. Editorial Temas de Debate.
- Rappole, J. H. 1995. **The ecology of migrant birds: A Neotropical perspective.** Washington, DC: Smithsonian Institution Press.
- Red Mexicana Ante el Libre Comercio (RMALC). 2003. **Espejismo y realidad: el TLCAN tres años después, Análisis y propuesta desde la sociedad civil.** <http://www.developmentgap.org/rmalecon.html>.
- Russell, P. 1995. **The Chiapas Rebellion.** México Resource Center. Austin: 1995.
- Santana C., E. 2000. **Dynamics of understory birds along a cloud forest successional gradient.** University of Wisconsin, Madison. Ph.D. Thesis
- Santana C., E., compiler. 1995. **Training needs.** In: M. H. Wilson and S. A. Sader, editors. Conservation of neotropical migratory birds in México. Maine Agriculture and Forest Experiment Station, Miscellaneous Publication 727; 277-279.
- Santana C., E., S. Contreras, J. Schondube, S. García, I. Ruán, J. Carrillo and C. Guerrero. 2002a. **Monitoreo, conservación y educación sobre las aves en la Reserva de la Biosfera Sierra de Manantlán.** In: H. Gómez de Silva and A. Oliveras de Ita, editors. Conservación de Aves: experiencias en México. CIPAMEX; 251-254.
- Santana C., E., S. Contreras, J. Schondube and I. Ruan. 1996. **Bird conservation looks south.** Bird Conservation, ABC, Winter : 2.
- Santana C., E., S. Graf M., E. Jardel P., L. Rivera C., and M. Gómez. 2002b. **Alianza Estratégica entre institutos académicos y dependencias gubernamentales para la implementación de proyectos de conservación y desarrollo: el Caso de Manantlán.** Proceedings (C.D.) of Memorias de la Mesa sobre "Equidad y Pertinencia Social

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- de la Educación Superior” del Tercer Congreso Nacional y Segundo Internacional “Retos y Expectativas de la Universidad” ANUIES, 6 - 9 November 2002, Ixtapan de la Sal, Edo. De México.
- Santana C., E., R. Guzmán M. and E. Jardel P. 1989. **The Sierra de Manantlán Biosphere Reserve: The difficult task of becoming a catalyst for regional sustained development.** In: W. P. Gregg, S. L. Krugman, and P. Wood, editors. Proceedings of the symposium: Biosphere reserves, IV World Wilderness Congress. Washington, DC: National Park Service, U.S. Department of the Interior; 212-220.
- Santana C., E., and E. Jardel P. 1994. **Research for conservation or conservation for research?** Conservation Biology 8: 6.
- Santana C., E., E. Jardel P., and S. Graf M. **Aportes hacia la construcción de una estrategia para la conservación de aves en México.** Unpublished.
- Simeon, L. 1995. **Defending the land of the jaguar. A history of conservation in México.** Austin, TX: University of Texas Press.
- Stotz, D. F., J. W. Fitzpatrick, T. A. Parker, III and D. K. Moskovits. 1996. **Neotropical birds: Ecology and conservation.** Chicago, IL: University of Chicago Press.
- Toledo, V. M., P. Alarcón-Chaires, P. Moguel, M. Olivo, A. Cabrera, E. Leyequien, and A. Rodríguez-Aldabe. 2002. **Biodiversidad y pueblos indios.** Biodiversitas 43: 1-8.
- Villaseñor G., J. F., and E. Santana C. 2002. **El monitoreo de poblaciones: Herramienta necesaria para la conservación de aves en México.** In: H. Gómez de Silva and A. Oliveras de Ita, editors. Conservación de Aves: experiencias en México. CIPAMEX; 224-250.