



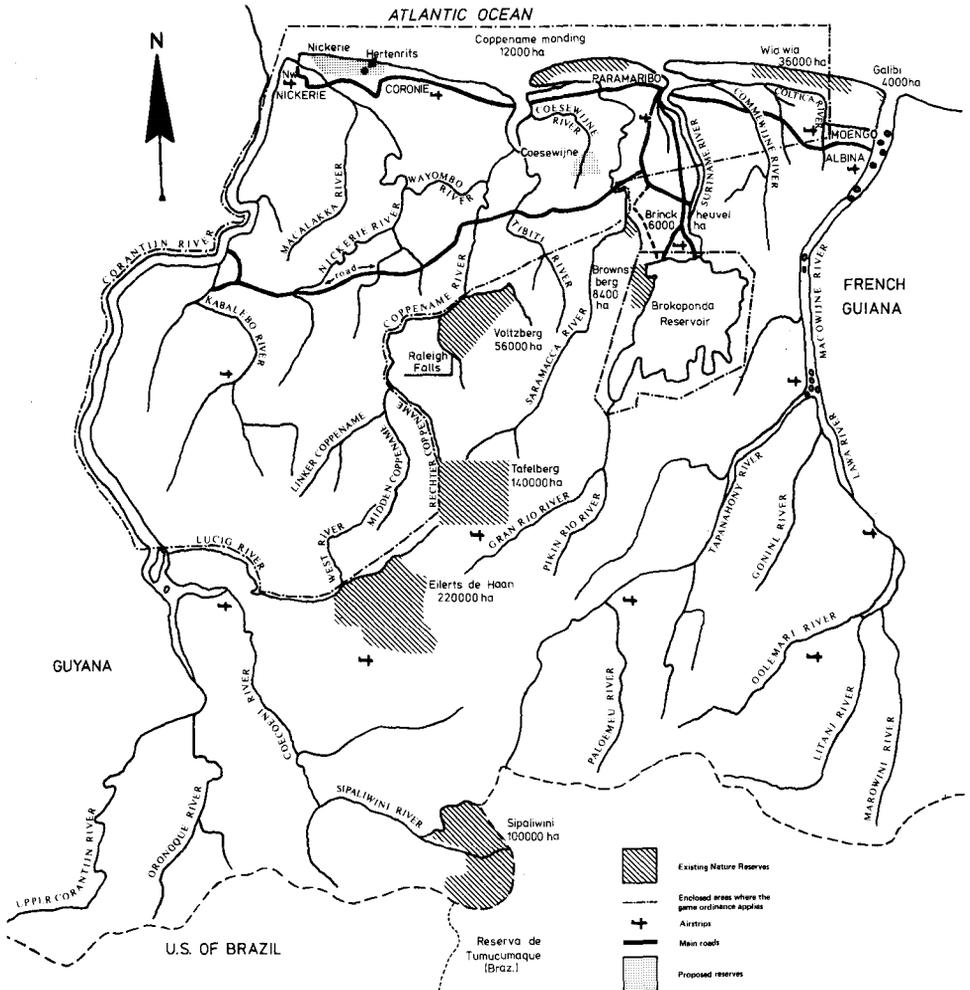
Wildlife in Surinam

Joop P. Schulz, Russell A. Mittermeier, Henry A. Reichart

Surinam is one of the few countries in the world where uninhabited and undisturbed tropical rain forest still covers large areas. The Government is fully aware of the importance of this natural heritage. Wildlife is protected, and eight nature reserves, ranging in size from 4000 to 22,000 ha, have been created to protect representative habitats – forest, savannas, coastal flats and important breeding beaches for Kemp’s ridley, green and leatherback turtles.

The Republic of Surinam, a former Dutch colony that became fully independent in November 1975, is one of the most thinly populated countries in South America. Only 375,000 people inhabit 162,000 sq. km, and almost 90 per cent are concentrated in the capital, Paramaribo, and smaller settlements on the coastal plain. In the interior live some 50,000 Bushnegroes and Amerindians, mostly in scattered villages along the Suriname, Marowijne and Saramacca Rivers. As the rest of the country is covered with uninhabited and undisturbed Neotropical rain forest, Surinam offers unequalled opportunities for preserving primeval tropical forest ecosystems. In the north and the extreme south there are a variety of unusual savanna types, and the coast has bird colonies and turtle nesting beaches of major importance. The Surinam government, realising the value of the country’s natural heritage, has set aside eight reserves and one nature park as a first step in protecting a representative cross-section of the flora and fauna. Several of these reserves are readily accessible and offer superb opportunities for tourism and scientific research.

Surinam’s first attempt at nature conservation was the establishment in 1942 of a game sanctuary to protect nesting scarlet ibis *Eudocimus ruber* and other birds in the Coppename River estuary; this is now part of the Coppename-mouth Reserve. In 1948, a Nature Protection Commission was



created, and in 1954 a Nature Protection Ordinance provided for the establishment of nature reserves by decree, and made public lands eligible for reserve status if of scientific, aesthetic or cultural value. Management was put in the hands of the Forest Service, under the Ministry of Development. The new protected areas include large representative samples of most of the country's major landscapes and ecosystems, all uninhabited, and all land in their vicinity is public.

Wildlife protection, now under the Ministry of Agriculture, is likely to be transferred to the Ministry of Development. The 1954 Game Ordinance gave protection to all wild mammals, birds, and sea turtles, except those designated as game (page 148), domesticated (i.e. cage birds) or harmful, and the status of any species can be changed by decree. But both the Game Ordinance and the decree only apply to the northern and north-western parts of the country and to the Brokopondo Reservoir. No protective legislation exists for the sparsely inhabited remainder.

THE COPPENAM RIVER'S
Raleighvallen rapids, in the
Raleighvallen-Voltzberg Nature
Reserve *J. P. Schulz*

When the legislation was drawn up, little information was available on wildlife population biology. Hunting is an important recreation in Surinam, as well as a source of protein for people in the interior, and a clear understanding of population dynamics of the major game species is essential. Several such studies are now under way, and another, sponsored by IUCN, is concerned with the effect on wildlife of human activities such as habitat manipulation and hunting. As more data become available, improvements will be made in the existing legislation.

In addition the Planning Ordinance (passed in 1974, but awaiting regulatory decrees) and the Forestry Ordinance (now before Parliament) will provide the legal tools for integrated management of soil, water, timber, wildlife and recreation, and permit the creation of 'special management areas' and 'special protection forests' in addition to the strict nature reserves. These ordinances are the key to the protection of social, cultural and environmental values.

In 1969 the Foundation for Nature Preservation in Surinam STINASU, a semi-governmental organisation that maintains links with IUCN, WWF and other international bodies, was founded. Its functions are to coordinate information for national education and publicity purposes, encourage and facilitate tourism in the reserves (without interfering with their primary conservation objective), and demonstrate their economic value. A number of foreign investigators have worked in Surinam, and a major field research centre at the Raleighvallen-Voltzberg Nature Reserve is planned. STINASU has produced films, published field guides, and financed the construction of excellent tourist facilities in or near three reserves and in Brownsberg Nature



Park. STINASU believes that nature can support its own conservation through tourism, which is on the increase, and offers both package tours and information (STINASU, P.O. Box 436, Paramaribo, Surinam).

COASTAL RESERVES

Galibi Nature Reserve

The smallest Surinam reserve, at 4000 hectares, Galibi is nonetheless of great international importance. Established in 1969, after years of resistance from local Carib Indians and some officials, it is on the Atlantic coast near the Marowijne River (the boundary between Surinam and French Guiana), and includes three important turtle nesting beaches: Eilanti, Galibi and Baboensanti. Eilanti was discovered in the sixties to be the only important nesting place in the Atlantic for the *warana*, olive ridley turtle *Lepidochelys olivacea*. In June and July, on roughly predictable nights, turtles arrive in spectacular numbers, on the half-kilometre beach at Eilanti. Until 1966 almost all the *warana* eggs, as well as those of the green turtle *Chelonia mydas*, were taken by Carib Indians from nearby villages. In 1967 and 1968, WWF provided funds to purchase the Indians' customary 'egg rights', the area was declared a nature reserve, and a ban was placed on egg collecting of both ridleys and leatherbacks *Dermochelys coriacea*.

Nesting ridleys continued to decrease, however: in 1968 over 500 nests were registered on the main *arribada* night; in 1974 the highest number was 88, and in 1975, 40. The decline is probably the result of severe egg exploitation in previous decades and/or killing of adult and baby turtles in the nets of the many fishing boats and shrimp trawlers operating off the coast of Venezuela and the Guianas. Conservation measures may have come too late for the ridley and the downward spiral may be irreversible, but efforts to save it will continue at full strength.

The green turtle outlook is somewhat better. The *krapé* nests in considerable numbers on the Galibi Reserve beaches and the Bigisanti rookery. On Galibi, many eggs are laid on a section of beach that is eroding and therefore unsuitable; the eggs are destroyed by sea water. These 'doomed' eggs are being harvested as part of the yearly quota allowed to be sold at the market. Since 1970 STINASU has sold an annual average of about 400,000 *krapé* eggs (about half the number laid each year in Surinam), the proceeds being used to finance further conservation measures. The future of these turtles now largely depends on their fate in the long migrations to and from their feeding grounds off the Brazilian coastal states of Ceará and Alagoas.

The leatherback turtle, the *aitkanti*, has been nesting on Baboensanti beach in increasing numbers. This is probably due to the shrinking of the French Guiana beach on the other side of the Marowijne River, which some years ago was discovered to be the largest nesting aggregation of leatherbacks in the world. Schulz gives a full account of Surinam's sea turtles.⁶

STINASU owns and runs three modest lodges in the Galibi reserve: one at Eilanti built by the Netherlands Foundation for International Nature Protection (which has contributed in other ways also), one at Baboensanti, and a third overlooking the impressive Marowijne river mouth. From

Sea Turtle Nests on Surinam Beaches 1967–1975

	1967	1968	1969	1970	1971	1972	1973	1974	1975	1976
Green turtle <i>Chelonia mydas</i>	?	3400	1260	1800	4015	5150	4625	5300	2675	6305
Olive ridley <i>Lepidochelys olivacea</i>	2875	3290	1665	1750	1595	1270	890	1080	1070	1170
Leatherback <i>Dermochelys coriacea</i>	90	200	305	255	285	380	900	785	1625	615
Hawksbill <i>Eretmo- chelys imbricata</i>	10	4	10	3	14	12	7	29	14	55

Paramaribo involves a three-hour journey by road to Albina, on the Marowijne, and then three hours by boat. The Carib Indian villages are an additional tourist attraction.

Wia-Wia Nature Reserve

Some 25 km west of Galibi is the Wia-Wia Nature Reserve, established in 1961 to protect the turtle nesting beach of Bigisanti. The continuous westward movement of this beach (at an average rate of 1.7 km a year) made it necessary in 1966 to increase the size of the reserve. But the beach movement has continued so fast that since 1973 the nesting area, still called Bigisanti, has been entirely outside the original reserve. To continue the turtle protection STINASU set up two new camps, one at Krofajapasi in the middle of current nesting activity, and another at Matapica, at the mouth of the access canal to this part of the coast. Leatherback and green nest in large numbers, and olive ridleys occur, but are less numerous than at Eilanti. Hawksbills *Eretmochelys imbricata* are rare (Table 2) and only one loggerhead *Caretta caretta* has been seen nesting here.

The camps are manned by Forest Service personnel who patrol the turtle beaches intensively. Tourists are accommodated in a guest house at Matapica or in the Krofajapasi camp. Matapica takes about five hours from Paramaribo by a combination of commercial riverboat and Forest Service patrol boat along the mangrove forests of the Commewijne, a tributary of the Suriname, and the Matapica Canal. Krofajapasi, about 12 km east of Matapica, is reached from there by boat, or by an hour's walk along the beach.

The Wia-Wia Reserve, itself now quite difficult to reach and without accommodation, covers some 36,000 ha of tidal mud flats, shoals, black mangrove vegetation in various states of succession, shallow lagoons, herbaceous swamps, forested sand 'ridges' (old sand/shell beaches now located inland), and other coastal formations. It covers a 53-km stretch of coast extending 6–9 km inland, and jaguar *Panthera onca* occur. Offshore are thousands of hectares of soft mud flats known as the Wia-Wia flat, which, with the lagoons and the brackish herbaceous swamps, are important feeding grounds for many local and migratory birds – herons, egrets, storks, scarlet ibis, roseate spoonbill *Ajaia ajaja*, American flamingo *Phoenicopterus ruber*,

waterfowl, birds of prey, shore birds (mainly migrants from North America), gulls, terns and skimmers. There is a large mixed breeding colony of herons, egrets and scarlet ibis, and black-bellied tree ducks *Dendrocygna autumnalis* and Bahama pintails *Anas bahamensis* breed in large numbers.

Coppename-mouth Nature Reserve

A protected area since 1953 and a reserve since 1966, Coppename-mouth Nature Reserve covers 10,000 ha of mangrove vegetation and mud flats in the Coppename River estuary and an adjoining stretch of the Atlantic coast. It is primarily intended to protect nesting colonies and roosting places of tricoloured heron *Hydranassa tricolor*, little blue heron *Florida caerulea*, night herons *Nycticorax violacea* and *N. nycticorax*, common and snowy egrets *Egretta alba* and *E. thula*, boat-billed heron *Cochlearius cochlearius*, scarlet ibis and roseate spoonbill. Sometimes these colonies are easily accessible to birdwatchers at the mouth of the Coppename; at other times, they move to areas of younger mangrove forest along the coast, and access is quite difficult.

The Surinam coast is important for many North American waders and may be crucial for some. Twenty species are regular visitors⁹, some on migration, others as winter residents. At any one time, there may be several hundred thousand lesser yellowlegs *Tringa flavipes*, short-billed dowitchers *Limnodromus griseus* or semipalmated sandpipers *Calidris pusilla*. This coast also provides exceptionally good conditions for other water birds such as scarlet ibis, egrets and herons. Spaans's aerial surveys in 1971 and 1972 along the 2000-km Guiana coast, between the mouth of the Amazon and the Peninsula de Paria in north-east Venezuela, located 21 mixed breeding colonies. Nearly half were on the 350-km Surinam stretch, including two of the seven scarlet ibis colonies, and the two accounted for over half the breeding pairs (approx. 20,000). In 1975 another aerial survey revealed three colonies in Surinam. For several species, including wood ibis *Mycteria americana*, jabiru stork *Jabiru mycteria*, roseate spoonbill, common egret and white-necked heron *Ardea cocoi*, the most important Surinam breeding colonies and feeding grounds lie



NESTING LEATHERBACK returning to the sea J. P. Schulz



HARPY EAGLE

outside the existing reserves on the north-west coast. The birds are legally protected, but the possibility of creating a nature reserve or a multiple use 'special management area' (under the Planning Ordinance) in the Nickerie area is being investigated. In fact, the whole brackish/salt coastal zone ought to be studied, monitored and zoned so that human use can be regulated and the exceptionally high biological productivity so characteristic of estuarine ecosystems conserved.

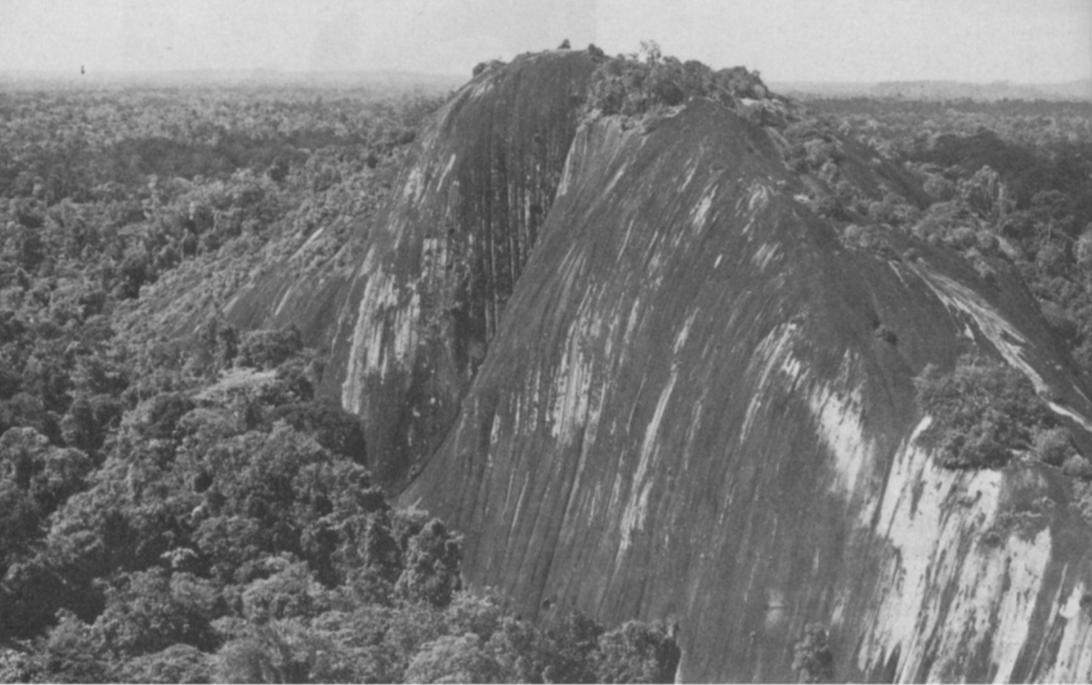
RESERVES IN THE INTERIOR

Brinckheuvel (Saban-pasi) Nature Reserve

Established in 1961, the unusual landscape of the 6000-ha Brinckheuvel Nature Reserve consists of low, pebble-covered subgreywacke and conglomerate ridges and hills, with flat colluvial areas between. The vegetation is primarily one-layered sedge grass, orchard savanna and savanna bush communities of the Sabanpasi type, the result of periodic burning since pre-Columbian times. Before World War I, there were prosperous villages whose inhabitants kept up the burning. Today the reserve is uninhabited, although frequently visited by poachers and sporadically patrolled by the Kwakoepron forest guard. From Paramaribo it can be reached in three hours on an old 'gold train', a relic of the gold rush in the first decade of this century, but there is no accommodation in the reserve.

Raleighvallen-Voltberg Nature Reserve

Established in 1961, the Raleighvallen-Voltberg Nature Reserve in north-central Surinam covers 56,000 hectares of tropical lowland rain forest and will be increased by 20,000 ha in the near future. The reserve includes Raleighvallen, the boulder-strewn rapids and falls that mark the limit of navigability of the Coppename River, and several granitic inselbergs, notably the impressive 240m dome-shaped Voltberg and the 360m Van Stockumberg. The granite outcroppings carry a characteristic and well-studied xerophytic vegetation, including a number of endemic species. The extensive system of



VOLTZBERG DOME in the Raleighvallen–Voltzberg Nature Reserve

rapids making up the Raleighvallen also has a characteristic fauna and flora, including several fish species and Podostemonaceae, and the rain forest fauna is unsurpassed. Foengoe Island, where the main lodges are, has been called ‘the bird bonanza of tropical South America’, with parrots, macaws, toucans, jacamars, trogons and many others. Surinam’s eight species of monkeys occur in the reserve and other mammals include jaguar, ocelot *Felis pardalis*, giant armadillo *Priodontes giganteus*, bush dog *Speothos venaticus* and probably giant otter *Pteronura brasiliensis*. The reserve is a three-hour road journey from Paramaribo to Witagron, a Bushnegro village on the Coppename, followed by three to four hours in a motorised canoe up the scenic Coppename to Foengoe Island, or by air one hour from Paramaribo.

Eilerts de Haan Gebergte Nature Reserve

Created in 1966, this is the largest of Surinam’s reserves (220,000 ha), consisting of uninhabited virgin lowland and lower montane rain forest; except for the geology it is virtually unstudied. Most of the reserve consists of a mountain ridge of Precambrian age. There is no accommodation, but the Kayser airstrip at the Zuid River serves as a starting point for scientific expeditions.

Tafelberg Nature Reserve

The flat-topped 50-sq-km Table Mountain, that gives this 140,000 ha reserve its name, is the only extensive part of the Roraima Formation in Surinam that has withstood erosion. The Proterozoic Roraima Formation in Surinam consists of more or less horizontal sandstone sediments overlying granitic basement rocks that are supposed to be 1.6–1.7 billion years old. It is similar in



SIPALIWINI SAVANNA

physiography to the Kaieteuran series in Guyana and the Canaima Mountains and *Tepuys* of the 'Land of Lost Souls' in Venezuela. The plateau, between 500 and 1025m above the forest-clad surroundings, is covered with scrub savanna of the Tafelberg type, dry evergreen forest/woodland, semi-montane rain forest on the highest elevations, and marsh forest wherever drainage is impeded. In 1944, a New York Botanical Garden expedition found here a number of endemic plants new to science, and the Kappel Savanna in the vicinity of the nearby airstrip has been explored by the Utrecht Herbarium. Otherwise, apart from bird and herp collections made near the airstrip, little is known about the fauna. There is no tourist accommodation, but the airstrip makes expeditions possible; it takes about a week to reach the plateau.

Sipaliwini Savanna Nature Reserve

Declared in 1971, the Sipaliwini Savanna Nature Reserve, covering some 100,000 ha on the Surinam-Brazil border, is part of the extensive Paru savanna of Brazil. The undulating terrain includes large boulders, inselbergs and isolated hills, and there are also gallery forests, swampy areas and isolated forest patches. The area is drained by the Sipaliwini River, part of the Corantijn River basin. It has never been grazed, but, like the Rupununi-Rio Branco savannas in Guyana and Brazil, has been regularly burned since pre-Columbian times, and is uninhabited, although Trio Indians from Brazil periodically enter the reserve. The geology, geomorphology, flora, (especially

Surinam Game Animals
Closed seasons indicated by crosses

Months: J F M A M J J A S O N D

Reptiles

Iguana *Iguana iguana* X X X

All sea turtles (open season for egg collecting only) X X X X X X X X X

Birds

Pale-vented pigeon *Columba cayennensis*

Blue-and-yellow macaw *Ara ararauna* X X X X X

Scarlet macaw *A. macao* X X X X X

Red-and-green macaw *A. chloroptera* X X X X X

Blue-headed parrot *Pionus menstruus* X X X X X

Orange-winged parrot *Amazona amazonica* X X X X X

Mealy parrot *A. farinosa* X X X X X

Muscovy duck *Cairina moschata* X X X X X

Common snipe *Gallinago gallinago* X X X X X

All tinamous (Tinamidae) X X X X

Back curassow *Crax alector* X X X X

Marail guan *Penelope marail* X X X X

Little chachalaca *Ortalis motmot* X X X X

Limpkin *Aramus quararuna* X X X X

Grey-winged trumpeter *Psophia crepitans* X X X X

All rails and gallinules (Rallidae) with the exception of the purple gallinule X X X X

Whimbrel *Numenius phaeopus* X X X X

Black-bellied tree duck *Dendrocygna autumnalis* X X X X

White-cheeked pintail *Anas bahamensis* X X X X

Blue-winged teal *A. discors* X X X X

Purple gallinule *Porphyryla martinica* X X X X

Mammals

Jaguar *Panthera onca*

Capuchin monkey *Cebus apella* X X X X

Kappler's armadillo *Dasypus kappleri* X X X X

Nine-banded armadillo *D. novemcinctus* X X X X

Tapir *Tapirus terrestris* X X X X

White-lipped peccary *Tayassu pecari* X X X X

Collared peccary *T. tajacu* X X X X

White-tailed deer *Odocoileus virginianus* X X X X

Red brocket deer *Mazama americana* X X X X

Brown brocket deer *M. gouazoubira* X X X X

Capybara *Hydrochaeris hydrochaeris* X X X X

Orange-rumped agouti *Dasyprocta leporina* X X X X

Paca *Agouti paca* X X X X

All other mammals and birds with the exception of the species designated as 'predominantly harmful' (8 mammals and 3 birds) or as 'cage birds' (24 species) are fully protected. The only protected reptiles are the sea turtles, the two *Paleosuchus* caimans, *P. trigonatus* and *P. palpebrosus* and the iguanas *I. iguana*.

insects, herps, fish and birds), and the very interesting archaeology are well known. The flora includes 400–450 characteristic savanna plants of which about a quarter here reach their northern limit. The savanna birds include some found nowhere else in Surinam and some not even known anywhere else north of the Amazon. Mammals include giant anteater *Myrmecophaga tridactyla* and savanna fox *Cerdocyon thous*, and, in the moister areas, tapirs *Tapirus terrestris*. An airstrip allows access from Paramaribo, but there is no visitor accommodation.

Brownsberg Nature Park

Obtained on long-term lease from the government in 1969, Brownsberg Nature Park includes the steep, forest-clad slopes and part of the 500-m high Brownsberg plateau, at the edge of the new Brokopondo Reservoir (formed by the damming of the Suriname River in 1964). Only two hours by car or bus from Paramaribo (or six hours by an old wood-burning steam train), it is a popular centre for both local and overseas visitors and for school field studies, and tourist facilities are excellent.

Brownsberg is a northern outpost for several plant, insect, bird, and amphibian species found primarily in the south. The mammals include seven species of monkeys; agoutis and brocket deer are often seen, and occasionally jaguar and puma. STINASU has published a guide book to the birds.

PROPOSED RESERVES

A 15,000-ha reserve is planned in the upper Coesewijne River area to protect landscapes and vegetation types not represented in other reserves, it would include the Coesewijne and two other savanna types, freshwater swamps and riparian woodlands along the Coesewijne River, a black water stream of unusual beauty. Several orchid species are abundant in the woodlands (not yet discovered by orchid hunters) and the stretch of river that would fall within the reserve has populations of both manatee *Trichechus manatus* and giant otter, two highly endangered species.

The other planned reserve or 'special management area' is in the ornithologically very important coastal region of the Nickerie District, already mentioned.

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Authors: Russell A. Mittermeier, Department of Anthropology and Museum of Comparative Zoology, Harvard University, Cambridge, Mass. 02138, USA; Henry A. Reichart, STINASU, PO Box 436, Paramaribo, Surinam; Joop P. Schulz, Director STINASU, PO Box 436, Paramaribo, Surinam, who also took all the photographs.

Wintering Monarchs are Food for Cattle

Farmers in a part of Mexico where monarch butterflies overwinter in numbers possibly up to 100 million (in 3.7 acres) habitually smoke out the butterflies from the trees to which they cling and allow their cattle to feed on them as they fall to the ground. In this way the cattle are consuming about 20 per cent of the monarch colony each year, says one of the scientists who discovered the colony. Professor Lincoln P. Brower believes that an international campaign is needed to preserve the site, and he refuses to reveal its location until it is fully protected. The discovery of the monarchs was particularly interesting because nothing had been known about where these monarchs from east of the Rockies spent the winter. The butterflies are so densely packed on the trees that 'it was nearly impossible to see the foliage, and some smaller trees were bowed over by the weight'.

New Rock Wallaby Discovered

For the past four years members of the Proserpine Branch of the Wildlife Preservation Society of Queensland have been aware that a hitherto unidentified species of rock wallaby *Petrogale* occurred in their area. Now a survey team from Macquarie University have confirmed that this animal differs in coat colour, fur texture, size and head shape from any previously known rock wallaby. The Society has called for the preservation of its habitat as a matter of urgency.

The *Proceedings* of the Royal Entomological Society of London have been superseded by a quarterly journal, *Antenna* (RESL, 41 Queen's Gate, London SW7 5HU; £4 annually, £2 for 1977), which offers entomological news, comment, reports and reviews. Volume 1 Number 1 (July 1977) includes reports on entomology at Furzebrook Research Station and Liverpool Polytechnic.