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FOREWORD

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This compilation represents the third time that iguana researchers from around the world have collaborated to publish a diversity of papers on the behavior, ecology, evolution, and conservation of this unique taxonomic group. In 1982, Burghardt and Rand published *Iguanas of the World*, focused on systematics and biogeography, food and energetics, demography and life history strategies, adaptive behavior and communication, social organization, and conservation and management. The majority of papers featured *Iguana*, although every genus other than *Dipsosaurus* was represented by at least one contribution. At that time, 30 species were recognized, including a recently discovered species, *Brachylophus vitiensis*. The volume brought together a wealth of information on iguana biology and natural history, recognizing the importance of large body size and an herbivorous lifestyle in shaping observed life history traits. Potential threats to iguanas were identified and initial recommendations made for the protection of wild populations.

A second volume, *Iguanas: Biology and Conservation*, followed in 2004 (Alberts et al.). Much had changed in 22 years since the original publication, including a revised taxonomy that included 40 species. New molecular genetic technologies had emerged, allowing researchers to better understand genetic structuring within and between populations, and begin to apply this information to conservation decision-making. This volume focused on a deeper understanding of iguana diversity, behavior, ecology, and conservation, with a strong emphasis on *Cyclura* (12 of the 20 chapters), a genus that until then had received little attention. Notably, all seven conservation-themed chapters highlighted *Cyclura*, for which six of the nine recognized species had been classified as Endangered or Critically Endangered on the IUCN Red List of Threatened Species. A number of new approaches and techniques were tested and evaluated, including translocation, captive rearing, head-starting, and habitat restoration, significantly enhancing the toolbox available to iguana conservation practitioners.

The present volume complements and builds on the previous two, expanding our knowledge of iguana systematics, distribution and habitat, ecology, population biology, and conservation, while highlighting areas where further research is still needed. An updated taxonomy including 44 living species is presented, although genetic analyses in progress suggests this number may continue to grow (ITWG 2016). *Ctenosaura*, a species-rich genus only touched on in the first two volumes, is heavily emphasized in the current volume (Goode et al. 2016; Morales-Mávil et al. 2016a, b; Pasaschnik and Hudman 2016; Zarza et al. 2016). New information is presented on species distributions, habitat use, reproductive biology, and genetics that will be critical in guiding future conservation management decisions. Caribbean species are still featured prominently, with a continuing emphasis on applied research.

Technology is changing rapidly, a trend that will undoubtedly have a major impact on our knowledge of, and appreciation for, the world's iguanas. The advent of whole genome sequencing will change our understanding of species boundaries, as well as open new avenues for genetic management of populations. Sensor-enabled radio transmitters will give us insights into the physiology of free-ranging iguanas that were previously unattainable. Pioneering tools such as remote camera traps and unmanned aerial vehicles will significantly enhance our ability to monitor iguana populations in space and time. Collectively, these technological advances will not only provide a new level of biological understanding, but should also elucidate novel ways to help conserve dwindling wild populations.

Despite many advances in our knowledge of the phylogenetic relationships among iguana species (see ITWG 2016), a comprehensive phylogenetic analysis of the entire subfamily has yet to be published here or elsewhere (but see Fig. 1, adapted from Pyron et al. 2013). Addressing this gap must be a high priority for future researchers if we are to fully understand the adaptive significance of the morphology, physiology, behavior, and ecology reported for iguanas in these three dedicated volumes.

With each volume, the number of contributions from range country scientists has increased, reflecting a growing cadre of international researchers with an interest in iguana biology and conservation. Although the number of chapters is similar in each volume (23, 20, and 18, respectively), the number of contributors has more than doubled in the present volume, with 69

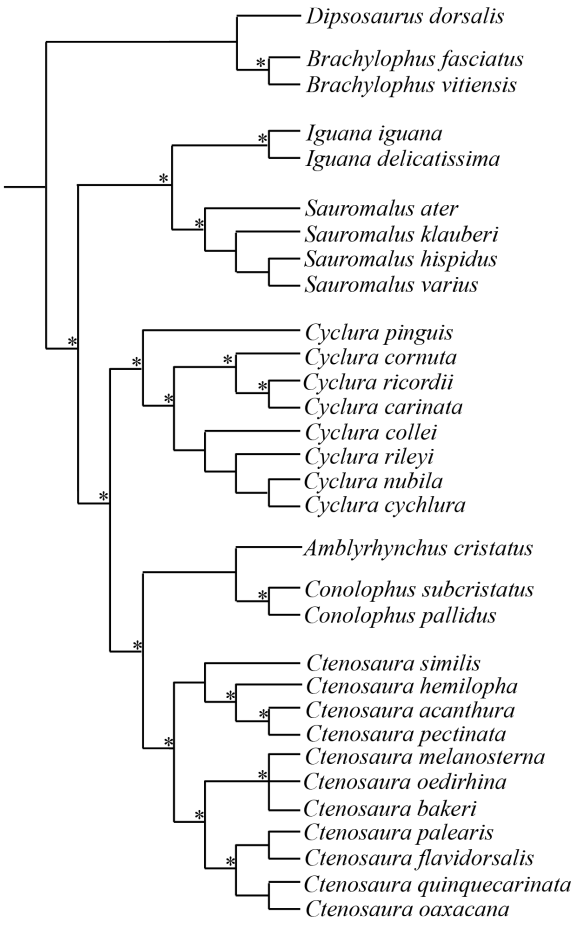

FIGURE 1. Cladogram for the subfamily Iguaninae adapted from Pyron et al. (2013). Structure reflects bootstrap values > 50, as in the original figure. Nodes with an asterisk reflect bootstrap values > 90. We acknowledge that 13 species (30% of species) are missing and that there are inconsistencies with previously published generic level work; however, this is the most complete tree for Iguaninae currently available.

authors represented, compared to 31 and 42 in the two previous volumes. Additionally, the percentage of contributions from scientists based outside the United States and Europe grew from 16% in the first two volumes to 42% in the current volume, with ten countries represented in total. Fifteen authors in the present volume also contributed to one or both of the previous two volumes, reflecting their long-term commitment to iguana research. Gordon Burghardt and John Iverson, who contributed to all three volumes, have dedicated much of their careers to furthering our understanding of iguana behavior and ecology. At the same time, they have trained a multitude of students – many of whom are authors in the current volume – who continue to expand our collective knowledge and bring new perspectives to a thriving field.

A major factor in bringing together this community has been the IUCN SSC Iguana Specialist Group (ISG), formed in 1997 and since expanded to 93 members in 25 countries, including representation from all regions in which iguanas occur naturally (http://www.iucn-isg.org). The group has worked with local government agencies and NGOs to draft 14 species recovery and conservation management plans that outline the most urgent research needs and conservation actions for individual taxa, many of which are reflected in the papers presented here. Not surprisingly, 29 (42%) of the 69 authors of this volume are ISG members. The commitment to assembling this volume was solidified during the group's 2013 annual meeting in Kingston, Jamaica. At that time, the group agreed to make this an online publication with the hope that it would be more immediately available and accessible to the rapidly increasing number of citizens worldwide with an interest in iguanas.

Major progress has been made in terms of stopgap measures to prevent the outright extinction of several iguana species, and a number of taxa seem to be tenuously on the road to recovery, including *Cyclura collei, C. lewisi, C. pinguis, C. cychlura inornata, C. cychlura figginsi*, and *C. rileyi cristata*. However, the large underlying threats that have led to their declines remain. It is especially troubling that over 90% of all threatened insular iguanas occur on at least one island with invasive vertebrates present (Tershy et al. 2016). Eradication of non-native species is becoming more feasible and economical over time, and several projects benefitting iguanas are under discussion. While the utility of head-starting as an emergency rescue measure has been proven, having dedicated habitat set aside for each iguana species is critical to their future survival. Nowhere has this been more evident than in the case of the Jamaican Iguana, which was saved from almost certain extinction by head-starting and invasive species control, but now faces the potential loss of its remaining wild habitat to development of a large-scale trans-shipment port (Wilson et al. 2016). Fortunately, as the papers in this volume attest, there is no shortage of passion and commitment within the iguana conservation community in seeking innovative ways to meet these challenges. The IUCN SSC Iguana Specialist Group is always open to new collaborators, and we enthusiastically welcome others who are interested in joining us. For more information, please visit http://www.iucn-isg.org.

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ALLISON C. ALBERTS serves San Diego Zoo Global as Chief Conservation and Research Officer. She is responsible for ongoing conservation science activities at the San Diego Zoo and Safari Park, including work at the Zoo's Institute for Conservation Research and field sites in 35 countries. She holds bachelor's and doctorate degrees in Biology from the University of California at Berkeley and San Diego, respectively, and is an adjunct professor at San Diego State University. As a reptile and amphibian specialist, she has participated in conservation programs for endangered iguanas in Costa Rica, Cuba, Turks and Caicos Islands, and Fiji, as well as working with komodo dragons, sea turtles, desert tortoises, and a variety of native California frogs, lizards, and snakes. Much of her research has focused on the development of innovative techniques for restoring critically endangered species to the wild. She is co-founder of the IUCN SSC Iguana Specialist Group and served as Co-chair of the ISG for over a decade. Currently, she is a member of the ISG steering committee and serves as President of the International Iguana Foundation. (Photographed by Jeffrey Lemm).