Status of Pollinators: Monitoring and Prevention of their Decline in North America

Committee

May R. Berenbaum

Chair

May Berenbaum is Swanlund Chair of the Entomology Department, University of Illinois. She is internationally known for her contributions to the field of chemical ecology. Dr. Berenbaum joined the Illinois faculty in 1980 and became head of the Department of Entomology in 1992. She specializes in the chemical interactions between insects and plants. Dr. Berenbaum is a member of the National Academy of Sciences and a fellow of several scientific societies, including the American Academy of Arts and Sciences. In 1996, she was recognized for her commitment to teaching and fostering scientific literacy with the Entomological Society of America North Central Branch Distinguished Teaching Award. She was appointed chair of the Board on Agriculture and Natural Resources in March, 2003. Dr. Berenbaum attended graduate school at Cornell University and received a Ph.D. in ecology and evolutionary biology in 1980.

Peter Bernhardt

Member

Peter Bernhardt is Professor at the Department of Biology St. Louis University and an Associate of both the Missouri Botanical Garden and the Royal Botanic Garden of Sydney. He received his Ph.D. in Botany from the School of Botany, University of Melbourne, Victoria, Australia. Since 1976, Dr. Bernhardt's fieldwork has specialized in the ecology of animal-pollinated angiosperms in relation to the compatibility (SI) systems. In North America, Dr. Bernhardt's studies included work on insect-pollinated Erythronium, Hepatica, Tolmeia, Penstemon and Xerophyllum spp. His lab is currently under contract with the USDA-Forestry Services (Corvallis, Oregon) to complete projects on the pollination of three Potentilla spp., Paeonia brownii and Cypripedium montanum. Dr. Bernhardt teaches a series of plant science courses at St. Louis University including Pollination Biology (BLA-404) and The Biology and Classification of Orchids (BLA-421).

Stephen Buchmann

Member

Stephen Buchmann is President and Founder of The Bee Works, LLC, an environmental consulting company in Tucson, Arizona. He is also an adjunct professor of Entomology in the Entomology Department at the University of Arizona in Tucson and a research associate in the Department of Ecology and Evolutionary biology at that same institution. He was a research entomologist with USDA-ARS for 22 years at the Carl Hayden Bee Research Center in Tucson, AZ. Dr Buchmann is recognized as a world authority on pollinating animals, especially native bees having conducted primary research on bees, crop plants and native flowering plants in 15 countries on three continents. Buchmann is most known for his pioneering research on "buzz pollination", including economically valuable plants as blueberries, cranberries, chile peppers, kiwi fruit and tomatoes. He is the author of more than 175 scientific publications and 5 books (including "The Forgotten Pollinators" in 1997 with Gary Paul Nabhan, and most recently "Pollinators of the Sonoran Desert" and "Letters from the Hive". He earned his doctorate in entomology (minor in botany and pollination ecology) from the University of California at Davis. Dr. Buchmann holds other honorary research positions including senior researcher at the Arizona-Sonora Desert Museum, research associate in Entomology at the American Museum of Natural History in NYC, and with the Smithsonian Institution.

Nicholas W. Calderone

Member

Nicholas W. Calderone is Director of the Cornell University Dyce Laboratory for Honey Bee Studies. He has responsibilities in research, teaching and extension and continues to work on methods for controlling parasites and pathogens of honey bees. His current research involves the development of an Africanized-free population of honey bees with resistance to both parasitic mites and several honey bee pathogens. Dr. Calderone received his M.S. and Ph.D. from The Ohio State University. After receiving his degrees, he worked for seven years with the USDA-ARS Bee Research Lab in Beltsville, MD where he focused on the biology of Varroa destructor and IPM methods for control of parasitic mites in honey bees. Dr. Calderone has authored over 40 peer-reviewed research articles and over 30 extension articles on honey bee management. In 2000, he co-authored an article on the value of honey bee pollination to U.S. agricultural production. He has also developed a Master Beekeeper Program serving beekeepers throughout the northeastern U.S.

Paul Goldstein

Member

Paul Goldstein is currently Assistant Curator of Lepidoptera at the McGuire Center for Lepidoptera and Biodiversity of the Florida Museum of Natural History in Gainesville. Before moving to Florida, Dr. Goldstein was Curator in the Division of Insects at the Field Museum of Natural History in Chicago, IL, where he presided over the collection of Lepidoptera and served as one of the principal investigators in the Pritzker Laboratory for Molecular Systematics. Dr. Goldstein's primary research has focused on the evolution of host plant associations in herbivorous insects, particularly moths, as well as on the intricacies of conservation genetics and invertebrate conservation and monitoring programs in unusual plant communities, such as prairies and pitch pine/scrub oak barrens. Since 1986, Dr. Goldstein has devoted many of his conservation efforts to the Massachusetts coastline and offshore islands, where he continues to work on such projects as the conservation genetics of the Northeastern Beach Tiger beetle, the reintroduction of the Imperial Moth, and the use of assemblages of threatened moths and butterflies to set landscape-level conservation priorities.

David W. Inouye

Member

David W. Inouye is Professor in the Department of Biology at the University of Maryland, College Park. He was an undergraduate (zoology, 1971) at Swarthmore College and received his Ph.D. (zoology, 1976) from the University of North Carolina. He directs the graduate program in Sustainable Development and Conservation Biology at the University of Maryland, teaches courses in ecology and conservation biology, and currently supervises 6 Ph.D. students. From 1988-90 he was Director of the University of Colorado's Mountain Research Station. Dr. Inouye has conducted field research at the Rocky Mountain Biological Laboratory (Colorado) since 1971, where he has studied resource partitioning in bumblebees, pollination biology, plant demography, and ant-plant mutualisms. His current focus is on long-term (since 1973) studies of variation in the phenology and abundance of flowering by wildflowers, to identify the effects of environmental variables and climate change on flowering, and the consequences for consumers of this variation in flowering. He has also done research on pollination biology in the Snowy Mountains in Australia and Panama, and field work in South Africa, Austria, and Costa Rica. He is co-author of the book Techniques for Pollination Biologists, a member of the Steering Committee of the North American Pollinator Protection Campaign, a member of the Task Force on Declining Pollination Services, of the Species Survival Commission of the IUCN (The World Conservation Union, and Secretary of the Governing Board of the Ecological Society of America.

Peter Kevan

Member

Peter Kevan is Professor in Environmental Biology and in Botany at the University of Guelph, Ontario, Canada. His experience in pollination started with his studies in the Canadian High Arctic. Since graduating with his doctorate in 1970, Dr. Kevan has worked widely throughout the world on pollination ecology. His tropical experiences range from Asia, the Americas, Africa, and Australia. In temperate regions, he has worked in Canada, USA, and Europe. He has also worked extensively in natural, agricultural, plantation, and forest pollination problems, with special emphasis in practical and conservation issues. His research in the 1970s on the demise of pollinators caused by insecticides in New Brunswick, Canada stimulated serious considerations about the consequences of pesticide applications in forestry. He is presently chair of the Task Force on Declining Pollination of the IUCN, actively involved in initiatives in pollination stemming from the Convention on Biological Diversity, and a member of the Steering Committee for NAPPC.

Claire Kremen

Member

Claire Kremen is an Assistant Professor in the Department of Environmental Science, Policy and Management at the University of California, Berkeley and an Associate Conservationist with the Wildlife Conservation Society. She previously was an Assistant Professor in the Department of Ecology and Evolutionary Biology Department at Princeton University. Her primary interest is to use biological, social and economic data to develop conservation plans that benefit both the environment and people. Within conservation biology, she has studied a wide array of topics, including the economics and ecology of ecosystem services, sustainable forestry, ecology and biogeography of tropical butterflies, population biology of lemurs, and ecological monitoring. Her work reaches from theory to practice and includes hands-on conservation action. From 1993-1997, she designed and helped to establish Madagascar's largest National Park on the Masoala Peninsula. Her current research examines the functional links between the spatial distribution of wildlands, the composition of wild bee communities, farm management practices, and the delivery of pollination services to agriculture in California and New Jersey. She is leading an NCEAS working group that is using models and meta-analysis to predict how to restore pollination services in degraded landscapes. She is also working with a variety of organizations in Madagascar to establish a national conservation-planning tool by accumulating data on species occurrences, developing predictive models of species distributions, and conducting conservation analyses. She received her Ph.D. in Zoology from Duke University in 1987 and her B.Sc. in Biology from Stanford University in 1982. She is a scientific advisor for several conservation organizations and sits on the Editorial Board of Conservation Biology. She is a 2001 recipient of the McDonnell 21st Century Research Award.

Rodrigo Medellin

Member

Rodrigo A. Medellín is Head of the Department of Ecology and Biodiversity in the Institute of Ecology at the National Autonomous, University of Mexico. He is also adjunct professor at Columbia University in New York and Associate Researcher at the American Museum of Natural History and the Arizona-Sonora Desert Museum. He has studied and worked on the ecology and conservation of mammals in Mexico for over 25 years. After completing his undergraduate studies at the University of Mexico he obtained his Ph.D. from the University of Florida. Working in diverse settings in the field from rainforests to deserts to montane forests, he uses a diverse approach including community ecology, plant-animal interactions, population biology, and more recently, molecular ecology. He has produced more than 70 publications including over 40 scientific papers in international journals and six books and book chapters on bat ecology and conservation, mammal diversity analyses, and conservation of large mammals. Rodrigo was head of the Wildlife Department of the Mexican Federal Government in 1995-96. He has been President of the Mexican Society of Mammalogists, served as Chair of the Committee for International Relations and currently chairs the Latin American Fellowship Committee of the American Society of Mammalogists, and has been a member of the Board of Directors of the same society for six years and was reelected in June, 2004 for a third 3-year term. He is a member of the Scientific Advisory Board of Bat Conservation International, and founder and director of the 10-year-old Program for the Conservation of Bats of Mexico. Rodrigo is currently an Associate Editor for the journals Conservation Biology, ORYX, Acta Chiropterologica, and Mastozoología Neotropical. Dr. Medellín's recent recognitions include: the Whitley Award for International Nature Conservation from the hands of Her Royal Highness, Princess Anne of England (April 2004); the Gerrit S. Miller Award from the North American Society for Bat Research (October 2004); and Mexico's 2004 National Nature Conservation Award presented to him by President Vicente Fox (November 2004).

Taylor H. Ricketts

Member

Taylor Ricketts is the Director of the Conservation Science Program at World Wildlife Fund. His research interests include global patterns of biodiversity and threats, ecological and economic consequences of habitat fragmentation, and interactions between people and nature in agricultural landscapes. At global scales Dr. Ricketts analyzes compiled datasets for insights into (i) why biodiversity is distributed the way it is, (ii) how these patterns relate to those of human threats, and (iii) how this information can improve conservation. Dr. Ricketts' field studies currently focus on the value of tropical forest fragments as sources of wild pollinators to surrounding coffee crops. This project is part of a long-term interest in the interactions between habitat fragments and surrounding agricultural areas, and in improving the potential of these landscapes to support native biodiversity. Taylor received his Ph.D. from Stanford University and has received numerous awards for his work from the Society for Conservation Biology, the National Science Foundation, the Summit Foundation, and others.

Gene E. Robinson

Member

Gene E. Robinson joined the faculty of the University of Illinois at Urbana-Champaign in 1989 and is the G. William Arends Professor of Integrative Biology. He is also the Director of the Neuroscience Program, Theme Leader at the Institute for Genomic Biology, and a Professor of Entomology with affiliate appointments in the Departments of Cell & Developmental Biology and Animal Biology and the Beckman Institute of Science and Technology. He has authored or co-authored over 150 publications including almost 20 in Nature, Science and PNAS. He has pioneered the application of genomics to the study of social behavior, spearheaded the effort to gain approval from NIH for the sequencing of the honey bee genome, and heads the Honey Bee Genome Sequencing Consortium. He has sponsored 16 postdoctoral fellows, 20 graduate students, and 70 undergraduate students. His honors include: University Scholar, Fulbright and Guggenheim Fellowships, and membership in the American Academy of Arts & Sciences and the National Academy of Sciences

Allison A. Snow

Member

Allison A. Snow is Professor of Evolution, Ecology, and Organismal Biology at the Ohio State University. She is noted for her expertise in the evolutionary ecology of plant populations, including breeding systems, pollination ecology, and conservation biology. Dr. Snow's current research focuses on hybridization as a stimulus for rapid evolution in weedy and invasive plants. She has published widely in numerous peer-reviewed journals, in addition to having published several technical reports and book chapters on topics such as transgenic crops, pollination ecology, and gene flow. Dr. Snow is an Aldo Leopold Leadership Fellow of the Ecological Society of America and is the current President of the Botanical Society of America. She served on the NRC Committee on Genetically Modified Pest-Protected Plants and the NRC Committee on Biological Confinement of Genetically Engineered Organisms. Dr. Snow received her Ph.D. in botany from the University of Massachusetts in 1982.

Scott Swinton

Member

Scott Swinton is Professor of Agricultural Production Economics and Environmental Management at Michigan State University. He received his MS from Cornell University and PhD from the University of Minnesota. Dr. Swinton teaches agricultural production economics and agribusiness operations management. His economic research on agricultural production and environmental management focuses on technology evaluation and policy analysis. He concentrates on problems involving crop pest and nutrient management, precision agriculture, resource conservation, and management of risks to human health and income. Besides his work on U.S. farming, he is engaged in research on agricultural and natural resource management in Latin America and Africa.

Leonard B. Thien

Member

Leonard Thien is Professor in the Cell and Molecular Biology Department, Tulane University. He received a M.S. in Botany (systematics and evolution) from Washington University, St. Louis and a Ph.D. from University of California, Los Angeles in Botany (evolution). Dr. Thien?s research interests are centered on pollination biology of ancient plants in the ANITA group, basically the first three branches of the flowering plant phylogenetic tree. In this group, Dr. Thien published papers on the pollination mechanisms and population structure of Amborella (sister to all the rest of the angiosperms). In addition he elucidated the pollination mechanisms and breeding systems of Illicium and Trimenia (third branch of the angiosperm cladogram). In North America, Dr. Thien's work includes study of mosquito pollination in orchids (Habenaria in northern Wisconsin and Canada), bee pollination of orchids in the bogs of northern Wisconsin, and beetle and fly pollination of Magnolia in southern United States and Mexico. The Magnolia studies involved gas chromatography and mass spectrometry analysis of floral fragrances of the various species and mapping of the chemical profiles onto DNA constructed cladograms (also conducted for the family Winteraceae in North American and S. Pacific). In 1991, Dr. Thien was elected Fellow, American Association for the Advancement of Science for work with pollination mechanisms in basal (ancient) angiosperms. Currently Dr. Thien is working with a group of Chinese scientists on the pollination of Schisandra (ANITA group, third branch) that occurs in North America and SE Asia. The work involves pollination, construction of a DNA cladogram and an analysis of all aspects of the breeding system.

F. C. Thompson

Member

F. Christian Thompson is Research Entomologist at the Systematic Entomology Laboratory of US Department of Agriculture and Scientist at the Smithsonian Department of Entomology. He received his B.S. and Ph.D. from the University of Massachusetts, Amherst. His research interests lie in the systematics of flower flies (Syrphidae). He also has expertise on flies generally, especially their names and classification. He is an authority on zoological nomenclature. He maintins the Diptera web site and the BioSystematic Database of World Diptera (www.diptera.org. Dr. Thompson's unique expertise in systematics of flower flies and zoological nomenclature is essential to the committee's work. As a research entomologist, Dr. Thompson does not engage in any deliberative, policy-making or other similar processes at USDA that relate to the study.