

Sharing the Earth: Case Studies on Population, Wildlife, and the Environment

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AS A MEMBER OF THE U.S. DELEGATION to the U.N. International Conference on Population and Development (ICPD) in Cairo, I carry a special responsibility to see that the viewpoint of other species is reflected in the planning and recommendations related to human population considerations. This is not an easy task. First, I presume to know what is best for other species. Second, we all presume to know what is best for all people. Third, there is an anthropocentric bias built into development from the beginning. And with the world's poor growing in numbers it is not surprising that this bias exists.

The National Audubon Society, with nearly a century of experience in protecting wildlife and its habitat, early on recognized the impact of human population growth on the natural environment and on Earth's resources. One of Audubon's goals is to ensure that sound population policies are established in the United States and overseas, policies that contribute to the health, well-being, and dignity of the individual human and protect non-human species and their habitat. One major program objective has been to demonstrate the interrelationship between population and environment and to actively pursue means of addressing these issues.

The classic J-curve of population, a chart of the growth of human numbers throughout history, tells an impressive story of human triumph over adversity. Current projections for 2020 place the world's population at 8.7 billion. The less-developed countries will make up 7 billion of that total. Thus, over three-quarters of the global population growth is occurring in those countries. The total human population could rise to 14 or even 20 billion before stabilizing.

But population is more than demography. Issues surrounding quality of life equalize people country by country. The economist and minister, Thomas Malthus, warned of the perils of population growth outpacing agricultural production. Equally of significance today is the neo-Malthusian crisis: people using more than their own share of resources. Today's population crisis

is in two parts: *high numbers and high consumption.*

Although the predominant theme of the U.N. document for the ICPD is women's health and family planning, Chapter 3 of that document sets the stage for government action by discussing the role of economic growth, sustainable development, and the environment. Unsustainable patterns of consumption and production are very much a part of defining and correcting the problem.

However, this is not a new way of looking at the population and environment crisis for Audubon. Certainly every environmental activist understands the interplay among people and resources. Yet no one sees it as clearly, perhaps, as the wildlife biologist committed to caring for other species and their habitat.

The Population, Wildlife, and Environment Project

In 1988, Audubon's Population Program and its Sanctuary Department began to develop a joint project to look at the issues of human population growth and wildlife management. We sought to compare sites in the United States and overseas, presenting similarities and contrasts, and identifying actions necessary to change the course of humans struggling to balance their needs in a sustainable ecosystem.

Some of the objectives of this Population, Wildlife, and Environment Project were to:

- Explore examples of population pressures in the United States and overseas, including addressing the U.S. resource consumption issue;
- Explore examples of attempts to preserve plant and animal species against the pressures of population growth and economic development;
- Accumulate "lessons learned" from these examples;
- Connect habitat destruction and population growth;
- Formulate policy recommendations for national governments and international organizations;
- Formulate and promote an action agenda for local activists worldwide; and
- Introduce U.S. citizens to Third World citizens making a difference in protecting people and wildlife.

Out of 100 established Audubon wildlife sanctuaries, eight sites managed by wildlife biologists, wardens, or land managers were chosen. The basic criteria for selection of the U.S. sites included demonstrable direct or indirect pressures on the land from human activity, either in numbers or in resource consumption. These sites were then matched with eight sites in other countries which had an existing local or na-

tional management program of protection. Other criteria included the presence of similar biomes, species, or threats to the system.

The Audubon wildlife managers visited their partners' international settings and then hosted their counterparts at their own sanctuaries in the United States. All of the paired project sites involve water resources: three are coastal systems, two involve major rivers, and three relate to freshwater wetlands.

Coastal Systems

Tampa Bay Sanctuaries, Florida, and Wat Phai Lom, Wat Asokaram, and Ban Lung Jorm, Thailand. The colonial nesting birds islands of Tampa Bay, Florida, were matched with traditional nesting sites in and around Bangkok. Thailand, with 55 million people in an area somewhat smaller than the state of Texas, is growing at a rate of 1.5% annually and is home to 281 people per square mile. Florida, one-quarter the size of Thailand, and with a population now exceeding 12 million, has a density of 228 people per square mile and an annual growth rate of 2.8%. As the industrial economies of both areas grow, human needs increasingly conflict with those of wildlife.

In Thailand, the Buddhists have set aside wildlife sanctuaries within monastery grounds. As a result, the Thai bird colonies seem more secure than those of Tampa Bay. The environmental movement is just now becoming a force in Thailand, so most conservation efforts depend upon the commitment of individuals within the community. In Florida, the environmental movement has grown considerably over the past two decades and has produced a system of regulations and funding for habitat preservation and restoration. Both areas will need specific protection for their bird species, which requires the establishment of sanctuaries in the midst of human development.

Rookery Bay Sanctuary, Florida, and Pulau Rambut, Indonesia. The Indonesian archipelago accommodates 258 people in every square mile of its land mass. The state of Florida, smaller in total area, almost equals the population density of Indonesia. With 189 million people, Indonesia has a natural annual rate of increase of 1.8%, as opposed to Florida's 2.8%. Indonesia's rate of increase reflects the national birth rate, while Florida's largely reflects migration into the state. Among other things, the two share a concern for coastal management and wetland preservation.

In Indonesia, land is owned and protected by the government. It was a surprise for Indonesian officials to learn that a private organization such as Audubon owns and maintains a vast system of land and water. An Audubon warden patrols southwest Florida's Rookery Bay, and he has made it his business to be an official part of the community environmental planning process. Pulau Rambut, the Indonesian island in Jakarta Bay, which was matched with the Rookery Bay Sanctuary, is a public area, and there is insufficient government staff to patrol and protect it from human disturbance.

As a holiday site for the city of Jakarta, which has a 4% annual growth rate, Pulau Rambut does not have a bright future for its wildlife. Rookery Bay contains island resort communities which are growing as well. The closest city, Naples, is one of the fastest-growing metropolitan areas in the United States. Both sanctuaries must have more support for studying what exists in their resource base, how each sanctuary functions, and what the significance of each is in the broader ecosystem. Public education will be essential, as well.

Rainey Wildlife Sanctuary, Louisiana, and Rio Lagartos, Mexico. In increasing numbers, the human population is congregating along the

seacoasts of the world. Two of these coastal sites are located in Louisiana and Mexico's Yucatan Peninsula. Louisiana's Rainey Sanctuary and the Rio Lagartos system of the Yucatan both shelter vast, rich wetlands which serve as the breeding grounds for spectacular gatherings of wildlife. But Louisiana is steadily losing its coastal wetlands at a rate of 130 square kilometers per year, the largest loss anywhere on Earth. The economic effects of this loss on the state's 4.4 million people are felt most acutely by the commercial fishermen.

Across the Gulf, Mexico, with a population of 88.6 million, is growing annually as a rate of 2.4%. Mexico's population density exceeds that of Louisiana. In the Yucatan, coastal wetlands remain intact even though they are subject to the same types of economic pressures as in Louisiana. It is because of a slower rate of economic development that the Yucatan has lost much less of its natural resource base than has the Louisiana coastal system. Yet both areas are subject, in the immediate future, to massive oil exploration and environmental impacts from the petroleum industry.

For Louisiana, coastal subsidence may now be inevitable. However, there are initiatives which can be implemented to take the pressure off the coastal wetlands. What is needed today is an effort of collaboration and coordination among agencies in and out of the government. Louisiana may not grow demographically in the future because of coastal problems, but the Yucatan will likely face enormous populations, as it did centuries ago during the ancient Mayan civilization. The challenge, once again, is to find a balance between the land and its people, so that this time both can survive in harmony.

River Systems

Sabal Palm Grove Sanctuary, Texas, and Biotopo del Manati, Guatemala. Guatemala has 9.2 million people and is growing at a rate of 3.1% per year. The state of Texas jumped from 14.2 million people in 1980 to 16.9 million in 1990, which indicates an overall annual rate of almost 2%. However, in the Rio Grande Valley the rates of growth are much higher. Biotopo del Manati and the Rio Grande's Sabal Palm Grove were matched because of their biological similarities and shared bird and animal species. Rapid population growth and development are threatening the survival of the respective rivers and the people and wildlife served by both.

Rapid population growth, poverty, cultural disparity, unplanned agricultural expansion, and unsustainable economic activities are all part of the pressures on these two river systems. Deforestation is a significant issue: in Guatemala the trees are disappearing at an alarming rate; in Texas, most of the trees are already gone. The local citizens in Texas are lobbying for a "wildlife corridor" along the Rio Grande to protect the river and the remaining vegetation. The Kekchi Indians in Guatemala are getting involved in reforestation and sanctuary protection.

The creation of demonstration water-quality projects on the two rivers is intended to provide safe water supplies and will also serve as learning laboratories in sustainable resource management. And while South Texas may now be suffering from the effects of tourism, controlled ecotourism may be part of the answer to preserving the biotopos of Guatemala. If nothing else, Guatemalans can at least learn from the mistakes made in South Texas.

Platte River, Nebraska, and Indus River, Pakistan. The state of Nebraska is home to 1.6 million people—a relatively small population in a critically important area involved

in agricultural production. In the neighboring state of Wyoming, 500,000 people make up the smallest population of the fifty states. But the city of Denver, across the Nebraska border in Colorado, has over 1.8 million people and is anticipating further growth. All three states are linked by the precious flows of the Platte River, and the water needs of growing cities in this semi-arid region are competing with agriculture and wildlife for the rights to the last of the Platte's water.

Around the world, another river system is also under pressure from people. In Pakistan, the Indus River provides water for many of the 114.6 million people living there. Pakistan's population density, at 369 people per square mile, is over 15 times that of Nebraska, and Pakistan's human population is growing at the high rate of 3% per year. Like the rivers themselves, the scale of the population problems in these two regions may seem a world apart. Yet, in the challenges that growing or dense populations may bring to the preservation of an area for wildlife, the choice of the Platte and the Indus rivers for a case study turned out to be a perfect match.

Despite thousands of years of use, the Indus still maintains much of its pristine quality. The Platte, however, has been dammed and diverted almost beyond recognition. Technology and consumption have had more devastating effects on many of the Platte's resources than on most of the less-developed rivers of the world. The comparison of these two rivers is a microcosm of issues relating to water and its use around the world.

All of the participants from all around the world discovered that they had in common a deep commitment to preserving natural resources. The fast-growing developing countries have a challenge not to repeat the mistakes of industrialized countries in overstressing their own land and water systems. How-

ever, the wildlife managers of areas in Pakistan, Kenya, and Guatemala also realize that the poverty of their human populations must be addressed first.

The managers of sites in Florida and Texas saw the rapidly growing population base in and around their sanctuaries in a new light. The land of the prosperous United States is more degraded than in some of the poorest countries of the world.

Freshwater Wetlands

Corkscrew Swamp Sanctuary, Florida, and Lake Nakuru, Kenya.

Florida and Kenya are experiencing some of the highest population growth rates in the world. Florida's human population grew 31% in the 1980s and reached nearly 13 million. Kenya experienced a 44% increase during that period, and now supports an estimated 25 million people. Florida's Corkscrew Swamp was matched with Lake Nakuru in Kenya because of similar high population growth rates.

The Corkscrew area's growth is caused by the migration of families into the region. Nakuru's growth is the result of a combination of migration, urbanization, and a very high birth rate. For Corkscrew, water-use regulatory processes and comprehensive growth-management laws are necessary to achieve a balance between human demands and resource protection. However, the economic forces that drive growth are powerful, and the long-term survival of Corkscrew will be a continuing struggle. At Nakuru, the challenges are even greater. There are immediate problems linked to basic human survival, such as soil erosion and fuelwood supply, which must be addressed even before comprehensive growth planning can be instituted. The long-term future of Lake Nakuru, like much of East Africa, is dependent in part on a substantial reduction in the human birth rate.

Alkali Lake Sanctuary, North Dakota, and Estancia Caiman, Brazil. North Dakota hardly ranks as a populated state, with a total population of 666,000 people spread out over 70,000 square miles. Brazil, in contrast, has 150 million people and encompasses over 3 million square miles. Brazil is also home to the fourth-largest city on the world, São Paulo, which grew from 6 million in 1965 to 17.2 million in 1990. The result of that growth has been a deterioration of the quality of life for its inhabitants.

The Prairie Potholes of North Dakota and the Pantanal of Brazil are both regions containing internationally important wetland habitats, and the major industries of both are agriculture and cattle ranching. Each of these areas supplies food primarily for markets outside of its ecosystem, and the economic pressures to do so are enormous.

For North Dakota, the environmental story is one of continuing loss of wetlands as the "potholes" where ducks breed are drained for agriculture. Brazil's Pantanal is one of the world's largest remaining contiguous wetlands. It is rich in wildlife, but faces the pressures of expanding human populations, intensified grazing, and logging. While North Dakota may depend on legislation to protect and restore wetland habitat, it is a slow process. At Estancia Caiman in the Pantanal, a private landowner is experimenting successfully with finding a balance among the competing interests of wildlife, cattle, and agriculture. Yet the survival of each of these sites will require substantial education and information for local farmers and other citizens, as well as formal protective measures such as international wetland site designation.

Initial Findings

The exchange project began with the assumption that there is a complex relationship between population and environmental degrada-

tion, recognizing that resource consumption is a key factor in the population equation. Most of the data available on these relationships is experiential and only recently is beginning to be supported by hard science. Therefore, the goal was to explore examples of human population pressures in the United States and overseas, not through detailed scientific research, but rather through a review of the issues, aimed at understanding each case in the broadest terms. The intent has been to highlight attempts to protect plant and animal species against the pressures of population growth and economic development and learn from one another's experiences in protecting the environment.

Some basic findings are as follows. First, wildlife managers and conservationists share common problems throughout the world, despite differences in geography, economy, and culture. Second, natural areas are being lost or degraded worldwide, and much of the habitat loss is related to human population pressures through either sheer numbers or how those numbers use Earth's resources. Third, in many cases, human technology and affluence have led to more rapid and extensive environmental degradation than have masses of humans living in poverty, yet the nature of the damage is similar, if not exactly the same.

In addition to the factors of human population growth and/or overconsumption, water, and wildlife, each study had in common the fundamental issue of economics and/or ethics and values. This is particularly important in underlining the complexity of the issues and the need to study them as a cyclical process with intervening variables rather than linear studies.

The Sharing the Earth Project

In 1991, Audubon began the Sharing the Earth Project as a follow-on project to the initial studies.

Audubon has set up two centers of expertise, based in Nebraska and Texas, to continue exploration of human population, wildlife, and environment interrelationships.

The Nebraska project serves to further internationalize Audubon's commitment to the campaign to save the Platte River. In partnership with Pakistan, Nepal, and Russia, the project focuses on the establishment of "sister" sanctuaries, education and outreach to the surrounding "shareholding" human community, and exploring ways to deal with related economic issues.

This partnership has resulted in three international symposia on people, water, and wildlife; collaboration with Moscow State University on internships for Russia nature park managers; and co-sponsorship of an international conference which included participants from Russia, China, Korea, Japan, and the United States. The most recent event is the establishment of the Amur Conservation Education Project, which is designed to raise the level of community awareness on these issues along the Russia-China border.

The Texas project focuses on education, outreach, and involvement of the local "shareholding" human community, which is largely Spanish-speaking in South Texas. Also included is work with neighboring Mexico on population, environment, and trade issues. A partnership between teenagers in Brownsville and the Mexican city of Matamoros has been formed under the name of the International Youth Alliance. The youth have generated media attention, brought adults into important community meetings, and testified at public hearings.

With assistance from the University of Michigan's population and environment fellowship program, a two-year fellow has been placed in Matamoros to work with the project. A major task will be to collect data

on the health and population needs of the Matamoros community.

After Cairo

In November 1994, Audubon will host a post-Cairo population conference in Miami, Florida, to assess the accomplishments of the ICPD and to plan a strategy for addressing national and international population issues for the rest of the decade. The United States does not have a population policy. If we are to save people, wildlife, and habitat, we must have one. If we are to be cred-

ible to the rest of the world when we discuss population, the environment, and development, we must lead by example.

From the lessons we are learning through Sharing the Earth, we will continue to look for solutions to the problem of finding a balance between humans and other species. Most of all, we will continue to learn from the experiences of other biologists, scientists, and everyday people around the world, and to share what we are finding out as we pursue a sustainable future.

