

台灣有得天獨厚的高山水系，豐富淡水資源。圖為遠眺中央尖山的景緻。/ 戴進元攝
Taiwan has exceptional apline water system rich in fresh water resources. The picture above is the landscape of Jhongyangjian Mountain. / by Jin-yuan Dai



中央山脈生態廊道巡禮

守護 台灣的心臟地帶

Guarding the Heart Zone of Taiwan

A Pilgrimage through Central Mountain Ecological Corridor

採訪撰文 Interview & Text / 賴宛靖 Wan-ching Lai 特別感謝 Special thanks to / 營建署許文龍副署長 Wen-long Xu, Deputy Director-general of CPA、前國家公園組組長林義野先生 Yi-ye Lin, Chief of National Parks Division 翻譯 Translator / 鄭淳怡 Chun-yi Cheng

最近，台灣的山很受矚目。

不光是揚名海外的台灣七頂峰探險隊光榮返鄉後，掀起一波登山熱，還加上在世界新七大奇景票選中，在尼泊爾聖母峰、日本富士山、義大利維蘇威火山等眾多山岳美景中，玉山不光是擠入前77名，至截稿前傳來的消息，玉山已確定晉級前28名。

論高度，玉山沒有聖母峰雄偉；論山型，玉山沒有富士山、維蘇威火山奇特，但玉山因孤島地形而孕育出的生物多樣性、容易攀登的高度可及性，以及清代八通關古道及原住民聚落文化遺址，都是其他山嶽所沒有的特色。

從玉山得天獨厚的傲人本錢，可以充分了解，山脈，可說是上天給台灣的恩賜。但即便擁有天賜風光，倘若如果無法妥善保護，任其因人為破壞或過度開發，導致美景荏苒，這不光是台灣、更是全世界的一大損失。

風災肆虐 正視環保

在本期季刊製作期間，中颱莫拉克襲台，竟為台灣帶來了50年來罕見的嚴重水患，暴雨肆虐全台，高屏地區更是在兩日之內降下了近2千4百公釐，相當於全台年平均雨量。洪水摧毀了山林、沖垮了橋梁，半個台灣被泥流吞噬，至截稿為止，已造成全台126人死亡、61人失蹤，農業更損失達122.36億元。這場令人猝不及防的洪災發生後，人們終於正視國土過度開發及生態環境破碎所帶來的問題，重新檢視台灣國土復育及保護的重要性，此時此刻，再來談中央山脈生態廊道的建構與價值，更具有深沉的意涵。

「中央山脈就是台灣的『龍骨』！」營建署許文龍副署長開宗明義，就用了這麼一個貼切的形容詞。「就像人體一樣，脊椎歪了、長骨刺了，就會全身不舒服，對台灣來說，這條『龍骨』如果沒了森林、水資源，沒了特有的動植物，土地就容易分崩離析，造成土石流等災禍。」

2000年，台灣建置整合了中央山脈地區高山林地、自然保留區、自然保護區、野生動物保護區及國家公園，形成連綿不絕的綠色廊道，這條長達300公里的連續保護帶，連貫了生態環境的完整性，降低生態環境的破碎所造成生物多樣性的降低。以「島嶼生物地理學」來說明，在面積效應、邊緣效應、距離效應、連結效應，避免人為的生態區系區隔，造成棲地碎裂化，面積愈大、兩棲地間距離愈近、不同棲地的連結度愈好，更能維持一貫性、整體性，加強功能運作上的穩定與持續。

Recently, the mountains in Taiwan have drawn a lot of attention.

The glorious return of the “Atunas Seven Summits Expedition Team” has aroused a fervor for mountain-climbing, and Mt. Jade has so far headed into the 28 finalists in the vote for the New 7 Wonders of the World.

Mt. Jade is not as magnificent in height as Mt. Everest, neither is it as unique in shape as Mt. Fuji or Vesuvius. Yet its unique features include biodiversity, accessibility, the Batongguan Historic Trail, and the aboriginal cultural sites.

The exceptional features of Mt. Jade remind us that mountains are God's gifts to Taiwan. Yet without proper protection, human damage could make the beauty gone, which would be a great loss to us and to the world.

Take Environmental Protection Seriously In The Aftermath of Typhoon

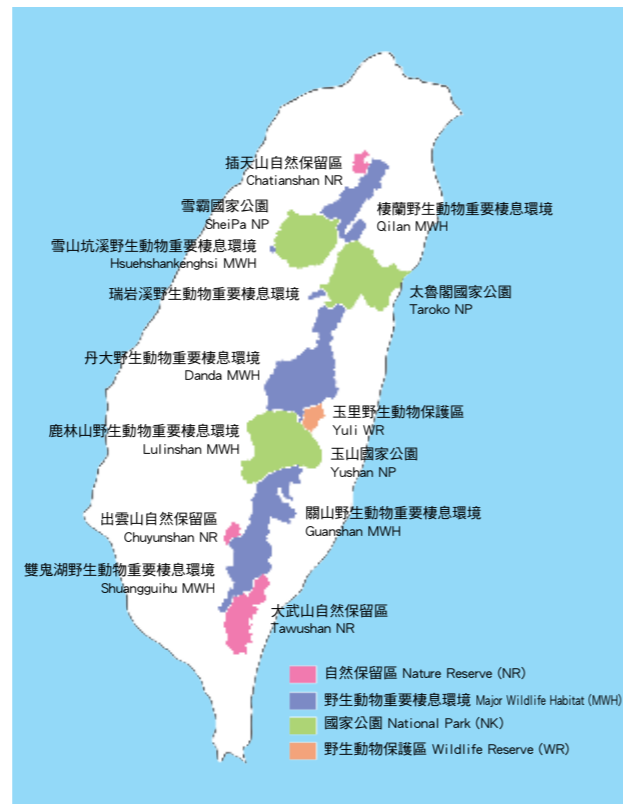
During the production of this issue of NPQ, a medium typhoon Morakot rampaged through Taiwan, causing devastating floods and mudslides that were the worst in fifty years of the island's history. The precipitation in Kaohsiung and Pingtung alone totaled to 2,400 mm in two days, just as much as that of the entire Taiwan for a whole year on average. The floods had destroyed numerous forests and bridges, while the mudslides had devoured half of the island. By the deadline for the printing of this issue, 126 people have been killed and 61 missing, and the loss in agriculture has reached NT\$12.632,000. The sudden and destructive floods have aroused serious domestic concerns toward the exploitation of land and the fragmentation of ecological environment, and people's rethinking on the importance of revitalization and protection of national land. Under this backdrop, it is particularly meaningful to talk about the construction and value of CMEC.

“The Central Mountains are the ‘spine’ of Taiwan,” opens up Deputy Director-general of Construction and Planning Agency, Wen-long Xu. “A man won't be all right without a healthy spine. If the spine of Taiwan loses its forests or water resources, the land will then disintegrate.”

In 2000, high mountain forests, natural reserves, wildlife reserves and national parks in Central Mountain Range were integrated into a 300-km continuous green corridor, which protects the wholeness of ecological environment and reduces the degradation in biodiversity brought by the fragmentation of eco-environment. Judging from the area effect, edge effect, distant effect and connection effect in island biogeography, artificial division of eco-system and fragmentation of habitats should be avoided, and a larger area of eco-system, shorter distance between two habitats, and a closer link among various habitats could result in a better unity and integrity of the eco-system and foster its stable and sustainable functioning.



中央山脈生態廊道蘊藏珍貴的動植物資源。圖為插天山自然保留區。
/ 吳志學攝
The Central Mountain Ecological Corridor is abundant in precious animal and plant resources. The picture above is Chatianshan Nature Reserve. / by Chi-hsue Wu



中央山脈生態廊道區域分布示意圖
The distribution of Central Mountain Ecological Corridor (CMEC)

除了生態保育上的功能，生態廊道的建置也能達到涵養水資源的功能。

許副署長表示，由於中央山脈南北縱走，許多山嶽超過海拔3,000公尺，因此台灣河川大都東西流向，分別注入太平洋及台灣海峽。加上國土地形狹長，東西最寬處也不過150公里，所以河川都十分湍急，降雨後逕流入海，儲存不易。

「也許有人認為多蓋水庫就可以留住水資源，但這觀念是錯誤的，因為台灣河谷狹窄，庫容有限，水庫總容量不大，為了儲水而多蓋水庫反而是錯誤的觀念。與其蓋水庫，倒不如針對集水區的經營、水資源的利用和土地資源的開發限制多下點功夫。」許副署長語重心長的說。「如果將台灣全島三大主軸—中央山脈、海岸山脈、濕地沿海地區等作全面性的保護，讓完整的國土與植物發揮涵養水源的功能，如此一來便可解決水資源的問題，這才是治本之道。」

中央山脈生態廊道之於台灣的意義，不光是國土復育及水資源涵養，它更是許多珍貴特有物種的觀察研究的天然教室。因此，生態廊道的規劃不是近幾年才有的新觀念，台灣在民國50幾年，就已經開始進行生態廊道的資源調查。

而公務員經歷由林務局到國家公園的林義野前組長，對於中央生態廊道有更深層的情感。「從民國50幾年開始，我就常到山林裡去，一步一腳印地做資源調查，並走遍中央山脈生態廊道。」

Besides its merits in ecological conservation, the establishment of this CMEC would also help reserve water resources.

Because the Central Mountains lie north-south, with many of them higher than 3,000m, plus the fact that our territory is narrow and long, most rivers in Taiwan flow rapidly east-west into the Pacific Ocean and the Taiwan Strait respectively.

“Building reservoirs does not really help keep the water resources; instead, we should focus more on the management of catchment areas, the utilization of water resources, and the limit on the development of land resources,” says Xu earnestly. “If we can fully protect the island's three major axes—the Central Mountains, the Coastal Mountains, and the coastal wetlands, so that their functions of conserving water is fully brought out, then we may solve the problem of water permanently.”

So the “Central Mountain Ecological Corridor” (CMEC) was established to restore the land, conserve water resources, and preserve unique species. It is a project starting from the 1960s.

Chief Yi-ye Lin of the National Parks Division feels a special bond to the Corridor. “Since the 1960s, I've often gone into the mountains and through the whole corridor step by step to conduct resource investigations.”

林前組長服務於林務局農林航空測量隊期間，從事全台灣的資源調查，在深山裡走了將近20年。在偶然的機緣中，民國72年參與營建署的相關計畫而加入這個大家庭，從此與國家公園結下不解之緣。

初時規劃的生態保育區為北起插天山，南至大武山，將插天山自然保留區、棲蘭野生動物重要棲息環境、雪霸國家公園、太魯閣國家公園、丹大野生動物重要棲息環境、玉里野生動物保護區、玉山國家公園、關山野生動物重要棲息環境、出雲山自然保留區、雙鬼湖等野生動物重要棲息環境。

「將這些重要保護區連結起來，加上大武山自然保留區等11個保護區區塊，就成為南北長達300公里之綠色生態廊道。」林前組長對生態廊道的範圍如數家珍。

山中瑰寶 上天恩賜

在這得天獨厚的綠色廊道中，擁著各類豐富的原始資源。如插天山區內孕育了大面積的原始木群，最代表性的植物是台灣山毛櫸，另有一葉蘭、吊鐘花。區內也有不少列為珍稀植物之紅星杜鵑族群，紅星杜鵑為常綠灌木，每年四月開花，多生長於台灣北部山區雲霧帶森林中，本區為其重要的生育地之一。瀕臨絕種鳥類則有藍腹鷓、褐林鴉等。

In 1983, Lin participated in a related project of CPA and has since been bonded with national parks. Before that, he had already conducted investigations in deep mountains for nearly 20 years.

The ecological protected area is initially planned to start from Chatian Mountain to Dawu Mountain, connecting Chatianshan Nature Reserve (NR), Qilan Major Wildlife Habitat (MWH), Shei-Pa National Park, Taroko NP, Danda MWH, Yuli Wildlife Reserve, Yushan NP, Guanshan MWH, Chuyunshan NR, and Shuangguihu MWH.

“Connecting these major reserves plus 11 others makes an ecological corridor 300km long from the north to south,” explains Lin.

Mountain Treasures, God's Gift

There are primitive resources of many kinds in this green corridor. A large area of primitive forests grow in Chatian Mountain; representative plants include *Fagus hayatae*, *Pleione formosaana hayata*, and *Enkianthus perulatus Schneider*. There are also rare and unusual *Rhododendron hyperythrum Hay* groups. Endangered birds include *Lophura swinhoii* and *Strix leptogrammica*.



關山的日出及雲海。/ 戴進元攝
The sunset and clouds of Guanshan / by Jin-yuan Dai



而出雲山自然保留區動植物資源亦相當豐富，林相保持得相當良好，包括闊葉林、混生林及針葉林。其中珍貴稀有的植物有台灣奴草、無脈木樺、阿里山山櫻花、牛樟、威氏粗榧與紅豆杉等，還有全世界少見而特殊的闊葉樹—「台灣雲葉」，分布在針闊葉混生林裡。它雖是闊葉樹，卻以針葉樹才有的「管胞」輸送水分，具備了針闊葉樹種的特徵；大武山有台灣穗花杉、指標種是大葉校欒、毬子欒、卡氏儲、紅檜、紅豆杉等，瀕絕物種有水獺、石虎、台灣雲豹等。

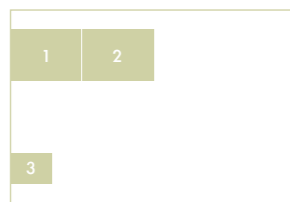
「地球上同樣海拔高度的國家中，只有台灣有這樣豐富多元的生態系，除了提供生物完整的棲地外，也提供了一個絕佳的生態教育典範及活教材。」林前組長表示。

正由於中央山脈生態廊道對台灣有牽一髮動全身的關鍵性，所以中央山脈生態廊道更有建置的必要性。只是越來越頻繁的商業活動，造成了生物棲息地的零碎化，導致大量物種消失，嚴重影響生態系的平衡。所幸，近年來生態保育觀念逐漸被大家所重視，長久以來建置中央山脈生態廊道的想望，也逐漸成形成中。

Chuyunshan NR also enjoys rich wildlife resources and well-maintained coniferous, mixed, and broad-leaved forests. Among many other rare plants, it also has an exceptional broad-leaved tree *Trochodendron aralioides*, which has a feature belonging to conifers: "tracheid". Dawushan NR, on the other hand, has *Amentotaxus formosana*, indicator species likes kawakami Tanoak (*Lithocarpus kawakamii*), *Taxus sumatrana* (Miq.) de Laub. etc, endangered species likes *Chinensis otter* (*Lutra lutra chinensis* Gray), *Neofelis nebulosa brachyuran* etc.

"Among the countries with similar elevation, only Taiwan has such a diverse eco-system, which is a sterling eco-education paradigm."

The necessity of constructing CMEC lies in its cruciality to Taiwan. Frequent commercial activities have resulted in the fragmentation of living creature habitats and mass disappearance of species. Fortunately, conservation concepts have been gradually valued in recent years, and the construction of CMEC can thus take shape.



1. 中央山脈生態廊道能觀察許多難得一見的野生動物。圖為長鬃山羊吃月桃葉 / 玉管處提供，李嘉鑫攝
Many rare wild animals can be observed in the Central Mountain Ecological Corridor. The picture above is a Formosan Serow, *Naemorhedus swinhoei*, eating Shell-flower, *Alpinia formosana* / by Ji-xin Li
2. 稀有的台灣一葉蘭 / 戴進元攝
Rare plant Taiwan Pleione, *Pleione formosana* Hayata / by Jin-yuan Dai
3. 山林調查必須一步一腳印，一趟入山往往得花上一個月的時間，才能將當地生態資源記錄下來。 / 林義野提供
Mountain study should be performed step by step. It usually takes one month a time in the mountains to record local ecological resources. / Photo provided by Yi-ye Lin

「以前人們把山林視為寶藏，只不過是以伐木、開採、開闢農場、茶園來換取經濟利益，但失去了森林的保護，大地逐漸脆弱、氣候變遷帶來的暴雨沖刷，讓國土嚴重流失，人類這才逐漸體會，這片寶藏不該過度開發，反而更該戮力保護，這片瑰寶才能傳給後代子孫。」林前組長感性的說。

而中央山脈生態廊道一來可以建立完整的保護區生態系，運用相關法令阻止不當開發；二來也可維護生物多樣性，保存物種基因庫，也能提供自然科學研究與自然教育環境、增加原住民的就業機會，建立正向的合作關係。

「這樣的作為，不光是減緩從前不當的環境利用與開發所帶來的負面影響，這片好山好水，還能提供人們從事生態旅遊，進而推廣正確的自然保育觀念。」

走訪過許多世界著名國家公園的許副署長，特別舉了位於美國西南部的大沼澤國家公園為例。「位於美國佛羅里達州的最南端的大沼澤國家公園，是唯一北美的亞熱帶保護區，園區有豐富的鳥類，而這裡也是世上唯一短吻鱷及鱷魚的共棲地。被列為世界歷史景點、國際水棲保護區及國際重要沼地。這裡沒有任何開發，人煙罕至，只有一條公路可以進出。遊客進入國家公園前有兩個任務，一是在遊

"In the past, people also viewed mountains as a treasure, but they procured profits by mere exploitation. Now only after the loss of forests has resulted in serious washing away of our land have we gradually realized the importance of conservation."

The CMEC, for one thing, helps establish a comprehensive reserve eco-system and prohibit improper development; for another, it maintains biodiversity and the species gene pool, provides research and education environment, and increases job opportunities.

"Doing so not only counteracts the negative impacts from the past, but encourages ecotourism and promotes conservation concepts."

Xu, who has visited many noted national parks in the world, gave us an example. "The Everglades NP located in Florida is the only subtropical reserve in North America. Abundant in birds, it is also the only place where crocodiles and alligators coexist. It is a World Heritage Site, an International Biosphere Reserve, and a Wetland of International Importance. No development is undertaken there. Before entering the park, visitors have to apply repellent all over their



位於美國佛羅里達州的最南端的大沼澤國家公園，被列為世界歷史景點，沒有任何開發，人煙罕至。/Johann Helgason 攝
The Everglades NP located in Florida is the only subtropical reserve in North America. It is a World Heritage Site, and no development is undertaken there. / by Johann Helgason

客中心聽取行前導覽，其次是必須將露出衣服外的皮膚，塗滿防蚊液。在大沼澤國家公園，每隻蚊子都扮演著維持生態平衡的角色，並且受到保護，遊客如果隨意打蚊子，可是犯法的呢。」

許副署長笑說。「在大沼澤國家公園裡，只要稍加不注意，就會被叮得滿頭包，但就是沒人敢打下去。而且人人甘之如飴，因為在這塊受到保護的領域裡，隨處可見鱷魚在池邊曬太陽、鸚鵡悠哉嬉戲，純粹的自然脈動讓人相當動容。」

相較於沼澤的小型生態系需要加以保育，位於台灣心臟地帶的廣袤森林，保育價值更珍貴、更需立即受到保護。為了讓生態永續發展，他國的做法的確值得借鏡。

「把好山好水留住，不能光靠禁止或是處罰，如果能適度的規劃美景，讓遊客有機會體驗、感受，這才是落實環境教育的最佳方針。」許副署長說。

福爾摩沙，這名字中就帶著盛讚美麗的島，這片貫穿全島的綠色山林，除了是舉足輕重的國家「龍骨」，也是物種生生不息、永續發展根源之所在。在國人為玉山加油、為成功完攀七頂峰的台灣登山家喝采的同時，也請將眼光投注在這上天的恩賜、世界的瑰寶，一同守護台灣的心臟地帶。

body because of swarms of mosquitoes; however, it is illegal to kill mosquitoes, which maintain the ecological balance!"

"In Everglades, people get bitten by mosquitoes easily, yet no one dares to kill them. People enjoy their time here, for in this protected area, crocodiles are seen bathing in the sun and pelican frolicking everywhere," laughs Xu.

If the small-scale swamp ecosystem needs such preservation, so much more shall be done to the forests in Taiwan for the sake of sustainability.

"To preserve nature, prohibition or penalty shouldn't be the only measure taken. The best policy will be giving visitors the opportunities to experience the beauty," says Xu.

The mountains and forests that penetrate Formosa, an island whose name means "beauty," are not only the "spine" of this country, but the source for the continuity of species and sustainable development. At the time when we are hailing Mt. Jade and our successful mountaineers, let's not forget our responsibility to guard the heart zone of Taiwan.



將土地劃做自然保留區，渾然天成的美景才能永續。圖為七彩湖 / 林義野提供
The natural beauty can be sustained only by designating the land as nature conservation area. The photo above is Rainbow Lake / Photo provided by Yi-ye Lin



台灣這片貫穿全島的綠色山林，除了是舉足輕重的國家「龍骨」，也是物種生生不息、永續發展根源所在。/Elwynn 攝
In Taiwan, the mountains and forests are not only the "spine" of this country, but the source for the continuity of species and sustainable development. / by Elwynn

何謂中央山脈生態廊道？What is CMEC?

中央山脈綠色廊道將中央山脈的高山林地、自然保護區及國家公園串連線成生態廊道。從南到北長達三百公里，面積則約為台灣的六分之一。

The Central Mountain Ecological Corridor connects the mountain forests, nature reserves and national parks of Central Mountains. It is 300-km long and its area is about one-sixth of Taiwan.

已規劃哪些保護區？What protected area are included?

中央山脈已設有插天山自然保留區、雪霸國家公園、太魯閣國家公園、玉山國家公園、玉里野生動物保護區、出雲山自然保留區、雙鬼湖自然保護區及大武山自然保留區。未來計畫將保護區連結中間的廊道缺口，成立國家公園，以加強保護野生動物重要棲息環境，使中央山脈由北到南連成一氣。

There are already Chatianshan Nature Reserve (NR), SPNP, TNP, YSNP, Yuli Wildlife Reserve, Chuyunshan NR, Shuangguihu NR, and Dawushan NR. More national parks will be established in the future to fill in the gaps of the corridor to further protect major wildlife habitats.

許文龍副署長簡介 Profile of Wen-long Xu, Deputy Director-general of CPAMI



國立臺灣大學森林系碩士。曾任太魯閣國家公園管理處處長、玉山國家公園管理處處長、金門國家公園管理處處長。現為內政部營建署副署長。歷任多處國家公園服務，對國家公園及國土規劃極為熟悉。

BA and MS of the School of Forestry, NTU. Xu had been Director of TNPH, YSNPH, KNPH, Section Chief of National Parks Division, CPAMI, Chief of YMSNPH.

林義野先生簡介 Yi-ye Lin, Chief of National Parks Division, CPAMI

曾任林務局農林航空測量隊技士，台北翡翠水庫建設委員會技士、墾丁國家公園管理處課長、營建署國家公園組科長、簡任技正、副組長、金門國家公園管理處處長及營建署國家公園組組長。2009年退休後依然關心台灣森林保育。

Lin had been Technical Specialist (TS) of the Aerial Survey Team, Forestry Bureau, TS of Taipei Feitsui Reservoir, Chief of KNPH, Section Chief, TS, Deputy Chief of National Parks Division, CPAMI, Deputy Director of KNPH.

