

Reticulated pythons in Sumatra: biology, harvesting and sustainability

Richard Shine^{a,*}, Ambariyanto^{a,1}, Peter S. Harlow^a, Mumpuni^b

^a*School of Biological Sciences A08, The University of Sydney, Sydney, N.S.W. 2006, Australia*

^b*Centre for Research in Biology, Museum of Zoology, LIPI, Bogor 16122, Indonesia*

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Abstract

Hundreds of thousands of giant snakes (*Python reticulatus*) are taken from the wild to be killed for their skins each year, raising doubts about the longterm sustainability of this offtake. We visited four locations in northern Sumatra (Medan, Seisuka, Rantauprapat and Cikampak) at four times of year and gathered information on the sizes, sexes, reproductive status and food habits of 784 slaughtered pythons. Pythons in northern Sumatra mature at larger body sizes than do those studied previously in southern Sumatra (Palembang). Their seasonal timing of reproduction is shifted appreciably, presumably because the two areas lie on opposite sides of the equator. The slaughtered animals are mainly adult males and adult plus juvenile females. Females attain larger sizes than males, but very large females are rarely captured. This bias may reflect size-related shifts in habitat selection; smaller snakes (including adult males of all sizes, and recently-matured females) feed primarily on commensal rats and hence are abundant in disturbed (agricultural and village) habitats. Female pythons produce large clutches (mean = 24.2) of large eggs (mass > 250 g), but reproduce only once every 2 to 4 years. The apparent ability of reticulated python populations to withstand high levels of offtake may reflect their demography (rapid growth rates, early maturation, high fecundity), their flexibility in diets and habitat use, and their ability to evade detection (because neither foraging nor thermoregulation require extensive movements). © 1998 Elsevier Science Ltd. All rights reserved.

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1. Introduction

It is almost always difficult to evaluate the degree of “sustainability” of exploitation of a wild population. For example, fisheries biologists have often failed to achieve this aim, despite intensive effort and complex models (e.g. King, 1995; Roberts, 1997). Even under ideal circumstances, where the resource in question is clearly delimited and easily quantified, it can be difficult to establish the degree of harvesting which will allow indefinite persistence of the resource at levels that are “acceptable” ecologically, economically, aesthetically, or genetically (e.g. Choquenot, 1996). In cases where the exploited species is poorly known biologically, and virtually impossible to survey quantitatively in the field, the problems are greatly exacerbated. Unfortunately, many of the biological resources that are being heavily exploited in tropical regions fall into exactly this category.

Conventional “optimal sustainable yield” approaches rely upon the investigator’s ability to quantify the impact of harvesting intensity on population density (e.g. Rothschild, 1983; Roberts, 1997). If this is impossible, we are left with few alternatives other than experimental management or highly conservative recommendations (Grigg, 1995). In either case, the most useful initial step is to characterise the basic ecological attributes of the exploited species. Such information is relatively inexpensive and easy to obtain (by examining harvested animals) and can serve as a basis for inferences on the species’ ability to withstand various types and intensities of anthropogenic offtake. Even though it may not provide a basis for quantitative suggestions on offtake levels, knowledge of the species’ biology may help to frame management plans that maximise economic returns while minimising the ecological impact of the trade (e.g. by identifying times and places that harvesting should not occur).

We have taken this approach to examine the ecological characteristics of a giant reptile species that is heavily exploited throughout much of southeast Asia. Reticulated pythons are either the largest or second-largest species of snake in the world, with reliable

* Corresponding author. Fax: +61-2-9351-5609; e-mail: rics@bio.usyd.edu.au

¹ Present address: Diponegoro University, Jl. Imam Bardjo SH, Semarang, Indonesia.