



The Pigeon Paradox: Dependence of Global Conservation on Urban Nature

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Introduction

We are faced with the potential extinction of thousands of species and with radical changes to many of the world's ecosystems in the next 50–100 years. Paradoxically, conservation may increasingly depend on the ability of people in cities to maintain a connection with nature. We term this concept the “pigeon paradox” because, if we are right, under the status quo a great deal of future conservation will rely in part on our interactions with urban ecosystems and the organisms, including non-natives such as feral pigeons (e.g., *Columba livia*), that call them home. The paradox lies in the dependence of conservation action worldwide on peoples' direct experiences with urban nature. Whereas the importance of urban conservation to urban populations and species has been highlighted (e.g., Miller & Hobbs 2002), the links between urban nature and conservation outside cities are poorly appreciated but may be at the heart of future conservation action.

The pigeon paradox is based on three simple assertions: (1) current conservation action is insufficient, (2) people are more likely to take conservation action when they have direct experiences in the natural world, and (3) as human populations (and hence sources of conservation action) shift to cities, humans will primarily experience nature through contact with urban nature. If these assertions are supported, future incentive for conservation will depend increasingly upon people's interactions with urban ecosystems.

Current Conservation Action Is Insufficient

Our most basic assertion is that current conservation action is insufficient and that future conservation will depend on more support (both financial and political) than currently present. By one estimate the need for conservation funding outweighs current spending by \$2.3 billion annually (James et al. 2001). In addition, the gap between scientific evidence and political action (e.g., climate-change policy in the United States) points to the need for more political pressure to ensure conservation action in the future. This political pressure can come from conservation-conscious voters, but a 2005 survey found that only 22% of U.S. voters based their votes in federal, state, and local elections on environmental issues (Hart & McInturff 2005).

People Are More Likely to Conserve Nature When They Have Direct Experiences in the Natural World

People with more exposure to nature are more interested in conserving it. Although interactions with nature are not the only route to interest in conservation (e.g., Kollmuss & Agyeman 2002), they are clearly an important and arguably necessary condition. For example, Chawla (1998, 1999) suggests that an individual's environmental sensitivity, which she defines as “a predisposition to take an interest in learning about the environment, feeling concern for it, and acting to conserve it,” is based on

“formative experiences” with nature. Direct experience with the natural world, especially during childhood, appears to be the most important source of environmental sensitivity (Tanner 1980; Chawla 1999 and references therein). Those who are active in conserving the environment most often cite childhood experiences in the natural world as critical antecedents to their later environmental actions (Chawla 1998). Although a suite of variables, including education, socioeconomic status, culture, motivation, awareness, attitudes, values, and ecological knowledge, must interact to ultimately determine an individual’s conservation action, direct experience with nature appears to be a prerequisite for those involved in environmental action. Without the foundation of experiences with nature, future action seems less likely. If we hope to nurture environmental leaders and encourage more conservation action (more proconservation votes and donors), we need to ensure that children have access to nature.

As Human Populations (and Hence Sources of Conservation Action) Shift to Cities, Humans Will Only Experience Nature through Contact with Urban Species

An increasing majority of the world’s people live in cities (UN 2001). We therefore suspect that a majority of people in the world have never seen in person any organisms or habitat that cannot be found in cities. If the majority of people, however, and thus future environmental leaders, votes, and financial resources reside in urban areas, then the future of conservation depends on urban people’s ability to experience nature. In many cities of the world, this currently means interacting most often with ecosystems that have been drastically altered by human activity. Many ecological processes and native species can persist in cities. People living in cities can still interact with native species and see “natural” ecological processes. Numerically, however, the majority of interactions between humans and nature in cities are likely to be with organisms and habitats with negative cultural connotations. The most visible aspects of urban landscapes are often non-native species such as pigeons, roaches, House Sparrows (*Passer domesticus*), and rats. If the potential for a person to undertake proenvironmental action (whether it is in the form of donations, votes, or a new career) depends on direct environmental experience, then we, as conservationists, cannot afford to write off urban ecosystems and species.

Consequences and Conclusions

If our assertions are correct, the future of thousands of species and many ecosystems depends on urbanites’ in-

teraction with urban nature. If the fate of nature depends on our relationship to urban nature, all is not lost, but we do need to consider more carefully how we manage, conserve, and interact with urban nature. Although our emphases on restoration and environmental access are not new, we think the realization that urban conservation has large implications for global conservation is new. We propose three major courses of action in response to the pigeon paradox: restoration of urban ecosystems, improved access to urban nature, and a careful consideration of the costs and benefits linked to how we portray non-native and so-called pestiferous urban species.

For us, the most satisfying solution to the pigeon paradox would be to restore as many native species and habitats in cities as possible, so as to allow people to connect with native ecosystems. The possibilities for restoring diverse ecological communities in cities are great and represent an active area of research (Rosenzweig 2003). Many projects aimed at ecological restoration in cities are already underway, and these vary in scale and scope from wetland restoration, such as the work in the Hackensack Meadowlands in New Jersey, to species reintroduction efforts, such as those by New York City’s Department of Parks and Recreation’s Project X, which has released native painted turtles (*Chrysemys picta*) and Screech Owls (*Otus asio*) into Central Park (see Rosenzweig 2003 for other examples). At their most ambitious, urban restoration projects can actually succeed in managing for rare species in urban settings, but at the very least such projects can restore more diverse ecosystems than those represented by sidewalk cracks and abandoned lots. When citizens are directly involved in such restoration, these projects have the additional benefit of allowing individuals to not only interact with nature, but also appreciate the value of intact ecosystems and native species in wild settings. Few experiences can be as valuable in allowing an appreciation of nature as restoration programs that involve local citizens. A native bird in the hand is worth thousands on the Discovery channel.

Even where diverse green spaces are present in urban areas, they are often clumped in wealthy neighborhoods (e.g., Iverson & Cook 2000). Considering the potential link between direct environmental experience and conservation action, inequitable distribution of urban nature may contribute to the incredibly low numbers of minorities in environmental leadership positions. Restoring green areas to poor areas need not be expensive and can add social and ecological benefits beyond engendering positive relationships with nature. If we want to attract a broader base of support, conservationists need to place more emphasis on the quantity and distribution of urban green space. Urban restoration, more urban parks, greenways programs, and community gardens can all bring the natural world to a larger portion of the urban population. More equitable access to high-quality zoos and museums can reinforce and expand on these interactions. Although

poor urbanites do not donate most of the money for conservation, they can vote. Because close to half of all people on Earth might be classed as poor and urban, this vote is not inconsequential. If more than half of the people on earth find no reason to care about nature, we are in trouble.

And what of those regions, poor or rich, where we are unable to restore habitats, either economically or practically? Here the options are complex and few. The status quo approach is to categorize many of these habitats (be they the cracks between sidewalks, underpasses, or back alleys) and the pest and introduced species that inhabit them as scary, unhealthy, and bad, and then to hope citizens can find interactions with native species elsewhere. For many of these species, negative categorizations may be useful when imposed in more natural settings, but the utility of these species should be context dependent. Is it worth encouraging citizens to interact, appreciate, and watch the species they can find in cities, even if they are non-native? We think it might be, but admit there are costs to embracing introduced species in urban circumstances, even where those species seem to cause little ecological damage.

One cost is that we could embrace these species at the expense of our ability to control them elsewhere. One way around the potential costs might be to encourage appreciation of the native species sometimes thought of as pests (e.g., raccoons, squirrels, crows, and moles) and those non-native species that have a known low environmental cost. The initial focus could be on those species with relatively neutral cultural values, such as pigeons. Most of the pigeon species in cities, including Rock Doves (*Columba livia*), have relatively few negative impacts on native ecosystems. Rock Doves are now an integral part of many urban ecosystems and together with European Starlings (*Sturnus vulgaris*), and Morning Doves (*Zenaidura macroura*) constitute most of the diet of some native raptors now found in these ecosystems (e.g., Roth & Lima 2003). Furthermore, and more to the point of our thesis, the complex coos of doves can be soothing and the lives of doves can open the door into a broader interest in wild nature. What we must now ask is how estimates of the costs of abundant urban species stack up against the

complex values of our interactions with them, including their value for global conservation.

Although most ecosystems and species will not be saved in cities, their conservation may depend on the votes, donations, and future environmental leadership of people in cities; so, in the end, a great deal depends on urban nature. The urban jungle, with its many non-native species, may well be the breeding ground for future environmental action. What that urban jungle looks like, and how people interact with it, deserves more attention.

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