

細心守護

讓愛像海洋一樣廣

Vast Amount of Love for the Sea

墾丁國家公園珊瑚礁生物保育週紀實

KTNP's Coral Reef Conservation Week

紅扇珊瑚 / 蟹膏蟲提供
Milipora ochracea / Photo provided by KTNP



刺河豚 / 蟹膏蟲提供
Eelwhisk / Photo provided by KTNP

盛夏，有許多人的美好回憶與沙灘分不開，與好友打場熱力四射的沙灘排球；牽著戀人的手浮潛，欣賞色彩繽紛的珊瑚；撿起大洋坐坐在海邊，看著孩子愉快的逐浪堆沙堡；挽著老伴一同望著夕陽沒入海平面……而在浪漫的海景之下，海洋更是眾多水生生物賴以維生的家園。

位處太平洋西緣的台灣，四面環海，在生物地理分布上屬於印度-西太平洋區，是全球最豐富的海洋生態區。台灣的海岸更是得天獨厚，從沙灘、岩岸、紅樹林乃至於珊瑚礁，一應俱全，海洋生態展現了高度多樣性。可惜，過往因為太過偏重經濟發展，著重短期利益，台灣周遭9成以上的自然海岸，均遭受到破壞，連帶使得台灣的海洋生物多樣性受到嚴重威脅。重創的大海雖無言，但受傷的生態、枯竭的資源，今日海洋資源的匱乏已經到了不容人們忽視的地步。

墾丁國家公園俱山海之勝，海域珊瑚礁生態資源的豐富與多樣更是本島之最。2005年，墾丁成立了「後壁湖海洋資源保護示範區」，擬訂了一系列關懷海洋生態的行動計畫，其中包括建置「海底長期生態遙控監測系統」，這套系統也讓台灣的海洋生態保育研究工作如虎添翼，累積了無數精湛的保育成果。

多年前，研究人員觀察到，每年農曆3月的月圓之夜，墾丁海域的珊瑚會集體產卵，大量的精卵會被排放到海中，熱鬧展現新生命誕生的喜悅，把原本漆黑幽靜的海底妝點得如同璀璨星空。台灣大學戴昌鳳教授等學者專家自1990年起，即進行為期數年的海底守候與調查。多年的調查結果顯示：珊瑚每年的生殖時間都非常準確，而且可以預測。

We often relate summer with the beach and have mental images such as beach volleyball, enjoying the colorful coasts with our families, relaxing on the beach, seeing children making sand castles, or watching the sun setting below the horizon. Besides the beauty it offers, the sea is definitely home to many life forms.

Located on the west edge of the Pacific Ocean, Taiwan is surrounded by water at all four fronts. In terms of biological and geographical distribution, Taiwan is located in the India-West Pacific area and enjoys the richest marine ecosystems in the world, complete with sand beaches, rugged coasts, red woods, and coral reefs. However, the focus on economic development and short-term profits have resulted in more than 90% of Taiwan's natural coasts being damaged, threatening the biodiversity in Taiwan's seas. Although the sea is silent, the damaged ecosystems and depleted marine resources have reached a degree that simply can no longer be ignored.

With both land and sea resources, Kenting National Park also has the richest coral reef resources in Taiwan. In 2005, KTNP established the "Hou-bi-hu Marine Resource Conservation Area" and a set of action plans for marine ecosystem conservation, including a "long-term ecosystem monitoring system" which is greatly facilitating Taiwan's sea conservation.

Starting many years ago, the researchers have noticed that during full-moon nights around May, the corals in Kenting waters would spawn eggs into the sea, turning the silent and dark sea into a dazzling starry night full of life. Scholars such as Chang-feng Dai (NTU) started making deep water observations since 1990, and the investigation shows that corals reproduce on an accurate and predictable schedule.



為了配合一年一度墾丁海域珊瑚的生殖週期，並藉此推動正確的海洋生態保育觀念，墾丁國家公園近年來持續推動「珊瑚礁生物保育週」活動，今年此系列活動於4月28日至5月3日進行，希望藉由一系列的珊瑚礁生物多樣性保育相關活動，讓有心加入海洋保育行列的民眾，有機會參與此意義非凡的活動，同時也為世代子孫保留住這片大自然所賜予的珍貴資產。

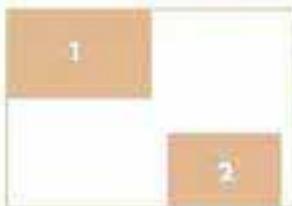
珍貴資產 產官學界與當地社區攜手守護

今年墾丁國家公園珊瑚礁生物保育週活動由珊瑚礁學會、海洋生物博物館、水中攝影協會、當地社區組織、學校共同合作，活動內容包括保育週開幕暨跳石示範區成立典禮、潛心守護——與海膽有約放流淨灘活動、海洋萬花筒——潮間帶生態系導覽活動、「海域遊憩活動如何與海洋生態保育結合——以國外為例」專題演講、潔淨海岸——海洋義工淨灘活動、墾丁國家公園96年度委託研究案成果展、海洋生態攝影展，以及珊瑚礁生態夜營紀實。系列活動開幕當天，當地社區的媽媽也歡歌載舞為保育活動加入不同以往的社區風格。

In order to complement the annual coral reproduction and teach the public about marine ecosystem conservations, KTNP has held the "Coral Reef Conservation Week" activity for several years. This year, the event takes place from April 28th to May 3rd, and it is wished that the public could participate in the meaningful marine conservation efforts and help preserve the invaluable assets for our future generations through a series of coral conservation activities.

Industrial, Governmental, and Academic Circles and the Locals Protecting the Resources

This year's KTNP Coral Reef Conservation Week activity is held by TCRS, NMMBA, UPA, local communities, and schools. The event includes the opening ceremony for Teo-shih Observational Area, the "Protecting with Our Hearts - Snorkeling and Sea Urchin Observation" activity, "Sea Kaleidoscope - Tidal Flat Ecosystem Observation," the seminar of "How do Foreign Nations Combine Marine Recreations with Marine Conservation," coastal clean-up volunteer work, exhibitions of KTNP's 2007 efforts, marine ecosystem photo exhibitions, and coral spawning observations. On the first day of the event, local women will also give musical and dance performances.



1. 墾丁的珊瑚礁海岸／蕭進元攝
Kenting's coral reef coast / Photo by Jin-yuan Dai
2. 小丑角與海葵／鯉智處理供
Clown anemone fish and anemone / Photo provided by KTNP

墾丁國家公園海域水質清澈、水溫適宜、又有充足的陽光，因此是台灣珊瑚礁最茂盛美麗的海。豐富的珊瑚礁生態，鮮艷亮麗海底珊瑚礁魚類來回穿梭，加上海底地形變化多端，造就各式各樣海洋中多樣性生物，這樣的美景每年都吸引為數眾多的遊客。可惜的是，親近海洋之時，也經常留下許多的傷害及隱憂。常在墾丁海域活動的族群都不難發現這片海的改變，當地土生土長的潛水業者蔡永春先生憂心忡忡，花了3年的時間，深情紀錄「後壁湖海洋資源保護示範區」生態資源由凋零而復甦的點點滴滴，這感人的影片也在活動開幕時放映，影片中滿載當地人對墾丁海洋的深情。

生活如常 墾丁珊瑚不受去年高溫白化影響

墾丁的珊瑚礁群舉世聞名，國家公園成立以來，許多學者專家即在這片海域般動記錄此生態系的動態變化。去年全球各地的珊瑚受到氣候變遷衝擊，在高溫的影響下呈現白化的現象，墾丁海域的珊瑚也不例外，為能及早因應珊瑚礁生態系的負面變化，墾管處甚至透過國內珊瑚保育學者與美國政府海洋暨大氣總署 (NOAA) 建立合作關係，將引入一套珊瑚礁早期預警系統 (Coral Reef Early Warning System)，希望透過與全球科學家合作，建立全球珊瑚礁白化預警及通報機制，預先防範珊瑚礁白化問題，並提供實際可行之珊瑚礁保育策略。

但慶幸的是，經過學者專家於珊瑚礁保育週的夜潛觀測，今年墾丁海域珊瑚礁集體健康的狀況與往年相較，並無異樣。這段期間，夜晚的珊瑚礁海洋依然如繁星流轉的太空。

KTNP has clear water, appropriate water temperature, and rich sunlight, making it the most beautiful coral region in Taiwan. The rich coral ecosystems, colorful fish species, and diverse underwater landscapes have created a biodiversity that attracts many tourists every year. Unfortunately, much harm is done when we are close to the sea. Those who spend much time in Kenting waters have noticed the changes made to the sea. Yong-chun Tsai, a local diver who is born and raised in Kenting, spent three years to record how the bio-resources in Hou-bi-hu Marine Resource Area have slowly recovered. This touching film he produced will also be shown on the opening day to show how much love the locals have for the sea.

Reproduction Not Affected by High-temperature Bleaching As Seen Last year

Kenting's coral reefs are known to the world, and many scholars have started recording the changes ever since KTNP was established. Last year, corals through out the world were showing bleaching due to the high temperature caused by global warming, and Kenting's corals were no exception. In order to respond to the negative changes to the coral reefs, KTNP and domestic coral conservationists have worked with NOAA to collaborate and introduce the Coral Reef Early Warning System to Taiwan. It is wished that by working with scientists around the world, we will be able to form a global coral bleaching and warning system in order to prevent the impacts and come up with feasible conservation strategies.

Fortunately, the nighttime diving conducted by the scholars during the Conservation Week indicates normal coral reproducing in Kenting waters. During this period of time, the sea in the night is still turned into a starry outer space by corals.



跳石示範區 保育的延伸

2008年為國際珊瑚礁年，透過鏡頭及影像，民眾或許已逐漸知道珊瑚礁的美，同時明白脆弱卻對海洋生態平衡極為重要的珊瑚礁，是多麼需要民眾的關懷及保護，因此在保育週開幕的同時，墾管處正式成立了「跳石海洋資源保護示範區」，並延續「後壁湖海洋資源保護示範區」的成功案例，結合當地社區居民的力量，組成社區保育巡守隊，運用在地參與來守護珍貴海洋資源。墾管處施錦芳處長為巡守隊授旗時表示：唯有落實社區保育，國家公園的保育才能真正實現。

跳石海洋資源保護示範區的計畫範圍由南寮南邊海岸，往南延伸至跳石，再往東南延伸至潭子灣漁港入口處，此範圍為國家公園海域遊憩區，面積約38公頃。此區域海藻生長茂盛，分佈區域廣且水位淺，據學者長期研究顯示，本區為每平方單位珊瑚種類最多之處，以浮潛或直接俯視，即可觀察海域區棲聚的珊瑚礁，美景動人心弦。然而，如此豐富的海洋資源因人為遊憩的壓力，面臨極大的續存挑戰，希望藉由保護示範區的成立，在大家共同守護下，跳石海域生態可以欣欣向榮，珍貴資源可以永續保存、永續利用。

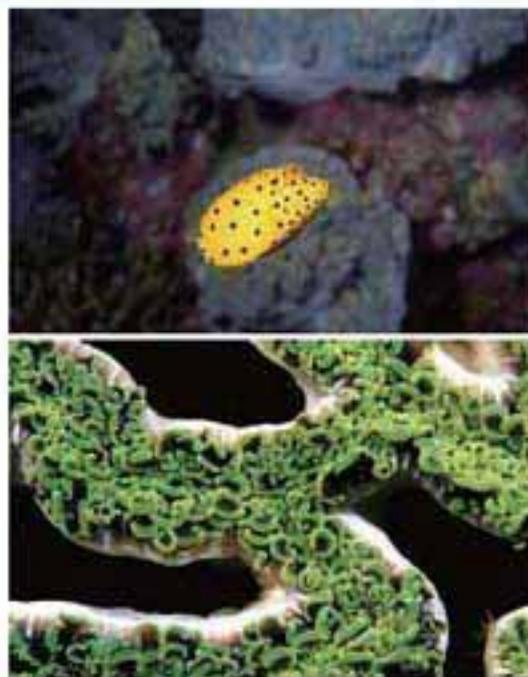
保護海洋的觀念必須從教育下一代開始深耕，才能讓保育觀念發揚光大，「湖心守護——與海獺有約放流浮潛活動」便是由當地學童擔任流放大使，孩子們在後壁湖海洋資源保護示範區，以浮潛方式撿拾馬糞海膽，再送至跳石海域放流。許多孩子都是第一次觸摸到馬糞

Tiao-shih Area Extends the Conservation Efforts

2008 is the International Coral Reef Year. Through photos and videos, the public now understands the beauty of coral reefs and the important roles this fragile species plays in marine ecosystem. With the opening of the Conservation Week, KTNP has also officially founded the "Tiao-shih Marine Resources Conservation and Demonstration Area." By continuing the success with "Hou-bi-hu Marine Resources Conservation and Demonstration Area," the locals have formed patrol teams to protect the resources. Director Jin-fang Shih of KTNP stated that only by actualizing community education would conservation be possible.

The scope of Tiao-shih Area reaches from the southern coral reefs to Tiao-shih and extends to the southeast to Tan-zi-wan wharf, giving this marine recreation area about 38 hectares of space. This area has rich seaweeds throughout and has low water level. According to long-term studies, this area has most coral species per square unit, and one can observe the beautiful corals in the water by snorkeling or direct observation. However, the recreation activities are also threatening the survival of this area. It is wished that with the conservation and demonstration area, all of us would be able to work together and help the valuable resources in Tiao-shih area conserve and live on.

The concept of sea conservation must take root in our future generations in order for it to be effective. In the "Protecting with Our Heats -- Snorkeling and Sea Urchin Observation," the children got to release sea urchins back to the sea. In Hou-bi-hu area, the children snorkel dive,





海膽，臉上帶著驚喜的笑容，輕手輕腳、小心翼翼地將海膽交予保育人員放流至跳石海域。「希望，這些從後壁湖復育成功的海膽，能拓殖至跳石，也希望能藉此機會，讓保育的種子在孩子心中萌芽。」蟹管處處長施錦芳感性的說。

潔淨海岸 為珊瑚礁大掃除

保育週適逢珊瑚礁產卵的季節，為了不讓海岸的垃圾廢棄物隨潮水進入海洋，甚至沈澱覆蓋珊瑚，窒息珊瑚礁生態系，蟹管處員工及海洋志工於龍坑海岸進行潔淨海岸行動。這樣的活動是海洋保育義工一年一度的聯合盛會，大家雖然汗流浹背，但卻精神愉悅，不過許多民眾看到從海邊搬來的70大袋垃圾，莫不感到震驚，除了對清除工作的辛勞留下深刻印象，在未來從事海洋活動時，也會多用一點心，為大海多想一點。

在蟹丁為期一週的活動雖已結束，不過，留下的點點滴滴，卻正在慢慢匯聚成一股力量，讓海洋保育觀念從台灣開始，感染全台灣，使這個得天獨厚、承受著海洋恩澤的小島，可以成為海洋的最佳拍檔，一同邁向共生共榮的新世代。☉

pick up *Trochus gastis*, and release them into Tao-shih area. Many children touched the sea urchins for the first time, with joy, they carefully handed over the sea urchins to the conservation staff. "It is wished that the sea urchins successfully nurtured in Hou-bi-hu can also reproduce in Tao-shih, and it is also wished that the children will know more about conservation," said Director Jin-fang Shih.

Cleaning Up the Shores and Coral Reefs

In order to keep waste from entering the sea and reaching and eventually suffocating the coral reefs, KTNP's staff and volunteers started shore clean-ups in Long-kang coast during the Conservation Week when it was also the coral reproduction season. This even is the major annual gathering for the volunteers, who broke a sweat with joy. Many bystanders were shocked to see more than 70 bags full of waste being collected from the shore, and perhaps they would cherish the sea more when they realize how much effort has been taken by the volunteers.

Although the Conservation Week is now over, it is actually still spreading its influence. From the southern tip of Taiwan, the concept of marine conservation is starting to reach all over Taiwan, helping this much-blessed island to continue its status as the partner of the sea and embrace a coming era of mutual prosperity. ☉



1. 勃突褶鮑 / 蟹管處提供
Ostrea oviculus / Photo provided by KTNP
2. 腎形真葉珊瑚 / 蟹管處提供
Euphyllia percnora / Photo provided by KTNP
3. 細紋刺蓋傘 / 蟹管處提供
Panicarthus striatus / Photo provided by KTNP
4. 親朋種子，為大海淨灘，破一次大掃除 / 蟹管處提供
Time to break a sweat and clean up the shore / Photo provided by KTNP

5. 放流海膽，讓海洋資源生生不息 / 蟹管處提供
Releasing sea urchins to the sea and keep the circle of marine life going / Photo provided by KTNP
6. 保育週閉幕，蟹管處處長宿願主持並與民眾分享成果 / 蟹管處提供
In the opening ceremony of the Conservation Week, Director Shih of KTNP shares the results with the public / Photo provided by KTNP