

Status of Insects in North America

Committee

Scott E. Miller

Chair

Scott Miller is Senior Biodiversity Advisor and Senior Research Entomologist at the Smithsonian's National Museum of Natural History in Washington, D.C. He previously held a series of leadership positions in the Smithsonian Institution central administration, including Deputy Under Secretary for Collections and Interdisciplinary Support, and served as Associate Director for Science at the National Zoological Park and Interim Director of Smithsonian Libraries and Archives. Before joining the Smithsonian, Miller held leadership positions at the International Centre of Insect Physiology and Ecology in Nairobi, Kenya, and the Bishop Museum in Honolulu, Hawaii. Many of Miller's activities focus on mobilizing information from museum collections and libraries, and his research focuses on the integration of systematics, ecology, biogeography, and conservation of insects and plants. He is co-chair of the U.S. Government's Interagency Working Group on Scientific Collections and helped establish and lead the Consortium for the Barcode of Life—an international network developing DNA-based identification tools to make biodiversity information more widely available. He is a Fellow of the American Association for the Advancement of Science and the Royal Entomological Society. Miller received a B.A. in biology from the University of California, Santa Barbara and a Ph.D. in biology from Harvard University.

Yves Basset

Member

Yves Basset is currently staff entomologist at the Smithsonian Tropical Research Institute in Panama. He is also Distinguished Investigator for the National System of Investigation of the National Secretary's Office of Science, Technology, and Innovation (SENACYT) in Panama, a Masters professor of Entomology at the University of Panama, and a faculty member at the University of South Bohemia, Czech Republic. Basset has been researching insect ecology in the tropics for more than 35 years and has been in professional residence in Australia, Hawaii, Papua New Guinea, Guyana, and Panama. He is particularly interested in insect-plant interactions; insect spatial and temporal distribution; community structure; and next generation insect monitoring (DNA metabarcoding, bioacoustics, and automated monitoring of insects). He serves as the Editor-in-Chief of the journal *Insect Conservation and Diversity*. Basset received an M.Sc. in entomology from the University of Neuchâtel, Switzerland and a Ph.D. in entomology from Griffith University, Australia.

May R. Berenbaum

Member

May R. Berenbaum is Maybelle Leland Swanlund Endowed Chair and Head of Entomology at the University of Illinois Urbana-Champaign. Her research focuses on elucidating biochemical and molecular mechanisms underlying interactions among pollinators, herbivores, and host plants, including detoxification of natural and synthetic chemicals, and for applying ecological principles toward developing sustainable management practices for natural and agricultural communities. She is a member of the National Academy of Sciences and serves as Editor-in-Chief of the Proceedings of the National Academy of Sciences. Berenbaum received a Ph.D. in ecology and evolutionary biology from Cornell University. She previously served as chair of the National Academies committee that authored the 2006 report Status of Pollinators: Monitoring and Prevention of their Decline in North America. She is a participant in the North American Pollinator Protection Campaign and has published on pesticide regulation.

David W. Crowder

Member

David Crowder is a professor of entomology and the director of Decision Aid Systems at Washington State University (WSU). Research in his laboratory uses experiments and models to assess the abiotic and biotic factors mediating insect population dynamics in natural and agricultural ecosystems. As the director of the WSU Decision Aid Systems, he also coordinates regional and national monitoring studies of insect pests and invasive species and leverages these data along with site-specific weather data to guide management. His research group has also led global studies examining long-term changes in insect biodiversity on farming systems. Crowder received the Faculty Research and Mid-Career Excellence Awards from WSU in 2023 and the Plant-Insect Ecosystems Award from the Entomological Society of America in 2017, and he was elected as a Fellow of the WSU Teaching Academy in 2020. He is currently an editor for the journal Food Webs. He received a B.S. with high honors and an M.S. in natural resources and environmental sciences from the University of Illinois Urbana-Champaign, and a Ph.D. in entomology from the University of Arizona.

Lenore Fahrig

Member

Lenore Fahrig is Chancellor's Professor of Biology and Gray Merriam Chair in Landscape Ecology at Carleton University, Ottawa, Canada. For decades, Dr. Fahrig and her students have studied the responses of wildlife, including plants, arthropods, birds, amphibians, reptiles, and mammals, to human-altered landscapes. Her research combines simulation modelling with field data to evaluate the effects of habitat loss and fragmentation, road density, and the spatial configuration of farmlands and cities, on species distribution, abundance and diversity. Dr. Fahrig is an International Member of the National Academy of Sciences, a Fellow of the Royal Society of Canada, and a Guggenheim Fellow. She is recipient of the Distinguished Landscape Ecologist Award from the North American Association for Landscape Ecology, the President's Award from the Canadian Society for Ecology and Evolution, the Banco Bilbao Vizcaya Argentaria Foundation Frontiers in Knowledge Award in Ecology and Conservation Biology, and the Herzberg Canada Gold Medal, Canada's top award in Science and Engineering. She completed her PhD in 1988 at the University of Toronto. She previously served on the National Academies committee that authored the 2005 report *Assessing and Managing the Ecological Impacts of Paved Roads*.

Christina M. Grozinger

Member

Christina Grozinger is Publius Vergilius Maro Professor of Entomology, director of the Huck Institutes of the Life Sciences, and founding director for the Center for Pollinator Research and Insect Biodiversity Institute at Pennsylvania State University. She uses an integrative approach—spanning genomics, metagenomics, physiology, behavior, and spatial ecology—to study bee behavior, plant-pollinator interactions, and support management and conservation of bees. She leverages artificial intelligence and citizen science to monitor, model, and forecast how bees and other insect species and communities respond to environmental factors, including land use, weather, and climate. Grozinger is a Fellow of the Entomological Society of America and the American Association for the Advancement of Science. She was awarded the 2021 National Academy of Sciences Prize in Food and Agriculture Sciences and 2023 Penn State President's Award for Excellence in Academic Integration. She currently serves as the chair of the U.S. Department of Agriculture National Agricultural Research, Extension, Education, and Economics Advisory Board Pollinator Subcommittee. Grozinger received a B.S. degree in chemistry and biology from McGill University, an M.S. and a Ph.D. in chemistry and chemical biology from Harvard University and was a Beckman Institute Fellow at the University of Illinois, Urbana-Champaign. She was part of the committee that wrote the Entomological Society of America's Position Statement on Insects and Biodiversity.

Mehrdad Hajibabaei

Member

Mehrdad Hajibabaei is an associate professor in the Department of Integrative Biology and the Chief Scientific Officer of the Centre for Biodiversity Genomics at the University of Guelph and the founder and Chief Scientific Officer of eDNAtec, Inc. Hajibabaei is a molecular evolutionary biologist specializing in environmental genomics, DNA barcoding, metabarcoding, eDNA and bioinformatics. His research focuses on using high-throughput sequencing technologies to assess biodiversity, ecosystems, and environmental change. His work spans fundamental molecular evolution to the development of cutting-edge biodiversity monitoring applications. He has led efforts in integrating eDNA-based biomonitoring into conservation and sustainability initiatives. Hajibabaei has served on several advisory and review panels for major international organizations and funding agencies, such as the UN's Convention on Biological Diversity (CBD) , the Natural Sciences and Engineering Research Council of Canada, Canadian Institutes of Health Research, Mitacs, European Commission (Framework 7), German Science Foundation, Swiss Science Foundation, Dutch Technology Foundation, and UK Natural Environment Research Council. He is an associate editor for BMC Evolutionary Biology, BMC Ecology, and PLoS ONE, and a member of the editorial board for Scientific Reports. Hajibabaei received a B.Sc. in microbiology from Tehran Azad University, Iran and a Ph.D. in biology from the University of Ottawa, Canada.

Chris A. Hamilton

Member

Chris Hamilton is an Associate Professor of arthropod molecular systematics at the University of Idaho. His research aims to answer questions about how Earth's diversity has been shaped by evolution by focusing on integrating phylogenomic, morphometric, ecological, behavioral data, and traditional ecological knowledge (TEK) to establish hypotheses about the generation and maintenance of biodiversity. Hamilton is an expert in spiders and moths, in particular the Mygalomorphae spiders and Bombycoidea moths, and collaborates with researchers on all continents (except Antarctica). He has served as vice president-elect, vice president, and president of the Entomological Society of America (ESA), past president of the ESA Systematics, Evolution, & Biodiversity (SysEB) section, and a proposal reviewer for the National Science Foundation and other external funding agencies and associations. He currently serves as a subject editor for ZooKeys journal and an associate editor for the Zoological Journal of the Linnean Society and the Frontiers in Arachnid Science journal. Hamilton received a B.A. in photojournalism from Western Kentucky University, an M.S. in biology from the University of Texas at Arlington, and a Ph.D. in evolutionary biology from Auburn University.

Jonathan Koch

Member

Jonathan Koch is currently an Adjunct Research Assistant Professor at Utah State University in Logan, Utah. He will start as an Associate Professor with the Pacific Cooperative Studies Unit at the University of Hawai'i at Manoa in August 2025. He is passionate about solving challenges at the intersection of agriculture and insect conservation; his work is centered on pollinator biology, genetics, and insect conservation. In his research he has used population genetics techniques to inform the conservation status of imperiled bumble bee species and is currently identifying the capacity for eDNA, metabarcoding, and computer vision models (AI) to support pollinator monitoring programs on farms and public lands. Moreover, he leads research that applies the principles of agroecology and landscape ecology to examine how pollinators persist in landscapes punctuated by agriculture and wildlands. He actively works with stakeholders to identify the role of community science in monitoring native and non-native bees using ecological statistics and habitat suitability modelling. Koch received a B.S. in environmental science and a B.A. in geography from the University of Hawai'i, Hilo and an M.S. in biology and a Ph.D. in ecology from Utah State University. He has published on the linkages of bumblebee decline with climate, landcover, and pesticides.

Ivette Perfecto

Member

Ivette Perfecto is Bunyan Bryant Professor of Environmental Justice at the School for Environment and Sustainability of the University of Michigan. Her research addresses biodiversity in tropical agroecosystems and is focused on the effects of agricultural intensification, particularly pest control, on biodiversity and the ecosystem services provided by biodiversity in agroecosystems. She conducts research in Mexico and Puerto Rico. Perfecto is a member of the National Academy of Sciences and the American Academy of Arts and Sciences. She received a doctoral honorary degree from Universidad Sagrado Corazón in Puerto Rico and is an elected Fellow of the American Association for the Advancement of Science and the Ecological Society of America. She was a Lead Author of the Latin American Region International Assessments of Agricultural Science, Technology, Development and Knowledge (IAASTD). Perfecto received a B.S. in biology from Universidad Sagrado Corazón, an M.S. in ecology and a Ph.D. in natural resources from the University of Michigan. She is a member of the Executive Board of the Institute for Research and Action in Agroecology.

Jorge Soberon

Member

Jorge Soberón is a University Distinguished Professor in the Department of Ecology and Evolutionary Biology and Senior Scientist in the Biodiversity Institute at the University of Kansas. Prior to joining the University of Kansas, Soberón was a researcher at the Institute of Ecology of the National University of Mexico (1983 to 2005) and was the Executive Secretary of the federal-level Mexican Biodiversity Agency (CONABIO) from 1992 to 2005. His areas of expertise include theoretical population ecology, conservation biology, and informatics and policy for biodiversity. He is a member of the American Academy of Arts and Sciences. Soberón received a B.S. and M.S. in biogeography from the Universidad Nacional Autónoma de México and a Ph.D. in ecology from Imperial College London.

David L. Wagner

Member

David L. Wagner is a professor of ecology and evolutionary biology at the University of Connecticut with core research interests in the biosystematics of Lepidoptera (butterflies and moths), insect decline, and invertebrate conservation, but he has also published on bees, dragonflies, insect behavior, and insect ecology. Much of his current focus is on the consequences of global insect declines, and especially the role of drought as a primary driver of faunal change across arid lands of the American southwest and tropics. Wagner's ecological collaborations anchor to his four decades of hostplant data for North American caterpillars. He and his coauthors have used these data to address matters of ecological specialization, latitudinal diversity gradients, and species packing. Past work has highlighted the importance of early successional habitats to plants, insects, and other wildlife in forested landscapes, as well as studies on imperiled species of butterflies. Wagner received a B.S. in plant science from Colorado State University and a Ph.D. in entomology from the University of California, Berkeley.

Jessica L. Ware

Member

Jessica Ware is a curator at the American Museum of Natural History (AMNH) where she serves as Chair of the Division of Invertebrate Zoology. She was previously a professor at Rutgers University for ten years before moving to the AMNH. Ware is part of a group of researchers evaluating insect decline and her research focuses on the evolution of behavioral and physiological adaptations in insects, with an emphasis on how these occur in Odonata (dragonflies and damselflies) and Dictyoptera (termites, cockroaches, and mantises). She was awarded a Presidential Early Career Award for Scientists and Engineers (PECASE) medal from the U.S. government for her work on insect evolution. Ware served on the Governing Board of the Entomological Society of America, as a director at the Society of Systematic Biologists, and is the past president of the Worldwide Dragonfly Association and the past president of the Entomological Society of America. She is the current president of the Society of Systematic Biologists. Ware received a B.Sc. in invertebrate zoology from the University of British Columbia, Canada and a Ph.D. from Rutgers, New Brunswick. She was an NSF Postdoctoral Fellow.

Wei Zhang

Member

Wei Zhang is a Senior Research Fellow and Research Lead on Ecosystem Health and Biodiversity in the Natural Resources and Resilience Unit at the International Food Policy Research Institute. In the CGIAR 2022-2024 Research Portfolio, she co-led the Research Initiative “Low-Emission Food Systems” and directed the “Living Labs for People” Work Package and was also the biodiversity focal person for the Environmental Health and Biodiversity Impact Platform. She leads the Area of Work on Institutions and Policies in the Multifunctional Landscapes Science Program under CGIAR 2025-2030 Science and Innovation Portfolio. Zhang conducts policy-relevant research at the intersection of agriculture, development, and nature/environment and her research interests include economics and behavior of ecosystem service management and biodiversity conservation, valuation, natural resource governance, nature-based/positive solutions including integrated pest management, participatory action research, and games for experiential learning, with gender and climate change as cross-cutting issues. She has extensive experience leading and implementing multidisciplinary projects in Africa, Asia, and Latin America. Zhang received an M.S. in community development and applied economics from the University of Vermont and a Ph.D. in agricultural, food, and resource economics from Michigan State University.

Elise F. Zipkin

Member

Elise Zipkin is Red Cedar Distinguished Professor and director of the Ecology, Evolution, and Behavior Program at Michigan State University. As a quantitative ecologist, Zipkin connects the complexities of ecology with the precision of mathematics to unravel the world's natural mysteries at the intersection of conservation biology and the management of biodiversity. She and her team develop analytical frameworks to address grand challenges in the study of biodiversity loss and the effects of anthropogenic activities, such as climate change, including on monarch butterfly dynamics. She harnesses empirical data (big and small) to understand fine and subtle interactions in the natural world, revealing the causes and consequences of species' declines and biodiversity loss while charting pathways to mitigate and reverse these alarming trends. Among her honors is being named a Fulbright U.S. Senior Scholar, an International Ecology Institute (ECI) IPRE Laureate, and an Ecological Society of America Early Career Fellow. Zipkin received a B.S. in mathematics from the University of Michigan, an M.S. in natural resources from Cornell University, and a Ph.D. in biology from the University of Maryland.

April Melvin

Staff Officer

April Melvin is the Associate Director of the Polar Research Board and Senior Program Officer on the Board on Atmospheric Sciences and Climate at the National Academies of Sciences, Engineering, and Medicine. She has led and supported a broad range of National Academies activities focused on biodiversity, the polar regions, climate change, and other related topics. Dr. Melvin also has extensive experience studying the impacts of climate change and air pollution on the health of ecosystems and society. Prior to joining the National Academies, she was a Science and Technology Policy Fellow sponsored by the American Association for the Advancement of Science and hosted by the U.S. Environmental Protection Agency. April holds a Ph.D. in ecosystem ecology and biogeochemistry from Cornell University.