

INTERNATIONAL CONSERVATION

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Survey of Formosan Rock Macaque Populations

Following implementation of the Wildlife Conservation Law (WCL), conservation awareness has gradually increased in Taiwan. This and government conservation measures have helped increase Formosan rock macaque (*Macaca cyclopis*) populations in certain areas, with the result that conflicts between macaque troops and local people are becoming more frequent. The Council of Agriculture (COA), therefore, commissioned a team of primate specialists to conduct a comprehensive, three-year survey and to investigate the status of the Formosan rock macaque. The survey will form the basis for future conservation and management of macaque populations.

From the survey, it was found that Formosan rock macaques are distributed extensively in a variety of forest habitats throughout the whole of Taiwan. The species was found across a broad spectrum of elevations, from lowland areas to 3,600 meters above sea level. The species was most

commonly found in broadleaf forests at 500 to 1,500 meters above sea level. The Formosan rock macaque is a diurnal mammal living in troops of between 20 and 30 individuals. The largest troop of macaques recorded in the study was 75 individuals. The troops are normally composed of one to several adult males, numerous adult females, sexually immature adults and infants. The three-year study estimated that there are around 10,000 Formosan rock macaque troops living in Taiwan. If the number of individuals in each troop is estimated at 25 individuals on average, based on the results of the study, then the number of macaque individuals in Taiwan is approximately 250,000.

Recently, a number of crop raiding incidents by Formosan rock macaques has been reported, causing extensive losses to local farmers. To resolve the problem, the researchers recommended a number of ways to help farmers protect their crops and repel the macaques. Since Formosan rock macaque is a protected species, any farmer found guilty of using snares, traps, or other means to hunt crop-raiding monkeys without receiving permission from local authorities will be in breach of the WCL, and will be liable for a

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prison sentence of between six months and five years, as well as a fine of between NT\$200,000 to NT\$1,000,000. However, wildlife may be hunted or killed under one of the following circumstances: (1) danger to public safety or human life; (2) damage to crops, poultry, livestock or aquaculture; (3) being a disease vector of zoonoses or other pathogens; (4) danger to the safety of air transportation; (5) for traditional cultural or ritual hunting, killing or utilization needs of Taiwan aborigines living in reserved areas.

The COA says it will continue to support further in-depth research on Formosan rock

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macaques to understand the biology of various macaque troops at different elevations and in different habitats, as well as long-term projects to monitor the macaque population and its distribution. At the same time, the COA hopes to raise public awareness of differences in the regulations for dealing with non-protected species and protected species under the WCL in the hope that people will obey the law and help preserve one of Taiwan's rare and valuable endemic species.



Fisheries Administration Establishes System for Reporting Whale Shark Catch

Under article 46 of the Fisheries Law, the Fisheries Administration (FA), Council of Agriculture, has officially announced the establishment of "Regulations for Whale Shark Catch Reporting." Starting from July 1, 2001, the owners and captains of fishing vessels and set-net (trap net) fishing ground owners will be required to report catch data if they catch whale sharks (*Rhincodon typus*) in waters around Taiwan. In addition, they must notify the Fisheries Department or Fishery Management Bureau of the local government of the catch. On receiving such a report from fishermen, the local government must then send the relevant information by mail and by fax to the FA and the Fishery Resources Research Group of the Fisheries Science Department, National Taiwan

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Ocean University. If the fishing vessel does not notify local government of the whale shark catch, but the catch is reported to the FA by the local government, the fishing vessel will be liable for a fine of between NT\$15,000 to NT\$75,000. The FA has begun publicizing the new regulations through local Fishing Unions and fishermen's organizations in the hope that Taiwan's fishermen will cooperate.

The extremely late sexual maturity, low reproductive capacity, and high vulnerability to exploitation of the whale shark, which is believed to be highly migratory, has meant that the species has recently become the focus of international conservation efforts. However, at present, very little is known about the biological history of the whale shark, its ecological role, or its global conservation status. Although the species is listed as "data deficient" on the IUCN's 1996 Red List of Threatened Animals, it is not listed as a protected species. Only a small number of nations have begun to ban whale shark fishery. To conserve and utilize Taiwan's whale shark resources in a sustainable manner, the Fisheries Administration has commissioned the NTOU's Fishery Resources Research Group to conduct a survey of whale shark fishery along Taiwan's coastlines and to investigate changes in whale shark resources. The results of the survey are meant for use in developing management and conservation strategies for the whale shark.

The FA pointed out that Taiwan's fishing industry only started using whale shark resources approximately one decade ago. The species is referred to as "Tofu shark" in Taiwan

because of the white color, the soft texture, and the high water content of its flesh. However, Taiwan does not have a dedicated whale shark fishery. Usually whale sharks are caught accidentally by set net or on an opportunistic basis by harpoon. However this situation is changing following growing demand for the fish and the correspondingly high prices it fetches—a 1,000-kilogram whale shark could fetch as much as NT\$200,000 in wholesale markets. According to the FA's survey, in recent years, the whale sharks caught and landed at Taiwan's harbors are gradually diminishing in size. For instance, at Chengkung Harbor, the whale sharks landed by local fishermen four years ago were around six meters long on average, compared to just over four meters long today. The average weight has dropped from over 1,500 kilograms four years ago, to around 640 kilograms today. Conservationists are alarmed by this phenomenon because it suggests that the number of large adult whale sharks around Taiwan is decreasing rapidly.

The FA said that the work of conserving whale sharks must be undertaken gradually in several consecutive stages, with the first stage being the establishment of Regulations for Whale Shark Catch Reporting so that the current distribution of whale sharks around Taiwan can be understood more fully. From this information, fishing quotas can be established, with the ultimate aim of establishing a complete ban on whale shark fishery until the species recovers.



Farmland Tree Frog Conservation Project

With two Farmland tree frogs (*Rhacophorus arvalis*) looking on, the director of the Taipei Zoo, Mr. Yang Sheng-hsiung, signed a tree frog conservation agreement on May 27, 2001 with the village chief of Kukeng Township in Yunlin County, Mr. Hsieh Shu-ya. Hsieh signed the agreement on behalf of 21 bamboo farmers from Nantsai Village, Kukeng, and promised on their behalf to fully support a five-year project to conserve Farmland tree frogs. The “Five-year Farmland Tree Frog Conservation Project” led by the Taipei Zoological Foundation marks the first time in Taiwan that government, business, academia, and the public have come together to cooperate with conservationists on a particular wildlife project.

Rhacophorus arvalis, commonly known as the Farmland tree frog, was discovered and confirmed as a new species in 1996 by National Taiwan Normal University Zoology Department professor, Dr. Kuang-yang Lu. The frog’s distribution is extremely narrow and the species is found only on agricultural land in a handful of townships and villages in Yunlin, Chiayi and Tainan counties. In particular, *Rhacophorus arvalis* populations are mostly concentrated in the bamboo forests, orchards, and mixed forest areas around Kukeng.

A teacher at Chiao-chen Elementary School in Kukeng, Mr. Ching-chun Chen, has been observing local Farmland tree frogs over the past one year. He discovered that a large

number of tree frogs inhabited the bamboo forests in the village, but that their continued survival was being threatened by the fact that many farmers were switching to orange farming and cutting down their bamboo plantations, due to a recent slump in the price of bamboo shoots. The tree frogs face not only the loss of their habitat, but orange farming tends to require the use of more pesticides and other chemicals, which poisons the frogs. After learning about the frogs’ plight, NTNU professor Lu set about finding outside help. Finally, he was able to initiate the conservation cooperation project between the Kukeng bamboo farmers and the Taipei Zoo.

Under the agreement, for the next five years, the Taipei Zoological Foundation will compensate each bamboo farmer NT\$5,000 a year to encourage them to continue growing bamboo shoots in the 5.7 hectares of bamboo forest inhabited by the tree frogs, instead of switching to orange farming. The farmers will also be urged not to use chemicals and pesticides, but to preserve the Farmland tree frog’s habitat.



White Storks Spotted in Kaohsiung

The Kaohsiung Wild Bird Society (KWBS) is excited about the recent sighting of a pair of extremely rare White Storks (*Ciconia ciconia*) along the coast of Kaohsiung in south Taiwan. The species, which is listed as endangered, is considered to be as rare as the Black-faced Spoonbill (*Platalea minor*). The

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storks were seen building a nest in Kaohsiung. The location of the birds' sighting and their nesting place has not been revealed to prevent curious members of the public from disturbing them. KWBS has begun monitoring the nest site.

To highlight the importance of the recent sighting of the white storks in Kaohsiung, on May 29, 2001, Dr. Richard Thomas of BirdLife International visited Kaohsiung City Mayor, Mr. Frank Hsieh. While recognizing the Kaohsiung authorities' conservation efforts and work to attract rare birds and other fauna to inhabit the area, Dr. Thomas said that he hoped Mayor Hsieh would realize the importance of conserving threatened species like the white stork, which is currently listed on the IUCN Red List of Asian Bird Species. In response, Mayor Hsieh said that he intends to increase the number of wetland parks in the Kaohsiung municipality and to actively improve the environment around Kaohsiung Harbor and Love River (Ai River) to attract wild birds and other wildlife to these areas.



Police Thwart Attempt to Smuggle Plants

Several plant species, including *Pittosporum pentandrum* and the *Pemphis acidula*, which grows on coral reefs in south Taiwan, were recently stolen from Kenting National Park in Pingtung County. Acting on leads from police in Pingtung, the Pingtung

District Prosecutors Office, as well as the Taiwan Forestry Bureau, Homei District Police Criminal Investigation Team, Taichung Customs Bureau, and Taichung Harbor Police, raided a container awaiting export at Taichung Harbor on May 25, 2001. During the raid, police discovered that Tienwei garden center owner, Mr. Li Mu-yu, and his wife were attempting to smuggle *Pittosporum pentandrum*, *Pemphis acidula* and other plants stolen from Kenting National Park into China via Hong Kong, by packing the plants beside American peanut seedlings registered for export. After questioning by Homei District Police and Pingtung County Police, the couple was turned over for prosecution by the Pingtung District Prosecutors Office.



Taiwan Cracks Wildlife Crimes

In April, the Bureau of Agriculture of Taichung County Government and the Wildlife Protection Unit of the Council of Agriculture detained a pet shop owner in Daya Township, Taichung County, for illegally displaying protected tortoise and fish species. A total of five African spurred tortoises (*Geochelone sulcata*), one Red-footed tortoise (*Geochelone carbonaria*) and more than 80 *Sceropages formosus* were discovered in the raid. Inspectors determined that the protected species had most likely been smuggled into Taiwan. The tortoises were given a permanent home at

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Taipei Zoo, while the *Sceloporus formosus* are being temporarily safeguarded by the storeowner, pending a decision by the courts, after which the fish will be transferred to the appropriate authorities.

Meanwhile, in May, the owner of a local trading company, Liu Chi-chun, was caught at Kaohsiung Harbor trying to smuggle more than 3,800 kilograms of pangolin scales and 16 kilograms of tiger and lion bones into Taiwan by hiding them among *Machilus* tree bark imported from Indonesia. The Kaohsiung District Prosecutors Office charged Liu under the Wildlife Conservation Law for illegally importing protected species.

And finally, on May 18, the COA Wildlife Protection Unit, working with officers from Nantou County Government, Nantou County Police Criminal Investigation Team and Nantou Forest District Office of the Taiwan Forestry Bureau (TFB), caught two poaching suspects in a cabin at Tanta, Nantou County. The two men were found in possession of various protected species remains, including one Formosan serow (*Capricornis crispus swinhoei*) carcass, two Formosan Reeve's muntjac (*Muntiacus reevesi micrurus*) heads, three muntjac legs, one muntjac carcass and a sack of animal entrails. Hunting equipment, including homemade rifles, pellets, and a crossbow. The case has been passed on to the Nantou District Prosecutors Office.



Broad-tailed Swallowtail Butterfly Habitat Protected

The Council of Agriculture (COA) has designated the area around Kuanwu in Miaoli County as a Major Wildlife Habitat (MWH) under the Wildlife Conservation Law to conserve the rare and endangered broad-tailed swallowtail butterfly (*Agehana maraho*). This is the first MWH in Taiwan to be devoted exclusively to the conservation of insect species.

The Kuanwu Broad-tailed Swallowtail Butterfly MWH, which comes under the jurisdiction of the Hsinchu Forest District Office of the Taiwan Forestry Bureau (TFB), is situated in Mei-yuan Village in Tai-an Township, Miaoli County, at an elevation of 1,900 to 2,000 meters. With an area of around 23.5 hectares, the MWH contains a large area of extremely precious virgin *Sassafaras randaiense* forest, which is the sole food source of the broad-tailed swallowtail caterpillars.

The broad-tailed swallowtail is endemic to Taiwan. This rare and beautiful montane species was discovered for the first time in 1932 on the banks of the Maozi Stream in Yilan County. At the time, due to the difficult nature of collecting species samples, the butterfly was initially named the "golden butterfly." Later, in 1935, the Japanese listed the species as a "Natural Monument."



Chatienshan Nature Reserve

Introduction to Taiwan's Nature Reserves

Located in Sanhsia and Wulai in Taipei County, and Fuhshing Township in Taoyuan County, Chatienshan Nature Reserve was established in 1992. Stretching over the northern ridges of the Hsuehshan Mountain Range, with Mt. Lala at its center, the Reserve runs along a north-south axis from Wulai in the northeast to Fuhshing in the southeast. With a total area of 7,759.17 hectares, the Reserve is situated at an elevation of between 300 and 2,129 meters above sea level. The mean annual temperature is around 15.6 and mean annual precipitation is 3,290 mm. The Reserve falls into the very humid-type temperate climate.

The Reserve is characterized by the presence of rare Formosan elms (*Facus hayatae*), one of 11 rare and valuable plants in Taiwan. Chatienshan Nature Reserve marks the southernmost edge of this plant's distribution in the northern hemisphere. A member of the Fagaceae family genus *Fagus*, the Formosan elm is a very large deciduous tree that grows to more than 20 meters tall and over 70 cm in diameter. Most specimens are found near the mountain ridge, forming a large area of virgin forest within the Reserve. Due to the relatively low rate of fruit bearing of the Formosan elm, the rate of germination is extremely low and the number of seedlings is correspondingly low. The Reserve is also noted for several groups of *Rhododendron rubropilosum*, another plant listed as rare and valuable. An evergreen shrub,

the *Rhododendron rubropilosum* blooms every year in April. Most specimens are found among the fog forests of northern Taiwan's mountain areas. Chatienshan Nature Reserve is an important propagation area for this species.

A large number of rare and valuable, or endangered animal and bird species also inhabit the Reserve, e.g. the Formosan black bear (*Selenarctos thibetanus formosanus*), the Large purple fritillary (*Sasakia charonda formosana*), Swinhoe's pheasants (*Lophura swinhoii*) and Brown wood owls (*Strix leptogrammica*).

The Reserve makes up an important part of the undamaged medium-altitude forest ecosystems of northern Taiwan. Most of the plant types within the Reserve fall within the Machilus-Castanopsis Zone, while those growing at lower altitudes are part of the Ficus-Machilus Zone. A small number of coniferous species are distributed at altitudes of more than 1,800 meters above sea level. In addition to an abundance of rare and beautiful plant resources, the Reserve also encompasses the major watersheds of the Shihmen and Feitsui reservoirs. The integrity of the broadleaf forest cover within the Reserve provides excellent habitats and environments for various wild animal species.

At present, recreational activities, illegal logging and poaching pose significant pressure on the Reserve; therefore, the management of these activities must be strengthened. Furthermore, efforts need to be taken to help repopulate the Formosan elm, the major species

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protected by the Reserve, in order to maintain its natural rate of renewal.



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