

The Wild and Wilderness in Ottoman Gardens and Landscape

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This study proposes to examine territorial relationship of wildlife habitats to cultivated gardens and landscapes of the Ottoman world from the 15th century to the late 19th century, focusing on hunting preserves and imperial gardens. Hunting preserves defined a territory of wilderness—in most cases, adjacent to or within cultivated or semi-cultivated landscape(s), neighboring imperial palaces and the urban fabric, or experienced as nodes of wilderness between imperial centers. The study aims to examine the definition, selection, and territorial expansion of hunting preserves; understand and document the inventory of wild animals; and question the idea of wilderness caught up in the activity of hunting as identified by the rules and laws projected for the act of hunting and the location of hunting grounds. From the 16th to the late 19th centuries, imperial gardens housed wild animals as displays of power. In the 16th century, variety of animals represented wealth of the Empire as the center of the Islamic world—ornamenting imperial grounds with the qualities of the Paradise Garden. In the late 19th century, wildlife habitats within imperial gardens became part of exotic collections with animals imported from different countries and various regions of the Empire. The aim of the study is to understand and outline the cultural meaning(s) of the wild and wilderness in Ottoman culture by examining territorial allocations of wildlife habitats either designed, inhabited, visited, pursued, captured or, at times, imagined.

B. Deniz Çalış is an architect and historian of Ottoman architecture and landscape culture, practicing and teaching in Istanbul, Turkey. She received her architectural diploma from Middle East Technical University, Ankara, Turkey (METU) in 1995; Master's Degree in Architecture from Pratt Institute in Brooklyn, NY in 1996; and, completed Ph.D. in Architecture at METU in 2004. Çalış received fellowship from The Scientific and Technological Research Council of Turkey (1996–1998); grants from TUBA Turkish Academy of Sciences (2008) and Hamad Bin Khalifa Symposium on Islamic Art (2007). She was a junior fellow at Dumbarton Oaks Garden and Landscape Studies (2003–2004). One of the editors of the www.middleeastgarden.com; her work has also been published in TOPOS and Dumbarton Oaks Publications among others. She is currently writing a book on the deviant landscape culture of Ottoman Sufis from the 16th c.–18th c. Çalış is teaching at Bahçeşehir University, Faculty of Architecture and Design in Istanbul.

Designing a Wilderness for Wildlife: The Case of Pilanesberg, South Africa.

Jane Carruthers, *Professor, Department of History, University of South Africa*

In the late 1970s a ground-breaking project began in the Pilanesberg (presently in the North West Province of South Africa) to create a wildlife conservation and eco-tourism venture from marginal farmland. In the process of so doing, there was innovative design at a number of levels—community development, tourist satisfaction and ease of access, scientific and wildlife management, the aesthetics of wilderness, and in national identity formation—that subsequently served as models for similar projects elsewhere in southern Africa. During the apartheid era, a large gambling and luxury hotel was established in Bophuthatswana (near Rustenburg, about 200

km from Johannesburg) in order to draw tourists into the homeland and create employment, secondary industries, and to build local capacity. Close to the hotel complex lies the Pilanesberg, a long-extinct volcano of exceptional natural beauty and scientific and geological interest, which was considered appropriate for a small game reserve to amuse hotel visitors. However, the inventive ideas around community participation, wildlife management and environmental restoration initiated by a number of pioneering ecologists, game rangers and administrators, were important in creating the Pilanesberg National Park which is today a substantial and important tourist and wildlife attraction in the region.

Jane Carruthers is a Professor in the Department of History, University of South Africa, Fellow of the Royal Society of South Africa and Fellow of Clare Hall, Cambridge. She has held Visiting Fellowships in Australia and is on the Advisory Board of the Rachel Carson Center for Environmental History at the Ludwig Maximilian University in Munich. She has been President of the South African Historical Society and serves on the editorial boards of numerous academic journals and book series. Jane has written a number of books and chapters in books, as well as authoring more than 30 articles in scholarly journals. Her doctoral thesis, *The Kruger National Park: A Social and Political History* (1995) is a standard reference work. She is engaged in research around the history of the biology and national parks, colonial art, heritage and cartography in southern Africa and Australia and has been involved in land restitution claims and land reform.

From Elephants to Mice: the Impact of Ecology and Spatial Scale on the Design of Conservation Strategies

Joshua Ginsberg, *Senior Vice President, Global Conservation Program, Wildlife Conservation Society, New York*

Scale is a critical variable in both design and conservation planning. In this paper, I examine two aspects of scale as it relates to species-focused conservation efforts. I address how order of magnitude changes in geographic extent influence the conservation targets and concerns that conservationists address for individual species, particularly terrestrial vertebrates. At the smallest scale, in captive and extensive breeding facilities (0–10km²), genetics and demographic stochasticity of small populations dominate both conservation science and management. Management of species in small-scale facilities typically focuses on display and education; breeding for species recovery; or breeding to enhance an economic use of wildlife (e.g. hatcheries). At somewhat larger scales (10–100km²), conservationists focus on active management of threats that reduce population persistence, and the active management of small metapopulations becomes more critical. Many protected areas occur at scales of 1,000–10,000 km²: at this scale, conservation focus shifts from intervention at the species level, to greater attention to the management of habitat and threats at the scale of landscapes. Management efforts at scales of greater than 10,000 km² focus on larger landscape-level planning and policy efforts, emphasizing the matrix between and among protected areas and the connectivity of areas of relatively low human influence. Here conservationists tend to use species to plan conservation programs, or as metaphorical tools to engage real and epistemic communities in conservation efforts, across political boundaries. Such generalizations about scale, while mostly supportable, are highly influenced by the biology of individual species. In closing, I will note how individual

requirements—particularly home range size—affect species persistence as organisms interact with human activities and suggest that greater nuance is required when looking at issues of spatial extent and wildlife persistence.

Joshua Ginsberg is currently Senior Vice President and Deputy Chief Conservation Officer at the Wildlife Conservation Society. He spent 15 years working as a field biologist across East and Southern Africa leading a variety of mammal ecology and conservation projects. As Director of the Asia and Pacific Program at the Wildlife Conservation Society from 1996 until September 2004, Josh oversaw 100 projects in 16 countries. Dr. Ginsberg was also Acting Director of the WCS Africa Program for 10 months in 2002 and Vice President for Conservation Operations from 2003–2009. He received a B. Sc. from Yale, and holds an M.A. and Ph.D. from Princeton in Ecology and Evolution. He served as the Chairman of the NOAA/NMFS Hawaiian Monk Seal Recovery Team from 2001–2007. Dr. Ginsberg has held faculty positions at Oxford University and University College London, and is an Adjunct Professor at Columbia University where he teaches conservation biology and international relations of the environment. He has supervised 14 Masters and four Ph. D. students. He is an author on over 50 reviewed papers, and has edited three books on wildlife conservation, ecology and evolution.

Biodiversity of Wildlife Habitats as an Educational Resource: Two case studies, Alice Springs Desert Park and Cambodia Wildlife Sanctuary

Stuart Green, *Principal, Landscape Architect, Green & Dale Associates, Melbourne, Australia*

The Alice Springs Desert Park in Central Australia is a successful example of landscape design for biodiversity. It brings together botanical, zoological and ethno-biological elements which provide a rich educational experience for the visitor. The plant habitat regimes include riverine, sand dune desert and dry woodland areas. The zoological element entails protection of wildlife from predators with the design of 'habitat immersion' animal enclosures. The visitor's experience is enriched by the stories told by the indigenous park rangers and guides, who, as custodians of this park, have an extensive knowledge and appreciation of the wildlife and its Central Australian habitats.

The Cambodia Wildlife Sanctuary is located within one of the largest and richest surviving examples of the Indochinese dry forest habitat. The design objective of this project is to conserve the existing natural habitats of the region's wildlife. The urgency to protect wildlife by preventing wholesale deforestation and poaching in this area cannot be understated. In the expansive sanctuary prey and predators will share the same environment. The Sanctuary will be designed as an educational resource for the Cambodian community and for visitors.

The role of design in promoting zoological biodiversity as an educational resource is central to the contrasting projects of Central Australia and Cambodia. Drawing on the experiences of the author as a designer in both projects, this paper discusses the major factors that can influence the success or otherwise of design initiatives that integrate biodiversity conservation with education. These factors include the relative prioritization of education within the project, the local context (social, economic, geographic and political), the type of funding available, access to research and

the designer's ability to work with indigenous communities, investing in them a sense of ownership of the relevant project.

Stuart Green, Landscape architect and principal of Green & Dale Associates, studied Biogeography at University of Manchester, gaining a Bachelor of Arts, then worked as a Landscape Planner specializing in urban redevelopment and landscape planning. He completed a Postgraduate Diploma in Landscape Architecture at the University of Edinburgh. Working in Ireland, Canada, Singapore and settling in Australia where he formed a practice which has been providing specialist skills in the planning and design of parks and zoos for the past twenty years, with an emphasis on preserving and re-creating natural habitats.

Stuart Green has become a leading design specialist in Australia and South-East Asia on zoological planning and design, firstly in the natural habitat of the Australian Bush with the Alice Springs Desert Park, and later in animal conservation in Cambodia, with the Cambodia Wildlife Sanctuary. Other projects such as Trail of the Elephants and the Orangutan Sanctuary, at Melbourne Zoo, are all linked to education and conservation programs in Southeast Asia and Indonesia, all concentrating on the preservation of natural habitat and wildlife. This has involved trips to study habitat of these species, and to gain an understanding of the conflicts regarding wildlife management and the increased pressures of population growth.

Restoring Habitats to Degraded Urban Areas: Dreams and Nightmares

Steven Handel, *Professor of Ecology, Department of Ecology, Evolution, and Natural Resources, Rutgers University*

Patches of native habitat in urban and other degraded areas can advance many ecological services, and biodiversity goals, and are public amenities that are sustainable with relatively low maintenance costs. We have designed a series of experimental plantings in large urban areas (parks, landfills, brownfields) that attempt to restore ecological connections between fragmented remnant habitats. Projects on old landfills in New York City used woodland patches of various scales to test whether the reestablishment of several mutualisms, including seed dispersal and pollination, and habitat complexity can occur quickly. Habitat design work for the new Orange County Great Park in southern California, on a former military air base, includes the landscape goals of linking large existing preserves that are now separated by an extensive suburban zone and of meshing restored habitat complexity and large and small scales with civic needs.

Steven Handel studies the potential to restore native communities to many habitats, adding sustainable ecological services, biodiversity, and amenities to the landscape. He has explored pollination, seed dispersal, growth patterns, and most recently, problems of urban and heavily degraded lands. He works with both biologists and landscape designers, trying to improve our understanding of restoration protocols and applying this knowledge to public projects. Dr. Handel was an undergraduate at Columbia College and then received his M.S. and Ph.D. in ecology and evolution at Cornell University. Prior to his appointment as a professor of ecology and evolution at Rutgers University in 1985, he was a biology professor and director of the Marsh Botanic Garden at Yale University. Also, since 2006, he has been selected as an Adjunct Professor of Ecology at the University of California at Irvine. He serves as Director of the Center

for Urban Restoration Ecology, a joint initiative of Rutgers and the Brooklyn Botanic Garden, dedicated to rebuilding native habitats throughout the region.

Dr. Handel is an Aldo Leopold Leadership Fellow of the Ecological Society of America, and has been an editor of the journals *Restoration Ecology*, *Evolution*, and *Urban Habitats*. For his scientific achievements, he has been named as a Fellow of the American Association for the Advancement of Science (AAAS), of the Australian Institute of Biology, and of The Explorers Club. He was elected an Honorary Member of the *American Society of Landscape Architects in 2007* for achievements of national or international significance or influence to that profession. In 2009, he received ASLA Honor Awards for Research and for Analysis and Planning. He has worked on the planning of ecological restoration in major urban areas, including the Fresh Kills landfill and new Brooklyn Bridge Park in NYC, The Duke Farms Foundation's 2,700 acre holdings in New Jersey, the landscape for the 2008 Olympic Games in Beijing, and new public parks in Dublin, Ireland and in Orange County, California.

Climate Change and Biodiversity in Urban Regions

Kristina Hill, *Associate Professor and Chair, Dept. of Landscape Architecture, University of Virginia*

Urbanization is one of the leading causes of biodiversity loss worldwide, and is predicted to be a very important factor in the future along with the conversion of native ecosystems to crops, and regime shifts associated with climate change. Designed landscapes have contributed to improved performance in urban regions, in spite of the overall negative impacts of urbanization on wildlife. In the most open-minded sense, cities could be thought of as a relatively new land cover type that has not yet reached its full potential as a component of stable, relatively diverse regional landscapes. But active human learning and well-informed design agency is required in order for cities to reach this potential. Several cities have begun to implement better design approaches and offer lessons learned to other metropolitan regions, in relation to both terrestrial and aquatic biodiversity. Others have discovered that the more frequent droughts and increased flooding that will accompany climate change in many regions may alter their role in bioregional dynamics, requiring the city to act as a refuge during extreme events. I will review leading examples of the role of design in supporting biodiversity in cities, and then place these in the context of climate change as both a driver of and a limit on urban biodiversity.

Kristina Hill is a scholar, teacher, and consultant who specializes in understanding the ecology of urban regions and developing design strategies to improve urban performance. She is primarily interested in altering water systems in coastal cities to support biodiversity and address social justice concerns. Her recent work has addressed the influence of climate change trends on the selection of strategies for urban adaptation. She has consulted and engaged in research on urban water systems internationally, as well as in Seattle, New Orleans and New York City. She was an editor and author of *Ecology and Design: Frameworks for Learning*, with Bart Johnson, published by Island Press in 2002, and has authored numerous articles and book chapters on the subject of urban design and ecology. Her current writing project is a book on adaptation of urban water systems. Kristina holds a PhD from Harvard University in Landscape Architecture and ecology, a Master's in Landscape Architecture from Harvard's Graduate School of Design, and

an undergraduate degree in geology. She has taught as a member of the faculty at the Massachusetts Institute of Technology, the University of Washington, and Iowa State University. Currently, she is an associate professor and Chair of the Department of Landscape Architecture at the University of Virginia. She is also a member of the Research Committee of the US National Academy for Environmental Design.

'That's real meat': Birds, native people, and conservation

Shepard Krech III, *Professor of Anthropology, Brown University*

I wish to focus on the interface between birds and native people in hope of shedding some light on a set of linked issues concerning wild areas as gardens, the animals (birds) and people that inhabit them, and indigenous thought and action. Often threatened in the past, birds face an even more calamitous future because of demography, globalization, and climate change. Pressures are undeniable yet vary. Of all human beings, indigenous people have often been thought to possess a caring attitude toward nature, including birds. Yet have they been caring toward birds and how has this translated into action? Is it possible to draw any conclusions regarding indigenous thought about birds or action toward them? Indigenous environmental thought—indeed, indigeneity itself—are problematic, and the intersection of native people and birds, especially on conservation given perceived human needs and desires and the extension of the interface from the gut to the mind, is complicated.

Shepard Krech III is trained as an anthropologist and has conducted ethnography in the North American arctic among the Gwich'in, as well as historical and material cultural research in archives and museums on two continents. In recent years he has written on the intersections of indigenous people, ecology, and conservation; publications include *The Ecological Indian: Myth and History* (1999), *Encyclopedia of World Environmental History*, edited with Carolyn Merchant and John McNeill (2004), and *Spirits of the Air* (2009) on native people and birds in the American South. He is currently professor of anthropology and director, Haffenreffer Museum of Anthropology, Brown University; and serve as a trustee of the National Humanities Center.

Adaptive Infrastructure: Network Strategies for Urban Ecology

Nina-Marie Lister, *Associate Professor, School of Urban and Regional Planning, Ryerson University, Toronto*

Influenced by the rise of ecological systems science, there is a renewed interest in landscape as a medium of design agency, coupled with a growing recognition of landscape as a hybrid cultural-natural form. Central to this concept is the role of ecology as an agent of urban development, with the broader implication of elevating ecology from 'subservient science' to 'design partner'. In the past two decades, designers of urban projects have become increasingly fascinated with the science of living systems as both instrument and metaphor. From the large scale performative, operational designs for urban parklands in former brownfields and derelict spaces to the 'designer

ecologies' being deployed in small city sites, ecology is now central to the vocabulary and language of the contemporary urban(ising) landscape. The recent rapprochement of ecology with landscape, planning, and urbanism is underscored by a growing recognition of the deterioration and fragmentation of natural habitats and associated decrease in biological diversity and loss of ecological function. As ecological systems are increasingly understood to be dynamic, complex and uncertain, concomitant strategies for ecologically-relevant planning, design, and management must necessarily center on concepts of adaptation to change, and resilience rather than permanence—concepts that, until recently, have been principally useful as design heuristics rather than as empirical models. This paper explores recent speculative and empirically-driven responses to the challenge of ecological design. Adaptive infrastructures at several sites within an urban(ising) landscape are considered: bridge, edge and node infrastructures build resilience through stratifying, diversifying, and (re)connecting a landscape system through an emphasis on gradients rather than equilibrium points. As such, adaptive infrastructures articulate landscape and ecological processes as drivers of design, rather than merely relics of site and context. These projects further suggest that ecology may be a primary agent in ordering and framing the contemporary metropolitan landscape, renewing habitats and (re)activating resiliency.

Nina-Marie Lister is Associate Professor of Urban + Regional Planning at Ryerson University in Toronto, and Visiting Associate Professor at Harvard University's Graduate School of Design. A Registered Professional Planner (MCIP, RPP) with a background in ecology, Lister is the founding principal of plandform, a creative studio practice exploring the relationship between landscape, ecology, and urbanism. Her research, teaching and practice focus on the confluence of landscape infrastructure and ecological processes within contemporary metropolitan regions. She is co-editor of *The Ecosystem Approach: Complexity,*

Uncertainty, and Managing for Sustainability (Columbia University Press, 2008), and author of a variety of scholarly papers and articles related to adaptive complex systems as a context for biodiversity conservation, productive landscapes, and post-industrial parklands. Her research and professional work have contributed to several notable exhibitions in visionary planning and design, most recently at the Van Alen Institute in New York and the Canadian Centre for Architecture in Montréal. Lister is currently serving as the Professional Advisor for ARC: an International Design Competition for a major wildlife crossing structure in Colorado www.arc-competition.com.

A Coupled Human and Natural Systems Approach to Research and Design: The Case of Wolong Nature Reserve for Giant Pandas

Jianguo (Jack) Liu, *Rachel Carson Chair in Sustainability & University Distinguished Professor*, Center for Systems Integration and Sustainability, Michigan State University

Coupled human and natural systems (CHANS) are systems in which humans and natural components interact. The CHANS approach emphasizes dynamics of reciprocal interactions and feedback loops between human and natural systems. This talk presents an overview of a long-time study on a CHANS—Wolong Nature Reserve of southwest China. Wolong is one of the largest homes to wild giant pandas. It is also home to more than 4,500 local residents in approximately 1,100 households. The reserve is 200,000 ha, and since its establishment in 1975,

the number of people has increased by almost 80%. During the same time, the number of households has increased by approximately 180%, because the average household size (number of people per household) has declined rapidly. Various human-nature interactions in the reserve, such as agriculture and fuelwood collection for the increasing population and number of homes and increased tourism, have occurred and severely affected panda habitat. To protect and restore the habitat, the Chinese government has been implementing three major conservation policies since the early 2000s. These policies were helpful in reducing habitat destruction and restoring panda habitat. However, the habitat recovery process had a setback with the 2008 Wenchuan earthquake, which also caused several dozen deaths and severe damage to infrastructure, including roads and buildings. Post-earthquake reconstruction efforts, such as relocation of households closer to the main road and further promotion of tourism, may generate new impacts on both socioeconomic and ecological dynamics. Research in Wolong has produced important insights into complex interactions among panda habitat, people, and policies. Ideas and methods developed in Wolong have also inspired research at the regional, national, and global levels. For instance, habitat research across the entire geographic range of the panda helps identify spatial differences in habitat distribution and areas for new nature reserves and corridors. Another example is a study of 141 countries that indicates the number of households has been increasing much faster than population size globally, similar to the pattern in Wolong. Results from long-term CHANS research are essential for timely and effective design of wildlife habitat, as shown in the planning for post-earthquake reconstruction in Wolong. However, long-term consequences of design and planning on humans and wildlife also need to be evaluated using the CHANS framework through interdisciplinary collaborations between scientists, designers, planners, residents, and other stakeholders.

Dr. Jianguo (Jack) Liu is a human-environment scientist and sustainability scholar. He is the Rachel Carson Chair in Sustainability and University Distinguished Professor in the Department of Fisheries and Wildlife at Michigan State University (MSU). He also directs the Center for Systems Integration and Sustainability. Dr. Liu has been with MSU since completing his postdoctoral work at Harvard University. He is also a guest professor at the Chinese Academy of Sciences and a visiting scholar at Stanford (2001–2002), Harvard (2008), and Princeton (2009). Dr. Liu is particularly keen to connect seemingly unconnected issues (e.g., divorce and environmental sustainability). His broad research interests include household-environment interactions, complexity of coupled human and natural systems (CHANS), sustainability science, China's environment, and globalization. He takes a holistic approach to addressing complex human-environmental challenges through systems integration (i.e., integrating multiple disciplines such as ecology and social sciences). His work has been published in journals such as *Nature* and *Science*, and has been widely featured in the global news media. Dr. Liu has served on various international and national committees and panels. He is president of the U.S. Regional Association of the International Association for Landscape Ecology (US-IALE). In recognition of his efforts and achievements in research, teaching, and service, Dr. Liu has received many awards, such as the Guggenheim Fellowship Award, CAREER Award from the National Science Foundation, Distinguished Service Award from US-IALE, and Aldo Leopold Leadership Fellowship from the Ecological Society of America.

Biodiversity, Ecosystem Functioning, and Ecosystem Services: A Useful or Useless Construct for Wildlife Habitats?

Shahid Naeem, *Professor of Ecology and Chair, Department of Ecology, Evolution and Environmental Biology, Columbia University*

In the mid 1990s, ecologists reversed the central question of ecology, but this radical paradigm shift has had little impact on conservation. Beginning in the 1920s, the central focus of ecology was explaining how environment governed patterns in species distributions and abundances, but in the 1990s, as global awareness of biodiversity loss grew, the idea that patterns in the distribution and abundance of species could govern environment, the exact opposite of prevailing views, became a new theme. New studies and theories argued that the function of ecosystems was governed by the diversity of their biota and today, after much debate, two central principles have emerged. First, the magnitude of ecosystem functioning, such as how much carbon dioxide it sequesters, is governed by biodiversity. Second, the robustness of ecosystems, or how resistant, resilient, and steady carbon storage of an ecosystem is in the face of perturbation, is also governed by biodiversity. Because ecosystem services, or the benefits people derive from ecosystems, are derived from ecosystem functions (e.g., climate regulation is a service that is derived, in part, from plant sequestration of carbon), it stands to reason that biodiversity and ecosystem services are coupled. In spite of the well established link between biodiversity and ecosystem services, managed ecosystems are growing because of the ecosystem services they provide even though they have little biodiversity, while wildlife habitats, although more diverse and rich in ecosystem services, are shrinking. A recent review by Martin Solan and colleagues suggests little impact of the new paradigm in ecology on conservation in spite of 15 years of research consisting of over nine hundred published scientific studies. Is this lack of impact because the link between biodiversity and ecosystem services is useless for wildlife habitat conservation, or is it a useful construct, but poorly understood? Looking closely at the research and its implications, I suggest it is the latter.

Dr. Shahid Naeem is a tenured professor of ecology at Columbia University and Chair of the Department of Ecology, Evolution and Environmental Biology. He is also a fellow of the American Association for the Advancement of Science and an Aldo Leopold Leadership Fellow. His area of expertise is in the ecological consequences of biodiversity loss, and his work has demonstrated how the loss of species affects the stability of ecosystems. Dr. Naeem earned his masters and doctoral degrees from the University of California at Berkeley. He has authored numerous scientific articles, research papers and textbook chapters on issues in conservation, ecosystem functioning, restoration and biodiversity. He is also a recent recipient of Columbia University's prestigious Lenfest Prize and a recipient of the Ecological Society of America's Mercer Award.

Edging into the Wild

Harriet Ritvo, *Arthur J. Conner Professor of History, Massachusetts Institute of Technology*

The analogy between artificial selection of domesticated animals and natural selection of wild animals that opens *On the Origin of Species* is a powerful rhetorical component of Darwin's

argument. But the analogy is far from complete. An examination of his later work, *The Variation of Animals and Plants under Domestication*, gives detailed evidence of Darwin's awareness of this problem. And of course, Darwin's difficulty was not unique. The definition of wildness has varied greatly from time to time, from place to place, and even within a single culture. Historically, both wildness and domestication have defined very different ways of living for different kinds of animals. Within our own culture the borderline between the wild and the alternative has, like many others, become increasingly blurred. This ambiguity emerges in a variety of situations: for example, debates about indigenous or native versus introduced or alien species; about the goals of restoration projects (that is, what point in the history of a site or system is the original wild state); about whether animals possess some essential wild character that is eroded through human contact; about the taxonomic relationship between domesticated animals and their wild ancestors; and about whether hybridization enhances domestic populations or contaminates wild ones.

But in a world where human environmental influence extends to the highest latitudes and the deepest seas, few animal lives remain untouched by it.

Recently, as the valence of the wild has increased in response to perceived threats, its definition has become more obviously a matter of assertion rather than description.

Harriet Ritvo is the Arthur J. Conner Professor of History at the Massachusetts Institute of Technology, where she teaches courses in environmental history, British history, and the history of human-animal relations. She is also the president of the American Society for Environmental History. Her books include *The Animal Estate: The English and Other Creatures in the Victorian Age*, *The Platypus and the Mermaid, and Other Figments of the Classifying Imagination*, *The Dawn of Green: Manchester, Thirlmere, and Modern Environmentalism*, and *Noble Cows and Hybrid Zebras: Essays on Animals and History* (forthcoming).

Conserving for the Future: Design Without Borders

Kari Stiles, *Associate, Jones and Jones Architects, Landscape Architects, Planners, Seattle, WA*

Conservation of zoological biodiversity from the local to the global scale will require a multi-faceted approach to design and planning. At one end of the spectrum, lands and waters providing high quality habitat will need to be preserved and protected from physical human access. At the other, a diverse array of habitat types will need to be reconstructed or newly synthesized to fill in habitat gaps resulting from severely damaging and destructive land uses. In between, an infinite number of design solutions will be employed to preserve, restore and create site-scale structural and process elements critical to the survival of zoological species. Regardless of the design approach taken, successful sites will be those that do not exist in isolation: They will also function as contributors to an integrated matrix and they will recruit people to be active players in conservation by inspiring stewardship at a variety of spatial and temporal scales.

Using case studies from recent work at Jones & Jones, this paper argues that landscape designers are uniquely positioned to influence critical dialogues that will ultimately define where, how and to what extent site-scale design will contribute to conservation of zoological diversity: At the

regional scale a team of designers and planners is working with the Puget Sound Partnership to develop a conservation management framework for the Puget Sound Basin that maximizes conservation opportunities and ecological health within the context of human land use and behavior. At the municipal scale we are working with the City of Seaside, Oregon to design an open space and interpretive plan that refocuses attention on the city's position within a relatively intact, salmon-bearing estuary system. Along the US highway 93 corridor, between Missoula and Flathead Lake, the Western Transportation Institute is monitoring the performance of a string of 42 wildlife crossings designed by Jones & Jones. With various private partners, we are working to develop regional conservation and stewardship frameworks that facilitate protection of wildlife habitat while providing site-specific and network-scale recreation opportunities.

Kari Stiles is a landscape designer and planner at Jones & Jones Architects + Landscape Architects + Planners. With a PhD in Botany and Masters in Landscape Architecture from the University of Washington, her work focuses on the integration of ecological understanding in site and regional scale design and planning, and the interpretation of ecological understanding for diverse audiences. Prior to joining Jones & Jones in 2008, Kari held positions as lecturer or adjunct faculty in the Departments of Biology and Landscape Architecture at the University of Washington, the Department of Architecture and Landscape Architecture at the University of Virginia, and the Department of Herbal Medicine at Bastyr University. Committed to the creation of places that are equally respectful of the land and its people, her work is also heavily informed by her experience working with local community groups as the Neighborhood Park Program Director for the Seattle Parks Foundation and Executive Coordinator for the Friends of Seattle's Olmsted Parks.

Biodiversity and Farming: Defining a role for contemporary landscape architecture that encourages plant and wildlife biodiversity within the context of productive agricultural land.

Thomas Woltz, *Partner, Nelson Byrd Woltz Landscape Architects, Charlottesville, VA*

The face of agriculture has changed dramatically since World War II. Current practices in industrial agriculture, agribusiness, genetic modification, chemical crop management, and massive automated operations are in dramatic conflict with biodiversity, wildlife health, public health, and even the identity of community as it relates to sources of its food. Historically, physical landscape features such as hedgerows, vernal pools, stone walls, wetlands, and woodlots were present on many farms and supported and encouraged wildlife biodiversity. Contemporary farming practices have erased many of these features and rendered the land inhospitable to creatures with millennial histories of migration, breeding, and colonization allowing opportunistic species to flourish unchecked.

This presentation will primarily address two current projects: Nick's Head Station on the north island of New Zealand (3,000 acres) and Oakencroft Farm in Virginia (300 acres). Both are examples in which the skills and sensibilities of contemporary landscape architecture are employed in collaboration with teams of scientists to design structures and systems that integrate sustainable agriculture with best management practices for conserving wildlife and other ecological systems. The master plan of Nick's Head Station addresses the reconstruction of a 50-

acre wetland that was drained in the 20th century to maximize sheep-grazing land; the construction of a predator-proof fence enclosing 120 acres to encourage nesting of threatened migratory birds and eventually the re-introduction of the endangered *Tuatara*; the integration of shelter belts (protection for citrus cultivation) as wildlife corridors; and the reforestation of marginal lands to re-create native, temperate rainforest habitat that once covered the north island of New Zealand.

The master plan of Oakencroft Farm in Virginia converts conventional grape cultivation for wine into sustainable, organic grape juice and vegetable production; reconfigures an open grazing pasture into an intensively grazed grass-fed cattle operation; and establishes sustainable hay production. The master plan also incorporates several restoration strategies to increase biodiversity including the regrading of farm ponds to accommodate a broader range of amphibians and reptiles; reconstruction of vernal pools; stabilization of eroded creek corridors; management of invasive plants in woodlands and hedgerows; and establishment of warm and cool season grasslands.

These two master plans operate at very different scales and address the specific needs of very different wildlife ecological systems but they share the common goal of encouraging the greatest possible biodiversity in the context of productive, sustainable farming operations. Both projects have been the fruit of exceptional collaborations between scientists (wetland biologists, conservation biologists, forest ecologists, etc.) and designers to imagine a model for balancing biodiversity and farming.

Thomas Woltz is a principal and co-owner of Nelson Byrd Woltz Landscape Architects, a 30-person design practice in Charlottesville VA and New York City. Woltz holds masters degrees in Architecture and Landscape Architecture from the University of Virginia where he has taught part-time for 14 years. NBW has designed a broad array of public and private projects including botanic gardens and zoos, academic and corporate campuses, and town planning. Woltz recently developed the Conservation Agriculture Studio around a family of projects that employs the sensibilities of contemporary landscape architecture to integrate sustainable agriculture with best management practices for conservation of wildlife and natural resources.

Integration across Scales: Landscape as Infrastructure for the Protection of Biodiversity

Kongjian Yu, *Professor of urban and regional planning, and founder and dean of the Graduate School of Landscape Architecture, Peking University, Beijing, China*

In today's changing global climate, the most effective solution for biodiversity conservation is through planning and design of a new Security Pattern. Rigorous security pattern analysis and development for the urban environment will safeguard biodiversity and lead to more innovative approaches for the preservation of critical ecological processes.

A holistic understanding and protection of a species' wide range of habitats instead of protecting an isolated natural area will ensure long-term environmental sustainability. The rapidly expanding human demand for agricultural and urban land requires the protection of a vast network of integrated natural habitats. How can we minimize land consumption and enhance

spatial pattern planning and design so that urbanization can coexist with natural processes and biologically diverse habitats?

Ecological Infrastructure (EI) is a new vision within Landscape as Infrastructure. The concept of Landscape as Infrastructure can be traced to the pre-scientific model of *Feng-shui*- the sacred landscape setting for human settlement. The 19th century notion of greenways as urban recreational spaces, the early 20th century idea of greenbelts to limit sprawl, and the late 20th century movement of connecting ecological networks to preserve biodiversity, all strive to balance man and nature. EI is designed to strategically integrate critical landscape elements and structures to safeguard nature's assets such as biodiversity, species flow, hydrologic and geologic processes, and heritage corridors. The strategy of EI is to plan and develop land more effectively by preserving valuable ecosystem services.

From broad-scaled planning of the National Ecological Infrastructure of China, to the regional-scale Ecological Infrastructure of Beijing, to the fine-scale urban park restoration, the powerful tool of Landscape as Infrastructure presents a new opportunity to protect nature's processes within biologically diverse habitats.

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