Capybara
Capybara

Biology, Use and Conservation
of an Exceptional Neotropical Species
Large neotropical herbivore mammals are characterized by the wide variety of hystricognath rodents among them. These include pacas, agoutis, vizcachas, coy- pus, maras, and pacaranas, which in this region carry out ecological functions similar to those of ungulates on other continents. Among them, the capybara stands out because of its large size, gregarious and semi-aquatic habits, wide distribution in South America, and local abundance in flooded savannas and wetlands and on the margins of bodies of water. It is the largest living rodent in the world and the last remnant of a long line of gigantic grass-eating rodents that evolved in South America over millions of years.

The capybara attracted the attention of explorers and writers in the New World from the sixteenth century onward. They commented on its large size and gregarious habits, the use of its meat by local communities, and its incursions into crops near water, often linking it with pigs, as its Linnean name of 1766, *Sus hydrochaeris*, indicates. The pioneering naturalists in South America, such as Georg Marcgraf (1610–1644), Felix de Azara (1746–1811), and Johann Rengger (1795–1832) provided more detailed descriptions of the animal and its natural history. Over a century ago, meticulous studies of the paleontology of the Hydrochoeridae family began, especially in Argentina. There have also been parasitological studies, management experiments in zoos, and records kept of capybara hide exports and of the trade in its meat.

It is therefore surprising that ecological studies of the capybara, such a peculiar and widely distributed rodent, so important as a resource for many communities, and also commanding high market prices, should have only started about 40 years ago, and mainly in Venezuela and Colombia. Next came many important projects in Brazil and Argentina, covering the use of its habitats, diet, reproduction, behavior and social structure, estimates of abundance, population dynamics and productivity, as well as techniques for keeping capybaras in captivity. There have also been experiments in management and sustainable harvest of natural populations, and legal instruments to control these areas. As a result, the capybara is today one of the most studied and best known native mammals of South America.
However, a large number of the most original investigations were often unpublished theses or university monographs, or institutional projects and databases that are difficult to access. In consequence, the results of the studies are dispersed among numerous national and international journals and in the minutes of conferences and are often beyond the reach of the people and institutions interested in them. Almost all of the publications on this rodent that exist in book form are manuals for rearing it in captivity.

For this reason, we consider that it is extremely useful and appropriate to publish this work, which provides a global overview of up-to-date knowledge on the capybara’s biology, ecology, and management, in 24 chapters by notable specialists on each topic. This book, arising from a coordinated effort by a multidisciplinary and preeminently South American team, thus brings together the recent results of many studies and offers an excellent starting point for better plans that cover conservation, sustainable use, production, and successful commerce of this valuable giant rodent.

Juhani Ojasti
For the aboriginal peoples of South America, wildlife was an important source of protein and clothing. Throughout the period of colonization by Europeans, and during the growth of nations, wildlife has always contributed to the wealth of the continent. Early settlers described wild animals as plentiful, but since the 1970s the populations of many have been rapidly depleted. Historically, the importance of this once vital indigenous resource was neglected. Furthermore, until the mid-twentieth century very little was known by biologists about South America’s fauna. However, the last three decades of that century, and the first of the twenty-first century, have seen knowledge about neotropical wildlife grow rapidly.

The implications, scientific, political, economic, and even ethical, of using wildlife present topical, intricate, and challenging questions to wildlife specialists and wider society. In this context, the capybara has interest beyond its own specific case because, of neotropical wild mammals, it has the greatest potential for production. Furthermore, as the following chapters reveal, the consumptive use of wild capybaras raises a different set of issues to those associated with farming this species. We present the capybara, therefore, not merely as rivetingly interesting as a species in its own right, but as an exceptional model to inform thinking about wider, interdisciplinary wildlife issues. Among the features that give the capybara this special potential for use are its high prolificacy, rapid growth rate, herbivorous diet, resistance to disease, social behavior, relative tameness, and susceptibility to captive rearing.

Historically, the species has been eaten all over its range, especially by poor, rural, and traditional communities engaged in subsistence hunting. More recently, in large urban settlements, some city dwellers consider it a delicacy. The scene is set, therefore, with several South American countries committed to the sustainable use of capybaras, while others have encouraged capybara rearing in captivity. Each offers different insights and opportunities, and each poses its particular set of challenges and problems, and our purpose in creating this book is to identify, disentangle, and learn from these.

Since the mid-twentieth century, governments and institutions in various countries have fostered studies of the biology, use, and conservation of the capybara,
accumulating copious technical information. These data have been scattered across different research centers and universities and, sometimes, recorded in variously inaccessible publications. It was more than time to gather, evaluate, synthesize, and make available all of the diverse knowledge about this species. As the chapters that follow will reveal, there are many and diverse topics relevant to understanding the capybara’s biology, and weaving that understanding through considerations of their conservation and management. However, at the foundation of this invigorating interdisciplinarity lie fundamental questions about the species’ habitat use, social system, and behavioral ecology.

This book also represents a personal journey for us, the editors, because one of the first steps in answering these fundamental questions was taken by one of us (DWM) in the early 1980s with a field study of capybaras in Venezuela. This research set a trajectory joined by others (EAH and JRM, also editors) who were doctoral students at Oxford in Macdonald’s WildCRU – in turn, we have fostered a second generation of students, several of whom are authors of chapters in this book. This tradition, over three generations of researchers, inspired us to compile this book and to assemble the foremost students of capybara biology to synthesize the vast amount of knowledge now presented herein. We hope that this compendious account will inspire future neotropical mammalogists and conservationists. The insights are relevant to a spectrum of species, whether endangered or used.

The book is organized into three parts, each addressing a particular area in capybara biology, use, and conservation. The first part covers the evolution, biology, and ecology of capybaras. In this part, the opening chapter describes the species and its life history, scientific nomenclature, and distribution, providing a general overview of capybara biology and the basic framework for the rest of the book. The next two chapters cover the paleontological and genetic perspectives of capybara evolution, with leading researchers in each sphere presenting their different opinions on capybara systematics. Two chapters then describe capybara feeding habits and digestive physiology, and three cover capybara reproduction. Chapter 9 describes capybara infectious diseases and offers recommendations for their treatment and control. The next two chapters present a comprehensive overview of social behavior and chemical communication in capybaras, providing a foundation for understanding the species’ management in the wild and rearing in captivity.

The chapters in the second part include broad and up-to-date reviews on capybara production. The first summarizes the diverse uses of the species throughout its range, and these are elaborated in four chapters devoted to different aspects of captive rearing, such as management, behavior, feeding, and reproduction, providing compendious information from practitioners on how to rear capybaras safely, healthily, and economically. Information on the capybara’s behavior in captivity is deployed to inform the highest standards of husbandry. The part concludes with a simulation of the effects of various factors on the sustainability of harvesting capybaras, illustrating the role of scientific evidence in informing management decisions.
The third and last part deals with current conservation issues, describing the invaluable experiences of capybara use and conservation in Venezuela, Colombia, Brazil, and Argentina. These country-based chapters describe the history of capybara exploitation in each, presenting the different legislation, forms of management, human-capybara conflicts, and conservation status.

Across its vast range, some capybara populations appear to be used sustainably, while others are perceived as pests and judged by some to need control. In both situations, reliable estimates of population densities are necessary, and methodologies for estimating these are explained in Chap. 22. Addressing an emerging topical issue, Chap. 23 describes the capybara’s role in the epidemiology of Brazilian Spotted Fever.

In assembling this material, we have attempted to take an even-handed and impartial editorial role; we hope our contributors present the information necessary to inform critical evaluation of science and policy. Personally, we as editors do not advocate here any particular position on trade in capybaras, but we do advocate exposing the issues and facilitating discussion of them. With this in mind, we present an overview in the concluding chapter so that the reader can assess the conditions for a successful capybara management program under varying circumstances and local legal systems and cultures. Since each chapter is self-contained, they can be read in any order, and readers can concentrate on the topic of their interest.

The capybara is the largest living rodent. Its exceptional features (see Chap. 24) have made it an emblematic component of a range of ecosystems in much of South America. It is arguably the most important native mammalian herbivore in the ecology of the wetlands and savannas of this subcontinent. The adaptations that make the capybara a fascinating member of neotropical faunas, and an exceptional model for the study of behavioral ecology and social systems, also make it a candidate for sustainable harvest over much of its range, since its meat and hides are highly valuable. With this book, we hope to make biologists, conservationists, wildlife managers, and policymakers more conscious of the great value and ecological importance of this species and of the diverse neotropical fauna as a whole. We also aim to convince the reader of the beauty and value of wildlife, in general, and capybaras, in particular, to contribute to their sustainable management and conservation.

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