

CONSERVATION AND RESEARCH PRIORITIES FOR THREATENED SUIDS OF SOUTH AND SOUTHEAST ASIA

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1. The situation in the region

The eight suid species and numerous subspecies native to South and Southeast Asia constitute the highest diversity within this family found in any region of the world. Groves (1981) has gone a long way toward clarifying the taxonomy of these animals, but recent reviews of the Philippine pigs (Oliver *et al.*, 1993; Groves & Grubb, 1993) have shown that further taxonomic revisions are required as new material becomes available. With few exceptions, we have little detailed knowledge of the natural history of suids in the region, although during the past decade field surveys have begun to provide a better idea of the distribution, status, and habitat preferences of many of the taxa. An International Union for Conservation of Nature and Natural Resources (IUCN) action plan drawing together the existing knowledge and proposing conservation strategies (Oliver, 1993) is the source of much of the data summarized in the present paper. Several of the native suid species and subspecies have been classified as threatened and require conservation action to save them from extinction. Because these threatened taxa occur in a wide variety of habitats and interact with many varied human cultures, each faces a unique set of problems. Nevertheless, uncontrolled hunting and habitat destruction have been identified as the two predominant threats. Consequently, in most situations creation and management of protected areas combined with development and enforcement of sound hunting laws are solutions requiring high priority. Understanding what needs to be done is a major step toward successful conservation action. Unfortunately a series of factors often make it difficult for the necessary policies to be implemented.

Perhaps the most important constraint is the limited funds which governments of the region are able or willing to commit to the conservation of protected areas and wildlife in general. The World Bank calculates that direct government funding for protected area management in all of Asia is about US \$ 30-35 million annually, roughly one third of the amount IUCN estimates is needed as a bare minimum to support only the routine expenditures (Braatz, 1992). As a percentage of total annual national budgets, funding for protected area management is especially low in those countries most important for suid conservation. For the Philippines the figure is only 0.01%, the lowest in Asia. India and Indonesia provide their parks with only slightly higher proportions of 0.03% and 0.06% respectively. By way of comparison, Bhutan with a figure of 0.29% ranks highest in Asia in this respect.

In many societies negative attitudes toward pigs make it difficult to garner public and government support for their conservation. All pigs are despised and avoided by devout Muslims who refuse to eat or even touch any part of the animals, and Islam is the predominant religion in Indonesia and Malaysia. Additionally, farmers who suffer losses from crop raiding pigs are understandably reluctant to heed laws aimed at conserving species they regard as pests.

A somewhat paradoxical complication for suid conservation is that wild pigs are often an important protein source for indigenous societies which obtain much of their subsistence from hunting and gathering in the forests. This may endear the pigs to conservationists who see them as ideal sustainable "non-timber forest products". But where governments are more interested in converting the forest dwell-

lers to plantation workers or agriculturalists living in permanent villages, conserving wild pig populations for hunting is not a priority. To survive by hunting wild animals is viewed as backward, and, in the short term, there are more profitable ways to exploit forests than to maintain them as support systems for a relatively few people who want to continue with a disappearing way of life.

As conservationists we must understand these attitudes and monetary constraints and search for ways to overcome them, or to at least minimize them in each situation. Among other approaches, this may involve public education, training of local wildlife conservation professionals, encouraging conservation of biodiversity rather than species' conservation, promoting controlled hunting of wild pigs, or captive breeding. In addition, basic ecological research on virtually all threatened suid taxa is still needed. Much of the funding for these activities will need to be sought from international aid agencies and non-governmental organizations.

2. Threatened native suids (Tab.1)

Table 1: Threatened Southeast and South Asian Suids

Taxon/Status	Threats
<i>Sus scrofa riukiuanus</i> (V or E)	Hunting (pest/food), Disease, Genetic contamination
<i>Sus salvanius</i> (Critically E)	Habitat loss, Hunting (food), Political unrest
<i>Sus v. verrucosus</i> (V)	Poisoning, Hunting (pest/food)
<i>Sus v. blouchi</i> (V)	Hunting (pest)
<i>Sus barbatus oi</i> (R)	Habitat loss
<i>Sus b. ahoenobarbus</i> (V)	Hab. loss, Hunting (pest/food)
<i>Sus philippensis</i> (R)	Hab. loss, Hunting (pest/food)
<i>Sus cebifrons</i> (E)	Hab. loss, Hunting (pest/food)
<i>Babryrousa babyrussa</i> (V or E)	Hunting (food), Habitat loss

E = endangered; V= vulnerable; R= rare

Sus scrofa riukiuanus: Vulnerable or Endangered according to population

S. s. riukiuanus, the smallest and the only threatened subspecies of *Sus scrofa*, is endemic to the Ryukyu Islands south of the main islands of Japan. Numbers are declining rapidly, largely as a result of overhunting, and it is thought to be endangered on at least four of the six islands of the Ryukyu chain. Pigs are killed both for consumption and as agricultural pests, and commercial traders export carcasses to gourmet markets in Osaka. The subspecies is also threatened by a severe skin disease which has spread throughout the population on one island, and

genetic contamination through contact with free ranging domesticates. On Iriomote Island there are plans to build a road through a national park, increasing access by poachers who had already reduced pig numbers by half since the park was created.

Due to widespread governmental and local attitudes ranging from ambivalence to hostility toward the pigs, the most effective way to conserve them is by supporting existing or proposed programs directed toward the conservation of biodiversity. In addition, preliminary or repeat status surveys are needed on all six islands in the Ryukyu chain.

Sus salvanius: Critically Endangered

The Pygmy hog (*S. salvanius*) is now known to exist in only two isolated populations in the tall grasslands of northwestern Assam, India, and is considered to be one of the most endangered of all mammals. Its extremely reduced body size (males weigh only about 8.5 kg) makes it potentially a highly valuable genetic resource. The continuing decline in Pygmy hog

numbers is attributable to loss of its grassland habitat to human settlements, agricultural encroachment, commercial forestry, and flood control schemes. Annual burning of the tall grasses concentrates the hogs in the small remaining unburned areas where they are particularly vulnerable to hunters. The survival of the species is crucially dependent on the integrity of the Manas Wildlife Sanctuary, which is under threat from high numbers of illegal immigrants and an armed rebellion of local tribals.

The strategy for the conservation of the Pygmy hog places paramount priority on promoting

whatever actions are necessary to restore and maintain the Manas Wildlife Sanctuary and its buffer reserves. Field surveys of areas known or suspected to harbor pygmy hogs need to be undertaken, and detailed studies are needed on the behavior and ecology of the species to establish management criteria. A properly structured captive breeding program should be established to provide animals for eventual reintroductions to protected sites within its recent known habitat.

Sus verrucosus verrucosus: Vulnerable

The Javan warty pig (*S. v. verrucosus*) is confined to the island of Java where it is sympatric with the Indonesian subspecies of the Eurasian wild pig (*S. scrofa vittatus*). It occurs at altitudes below 800 m and prefers disturbed habitats and teak plantations to closed canopy forests. Although not uncommon in some areas, the remaining Javan warties are in isolated populations and are subjected to uncontrolled hunting and, in some cases, poisoning. They are killed both by sport hunters and by farmers protecting their crops. There is evidence that hybridization with *S. s. vittatus* occasionally occurs in the wild, but at current levels it is probably not a threat to the genetic integrity of the species.

Javan warty pigs are poorly represented in existing protected areas, and proposals to create three new nature reserves and expand two existing reserves of importance to the taxon need to be implemented soon. Poisoning must be stopped, and surveys of the extent of market hunting should be undertaken with the objective of formulating means to regulate or eliminate the practice. Sport hunters from the cities provide a source of income to rural people acting as guides, and Javan warty populations outside of protected areas should be managed to allow this activity on a sustainable basis. Captive animals need to be administered under a properly structured plan for the long term genetic and demographic benefit of the species.

Sus verrucosus blouchi: Vulnerable

S. v. blouchi, a smaller race of the Javan warty pig than the nominate form, is confined to the 200 sq km Bawean Island in the Java Sea where it is the only suid present. The Muslim population of the island does not hunt the pigs for food, but crop raiders are snared and killed. Much of the habitat of this subspecies consists

of forests and teak plantations located within a 4,500 ha wildlife reserve which was created primarily for the benefit of the endemic deer *Axis kuhli*. But because of its very restricted range the subspecies cannot be considered secure, and a survey to determine its current status and conservation requirements is urgently needed.

Sus barbatus oi: Rare

This race of the bearded pig is confined to Peninsular Malaysia and the island of Sumatra in Indonesia where it is sympatric with *S. scrofa vittatus*. It is known to travel over great distances in large herds of sometimes hundreds of individuals, and was widespread throughout the formerly unbroken rain forests characteristic of its range. Today forest fragmentation has disrupted these movements and reduced the subspecies' numbers. For example *S. b. oi* has been extirpated from the southern end of Sumatra, the portion of the island where deforestation has been heaviest during the past 40 years. These habitat changes have almost certainly favored *scrofa* over *barbatus*. Hunting does occur, but apparently not intensively enough to be a major threat. In Peninsular Malaysia, sport hunters are said to prefer the taste of Eurasian wild pigs to that of bearded pigs (Pan Khang Aun, pers. comm.). The subspecies is found in several protected areas in Sumatra and in the Taman Negara National Park in Peninsular Malaysia. Current knowledge of *S. b. oi* is too limited to enable formulation of practical management recommendations, and priority must be given to field surveys and other basic research to determine where they still occur, where and why they migrate, and whether they can survive in logged over forests. A properly structured captive breeding program should also be initiated.

Sus barbatus ahoenobarbus: Vulnerable

The Palawan bearded pig (*S. b. ahoenobarbus*) is endemic to Palawan and the smaller islands of Balabac and the Calamians in the Philippines. This pig is not known to undertake the long migrations for which the other two races of bearded pig are famous. Because it has a restricted range undergoing rapid deforestation, is known to be found in only one small protected area, and is subjected to heavy hunting pressure, the Palawan bearded pig is the most threatened race of its species. The field status survey recently initiated in the Calamian

Islands needs to be continued throughout the range of the race with a view to the development of recommendations for the enhanced future protection of selected populations. Management of the pigs in non-protected areas should be designed to enable their continued harvest on a sustainable basis.

Sus philippensis: Rare

The Philippine warty pig (*Sus philippensis*) is fairly widespread in most of the few remaining forests on the larger islands of the eastern Philippines. However deforestation coupled with uncontrolled hunting have already extirpated it over a large proportion of its former range and continue to threaten the species. As a first step to its conservation, field surveys and research into habitat requirements, population dynamics, and response to hunting pressure and commercial logging are needed. Local conservation education projects should be implemented to make the public aware of the importance of their native wildlife and forests in general, and their wild pigs in particular.

Sus cebifrons: Endangered

This most threatened of the Philippine suids, the Visayan warty pig (*S. cebifrons*), has been eliminated from four of the six islands where it was known to exist. On Negros and Panay it survives in a few small, isolated populations which are still hunted intensively. Forest destruction continues to reduce and fragment their remaining habitat. The overwhelming priority for the conservation of this species is the early declaration and effective future protection of the proposed Panay Mountains National Park; other smaller areas with remnant populations should also be given protected status. This can be done in the broader context of protecting the whole range of critically threatened species endemic to the Visayan faunal region. Data on the present status of the species are required from several islands. A properly structured captive breeding program needs to be developed, and public education projects should be initiated to raise local people's awareness of their natural heritage, including the uniqueness of their wild pigs.

Babyrusa babyrussa: Vulnerable or Endangered according to subspecies

Three extant subspecies of babirusa are curren-

tly recognized, all found in Indonesia: *Babyrusa babyrussa celebensis* from Sulawesi, *B. b. togeanensis* from the Togian Islands and *B. b. babyrussa* from the Sula Islands and Buru in the Moluccas. It has been extirpated from much of Sulawesi and is still threatened there and throughout its range by hunting and habitat loss. The babirusa inhabits tropical rain forests, and in recent years large-scale commercial logging has posed a major and increasingly serious threat. They are one of the first animals to become locally extinct after logging or land opening. On Sulawesi 12,000 sq km of land have been declared as wildlife protection areas, but as yet there are no national parks or other wildlife reserves within the ranges of the other two subspecies.

Effective conservation will require field status surveys to develop management recommendations for the enhanced protection of the species, particularly the least known but potentially most threatened races, *B. b. togeanensis* and *B. b. babyrussa*. The government should be assisted in its efforts to establish national parks on islands where these animals occur and require further protection. Hunting for subsistence and commercial purposes should be investigated with a view to its control or elimination. Captive breeding programs should be initiated for the two most threatened races, and fresh blood-stock should be introduced from the wild into the existing captive population of *B. b. celebensis*.

3. Non-native suids of conservation interest (Tab.2)

Introduced and feral pigs should generally be regarded as exotic pests which should be controlled or eradicated wherever possible, however some populations warrant in-situ conservation because they are representative of extinct or endangered taxa, are of anthropogenic or socioeconomic significance, or are of unique genetic importance. There are three such suid taxa in Southeast Asia.

Babyrusa b. babyrussa: Endangered

Although discussed above with the other races of babirusa, this distinctively long haired form may have been introduced to the Sula Islands and Buru Island from southern Sulawesi where it is now extinct. No matter what its origins, the race is severely threatened and in need of conservation action.

Table 2: Non-native SE Asian Suids of Conservation Interest

Taxon/Location/Status	Remarks
<i>Babyrussa b. babyrussa</i> Buru and Sula Island Endangered	Otherwise extinct form probably introduced from southern Sulawesi, threatened by logging and settlers from Java; two reserves proposed
ex- <i>Sus scrofa</i> Andaman Island-Endangered Nicobar Islands-Indeterminate	Feral, introduced 2,000 yrs ago; small (35-40 kg); primary food for native tribes; threatened by deforestation and immigrant poachers
ex- <i>Sus celebensis</i> Simeulue Island Several island in Moluccas and Lesser Sundas	Feral on Simeulue, brought by settlers whose language related to Buginese; reserve proposed; little known of situation on other islands

ex-*Sus scrofa*: Endangered - Andaman Islands
Indeterminate - Nicobar Islands

These small pigs have descended from feral stock introduced at least 2,000 years ago, and have evolved as an integral component of their insular ecosystems. Both the Andaman and Nicobar populations were formerly assumed to be endemic and are protected under Indian law. They are a primary food source for the isolated tribal societies inhabiting these islands, and may also have ritual and religious significance. A recent influx of immigrants has led to high levels of deforestation from logging, agricultural encroachment and other developments. The pigs are also threatened by immigrant poachers who use more efficient hunting techniques than the tribals, including firearms, snares and dogs. A joint zoological-anthropological survey is needed to ascertain the present distribution, status and threats to the pigs, and to understand their role in the culture of the aboriginal tribes. Based on these findings, recommendations should be made for the pigs' enhanced future protection, taking into account the legitimate rights and needs of the original human inhabitants.

ex-*Sus celebensis*: Indeterminate

On Simeulue Island, northwest of Sumatra, the presence of a highly modified form of *S. celebensis* gives clues to the origins of the island's human inhabitants whose language is most closely related to Buginese or other southern Sulawesi dialects. Thus apparently sometime in the past, settlers arrived at Simeulue from distant Sulawesi, bringing with them the pigs they had domesticated from the forests of their homeland. Other populations of wild pigs refer-

red to as feral *S. celebensis* are known from several islands in the Moluccas and Lesser Sundas. Field studies and surveys are needed to clarify the distribution, status and systematic affinities of these pigs. Anthropological components of such studies should investigate relationships between the ethnic origins of local tribal groups and the distribution patterns of wild pigs of varying derivation, as well as the cultural and socioeconomic importance of these animals. Protected areas need to be established, but management plans should also address the possibility that measures may need to be taken to control the population numbers of these feral pigs.

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