# 回首台灣海洋資源保育路
## A Look Back on the Development of Marine Conservation in Taiwan
# 海洋子民的覺醒與珍惜
## An Awakening of the Children of the Sea

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特別感謝 Special Thanks to / 中華民國溪流環境協會理事長張崑雄教授 Prof. Kun-hsiung Chang, President of the Society of Streams 、生物多樣性資訊專題中心執行長邵廣昭教授 Prof. Kwang-tsao Shao, Chief Executive Officer of the Thematic Center of Biodiversity Informatics、中研院生物性多樣研究中心詹榮桂研究員 Researcher Rong-quen Jan of Biodiversity Research Center, Academia Sinica
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台灣海洋保育路，學者一路走來輦路藍縷 / Peter 攝
On the road of Taiwan's marine conservation, the scholars have painstakingly braved many difficulties. / by Peter

2007年1月17日，台灣首座海洋國家公園——「東沙環礁國家公園」，正式公告成立，也象徵四面環海的台灣在海洋資源保育路上，往前邁進一大步。在此之前，台灣子民受這片大海環抱孕育四百年，或許一路以來我們為她做的始終不夠多，但這條路上，有群人真真切切地走著，早在2007來臨的許多年前，便開始一步一腳印，孤單卻不寂寞地走著……

## 海洋資源保育的先行者

經濟起飛的年代，環保在國內是鮮為人知的概念，海洋保育更是陌生的議題。或許在基本民生需求尚未獲得完全滿足之際，要將海洋資源保育觀點置入人們的思維裡，的確相當困難。1980年起，積極建設是政府與民間一致的目標，環保、保育等議題，往往容易被視作「阻撓發展」、「拒絕進步」，在這樣的環境氛圍下，曾任海洋科學學院院長的張崑雄教授卻毅然決然地成為這條路上的先行者，探究原因，張教授只說：「學者應當有一定的社會意識與社會責任！」

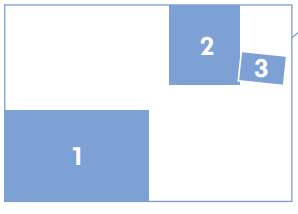
Dongsha Atoll National Park, the first marine national park in Taiwan, was founded on January 17, 2007. For Taiwan, this represents a major step toward the conservation of marine resources. The people of Taiwan have lived amongst the sea for four hundred years, but have perhaps never done enough for it. Even so, a group of people has worked so genuinely to protect the sea since many years ago before 2007

## A Pioneer in Marine Resource Conservation

Before Taiwan's economic take-off in the 1970s, environmental protection, let alone marine conservation, was a concept that few people in Taiwan knew about. Since then, economic development became goal pursued by the public and private sectors alike, and environmental issues were often seen as an obstruction to prosperity. It was in such an atmosphere that Professor Kun-hsiung Chang,who was the dean of College of Marine Sciences, now president of the Society of Streams, became a pioneer in the conservation of marine resources. "Social responsibility is the duty of an academic," says Chang.

「現在講『海洋保育』好像是件很時髦的事，大家搶著做，但早期不一樣，什麼經費、計畫……幾乎都是學者自發性地執行，哪來政府補助？不是政府不給，事實上，我們也沒想要爭取啊！當時只要政府願意採納建議，做一點政策方面的配合與宣傳，對我們來說就是很大的幫助了。」談起當年為海洋所做的努力，張崑雄教授時而懷念時而感慨，想起光是宣導最簡單基礎的資源管理概念——在適當時機，捕捉適當數量，保留生物資源的再生能力，過程中所遭遇的挫敗便不計其數，更遑論較先進的保育觀念了。所幸困難激起的並非退意，而是積極地想方設法，走出一條聰明的路，恰恰呼應他心中的保育理念：「保育不僅只是保護，海洋資源也不是不能運用，而是應該聰明的運用！」

"Marine conservation has become trendy in recent years, but it wasn't like that in the early days. Back then, there were no government subsidies for research projects. All that scholars hoped for was that the government would take our advice and make some policy comprimises," laments Chang as he looks back on the early days when he worked for the conservation of the sea. Even the promotion of the most basic concept of resource management, i.e., avoid overcatching to preserve the regeneration ability of biological resources, was met with countless setbacks. Such difficulties, however, did not discourage but impelled him to find more clever ways to campaign for his ideas.




1. 人工魚礁阻撓拖網漁業的破壞，魚群群聚海底的美麗畫面，在保育與復育的歷史中留下精采的一頁 / 蔡永春攝
Artificial reefs have obstructed trawling practices and served as habitats for sea life, so the beautiful scenes that schools of fish swim under the sea can be seen. Artificial reefs have now proven to be a monumental achievement in the history of conservation and restoration. / by Yung-chun Tsay
2. 在人工魚礁旁常可觀察到豐富的海洋生態，彷彿為海底生物構築安穩的家。/ 部落客阿助攝
One can observe rich marine ecology around artificial reefs, which seem to be stable houses for marine creatures. /by blogger A-Zhu
3. 張崑雄教授在海洋保育未受重視的時代，已毅然決然地成為這條路上的先行者，並帶起許多優良的後輩之秀傳承其志業 / 翻攝自《台灣國家公園史》
Prof. Kun-hsiung Chang became a pioneer in the conservation of marine resources when no one paid attention to it, as well as a teacher who has led many great students and passed on his aspiration. / from *The History of Taiwan's National Park*

過度使用網具捕魚，大魚小魚通吃的情況下，容易造成海洋生態失衡。/ 部落客阿助攝
People often overuse fishnet and catch a fish no matter how small the fish is. Under this circumstance, the marine ecology imbalances could be worse. /by blogger A-Zhu

## 保育、復育史上精彩的一頁

長年過度捕撈，終使沿海漁業資源失衡，1972至1973年間，政府決定參考鄰近國家（日、韓）的做法——放置人工魚礁。可是經過年餘，下放的經費卻有如石沉大海，毫無任何後續回覆。張崑雄教授臨危受命，負責調查人工魚礁計畫在各地方的施行實況，回憶起當時情景，張教授直說：「很辛苦！」

代表中央政府赴地方稽查的身分，讓他遇上許多不願配合的冷面孔，於是張教授索性決定親自潛水一探究竟，「在這之前，大概沒有學者會自己潛下去看吧！」說起當年的驚人之舉，張崑雄教授臉上還是有一絲絲無奈。

投在海底的人工魚礁，果然有許多環節並未按照計畫進行，莫怪難收其效！但張教授心想，就算直接向上呈報，對海洋環境也沒有立即性的幫助，不如循循善誘，讓站在第一線的執行者願意配合，落實計畫。

## A Monumental Achievement in Conservation and Restoration

As inshore fishing resources collapsed due to long years of overfishing, the government of Taiwan decided to set up artificial reefs in 1972-73. A year after the funds have been allocated, however, there was no report of any substantial results. Chang was then appointed to investigate the implementation of the project. “It was a demanding task,” he recalls.

Chang's investigation was met with hindrance from local officials, so he decided to dive underwater and see with his own eyes whether artificial reefs were set up as ordered. “I suppose they had never seen a scholar who would do such a thing,” a look of blue flickers across Chang's face as he recounts his past deeds.

Chang found that many of the reefs were not properly set up, which was why the results were inconsequential. But he did not report his findings. Instead, he chose to work with the frontline implementers, helping them see the importance of

台灣近海漁業資源已經出現捕不到魚的警訊，漁船不出港已是常見狀況。/ 賴宛靖攝 ▶
There are warnings to inshore fishing in Taiwan: the fish is gone and catch has greatly plunged. It is common nowadays that the fishing boats don't go to the sea. / by Wan-ching Lai

雖然時至今日仍無法精準地量化人工魚礁的成效，但它阻撓拖網漁業的破壞、創造魚群群聚作用，已在保育與復育的歷史中，留下精采的一頁。

## 名師出高徒

張崑雄教授不僅是先行者，同時也是傳承者，許多活躍於海洋資源保育領域的傑出人才，過去都曾是張教授的門下高徒。目前擔任「生物多樣性資訊專題中心」執行長一職，投入魚類研究長達30餘年的邵廣昭教授，當年也曾陪著教授南征北討，幾乎遍遍台灣海域，更自此進入生態研究領域

## 得天獨厚　台灣

土地面積僅占全世界的萬分之2點5，非常之小；海洋生物多樣性卻很高，達全球物種的10分之1，這就是得天獨厚的台灣！

物種多樣性高可說是台灣珍貴的財富，為我們帶來這些財富的，是多樣化的棲地與生態系，珊瑚礁、大洋、深海、沙泥地、河口、岩礁、紅樹林、潟湖……沒有一樣在台灣看不到。蕞爾小島像是個迷你的生態系博物館，不同的生態系孕育不同種類的生物，再加上海流、水溫、地形與地貌……等各種條件交叉影響，成就了台灣海洋資源的豐富。

carrying out the project thoroughly. Looking back, artificial reefs have obstructed trawling practices and served as habitats for sea life. They have now proven to be a monumental achievement in the history of conservation and restoration.

## Like Teacher, Like Student

Not only is Chang a pioneer, but he passes on the torch as well. Many marine resource conservation experts have studied under his guidance. Professor Kwang-tsao Shao, currently the chief executive officer of the Thematic Center of Systematics and Biodiversity informatics, has studied fish for more than 30 years. Back when he was a student, he used to accompany Chang on his forays into seas around the island, and has since entered the field of ecological research.

## An Island Rich in Natural Resources

Taiwan has a land area that accounts for only 0.025% of the world's total, but possesses a tenth of the entire marine life species around the globe, showing the bountifulness of this island.

A high biodiversity is Nature's precious gift to Taiwan. All kinds of habitats and ecological systems can be found here, ranging from coral reefs to lagoons, creating a tiny ecological museum out of this small island. Diverse ecological systems and the difference in such conditions as ocean currents, water temperature, and geography, are the reasons why Taiwan enjoys such abundant marine resources.

然而，海洋資源豐富並不等於「取之不盡，用之不竭」，大海的浩瀚常給人帶來一種錯覺，人類如螻蟻般的力量怎麼可能改變海洋呢？於是，人們絲毫不察也不信，自己對海洋有多大的殺傷力。但是，每年從海洋撈取千萬噸，甚至上億噸的資源，然後回以百萬噸垃圾與廢棄物，終於導致資源耗竭、海水汙染，我們這才發現，何止是改變，我們簡直是猛烈地撼動了海洋！

## 保育觀念再進化

近年來台灣保育觀念比起1980年代，雖已有所改變，卻仍落後於西方國家，在想法與做法上，依然有長足的進步空間。尤其海洋與陸地兩者的差距始終懸殊。

其實不單是台灣，全世界對海洋的了解與認識，普遍都落後陸域至少20到40年，許多海洋知識都是現代才開始慢慢有人鑽研，幾乎可以說是在有了探勘工具、研究船等設備之後，人類才逐步認識海洋，而那不過只是最近5、60年之間的事情罷了！

觀念絕對是需要被慢慢教育的，就像早期的台灣社會，可以在菜市場買到、看到現宰現殺的虎骨酒，但現在如果要我們吃老虎或犀牛，絕大多數的人應該是食不下嚥。這也是保育的進步之一。

倘若今天要你吃的是鯊魚、或鮪魚，你會怎麼想呢？相信絕大多數的人不會產生罪惡感，這就是弔詭，也是需要再教育之處。老虎、犀牛屬於陸域生態系，鯊魚、鮪魚屬於海域生態系，兩者在裡頭所扮演的角色地位其實是一樣的，差別在於，從來沒有人想過，「魚」也屬於野生動物，也需要被保護，不是天生為供給人類食用而存在。

But being rich in resources does not mean that they are inexhaustible. The bounty of the sea has always fooled mankind into believing that they cannot possibly ruin the oceans. Every year, we haul tens of millions of tons of resources from the sea, and dump millions of tons of garbage into it. Only now do we realize that we have severely damaged the sea by depleting its resources and polluting its water.

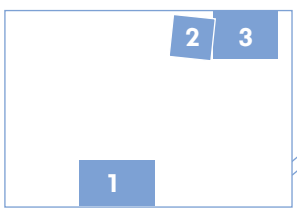
## More Conservation-Minded

Taiwan has become more conservation-minded in recent years than in 1980. Even so, it still lags far behind western countries, and the conservation of the sea has not received adequate attention as yet.

It is a problem seen across the world. People's understanding of the sea has generally lagged 20 to 40 years behind that of the land. Mankind has begun to know more about the sea after the required surveying equipment and research vessels were developed, and that was only five or six decades ago.

Ideas can be instilled in the public consciousness. In early Taiwan, wine made with tiger bones used to be a common commodity in markets. Now, however, most people would not even dream of eating tigers or rhinoceroses. This is one of the achievements in conservation.

Still, most people would not feel any guilt for eating sharks or tuna. This is an irony that needs to be addressed. Sharks and tuna are to the sea what tigers and rhinos are to the land. The only difference is that no one has ever thought of fish as wild animals that need to be protected. We are so accustomed to thinking of them merely as food.




1. 在大啖海鮮之餘，應也不忘融入教育意義，勿讓海洋文化變成海鮮文化 /tono 攝
   While we relish the seafood, we should also learn how to utilize the marine resources in a proper extent. Let's not make marine culture equal to seafood culture. / by tono
2. 海底環境遭受人類的自私破壞，「炸魚」的情景令人看了深惡痛絕 / 翻攝自《台灣國家公園史》
   Human selfishness has caused serious damage to the marine environment; it's really upsetting to see all those fish killed by "dynamite fishing." / from *The History of Taiwan's National Park*
3. 人類不當行為常為海洋帶來莫大傷害，圖為下錨傷及珊瑚礁的景況 / 蕭再泉提供
   Improper behaviors by humans often bring irreversible damage to the ocean. The picture shows how anchoring can hurt the coral reefs. / Photo provided by Zai-quan Xiao

## 海洋文化不等於海鮮文化

近年來，台灣開始流行起所謂的「海洋文化」，墾丁、屏東、台東、花蓮、宜蘭，乃至於西海岸，都有不少活動熱烈舉辦，例如飛魚季、黑鮪魚季、曼波魚季……這些將海鮮與海洋畫上等號的活動，毋寧說是「祭」還更為恰當。活動本身沒有錯，海洋生物資源也並非不能利用，只是，在大啖海鮮之餘，若也不忘融入教育意義；捕撈漁獲時，也能堅持適度不過量的原則，才是永續經營、值得推展的海洋文化。

## 知識就是力量　有期待就有希望

台灣沿海地帶開發不斷，成為全世界水泥化最嚴重的地區之一，海底垃圾量恐怕也是全世界之冠。但此處不是絕境、此刻無須絕望，除非不願意踏出那一步！只要願意改變就永遠不嫌晚。未來，海洋資源保育的觀念將會隨時代進步而進步，人們知道得越多便會做得越多，正所謂「知識就是力量啊！」以節制資源的概念，為海洋保留最後一線珍貴的生機。

## Marine Culture ≠ Seafood Culture

Marine culture has become a recent trend in Taiwan. Many events, such as the Flying Fish Festival and the Bluefin Tuna Festival, are held in Lanyu, Pingtung, and other places. Equating the sea with seafood, these events are more *sacrifices* than festivals. There is nothing wrong in consuming the biological resources of the sea, but as we catch and eat them, we should also learn to conserve the marine environment. A marine culture that utilizes marine resources in a proper extent is a sustainable one that is worth promoting.

## Knowledge is Power, and Faith Brings Hope

Because of excessive development, the coastal area in Taiwan has suffered one of the worst degree of cementization and probably the largest quantity of underwater garbage in the world. But there is still hope as long as we are willing to change. Knowledge is power. People will do more as they gain more understanding. If we slow the rate of fishing and fish consumption, we might just be able to keep the sea alive.

簡介 *Profile*

### 張崑雄 Kun-hsiung Chang

現任中華民國溪流環境協會理事長，早年自日本學成歸國，投身學術與保育領域，1984年成立台灣櫻花鉤吻鮭研究保護小組，為台灣首起瀕臨絕種動物之保護實例，學術地位深受國內外保育人士推崇。

Currently the president of the Society of Streams, Kun-hsiung Chang had studied in Japan and came back to work as an academic and a conservationist. He founded the Organization for the Study and Protection of the *Formosan Landlocked Salmon* in 1984, which is the first organization in Taiwan devoted to the protection of an endangered species. He holds a prestigious academic status both at home and abroad.

### 邵廣昭 Kwang-tsao Shao

系統分類與生物多樣性資訊專題中心執行長，致力魚類研究三十餘載，專長為魚類分類、海洋生物、生物統計、數值分類、生態與進化等。日前引進歐美紀錄片「魚線的盡頭」，希望能喚醒國人對海洋資源保育的重視。

Kwang-tsao Shao is the chief executive officer of the Thematic Center of Systematics and Biodiversity Informatics. He has studied fish for more than thirty years, specializing in a variety of fields, such as fish taxonomy, marine life, biological statistics, numerical taxonomy, and ecology and evolution. He recently introduced the documentary *The End of the Line* into Taiwan, hoping to raise the awareness on the conservation of marine resources.