



臺灣瀕臨絕種的 綠蠓龜

The Taiwan Green Turtle
Chelonia mydas



行政院農業委員會 編印
國立臺灣海洋大學 製作

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臺灣瀕臨絕種的綠蠵龜，*Chelonia mydas*

臺灣共有五種海龜，分別是綠蠵龜，*Chelonia mydas*，赤蠵龜，*Caretta caretta*，玳瑁，*Eretmochelys imbricata*，麗蠵龜，*Lepidochelys olivacea*，及革龜，*Dermochelys coriacea*，五種海龜中以綠蠵龜為最常見，但數量並不多。行政院農業委員會有鑑於此，遂於民國78年設立野生動物保育法，將五種海龜均列為“瀕臨絕種的野生動物”，並規定所有的海龜均須加以保護，除了特殊的情形外，禁止騷擾、獵捕、虐待、殺害、以及非法擁有或買賣。其他相關之法令，如民國71年設立之文化資產保護法以及民國78年修正之漁業法規中亦有明文之規定保護這些瀕臨絕種的野生動物。

農委會從民國81年起，委託國立臺灣海洋大學，海洋生物研究所副教授程一駿博士進行海龜生物學之研究，程博士已於近日受邀加入國際物種保存委員會（IUCN）以及國際



澎湖望安島沙灘上正待產卵的母龜。
The gravid green turtle on the beach of Wan-An Island, Penghu archipelago.

The Taiwan Green Turtle *Chelonia mydas*

There are five species of sea turtles in Taiwan, the Green Turtle, *Chelonia mydas*, the Loggerhead Turtle, *Caretta caretta*, the Hawksbill Turtle, *Eretmochelys imbricata*, the Olive Ridley Turtle, *Lepidochelys olivacea*, and the Leatherback Turtle, *Dermochelys coriacea*. Among them, the Green Turtle is the most common, but nevertheless few in number. The Council of agriculture (COA) enacted wildlife legislation in 1989, listing all sea turtles as "Endangered Wildlife". The law stipulates that all sea turtles should be protected. Except under extraordinary circumstances, sea turtles may not be disturbed, abused, hunted, captured, traded, killed, exchanged, or illegally owned or possessed. Other related laws, such as the Cultural Heritage Conservation Law dating from 1982, and the Fishery Law (amended in 1989) stipulate similar measures to protect these endangered turtle species both on land and on the high sea.

Research on the biology of the Green Turtles funded by the Council of Agriculture began in 1992. The project is headed by Dr.



保護區
Preserve





正在沙灘上工作的海龜研究小組。
The sea turtle research team at work.

生態保育聯盟 (IUCN) 之海龜工作小組。這個計劃主要集中於臺灣海龜之生殖生態學的研究，計劃執行迄今，發現綠蠵龜主要產卵於澎湖之望安島以及少數其他島嶼的沙灘之上。

望安島上的綠蠵龜

綠蠵龜在望安島上之產卵季節每年從五月到十月間，成熟



正在產卵的綠蠵龜。
The nesting green turtle.

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Cheng, I-Jiunn, an associate professor at the Institute of Marine Biology, National Taiwan Ocean University. Dr. Cheng became a member of the SSC and the Marine Turtle Specialist Group (MTSG) of the IUCN recently. His project, which concentrates on the nesting ecology of Taiwan sea turtles, found that the Green Turtle nests mainly on Wan-An Island, and few other beaches on the Penghu Archipelago, Southwest of Taiwan.

The green turtles at Wan-An Island

The nesting season of the green turtle at Wan-An Island lasts



產完卵後，母龜先用後肢將卵窩用沙蓋住。
After nested, the turtle first covers its nest with the rear flippers.

5



窩中之卵在經過 4 6
到 5 5 天孵化後，小
海龜出生了……

After 45 to 50 days, the
baby turtles hatched.

的危機，漁民撈捕海龜，吃其肉，將其龜殼製成裝飾品，挖掘其蛋來吃或孵化後非法販賣圖利，近岸定置網、延繩釣及其他網具之意外捕獲都會使海龜受傷或溺斃；許多被活捉的海龜都被賣到寺廟去展覽，不良的水族環境會使海龜得病而死亡；不當的海灘開發（如築堤及建步道）以及把沙做各種公共工程都會破壞其產卵環境，甚至會造成整個沙灘因侵蝕而消失。根據調查，過去臺灣的東岸及南岸共有 8 7 處海龜產卵的沙灘，如今只剩下 6 處，而且大部分都集中於澎湖群島區。

綠蠵龜的保育工作

儘管面臨許多的生存危機，綠蠵龜的保育工作仍然獲得若

……並於夜晚爬出窩巢……
...and emerge from the nest in the evening.



8



……很快的爬回海中
... move quickly toward the ocean.

coverage, proximity to the sea, nest depth, and whether or not the nest is subject to human disturbances such as egg poaching. The baby turtles range from 41 to 54 mm in straight carapace length and weight 12 to 33 grams. They emerge at night and move quickly toward the brighter shimmering world of the ocean. Within minutes, they were disappeared in the ocean, leaving behind nothing but hundreds of small footprints on the beach.

The endangered Green Turtle

Misuse of resource and the lack of proper research in the past have left the Green Turtle in Taiwan facing serious threats. Direct harvest of the turtle for its meat, use of its shell for ornaments, poaching and sale, unintentional capture in coastal setnet, longline, and other fishing gears also lead to injury or drowning of this species. Many turtles captured alive have been sold to temples for display. Poor captivity conditions result in turtle death from illness. Improper beach constructions (e.g. dikes and walkways) and sand mining have even eroded the beach completely. Once there were at

僅在沙灘上留下數百個小小的足印。
leave only hundreds of footprints on the beach.



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寺廟中展出的海龜。
The captured green turtle was displayed in a temple.

千成效，在當地鄉長的大力宣導環保及保育之重要性後，民眾已對拯救綠蠵龜之行動加以重視；許多澎湖群之中，小學亦以望安綠蠵龜做為保護野生動物之教育題材。

望安的綠蠵龜產卵族群雖然不多，但產出卵窩數卻有逐年增加之趨勢，母龜於1992年產下44窩卵，有6窩被盜挖，1993年產下53窩卵，僅1窩被盜挖，到了1994年夏天母龜共產了103窩，有五千隻以上的小海龜安全的孵化出來回到大海中，雖然說，目前仍無法確定在望安的綠蠵龜產卵族群已經恢復了，但從逐年增加的產龜數量中，我們可以看出島上的綠蠵龜將會有一個美好的前景。

今年夏天，這個計劃已推展至國際合作的層面，經由農委會的協助，程教授出面邀請了國際生態保育聯盟海龜工作小組之副主席博樂茲先生來臺協助人造衛星追蹤以及其他相關之保育工作，在他的鼎力幫忙之下，我們很成功地將與法國Argos資料處理公司連繫之ST-6人造衛星發射器裝置於兩隻海龜背上；這是我國第一次將人造衛星追蹤技術應用於野生動物之研究工作上。在經過兩個半月的追蹤後，發現望安一號在洄游了近一千一百公里的直線距離後，到達日本九州外海的鹿洲島附近海域；而望安二號則洄游了近四百



在藝品店中展示的海龜標本。
The stuffed green turtle was displayed in an ornament shop.

least 37 nesting beaches distributed on the southern and eastern coasts of Taiwan, but today only six remain, mainly along the Penghu Archipelago, where Green Turtles could still be found in 1994.

Protection of the green turtle

Despite all these threats, progress has been made toward protecting the Green Turtle. A strong campaign by the country's leadership for a clean environment and the protection of endangered wildlife has raised awareness of the need to save the Green Turtle on Wan-An Island. Most primary and high schools in Penghu County are studying the Green Turtle to practice wildlife conservation.

The remaining nesting rookeries of the Green Turtle on the Wan-An Island, though few in number, are increasing each year. The mother turtles laid 44 nests in 1992, six of which were poached. In 1993, 53 nests were laid and only one was poached. This summer, more than 100 nests were laid and thousands of baby turtles safely released to the sea. Although it is still too early to say with certainty that the Green Turtles on Wan-An Island are recovering, the increasing number of hatching does suggest a brighter future for the Green Turtle on the island.

This summer, the Project has advanced to the international level. Through the COA, Dr. Cheng has invited Mr. George H. Balazs, Deputy Chairman of the Marine Turtle Specialist Group, IUCN to assist with satellite telemetry research and certain aspects of sea turtle conservation. With his help, Telonic ST-6 satellite transmitters linked to the Argos system were deployed successfully on two green turtles. This is the first time we have ever utilized satellite biotelemetry to monitor wild animals. After two months' tracking, one turtle migrated northward over 1100 miles straight distance toward Shimo-kosmiki-jima Islet, which is a part of Kyushu Island, Japan. The other turtle also migrated northward over 400 miles straight distance, stayed in the nearshore waters outside the Tamsui Estuary, Taipei County. The South Pacific Regional Environment Programme (SPREP) announced that 1995 will be the Year of Western Pacific Sea Turtle. The COA in planning to join the program and host corresponding activities in the region.

In order to strengthen existing conservation regulations, the ROC legislature passed the New Conservation Law (Executive Act



被盜挖的海龜蛋。
The poached green turtle eggs.



建於澎湖望安島綠蠵龜產卵沙灘上之水泥步道以及衛浴設備。
The cement walkway and a bathroom-toilet combination built on the nesting beach of the Wan-An Island, Penghu Archipelago.

公里的直線距離後排相於大屯山到基隆附近之海域中。南太平洋地區環境組織 (SPREP) 已將 1995 年定為西太平洋海龜保育年，而農委會也正在積極地籌劃加入其組織，並準備主辦一系列臺灣地區的相關活動。

為了加強目前的保育法，立法院已於民國 83 年 10 月底通過野生動物保育法之修正條例，來加強取締非法交易、飼養，以及其他危及野生動物生存之活動；同時，農委會亦於同年 12 月通過澎湖縣政府所提之於望安島設立綠蠵龜產卵地保護區的建議書，在這個計劃下，我們可望在下一年度即季時多雇幾個沙灘巡邏員來執行保育工作。

一位保育人士於民國 83 年 9 月 23 日的夜晚於基隆的一家水族店內發現五隻小海龜正待價而沽，經由通報後，一位市政府的官員將它們救出並送到程博士的實驗室中暫時保管

澎湖望安島上一所小學牆面上的綠蠵龜圖案，它已成為該島中、小學保育教育之一主要動物題材。

The green turtle painting on the wall of a primary school as a symbol of conservative wildlife on the Wan-An Island, Penghu Archipelago.



博樂茲先生參與澎湖望安島上綠蠵龜人造衛星發報器之裝置工作。
Mr. George H. Balazs and the sea turtle research team on the satellite telemetry work at Wan-An island, Penghu Archipelago.

of October 1994, as amended) to tighten measures directed against illegal trade, breeding in captivity or other forms of destruction to endangered wildlife. Meanwhile, in December 1994 the COA also granted a proposal submitted by the Penghu county government to establish refuge beaches for the nesting Green Turtle on Wan-An Island. Under the new available budget, more guards will be hired in coming years to patrol the beaches during the nesting seasons.

On the evening of September 23 this year, a animal lover found five captive baby Green Turtles for sale in a pet store in Keelung. They were rescued and sent to Dr. Cheng's laboratory for the temporary shelter by officials from the Keelung city council. Two days later, the public prosecutor ordered the immediate release of the rescued turtles. Because the shop owner refuse to provide the information about the supplier of the baby turtles, the release ceremony was held on a carefully chosen beach, the Sanshu Beach on the Makang Island. Green Turtle nesting rookeries were quite abundant on this

背上裝置 ST-6 人造衛星發報器的綠蠵龜。

The green turtle with the ST-6 satellite transmitter mounted on her back.





背上裝有 ST-6 人造衛星發報器的綠蠵龜向大海。

The ST-6 satellite transmitter mounted turtle move toward the sea.



背上裝有 ST-6 人造衛星發報器的綠蠵龜回海中。

The ST-6 satellite transmitter mounted turtle move into the water.



中、美兩國在海龜人造衛星追蹤研究上攜手合作。

The cooperation in the sea turtle conservation work between ROC & US.



澎湖望安島上將蠵龜產卵地保護區之規劃工作。

The establishment of the refuge sites for the gravid green turtle on the Wan-An Island, Penghu Archipelago.



五隻從水族店中拯救出來的小海龜。

The rescued captive baby green turtle.



馬公島山水沙灘上的綠蠵龜野放儀式。

The release ceremony held on the Sanshu beach of the Makung Island.



海龜野放後，程博士與高縣長以及鎮主要商談澎湖的保育工作事宜。

After ceremony, Dr. Cheng discussed conservation issues with the local political leaders.



：兩天後，在偵查告一段落時，檢察官下令立即野放，因為店主拒絕提供海龜之來源，野放的儀式在經過細心選擇後，選定於澎湖縣馬公島上的山水沙灘，二十年前這個沙灘上有為數眾多的綠蠵龜上岸產卵，如今所剩寥寥無幾，我們真誠的希望藉由這個野放儀式喚起民眾的保育意識，並重建當地之產卵族群，這個野放行為引起全國的重視，也提供了中、小學老師一個保護野生動物的最佳教育題材。

臺灣綠蠵龜之前途

雖然說綠蠵龜的保育行動已經展開了，然而，以目前的情形要斷論說臺灣的海龜族群已恢復往日的盛狀又似乎太早了，不過，在不斷地加強野生動物保育之文宣工作，加強取締非法野生動物的交易以及透過各種管道教育民眾認識綠蠵龜的努力下，這個瀕臨絕種的野生動物將在臺灣有一個很好的生存的機會，而於望安島上設立綠蠵龜產卵保護區之舉，將更進一步地幫助這個動物恢復以往的族群量。



臺灣的綠蠵龜將有——光明的前景
The brighter future of the green turtle in Taiwan.

Beach twenty years ago, but now only a few are left. It is hoped that this ceremony will raise conservation awareness and rejuvenate the Green Turtle population. The rescue story attracted nation-wide attention and provide a good opportunity for school teachers to stress the importance of the wildlife conservation to their students.

The future of the green turtle in Taiwan

Even though there has been some progress in protecting the Green Turtle, it is still too early to declare that Taiwan's sea turtles have recovered. However, an increasing awareness of the need for wildlife conservation, tighten the conservtionn measures, increasing international cooperation on the sea turtle research, and growing public familiarity with the Green Turtles through education promise a brighter future for this endangered species. The establishment of the refuge site for the nesting Green Turtle on the Wan-An Island will also help bring this animal back to the previous population levels.