FEATHER

飛羽

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第十七屆第二次會員代表大會會議記錄

環社檢核管不到 室內魚電恐失控

新南田董米在地深耕 8 年，多種水鳥數量增加

田鷸／林哲安 攝

田鷸 小檔案 圖／林哲安

田鷸，學名 *Gallinago gallinago*，英文名 Common Snipe，常見於潮濕的草地到鹽沼的濕地棲息地中。大部分不顯眼，常在靠近蘆葦叢或其他有草覆蓋的地方，通常牠們直到被驚嚇飛起才會被觀察到，常會在相當近的距離飛起並發出粗啞的刺耳叫聲。其特徵是條紋羽色，喙直而長，在田鷸屬中占最大的身長比例，嘴尖柔韌，能探入軟泥中覓食蠕蟲、小型軟體動物和其他生物，眼睛位於頭部的上後方，休息和吃食時仍能維持警戒。求偶時身體垂直俯衝，空氣穿過其外側尾羽會產生像小羊叫的“咩咩”聲。

在亞洲和澳洲，要注意極其相似的針尾鷸、中地鷸和大地鷸，所有這些都缺少田鷸的飛羽白色後緣，並且飛行速度較慢。

再生稻田鷸

於田董米棲地營造田區集體覓食的田鷸

捐款名單

111 年 07-09 月捐款，合計：89,004 元

七月 27,100 元

- 100 元 王○育、李○琪、灰文、邱○哲、曾○雯、曾○儀、黃○莉、黃○瑾、湯○瑄、陳○偵、陳○真、張○
- 200 元 林○雯、張○玲、鄭○璇
- 300 元 黃○茹、樂○岑、趙○麗
- 500 元 王○禎、林○興、林○君、江○萱、李○靜、奕萱與汪汪、游○晶、笨鳥鳥、匿名、黃○傑、黃香菇、陳○鳳、廖陳全家、劉○均
- 600 元 仇○國、張○慈
- 1,000 元 江○惠、李○瑩、李○芳、張○菁、廖○伍
- 1,200 元 張○真
- 10,000 元 林○敏

八月 40,104 元

- 100 元 王○育、灰文、李○琪、邱○哲、許○瑜、曾○雯、曾○儀、黃○莉、黃○瑾、湯○瑄、陳○偵、陳○真、張○
- 200 元 林○雯、張○玲、鄭○璇
- 300 元 黃○茹、樂○岑
- 400 元 匿名
- 500 元 王○禎、林○興、江○容、奕萱與汪汪、游○晶、黃○傑、黃香菇、陳○鳳、盧○文
- 600 元 仇○國、張○慈
- 1,000 元 江○惠、李○瑩、李○芳、林○儒、林○賢、沈○純、梁○玥、張○菁、廖○伍
- 1,100 元 謝○庭
- 2,000 元 吳○芳
- 3,000 元 許○裕
- 5,000 元 yeh ruting
- 11,404 元 匿名

九月 21,800 元

- 100 元 王○育、灰文、李○琪、邱○哲、許○瑜、曾○雯、曾○儀、黃○莉、黃○瑾、湯○瑄、陳○偵、陳○真、張○、鄒○玲
- 200 元 張○玲、鄭○璇、許○倫、陳○甯、李○謹
- 300 元 黃○茹、樂○岑
- 500 元 王○禎、林○興、奕萱與汪汪、游○晶、黃○傑、黃香菇、陳○鳳
- 600 元 仇○國、張○慈、田○輝
- 1,000 元 江○惠、李○瑩、李○芳、張○菁、廖○伍、葉○忠
- 2,000 元 邱○紋、藍○倫
- 3,500 元 twt

Contents
目錄

- 發行人：方偉宏
- 發行單位：社團法人中華民國野鳥學會 Taiwan Wild Bird Federation
- 主編：邱柏瑩
- 編輯小組：呂翊維、Scott Pursner、林淑紋、王宣靄、邱承慶
- 美編設計：伯驊印刷有限公司

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- 法律顧問：詹順貴律師
- 外交顧問：吳建國大使
- 學術顧問：袁孝維教授 李培芬教授 丁宗蘇教授
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- 常務監事：歐玉芳
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  社團法人台北市野鳥學會
  社團法人桃園市野鳥學會
  社團法人新竹市野鳥學會
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  社團法人台灣野鳥協會
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  社團法人彰化縣野鳥學會
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  高雄市茄萣生態文化協會
  屏東縣野鳥學會
  宜蘭縣野鳥學會
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www.bird.org.tw

FB 粉絲專頁
www.facebook.com/TWBF 1988

38×52 cm
WALL CALENDAR

中華民國野鳥學會
TAIWAN WILD BIRD FEDERATION

熱賣中 !!

2023
臺灣野鳥月曆
Taiwan Wild Bird Calendar

原價 200 元 / 本

預購優惠 單次訂購 10 本以上，特惠 1 本 180 元（即 10 本 / 1800 元）並免運！

白鶴覓食中／楊錦秀 攝

白鶴米的故事

文 By 方偉宏 中華鳥會理事長・圖 By 方偉宏、楊錦秀 宜蘭鳥會理事、邱柏瑩

中華鳥會 2022 年會員代表大會在 9 月 24 日於宜蘭市中山國小舉行，宜蘭鳥會陳介鵬理事長及陳樹德總幹事熱心協助會場借用、食宿等安排，宜蘭縣農業處得知各地鳥會代表將到宜蘭開會，因此為各地而來的會員代表，準備了袖珍包的「白鶴米」做為伴手禮，而這米背後的故事，代表了這個年度鳥類保育的一項重要成就。

白鶴米／ 方偉宏 攝

在精巧的包裝上印著「白鶴米的由來：來自遠方珍貴訪客西伯利亞白鶴於 2021 年 11 月 15 日首次造訪宜蘭，亦是國內第二次紀錄，為此在縣市政府的共同合作下，將白鶴棲息的區域保存下來，並種植友善稻作推廣生態永續發展，讓宜蘭成為友善環境的標的。」

白鶴駐立田間／邱柏瑩 攝

陳總幹事為我們補充說明白鶴米背後的插曲，當白鶴一出現在宜蘭市延平里開興廟附近的農地，立刻成為許多賞鳥人及拍鳥人的注目焦點，吸引了各地民眾前來觀賞，宜蘭市公所為了讓白鶴在當地平安棲息度冬，結合了社區農民及愛鳥志工，展開了守護工作，為避免鳥被前來觀賞人群所驚擾，在白鶴棲息地四週架設告示牌及安裝監視器，呼籲民眾保持安靜不喧譁，保持適當的賞鳥距離，秉持不

架設告示牌，防止驚嚇白鶴／楊錦秀 攝

接觸、不驚嚇及不餵食等原則，也設置臨時停車場，並請在地里民協助維持現場秩序。所幸人鳥之間相安無事的度過一個冬季。

時序來到了春耕播種的時間，為了避免農耕會侵擾到白鶴棲息，由善心保育人士捐款，市公所積極協調白鶴棲息地附近農民進行友善農業的契作約 1.1 甲的農地，在主要的棲息地暫緩耕作，讓白鶴可以安心在此覓食棲息，周邊則翻田蓄水，停用化肥、農藥及除草劑等方式友善耕作，並且在棲息地附近每日派員觀察紀錄。

當春光明媚、南風吹起，連日看到白鶴展翅高飛盤旋空中，終於在 2022 年 3 月 8 日在社區民眾及守護志工滿滿的祝福下，乘著南風展翅高飛返回北方繁殖地。確定白鶴已安然北返，連忙詢問主要棲地契作的農民是否來得及耕地播種，於是進行了遲來的耕作。經過一季的耕耘成長，到了 7 月底這片友善農業耕作的田地迎來了收成階段，由市府、社區、保育人士共同建立了「宜蘭市白鶴生態米」這個招牌。

召開會員代表大會前，陳總幹事希望將白鶴保育的成果與各地鳥會代表分享，以白鶴棲地契作的米當作伴手禮，於是詢問農業處畜產科科長是否有相關物品可以跟大家分享，科長非常樂意並馬上詢問市農會有沒有現成包裝好的米，他們很熱心的表示：「沒有現貨，但我們現在就可以幫你包裝。」成果就是會員代表手中的白鶴米，包裝日期則是 2022 年 9 月 20 日。

架設告示牌，防止驚嚇白鶴／楊錦秀 攝

白鶴在宜蘭度冬這段期間，感謝縣市政府、社區及鳥友志工共同的守護，在地農民配合環境友善的農作，維護了白鶴棲息地的生態環境，但願今年的白鶴守護行動，讓自然生態保育的觀念在民眾心中埋下種子，未來能夠發芽生根、開花結果，共同為我們自然生態的維護盡一份心力，同時也為這片土地留下美好的紀錄。

The Story of the Siberian Crane Rice

By Dr. Fang Wei-horng Taiwan Wild Bird Federation President
Translated by Scott Pursner Taiwan Wild Bird Federaion Director of International Affairs

The Taiwan Wild Bird Federation's annual General Assembly was held on September 24, 2022 at Zhongshan Elementary School in Yilan City. As the local host, Wild Bird Society of I-lan president Chen Jie-peng and director-general Chen Shu-de enthusiastically assisted in helping with booking the venue, finding the accommodations and handling a number of other arrangements. Meanwhile, the Yilan County Agricultural Department, knowing that delegates would be coming from all over Taiwan to attend the meeting, prepared a special souvenir of "Siberian Crane Rice" for the visitors. Though only pocket-sized, the story behind this gift represents an important achievement in bird conservation this year.

The Siberian Crane Rice

Printed on the delicate packaging, it says "Origins of Siberian Crane Rice: The Siberian Crane, an extremely special visitor from Siberia, visited Yilan for the first time on November 15, 2021, which is on the second record for the species in Taiwan. Because of this, both Yilan County and Yilan City governments worked together to make sure that the area where it stayed was undisturbed and well maintained. Not only that, but eco-friendly agriculture using the tenets of sustainable development was promoted. These actions made Yilan a more nature-friendly environment."

Director-General Chen explained further. When the Siberian Crane appeared in a farmland near the Yen Ping Kai Xing Temple in Yilan City, it immediately became a magnet for bird watchers and bird photographers, attracting people from all over who were interested in catching a glimpse of the critically endangered species. Therefore, to ensure its safety and security, the municipal government of Yilan City coordinated with local farmers and volunteers to protect it. To prevent the bird from being disturbed by birdwatchers, they put up signs and installed surveillance cameras around the habitat. They also called on the public to keep quiet and not make noise. Furthermore, they asked birders to maintain an appropriate distance while birdwatching and adhere to the principles of "no contact, no disturbing, and no feeding". Temporary parking lots were also created and local residents were asked to assist in maintaining order there. This led to a peaceful coexistence between the Siberian crane, the local residents, and birdwatchers.

When winter began to turn to spring, it was traditionally the time for sowing seeds and tilling the earth. Yet thanks to a number of personal donations, the land was able to be protected from disturbance even though it was the planting season. The municipal government also actively coordinated with farmers near the habitat, encouraging them to do eco-friendly agriculture on that 1 ha farmland. Meanwhile, cultivation was totally suspended in the area considered the Siberian Crane's main habitat. These efforts ensured that the crane could forage

and rest safely. The surrounding fields were then used for water storage. Also, the use of chemical fertilizers, pesticides, and herbicides was stopped in favor of eco-friendly farming practices. Personnel were sent on a daily basis to observe and record the situation near the habitat as well.

When spring finally did arrive, the Siberian crane began to take to the sky for longer and longer periods. Finally, on March 8, 2022, with the community watching their new friend and neighbor, the Siberian Crane headed north to its breeding grounds. Once it was confirmed that the bird was safely on its way, the local farmers were asked if the area previously protected as the crane's main habitat could be converted back to farmland in order to at least have some harvest for the season. An earnest effort was made, and at the end of July, this eco-friendly agricultural land was ready for harvesting. The city government, community, and conservationists jointly declared the yield the "Yilan Siberian Crane Rice".

Before convening the General Assembly, Director-General Chen wanted to share this story of community, conservation, and cooperation with the participating delegates. To do this, he wanted to provide the rice cultivated on the prior Siberian Crane habitat as a gift. He approached the section chief of the Animal Husbandry Section of the Yilan Agricultural Department to see if it was possible. The section chief was more than happy to oblige and immediately contacted the Yilan City Farmer's Association to ask if there was any rice from that area already packed and ready. They replied, "There is no stock currently, but we can pack it for you right now!" The result was the rice distributed to the delegates on September 20, 2022.

In this special case of the wintering Siberian Crane in Taiwan, it would not have been possible without the support of the Yilan County and Yilan City governments, the local community, the passionate birders, or the local farmers who shifted their production to eco-friendly farming practices in order to maintain the necessary habitat. It is hoped that this experience might plant the seeds of s stronger coexistence with nature in the hearts of the people, and in the future, they will take root, blossom and bear fruit. Thus creating a long-lasting result to this precious experience.

中華民國野鳥學會第十七屆第二次會員代表大會會議記錄

時　　間：111 年 9 月 24 日（星期六）14:00~16:50

開會地點：宜蘭市中山國小視聽教室（宜蘭市崇聖街 4 號）

主　　席：方偉宏 理事長

出席人員：各團體會員之會員代表、第十七屆理監事

列席人員：各團體會員年度表揚之優良義工、秘書處專職

出席狀況：應到 63 人，實到 46 人 (含線上出席 13 人及委託 4 人)，請假 17 人

記　　錄：邱柏瑩

議　　程：

一、主席致詞（略）

二、來賓致詞（略）

三、優良義工表揚：頒發各團體會員 110 年度優良志工感謝狀，各團體會員代表上台領獎。

四、會務報告 ── 秘書處 110 年工作執行報告。

五、提案討論：

㈠ 提案一

案由：本會 110 年度收支結算表及資產負債表，提請審議。

說明：1. 本會 110 年度收支結算係配合年度工作計畫，並依政府規定辦理。

2. 110 年度收支結算表及資產負債表業於 111 年 4 月 30 日第十七屆第三次理監事聯席會審查修正並於 5 月 20 日電郵各理監事確認無誤。

3. 110 年度收支結算表及資產負債表請參閱大會手冊。

4. 擬於通過後，呈報內政部核備。

決議：通過。

㈡ 提案二

案由：本會 111 年度工作計畫草案

說明：本會 111 年度工作計畫草案業於 111 年 4 月 30 日第十七屆第三次理監事聯席會審查通過。

辦法：擬於通過後交秘書處執行。

決議：通過。

㈢ 提案三

案由：本會 111 年度收支預算表，提請審議。

說明：1. 本會 111 年度收支預算業於 111 年 4 月 30 日第十七屆第三次理監事聯席會審查並於 5 月 20 日電郵各理監事確認無誤。

2. 111 年度收支預算表請參閱大會手冊，其中本年度與上年度預算比較數差異較大者，於收支預算表格之說明欄位中有補充說明差異原因。

3. 擬於通過後，呈報內政部核備。

決議：通過。

㈣ 提案四

案由：中華鳥會以年度會務工作發起公益勸募，提請審議。

說明：1. 本會 111 年度工作計畫草案業於 111 年 4 月 30 日第十七屆第三次理監事聯席會審查通過。

2. 年度會務工作發起公益勸募目標額數 100 萬元整。

3. 擬於通過後交秘書處執行。

決議：通過。

六、臨時動議：無

七、散會 16:50

9/25 宜蘭壯六賞鳥行程花絮

文 By 邱柏瑩 中華鳥會秘書處・圖 By 陳祝欽、邱柏瑩

中華鳥會第 17 屆第 2 次會員代表大會已於今年 9 月 24 日 (六) 在宜蘭市中山國小視聽教室圓滿結束，再次感謝宜蘭鳥會的大力協助與幫忙。印象中，中華鳥會的會員代表大會，從來沒有在宜蘭舉辦過，開會地點又新增一個縣市，真是值得紀念！

原定賞鳥行程是前往員山鄉的大湖後山賞鷹，活動前一周 (9/17) 特地一大早 5 點開車去宜蘭現場勘查，7:30 時聽到小彎嘴、畫眉、黑枕藍鶲、台灣竹雞的聲音，又看到大彎嘴、白腹秧雞、樹鵲、白頭翁、大卷尾等，還想著這裡的鳥況真不錯，結果計畫趕不上變化，活動前兩天看氣象預報顯示 25 日會下雨，天公不作美，陳介鵬理事長跟我兩人在活動前多次討論，最終決定更換賞鳥地點，改到宜蘭縣壯圍、公館一帶的農田觀賞水鳥，若是運氣好的話，說不定能看到爪哇池鷺的蹤影。

原定的賞鳥地點——員山大湖後山賞鷹處／邱柏瑩 攝

活動當天早上果然飄著小雨，我們租了 2 台 9 人座，8:20 約在壯六活動中心前集合，由陳介鵬理事長開 1 台車當領隊，兩台車在後面跟著走，邊開車邊看路邊田裡的鳥，看到鳥多的地方就停下來，大家下車看水鳥，結果看一陣子就下大雨，又被雨趕回車上，就這樣停停走走、上車下車，也看到不少種鳥。

壯六活動中心集合，準備賞鳥趣／邱柏瑩 攝

第一個看鳥點，看田中的高蹺鴴、鷹斑鷸／邱柏瑩 攝

第一個看鳥點，大家撐傘戴帽的雨中賞鳥／陳祝欽 攝

第二個看鳥點，原本有丹氏濱鷸，大家下車後飛走，等待牠飛回來／陳祝欽 攝

陳祝欽大哥的傘（右邊橘色傘）被風吹落溝渠，手長腳長的 Scott 利用樹枝幫忙撈起雨傘／陳祝欽 攝

第三個看鳥點，雨越下越大，最後被迫上車躲雨／邱柏瑩 攝

宜蘭鳥會陳介鵬理事長（左一，單筒望遠鏡旁戴藍帽者）解說中／邱柏瑩 攝

宜蘭鳥會陳介鵬理事長超級認真地處理這趟賞鳥行程，希望讓大家能夠盡興而歸，會前 1 個月就與宜蘭鳥會理事們討論賞鳥點並事前勘察，結果因氣候不佳又討論更改賞鳥地點，9/25 當天一大早 6 點多就先去巡一圈壯六農田，並在手機上記下等會要帶大家下車看鳥的 4~6 個地點和鳥種，在此真的非常感謝介鵬理事長的大力協助，雖然天候不佳，但我們還是看到超過 30 種鳥喔！

今日紀錄鳥種，包括花嘴鴨、紅冠水雞、白腹秧雞、珠頸斑鳩、麻雀、家燕、小雨燕、棕沙燕、白頭翁、東方黃鶺鴒、斯氏繡眼、白尾八哥、東方環頸鴴、小環頸鴴、太平洋金斑鴴、高蹺鴴、鷹斑鷸、長趾濱鷸、黑尾鷸、丹氏濱鷸、紅胸濱鷸、田鷸、中地鷸、磯鷸、青足鷸、燕鴴、黑腹燕鷗、蒼鷺、大白鷺、黃頭鷺、小白鷺、翠鳥、大卷尾、棕扇尾鶯、

後來聽說當天 10 點半時，有鳥友在這群黃頭鷺中，發現爪哇池鷺蹤跡，但是我們從 10 點等到 10:20 分也沒有看到，真是可惜！／陳祝欽 攝

褐頭鷦鶯、樹鵲等約 36 種。

最後，10:20 大家驅車前往宜蘭火車站，近 11 點在火車站前解散，期待下次再相聚。

魚塭中覓食的黑面琵鷺與小白鷺 / 呂翊維 攝

聯合聲明

環社檢核管不到 室內漁電恐失控

聯合聲明 By 中華民國野鳥學會、台灣環境規劃協會、地球公民基金會、荒野保護協會、綠色公民行動聯盟、環境權保障基金會（按筆畫排序）

室內型漁電共生養殖場（下稱室內漁電），是現今行政院力推的重要能源轉型方向。室內漁電屬於屋頂型光電，光電板覆蓋率可達土地面積的80%，遠高於戶外漁電共生覆蓋率 40%；此外，室內養殖是採 24 小時水質處理的環境控制技術，具高技術門檻，發電業者多半需引入新的養殖團隊，或跟企業化的養殖戶合作的方式進行養殖，因此發電方及融資方認為相較戶外漁電共生多半需與原傳統養殖個體戶合作，室內養殖是較可控、風險較低的經營方式。因此，雖然室內漁電較戶外漁電的單位面積成本高出許多，但反而更受光電業者青睞，據了解近來申請案件數已遠超過戶外漁電。近期更有案例，得到了銀行團 88.8 億的鉅額貸款，創下 2022 年台灣金額最高的漁電共生聯貸紀錄。室內漁電是在魚塭上填土蓋建築物，相比戶外漁電是大幅增加了土地的使用強度，但目前卻缺乏相關環境社會檢核和漁業管理機制。大規模開發下很有可能失控，進而造成嚴重的環境破壞與漁業問題。

缺乏規範的室內漁電 對環境是更高強度開發與衝擊

中華民國野鳥學會呂翊維秘書長表示，台灣西南沿海是候鳥重要的度冬與過境地區，近幾十年來我國海岸天然泥灘地減少許多，室外型魚塭、廢棄鹽田等半自然濕地環境，已成為候鳥重要的替代棲地之一，包含彰化漢寶、雲林口湖、嘉義布袋、台

共同聲明記者會主持人綠色公民行動聯盟秘書長崔愫欣 / 吳勁萱 攝

南七股到高雄永安，魚塭佔有相當大面積的地景，亦是候鳥會利用的重要棲地類型，除了能提供候鳥貴重的食物來源，鄰海的魚塭堤岸也提供水鳥在潮汐漲退時可休息的棲地，而保育鳥類如黑面琵鷺也是經常利用魚塭的常客。為了盡可能減少光電開發影響魚塭原有的生態功能，近年經濟部透過環境與社會檢核機制，依生態敏感度規劃先行區、關注減緩區及迴避區，希望讓戶外漁電產業選擇適當的位置、以適當的方式設置，方能與環境生態共存共榮。但室內漁電目前並不受環社檢核的規範，其開發後土地幾乎都被建築物遮蔽，形同捨棄魚塭的生態功能，更無須遵循分區機制減少生態衝擊，亦未有總量上的限制。若不盡速檢討，讓大量光電開發導向室內漁電，可預期將造成魚塭地景的棲地破碎化，進而對生態環境造成嚴重的衝擊。

室內漁電一窩蜂　萬一爛尾難回復

環境權保障基金會研究員許博任指出，室內養殖是在室內設施採全天候水質控制養殖，較可排除氣候及水質影響，並且可提高養殖密度，長期是農委會推動養殖現代化的政策目標。但過往由於室內養殖水質技術門檻高、資本投入高、且須有人力 24 小時監控水質，故養殖漁民投入意願低，成功經營的實例並不多。目前因光電業者及融資銀行認為室內養殖是經營模式較可預測、較低風險的養殖方式，因而準備大量投資申設室內漁電案場，光嘉義縣預計申設面積就超過兩百公頃，這樣小區域大面積投入室內養殖是前所未有的狀況。就本會先前與養殖從業人員訪談，受訪者對於台灣室內養殖的技術及人才量能，是否足以支撐光電業者一窩蜂投入室內漁電案場多有保留，直指光電業者極可能低估室內養殖的經營門檻與風險。許博任特別指出，農漁業的新投資一般大約需要三年，才能知道是否可達產銷穩定，室內養殖無法順利經營的問題會遞延發生。現在若讓光電業者一頭熱同時大量的投入室內漁電案場申設，若兩三年後發現無法損益兩平，但室內養殖設施都已興建，土地都已蓋上建物難以回復原狀，恐怕會出現大量爛尾室內漁電案場的難解問題。

中華民國野鳥學會呂翊維秘書長發言 / 吳勁萱 攝

室內漁電應有區位盤點與總量管制
漁業署應提出室內養殖白皮書

許博任進一步指出，漁電共生的環境社會衝擊更大、養殖門檻更高，勢必需要相應的環社檢核及養殖漁業管理措施。由於室內漁電形式上是附屬於室內養殖設施的屋頂型光電，申設程序上是先申請農業主管機關的室內型水產養殖設施容許，後申請電業主管機關光電籌設許可的兩階段的程序，因此農業及電業主管機關都應負起各自加嚴管制的責任。漁業署應提出全國室內養殖設施白皮書，從經營量能、產銷穩定、生態環境等條件，盤點及規劃全國各區可以作室內養殖設施的區位、適養物種及總量管制，作為地方政府核發室內養殖設施容許的依據。

環境權保障基金會許博任研究員發言 / 吳勁萱 攝

室內漁電應排除關注減緩區
並要有環境社會議題配套處理機制

台灣環境規劃協會常務理事李翰林表示，台灣西南部沿海低窪地區原本就是淡鹹水交匯的洪泛地帶，先民依循自然條件築堤圍塭，這種開放式養殖

慣行會在冬季排乾水位進行曬池整地，池底露出的小魚小蝦剛好為冬候鳥提供珍貴的覓食環境。這是養殖文化與生態共生的韻律，具體說明了海岸魚塭養殖除了創造生產，還有供給（生態棲地）、調節（氣候與水循環）與文化（養殖者社群、地景認同）等不同面向生態系服務功能。這也是為什麼漁電共生環社檢核機制中，會特別去指認出具有重要環境社會課題的「關注減緩區」。上述位於區內的魚塭，除了能同時提供水鳥所需棲地及漁業生產功能，更可在適當因應對策設計下設置戶外漁電，達成生態、漁業和能源的共存共榮，廿年設置期滿也有機會回復原狀。然而開放型魚塭一旦轉為室內漁電，就會造成不可回復的永久性改變，表面上提高了漁電收益，卻會完全犧牲其他既有的生態系服務功能，因此關注減緩區內不應核准任何室內型案場的開發。而針對優先區經濟部和農委會亦應建立聯席審查機制，在業者申請電業籌設許可時，則應要求業者提出當地環境社會議題處理對策，依處理對策的可行性及良莠則作為是否通過或優先取得許可的審查衡量要件。

台灣環境規劃協會李翰林常務理事發言 / 吳勁萱 攝

立法委員洪申翰表示，近幾年看到滿多室內漁電出現，因為對於很多放貸方來說，室內養殖取得融資相對容易，使得民間的資源開始流向室內養殖，也讓過去漁業署一直想要推動的養殖現代化目標更加速。但也看到一些問題浮現，包括生態、海岸防護，甚至是農漁村生產模式及社會關係快速轉變帶來的衝擊。怎麼來管理增加的室內養殖案場？這是過去沒有好好談過，相關的配套需要有關的部會盡快來規劃。

立法委員洪申翰發言 / 吳勁萱 攝

我們的訴求：

1. 地方農業主管機關及經濟部應立即全面暫緩發給「位於關注減緩區內」的室內水產養殖生產設施容許使用及其屋頂型電業籌設許可。
2. 農委會及經濟部應儘速推動室內型漁電共生的環境社會議題處理機制。
3. 農委會應儘速研提室內養殖政策計畫書。

＊聯合聲明團體：

中華民國野鳥學會、台灣環境規劃協會、地球公民基金會、荒野保護協會、綠色公民行動聯盟、環境權保障基金會（按筆畫排序）。

＊新聞稿連結：https://www.bird.org.tw/news/2213

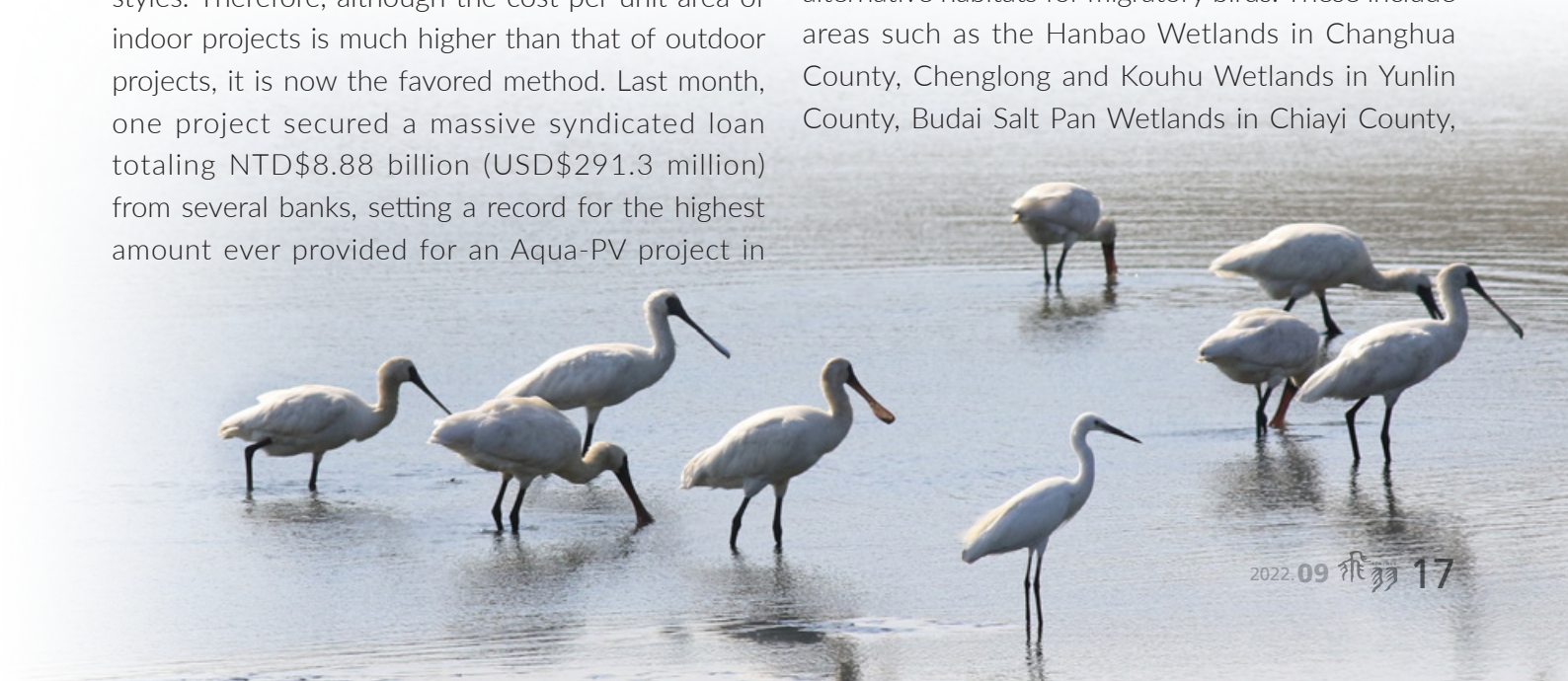
Indoor Aqua-PV Requires Environmental and Social Regulations Now!

Issuing Organizations Taiwan Wild Bird Federation, Taiwan Environmental & Planning Association, Citizens of the Earth, Taiwan, The Society of Wilderness, Green Citizens' Action Alliance, Environmental Rights Foundation

The application of photovoltaic systems to aquaculture farms (hereinafter referred to as Aqua-PV) has been actively promoted by the Executive Yuan as an important means of accelerating Taiwan's energy transformation. While Aqua-PV in open fields is done using ground-mounted systems with a maximum of 40% ground-coverage ratio, indoor Aqua-PV is done using rooftop systems which permit a much higher PV coverage ratio of 80%. Although indoor Aqua-PV seems more profitable, indoor fish farming is more technologically demanding as it requires 24-hour water quality treatment. Because of this, solar developers need to bring in new teams or cooperate with bigger fish farming businesses to set up aquaculture systems. Yet solar developers and investors believe that indoor Aqua-PV projects are more easily controlled and a less risky business venture compared with outdoor projects where there is more necessity to deal with traditional fish farming practices and management styles. Therefore, although the cost per unit area of indoor projects is much higher than that of outdoor projects, it is now the favored method. Last month, one project secured a massive syndicated loan totaling NTD$8.88 billion (USD$291.3 million) from several banks, setting a record for the highest amount ever provided for an Aqua-PV project in Taiwan. Compared with traditional aquaculture in open fields, indoor projects would permanently alter the land use and should be permitted only after special consideration. However, there is currently a lack of relevant environmental and social regulations and little to no management guidelines for indoor Aqua-PV. Without proper action now, large-scale development of indoor Aqua-PV projects will likely get out of control, resulting in serious environmental degradation and aquaculture problems.

Lack of Standards for Indoor Aqua-PV Creates High Risk of Negative Environmental Impacts

Taiwan Wild Bird Federation Secretary-General Allen Lyu said Taiwan's southwestern coast is an important stopover and wintering area for migratory birds. In recent decades, natural mudflats on the coast have been greatly reduced and semi-natural wetlands such as outdoor fish farms and abandoned salt pans have become some of the most important alternative habitats for migratory birds. These include areas such as the Hanbao Wetlands in Changhua County, Chenglong and Kouhu Wetlands in Yunlin County, Budai Salt Pan Wetlands in Chiayi County,



Joint Statement Press Release Host and Green Citizens' Action Alliance Secretary-General Cui Su-xin speaks at press conference. (Photo: Wu Chin-Hsuan)

Chiku District in Tainan City, and Yong'an Wetlands in Kaohsiung City. In addition to providing foraging grounds for migratory birds, fish farm embankments adjacent to the sea provide areas for waterbirds to rest. Conservation species such as Black-faced Spoonbills are frequent visitors to fish ponds. To minimize the impact of photovoltaic development and preserve the important ecological functions of fish farms, in recent years, the Ministry of Economic Affairs, through an environmental and social review mechanism, has designated areas as being "priority', "of mitigation concern" or "to be avoided" for Aqua-PV installations based on ecological sensitivity. This was all done with the hope that outdoor Aqua-PV project developers would choose appropriate locations and construct their installments in such a way as to allow for coexistence with the local ecology. However, indoor Aqua-PV projects are not currently subject to any environmental and social review mechanism standards. After developing the panel installation, almost all the land is covered over by structures or shade, essentially abandoning the ecological function of the fish farm. There are also currently no zoning regulations to reduce ecological impacts or a limit on how many of these projects can be done in an area. If this is not addressed as soon as possible, a large number of unregulated and unmanaged Aqua-PV projects will spring up. It can be expected that this will destroy critical fish pond habitat resulting in serious impacts on the local ecology and the overall environment.

We Must Address the Issue of Indoor Aqua-PV Before Hitting a Point of No Return

Environmental Rights Foundation researcher Hsu Po-Jen said that with indoor aquaculture, factors such as climate and water quality are controlled, and with the elimination of these limiting factors, fish production can greatly increase. It has also long been a policy goal of the Council of Agriculture to promote modernization of Taiwanese aquaculture. However, in the past, due to the high reliance on technology for indoor aquaculture in order to control the water quality, the high capital investment required, and the need for manpower to monitor the water quality 24 hours a day, aquaculturists had little willingness to invest in such plans and there were not many examples of successful cases. Yet now, the photovoltaics industry and financial institutions believe that indoor fish farms are a more predictable and a low-risk fish farming method, so they are preparing to invest heavily in indoor Aqua-PV projects. Chiayi County alone is estimated to have received Aqua-PV project applications totaling around 200 hectares. Such large-scale investment in indoor fish farming for such a small area is unprecedented. Meanwhile, aquaculturists have expressed reservations about whether Taiwan's indoor aquaculture infrastructure and current skill levels are sufficient to meet the expectations of the photovoltaic industry as it invests in these projects. They also pointed out that the photovoltaic industry is likely underestimating the operating costs and the risks posed by indoor fish farming. Hsu went on to explain that it generally takes about three years for

Taiwan Wild Bird Federation Secretary-General Allen Lyu Speaks at press conference. (Photo: Wu Chin-Hsuan)

investments in agriculture or fisheries start showing returns and to properly know whether production and sales can be stabilized. The risks that aquaculturists experience is not something the solar investors are familiar with. Also, even though investors are so eager to invest large sums in these integrated projects now, if in two or three years they aren't making enough, they may pull out. But it'll be too late for the land. The indoor fish farm facilities will already be built and the land already covered. Returning it to its original state will be difficult if not completely impossible. The land will already be past the point of no return.

There Should be Regional Inventories and Number Caps for Indoor Aqua-PV Projects; the Fisheries Agency Should Propose a White Paper on Indoor Aquaculture

Hsu Bo-Jen explained that as the environmental and social impacts of indoor Aqua-PV projects are so great, and because the technological intervention for indoor fish farming practices is higher, proper environmental and social regulations as well as appropriate aquaculture management guidelines are not only necessary, but required. Indoor Aqua-PV projects consist of rooftop panels attached to the indoor aquaculture facility. Therefore, those looking to establish new projects should first apply to the Fisheries Agency under the Council of Agriculture for permission to build the indoor fish farming facility. After that, they should go to the Bureau of Energy under the Ministry of Economic Affairs and apply for a photovoltaic installation permit. Also, as these projects involve both agriculture and electricity generation, it is only appropriate that both government agencies shoulder bear the responsibility of managing them together.

The Fisheries Agency should also create and publish a national white paper on indoor aquaculture. This white paper should address operating capacity, stable production and sales, ecological and other environmentally-related specifications, inventory and location planning, suitable fish species and

Environmental Rights Foundation researcher Hsu Po-Jen speaks at press conference. (Photo: Wu Chin-Hsuan)

management rules and standards. This information can then serve as a guide for aquaculturists throughout the country. It can also serve as the reference base for local governments as they review and issue permits for indoor fish farms.

Indoor Aqua-PV Project Planning Should Exclude Areas of Mitigation Concern and Have a Support Mechanism for Addressing Environmental and Social Issues

Taiwan Environmental Planning Association Executive Director Li Han-lin explained that southwestern Taiwan's low-lying coast was originally a brackish water floodplain where saltwater and freshwater mixed. Early residents there built embankments for fish ponds in line with natural environmental conditions. They also employed an "open" farming practice, which drained the water in winter, slowly drying out the ponds and naturally preparing it for the next aquaculture cycle. The small fish and shrimp which were exposed at the bottom of the ponds provided a foraging feast for wintering migratory birds. This is the local symbiosis between aquaculture and ecology. In addition to fostering production, coastal fish farms have also provided various ecosystem services and functions such as supplying important habitat and regulating climate and the water cycle. They have also helped create a cultural identity in traditional fishing villages. This is why, in the current environmental and social regulations for Aqua-PV projects, areas of mitigation concern which have important environmental and/or social

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components have been specifically identified. Fish farms within these areas could apply for open field Aqua-PV projects under the condition that specific mitigation measures are implemented to achieve coexistence and co-prosperity between local ecology, the fishery and the energy generation. There is also a chance that these areas could be returned to their original state after the 20-year installment period expires. Yet once an outdoor fish farm is converted into an indoor Aqua-PV project, it will cause irreversible and permanent changes. On the surface, it will increase profits. However, it will also completely sacrifice all other existing ecosystem services and functions. Therefore, indoor Aqua-PV projects should not be approved in areas of mitigation concern. Also, a joint review mechanism should be established by the Ministry of Economic Affairs and the Council of Agriculture to address such priority area applications. When an operator applies for a permit for an indoor Aqua-PV project, they should be required to include in the proposal measures for addressing the local environmental and social issues it may cause. This information can be used in the application review process as the feasibility and quality of the mitigation measures can be considered while deciding whether the application will be successful or permit prioritization will be granted.

Legislator Hung Sun-han said that in recent years we have seen the emergence of many indoor Aqua-PV projects because for many lenders, it is relatively easy to obtain financing for indoor fish farms. This has led to a great deal of money and resources flowing in the direction of indoor aquaculture and may seem

Taiwan Environmental Planning Association Executive Director Li Han-linspeaks at press conference.（Photo: Wu Chin-Hsuan）

to have accelerated the modernization of Taiwan's aquaculture, a goal actively promoted by Fisheries Agency in the past. Yet we are also seeing some problems emerging, including those related to ecology and coastal protections, not to mention the impact these rapid changes are having on both production patterns and social relations in fishing villages. How do we manage this rapidly emerging form of fish farming? This has never been adequately addressed. Appropriate support mechanisms need to be planned by the relevant ministries as soon as possible.

Legislator Hung Sun-han speaks at press conference.（Photo: Wu Chin-Hsuan）

Our Demands:

- Relevant local bodies responsible for agricultural management and the Ministry of Economic Affairs should immediately and comprehensively suspend the granting of permissions for the use of indoor aquaculture production facilities located in areas of mitigation concern as well as permits for rooftop electricity generation.
- The Council of Agriculture and the Ministry of Economic Affairs should develop and promote a mechanism to address the environmental and social issues regarding indoor Aqua-PV projects as soon as possible.
- The Council of Agriculture should research and create a policy proposal for indoor aquaculture as soon as possible.

Eight Colors, One Future: Fairy Pitta Conservation in Taiwan and Efforts for the Future

Part 1

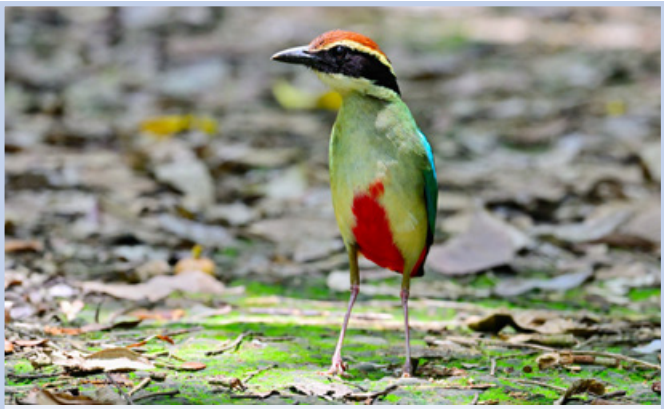
By Scott Pursner Taiwan Wild Bird Federation Director of International Affairs

Pitta History in Taiwan

Though first described by Temminck & Schlegel in 1850 (1), the first mention of the Fairy Pitta in Taiwan came from famed British naturalist Robert Swinhoe in 1864 (2). Swinhoe thought he had discovered a new species and called it *Pitta oreas*, an ally of Pitta cyanoptera (Blue-winged Pitta) and *Pitta nympha* (Fairy Pitta). Publishing his description in journal The Ibis, he claimed the specimen was from the Formosan mountains. The area was likely what we would today call Taiwan's western low-altitude foothills. In 1864, Swinhoe probably had no access to the actual high mountains or the eastern portion of Taiwan, as they were not under the control of the Qing Dynasty at that time.

After Swinhoe, it wasn't until 1951 that the species was more thoroughly studied by Japanese ornithologists Masauji Hachisuka and Tatsuo Udagawa (3). They listed it as a subspecies of the Indian pitta (*Pitta brachyura nympha*), and called it "a summer visitor.... more frequently met with on the western hills than the eastern side." The assumption that the Fairy Pitta was a summer migrant to Taiwan would continue until the late 20th century. Prior to the 1970s, Fairy Pittas were also under pressure in Taiwan due to hunting, as specimens were able to fetch high prices (4). However, the situation improved after the bird specimen industry was more strictly regulated by the central government in the early 1980s (4).

The first Taiwanese researcher to discuss the species was Dr. Lucia Severinghaus in 1991 (5). Her paper described a Fairy Pitta nest discovered in Taichung City's Dakeng District in 1987, a year after the IUCN had declared it "vulnerable" due to presumed population declines across its range. Severinghaus said the bird was "a rarely seen uncommon summer visitor" and "one of the least known bird species in Taiwan." However, she did speculate that it should be a regular breeder even if only at a few locations.



Fairy Pitta. (Credit: Philip Kuo)

The Fairy Pitta (*Pitta nympha*) is a long-distance migratory land bird restricted to the East Asian-Australasian Flyway. Known in Mandarin as the "Eight-colored Bird" (八色鳥), its extensive breeding range includes the Korean Peninsula, China, Japan, and Taiwan. Taiwan, however, is where much of the research on the species over the last 20 years has been conducted. This passerine also holds special significance in Taiwan among those involved in the country's environmental movement as it played an outsized role in Taiwan's modern conservation history. Yet for such a brightly colored bird, it still keeps its secrets well hidden. Even now, there is much that is not known about the species, which is considered "vulnerable" by the IUCN.

Map of Taiwan highlighting Yunlin County and Huben Village.
(Credit: TWBF)

Internationally, the Fairy Pitta was formally afforded protections under the Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES) in 1992.

From 1864 to 1991, very little was known about the distribution and ecology of this secretive species in Taiwan. It could have stayed that way if not for various land development pressures which threatened its breeding habitat. By the early 2000s, it would become the eight-colored face of the Taiwanese environmental movement.

Enter Pillow Mountain

Yunlin County sits in the center of Taiwan's west coast and is mainly known for agriculture. In 1995, the county magistrate green-lighted certain parts of an area known as Pillow Mountain in eastern Yunlin's Huben Village for gravel extraction. The area was home to a small community of roughly 1,000 people, mainly farmers. Between 1995 and 1999 nothing happened. But then in February of 1999, though no permits for extraction were officially issued, residents began seeing piles of gravel along the hillsides (6). They didn't want the gravel extraction due to the pollution and property damage it could cause as well as the possibility of bad fengshui due to certain extraction sites being too close to the local Tien-Shen Temple (6).

The Tien-Shen Temple aka the Fairy Temple, 2005.
(Credit: Mark Wilkie)

Fairy Pitta Habitat in Huben Village, Yunlin County, Taiwan.
(Credit: TWBF)

By August of 1999, the government had still not addressed their issues so the villagers created the Anti-Gravel Extraction Association, mainly arguing that the Environmental Impact Assessments done for the extraction areas were flawed (6). Although this matter

was later addressed, permits were still being granted and extractions continued. The fight changed in November of 1999 is when researchers and conservationists got involved after hearing that there was a Fairy Pitta spotted in the woods around Pillow Mountain (6). It prompted the Taiwan Wild Bird Federation, Taiwan's largest bird conservation organization, and its partners, to get involved in the fight.

As part of these efforts, TWBF member, the Wild Bird Society of Yunlin sought out Scott Ruey-shing Lin, then an assistant researcher at the Taiwan Endemic Species Research Institute, to help survey for the species in 2000. According to Lin, "Some locals said the Fairy Pitta was quite common there. But we knew so little about it back then that the members of the Wild Bird Society of Yunlin didn't know if it was true or not. As some of them were good friends, they asked me to help them verify the status of the Fairy Pitta in the village."

This would start Lin down a path that he has walked for the last 22 years.

Dr. Scott Lin of the Taiwan Endemic Species Research Institute. (Credit: TWBF)

"That spring, I spent my personal time, Saturdays and Sundays, going to the village to check for the birds. It was easy since as I discovered, they were very common there. In the beginning, I was just doing some basic surveys in Huben Village. Then I prepared some surveys for them [the local people] to do. It was very useful evidence," he said.

The "evidence" mentioned by Lin refers to proof that the Fairy Pitta was breeding regularly in Huben. Furthermore, with so little known in Taiwan or elsewhere about the species, its ongoing presence there during the breeding season raised the possibility that Taiwan had one of the largest breeding populations of Fairy Pittas in the world. This gave NGOs and villagers an argument to try and stop the gravel extractions. An environmental movement took shape, led by members of the local community and conservation groups, and the Fairy Pitta was their star.

In February 2000, the TWBF launched a global appeal called "Save Huben Village – Home of the Fairy Pitta." By May, 73 international conservation organizations from 21 different countries had come out in support of the campaign. Locally they worked with villagers to increase publicity for the issue and holding letter writing campaigns and petition drives. The TWBF was also applying to BirdLife International for Huben Village and Pillow Mountain to be included for certification as an "Important Bird and Biodiversity Area" (IBA) (7). Though without domestic legal effect, this international certification of a site's importance to birds and biodiversity could be used to fight for legal protections and to show the world the importance of this fairy pitta hotspot.

In June, the case to protect the area was bolstered when footage of a Fairy Pitta in Pillow Mountain came to light. With the video and thousands of signatures locally and internationally in hand, a public hearing at the Legislative Yuan was held on the issue. This got the attention of Taiwan's Presidential Office (6). Recently-elected President Chen Shui-bian came out in favor of protections for the Fairy Pitta. He said "Taiwan is a beautiful island and gives due consideration to both conservation of the natural environment and industrial development. People living in harmony with nature means that the environment will be healthy and will last forever. If Taiwan lost the Fairy Pitta, we would not only lose the most beautiful thing in Taiwan, but the whole world would be a poorer place." (8) Later that month, on June 23rd, Taiwan's Council of Agriculture suspended gravel extraction operations and considered giving Huben and Pillow Mountain the designation of "Major Wildlife Habitat" (7).

Results of Gravel Extraction and Mining in Huben Village, 2006. (Credit: Mark Wilkie)

Fairy Pitta Cafe. (Credit: TWBF)

On July 1st, Marco Lambertini, then head of BirdLife International's International Affairs Division, came to Taiwan to urge the government to name Pillow Mountain an important wildlife habitat and stop gravel extraction (9). Huben gained IBA status in September of that same year (7).

The gravel extraction issue at Pillow Mountain thrust Huben Village into the local and international spotlight. Soon there were a number of conservation groups, researchers, and birders headed there for research, organizing, or to catch a glimpse of a Fairy Pitta. As there was no visitor's center or a place for all these new guests, in 1999 the village decided to pool resources to create the Huben Community Space, known today as the Fairy Pitta Café and run by owner and Fairy Pitta expert Chen Jia-hong. Originally from neighboring Chiayi County, Chen first came to Huben in 2007 to work as a research assistant in Lin's Fairy Pitta surveys. He explained, "This place was created by the village and really only started from the time the environmental issues started up. The villagers thought that if they created a specific place for visitors, they could come and make the connections necessary to bird or find what they were looking for. It became Huben's de facto visitor center." The center went on to serve as a base of operations for researchers, birders, and international guests who frequented the area over the coming years and is still in operation today.

The increased profile of the gravel extraction issue eventually prompted the Council of Agriculture to approach Scott Lin, who had already been conducting preliminary research on the Fairy Pitta population there, and commission him to execute a more detailed study. According to Lin, "From 2001, there were two projects. The first one was to understand the status of the Fairy Pitta in Taiwan, and the second was to do some detailed studies of the area around Huben."

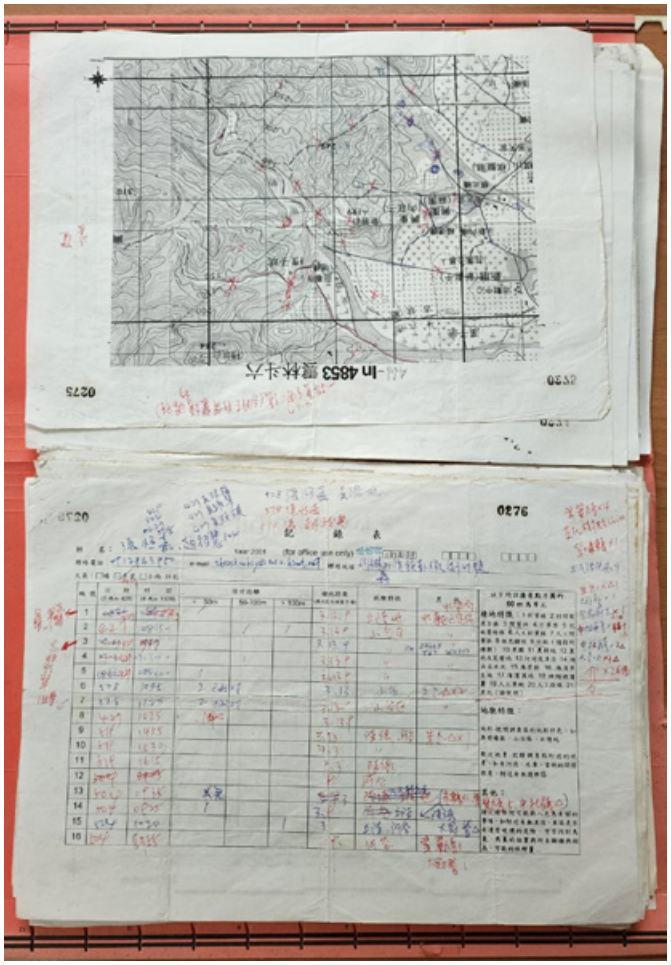
The survey in Huben was technically easier, yet one problem remained—how to survey these secretive forest dwellers which prefer leafy undergrowth in dense forests. During his earlier work, Lin discovered that males were highly territorial just before breeding began and would respond to pre-recorded calls, also known as playbacks. He decided to test playbacks as a tool to conduct surveys, which proved a great success. Responses were quick, with most Fairy Pittas replying to the playbacks within five minutes of the recording (10). This greatly increased the chances of detecting pittas, and would lead to population estimates twice as high as previously thought (11). The study also found that the pittas were most active prior to the breeding season, during a period of about 3 weeks between late April and early May. Once breeding had begun, they would go silent. Knowledge that playbacks were effect in surveying for pittas would change the way that surveys and population modelling for the species were conducted.

An island-wide survey was to be a much bigger undertaking, as such a large-scale survey for such a secretive species had never been done before, let

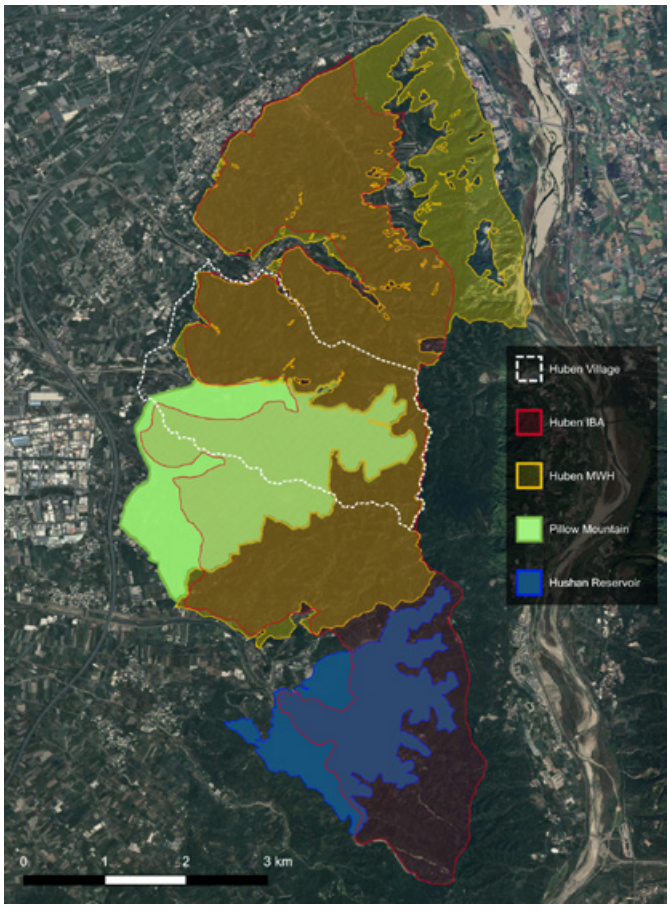
alone by Lin as one person. It was at this time he thought of the potential of "citizen science" for doing such a project. As he put it, "I knew there were many birdwatchers around all of Taiwan. I also knew that most of them didn't know Fairy Pittas. But there would definitely be a strong attraction for them. It could be possible to design some kind of project and then invite birdwatchers from around Taiwan to use the same method to conduct the survey."

After coming up with a standardized experimental design method, Lin took to the road in January and February 2001, going to each local bird society to pitch his idea, compiling a list of names of those interested, then teaching the volunteers how to do the surveys. About 250 volunteers were mobilized for the surveys that took place in 2001 and 2002 (11). In the field, volunteers would fill out forms and send them back to him to check and verify, contributing data that proved useful during analysis. These earlier surveys showed that pittas were also breeding by the Shimen Reservoir in northern Taiwan's Taoyuan County as well as in Kaohsiung's Meinong District. Overall, it seemed that areas with substantial forest cover in low-elevation hilly terrain could serve as potential Fairy Pitta habitat, with particularly high numbers of sightings in forested hills in Taoyuan, Miaoli, Taichung, Yunlin and Tainan Counties (11). A conservative estimate of Taiwan's overall Fairy Pitta population was put at more than 2,000 individuals (11). This served as a breakthrough in understanding the population status of Fairy Pittas in Taiwan, at a time when the global population of the bird was thought to be between 1,500 and 10,000.

Though having initial success in 2000, a small amount of extraction permits were still being issued after since the extraction areas were on private land. Yet following the efforts of local people and NGOs, and with the use of Lin's data, the Council of Agriculture in 2005 directed the Ministry of Economic Affairs to fully ban



Data Recording Sheet and map from 2001 Survey.
(Credit: Scott Lin)



Map of area around Huben Village involved in the Fairy Pitta conservation history discussed in article: white dotted line = Huben Village, red line = boundaries of Huben IBA, yellow line = boundaries of Huben Major Wildlife Habitat, green area = Pillow Mountain, blue area = Hushan Reservoir.

the extraction of gravel at Pillow Mountain to conserve Fairy Pittas under the Sand and Gravel Excavation Act. That same day, the MOEA declared a 588-hectare zone in Linnei Township and Pillow Mountain as off-limits to gravel extraction. According to Lin, it was a conservation victory at the time, with about 20-30 Fairy Pitta breeding in that area (7).

In November 2008, the Forestry Bureau would declare 1,737ha of land including parts of Huben and neighboring Douliu in Yunlin as well as a section of Zhushan Township in Nantou County the Yunlin Huben Fairy Pitta Major Wildlife Habitat (7).

But though the gravel extraction was eventually stopped, an even greater threat to the Fairy Pitta population in Huben was taking shape in the construction of the Hushan Dam.

Hushan Dam

Just 7.7 kilometers south of Huben Village is Yunlin's Youqing Valley, part of the Huben-Hushan IBA. In December 1994, initial plans were put forth to submerge the valley and create a reservoir using water diverted from the Qingshui River, which developers and the government said would address local water shortages and mitigate serious land subsidence resulting from excessive pumping of groundwater. These plans were temporarily shelved before being dusted off by policymakers in 2000 around the same time of the gravel extraction issue (12).

Yet this fight was more difficult. In the words of Lin, "It was a very different situation when it came to the Hushan Dam since it was a kind of national project. Most people in Taiwan would look at it as important for the country."

And though the site was ecologically important for many other reasons, including 21 different frog species, certain Taiwan endemics, and other flora and fauna, Fairy Pittas took center stage. With such little information from other known parts of its breeding range in Japan, Korea, and China, Taiwan, and Huben in particular, were thought to be the most important breeding habitat for the globally threatened species.

Lin was approached by Taiwan's Water Resource Agency in 2002 to help develop a long-term monitoring project to survey the Huben-Hushan IBA area to understand the possible long-term effects of the Hushan Dam on the population of the Fairy Pitta. From 2004 to 2014, he surveyed the area annually to assess population numbers before, during, and after construction.

Just as with the gravel extraction, a movement took shape to stop the dam's construction. In the early 2000s, the Taiwan National Coalition Against the Hushan Dam was formed for this purpose. Mainly represented by Wild at Heart Legal Defense Association, the alliance included the Wild Bird Society of Yunlin, Taiwan Wild Bird Federation, Taiwan Environmental Protection Union, Meilin Community Development Association, Taiwan Academy of Ecology, Environment and Animal Society of Taiwan, Taiwan Environmental Action Network, and many others (13). One of the people actively involved with work on the ground in Huben was Mark Wilkie, a bird enthusiast and wildlife documentarian. In 2003, Wilkie moved to Douliu, Yunlin's largest city, from his native South Africa. Having just missed the Fairy Pitta season in 2003, Wilkie recalled how excited he was to go looking for a pitta in his local birding patch in 2004. Yet, when the time came, everything was gone. "The whole valley had been destroyed due to the gravel extraction," he recalled. So he headed to Huben, where he was put in contact with Mr. Zhang, a well-known former hunter turned pitta guide. Wilkie and his wife hired Mr. Zhang to help them find pittas around Huben. Within 30 minutes, they had already spotted seven.

Wilkie met Lin a few months later at the Fairy Pitta Café, and helped survey and record the conservation work taking place. He also met Robin Winkler, a lawyer and founder of the Wild at Heart

Legal Defense Association, in 2005. Wild at Heart, as Wilkie describes it, was really leading the alliance working to stop the dam. Wilkie helped the group record what was happening in Huben and Yunlin, and raised awareness of the issue via his role as super moderator of the popular birding discussion forum Bird Forum.

According to Wilkie, the alliance did letter-writing campaigns, petitions, international exchanges with other NGOs, and meetings at Taiwan's legislature. They even helped host a concert to raise awareness about the dam and its effects. Via Bird Forum, Wilkie convinced people to come to Huben to see the local habitat, learn about pitta conservation, and support the local community fighting the dam. As he put it, “These efforts seemed to be having an effect and mobilized the conservation community and young people. We really thought that [the dam construction] could be halted.”

The Save the Fairy Pitta Fair and Concert was held outside Yunlin University of Science and Technology April 8, 2006. A petition drive took place the same day.（Credit: Mark Wilkie）

He added, “There were many things that people were upset about regarding the dam project, from what they considered to be a faulty Environmental Impact Assessment process, to the local geology which didn't seem correct for the dam, to the possibility that the water wasn’t going to the locals but to two proposed major construction projects for Yunlin's offshore business.” Those two projects were run by Formosa Plastics, which wanted to build a steelworks, and the China Petroleum Corporation, which was looking to build a petrochemical science and technology park. Both were planned for being built on Yunlin’s coast and would require massive amounts of water. "So we tied the pitta conservation to humpback dolphin conservation, which was also extremely threatened by such projects."

Meanwhile, in November 2004, BirdLife International's Asia Council held its Council Meeting in Taipei, at which members expressed concern about the proposed dam project at Hushan (14). Later, then CEO of BirdLife International Dr. Mike Rands sent a letter to President Chen Shui-bian, noting that that the forests within the Huben-Hushan IBA supported what was then the largest-known breeding population of Fairy Pittas anywhere in the world. This made protection of the habitat globally important and of major concern to international NGOs (14).

Two years later, in June 2006, BirdLife sent Jonathan Eames, International Programme Manager for Indochina, and Richard Grimmett, Birdlife Asia Division Head, to participate in the first International Fairy Pitta Symposium hosted by the National Coalition Against the Hushan Dam (15). Grimmett spoke at the meeting about the need for a coordinated effort by organizations across the Fairy Pitta's range in Japan, Taiwan, Malaysia, and Borneo to work together to protect the bird's habitat.

Taiwan's first International Fairy Pitta Symposium hosted by the National Coalition Against the Hushan Dam, 2006.
（Credit: Mark Wilkie）

Richard Grimmett, Birdlife Asia Division Head（far left）Jonathan Eames, International Programme Manager for Indochina（next on right）and current TWBF president Dr. Woei-Horng Fang（far right）search for Fairy Pitta after International Fairy Pitta Symposium, 2006.（Credit: Mark Wilkie）

Meanwhile, Lin was still conducting population surveys, but now as a PhD candidate focusing on the species. While continuing an annual count at Huben, and with the Fairy Pitta Café as his base of operations, he did another island-wide study in 2005. The method changed only a little. As he put it, “I did not use the volunteers anymore. At the beginning, I thought I had 4 weeks [for the survey], but I found that to be too long. So I reduced it to three weeks. This is such a short timeframe for volunteers. So in the end I applied for funding to hire 30-40 people, and they'd spend a couple of days on the surveys.”

Clearing land for the Huben Reservoir, 2007.
（Credit: Mark Wilkie）

Scott Lin, research assistants, and colleagues who helped him with the Fairy Pitta research, 2008.（Credit: Scott Lin）

In 2007, everything changed when construction on the dam officially began. Wilkie recalls, “In early 2007, things weren't really passed yet, and then [the Taisei Company] just went in and walled off the area. A few months later, in June, they finally let us go in, and it was presented as a fait accompli. Everything was cleared. There were also smaller projects going on where they were concreting streams in Huben. I actually have some photos of this pitta fledging on the tracks of a grader.”

Scott Lin taking measurements of Fairy Pitta fledgling, 2007.
（Credit: Mark Wilkie）

Yet even with construction beginning, conservation efforts didn't stop. In August 2007, the Taiwan Wild Bird Federation, with the support of government agencies and industry, hosted the 2007 International Symposium for Fairy Pitta. Speakers representing Korea, Thailand, Indonesia and Taiwan came together to discuss pitta conservation, and at the end of the symposium, a call was made for future

collaboration and efforts for regional cooperation in pitta conservation. One of the speakers, Dr. Eu-mi Kim of Korea, later invited Lin and Wilkie to take part in the Jeju Wildlife Research Center Workshop held in February 2008. Lin presented on current research and conservation goals for the Fairy Pitta in Taiwan while Wilkie discussed the Hushan dam threat (16).

Scott Lin（right）, Dr. Eu-mi Kim（center）, and Mark Wilkie（left）talk together at the Fairy Pitta Cafe, 2008.（Credit: Mark Wilkie）

Lin was also invited to Kochi, Japan to present on Taiwan's pitta research and learn about what was being done by Japanese researchers. His research by now included not just population dynamics and survey techniques, but also diet and breeding area preferences for Fairy Pittas, some of the earliest works in the region on these topics. The most important finding, though, was still the discovery of the effectiveness of the playback approach. “I know several research projects about the Fairy Pitta now where they use the playback as well, like in Korea and China. They'll also use it for some other pitta species too.”

One major mystery which remained was that of the Fairy Pitta's wintering grounds, which were long assumed to be Borneo. In 2007, a sighting at the Matang Wildlife Center in Sarawak, Borneo, led Lin to take a trip there in April 2008. However, no Fairy Pittas were seen or heard on the trip (17).

In 2009, Lin finished his PhD and again conducted another island-wide survey. The method was changed one last time. As he explained, "From 2009, the purpose was to get more information from more locations. After the surveys in 2001, 2002, and 2005, I already had enough data to understand the situation of the distribution around Taiwan. So, I shifted the focus to building a systematic monitoring method for the Fairy Pitta. This method stabilized the locations, and is still used today for the island-wide survey which takes place every 4 years."

Looking at the results of the 2009 survey, something struck Lin as odd. "My assumption was that after dam construction began, the Fairy Pitta would lose some habitat and need to try and find new territory around the area. I figured there would be a short period of time where that number would increase in Huben, as it is just a few kilometers from the dam site. But it was the opposite. Numbers went down at Huben too. I spent a lot of time thinking about this. Looking at the 2009 data compared to 2005, I started thinking that maybe the phenomenon we were experiencing around the Hushan Dam wasn't just a random occurrence, but perhaps something taking place around all of Taiwan. Maybe there was something else going on here."

The Huben Reservoir, 2022.（Credit: TWBF）

The dam construction continued. As Wilkie put it, "The period from 2005 to 2010 was really wild; we fought so hard. But really, after the removal of the forest in 2007, we were still able to make some noise, but there wasn't much left to save." In the end, the dam was finished in 2014 and the sluice gate closed in 2016. In total, 422 hectares of Fairy

Pitta habitat was lost. As Lin had predicted, Fairy Pitta numbers in the area decreased dramatically. From 222 counted in 2004, only 37 were counted in 2014 (7). However, as he had initially thought, the problem seemed to go beyond Taiwan.

Part Two will discuss efforts to understand Fairy Pitta numbers, distribution, and the effects of research and conservation work already done in Taiwan.

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台北市野鳥學會 文圖 By 台北鳥會

「2022 臺北國際賞鳥博覽會」將於 2022 年 11 月 5 至 6 日（星期六、日）在關渡自然公園舉行，
今年活動主題為「賞鳥生活節」，主題所示，希冀推廣民眾賞鳥與休閒生活結合，
在生活的步調當中，學習欣賞鳥、愛護鳥，了解鳥類保育的重要性！

- 飛羽小隊大集合
- 跳島闖關大進擊
- 野望放映室
- 賞鳥補給站
- 樂活鳥市集
- 鳥人講座

免費入場

指導 行政院農業委員會林務局 FORESTRY BUREAU C.O.A TAIPEI 臺北市動物保護處

主辦 社團法人台北市野鳥學會 Wild Bird Society of Taipei

undiscovered taipei Guandu Bird Art

桃園市野鳥學會
文圖 By 桃園鳥會

2022 唐白鷺季

秋天來了，候鳥也跟著來了！

2022 年 10 月 30 日下午我們一起來看看哪些候鳥抵達了許厝港，

一面觀察候鳥，一面玩闖關遊戲，最後還可以看夕陽，一舉三得！

活動免費，不須報名！

時間：2022 年 10 月 30 日 星期日 13:00~17:00

地點：許厝港重要濕地（國家級）服務台設於觀景台內

臺南市野鳥學會 文圖 By 臺南市野鳥學會

鳥鳴春澗敘 賞鳥大賽 30 周年

預計招募 15 隊
隊伍數量 (一隊3~5人)

2022 / 11 / 06 (日)

報名時間：10 / 1~10 / 21 (額滿為止)

活動費用：免費
(交通及當日花費敬請自理)

參加對象：親子組隊參加
至少需有一位少於18歲 (2004 / 11 / 06以後出生)

報到地點：四草野生動物保護區鹽田生態文化村集合

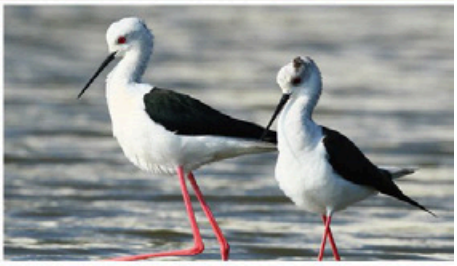
比賽範圍：四草台17線以東，曾文溪及鹽水溪兩溪之間區域

紀錄工具：eBird Taiwan (APP)

比賽獎項：最高鳥種數 (3名)
指定鳥種最高數量 (1名)
預測鳥種數 (1名)

註 主辦單位提供雙筒望遠鏡租借服務，若有需要請洽台南鳥會辦公室。租用方式請詳閱《台南鳥會望遠鏡租借規則》





社團法人臺南市野鳥學會

南投縣野鳥學會 文圖 By 南投鳥會 日月潭慈恩塔賞鳥紀錄

秋風吹起，遷徙的季節已到，鳥兒們奮力振著雙翅飛抵台灣！快跟著我們一起去歡迎它們！

台灣鳥會、南投鳥會、彰化鳥會，聯合推出『Chill 遊山海——中彰投秋賞鳥趣』系列活動，帶您上山、下海，認識千里跋涉而來的嬌客們。

一系列活動共 10 場，只要參加 3 場活動，即可獲得精美宣導品，還可以參加抽獎，獎品豐富，還不快來報名！


蔡牧起老師集合參加者，說明活動流程


蔡牧起老師解說中


大家快看，上面有鳥

活動辦法：https://reurl.cc/jGaG52

快加入『Chill 遊山海』line 官方帳號，隨時掌握活動訊息：https://lin.ee/2dPs1Tn

社團法人彰化縣野鳥學會

指導單位 /彰化縣政府　主辦單位 /社團法人彰化縣野鳥學會

生態觀察體驗列車

有個農夫這麼說：「望天、看地、吹風、聽鳥仔聲。」
跟大自然的連結可以很輕易。靜下心來，我們就身處在大自然裡。
這次我們要帶你去哪裡呢？
親近彰化平原的母河— 濁水溪、傾聽彰化海岸潮間生物在灘地上的呼吸……
總共四個梯次，請不要錯過唷！

集合出發：早上7點40分在彰化火車站前站廣場，8點準時出發
　　預計下午5點回到彰化火車站
交通方式：遊覽車
名　　額：每梯次30人
對　　象：對生態體驗有興趣的你，亦適合親子參加（建議至少須滿五歲）

臨溪線

日期：10/16(日)、10/23(日)
費用：250元
地點：二水源泉社區、四季農園
內容：友善農耕介紹、農事體驗、籠仔篙DIY、黑泥田拔河

濱海線

日期：10/16(日)、10/23(日)
費用：200元
地點：漢寶哈哈魚場、王功海洋食研基地、福寶濕地
內容：潮間帶觀察、魚丸DIY、友善養殖漁法及摸文蛤體驗

報名後會寄發錄取通知到您留的信箱，請務必記得收信後再繳費！
收信匣跟垃圾信件匣都要注意有沒有信件喔！
不確定有沒有報到的夥伴也歡迎跟彰化鳥會聯繫

與時共存，與地共生
2022生態觀察體驗列車等你上車

社團法人花蓮縣野鳥學會

蘭陽平原水稻田是鳥類的「主棲地」

新南田董米在地深耕 8 年 多種水鳥數量增加

文圖 By 林哲安

蘭陽平原的水稻田不僅提供美麗的風景、產出優質的稻米，讓人們吃得開心、看得愉悅，同時也是鳥類重要的棲息地。

有別於過去及國內外相關文獻對「水稻田是天然濕地的替代或備用棲地」的認知，蘭陽平原水稻田的水鳥不論在豐富度 (richness) 及豐度 (abundance) 上皆不亞於天然濕地，甚至有多種水鳥幾乎只出現在水稻田淡水域，鮮少棲息於天然濕地，如長趾濱鷸、鷹斑鷸、田鷸、彩鷸。搭配宜蘭水稻田一年一穫、冬季湛水休耕、如同一整片廣大開闊濕地的特性，將蘭陽平原的水稻田視為水鳥「主棲地」並不為過。而「巡田水」也成了宜蘭賞鳥者的獨特用詞，具備多重涵義，相當貼切，讓人會心一笑。

然而，自雪山隧道開闢及通車以來，蘭陽平原的濕地面臨嚴重開發壓力，水田變水泥、棲地破碎化，許多良好棲地消失，水鳥數量大減。加上原本就存在的農藥、毒藥問題長期未解，更是雪上加霜。宜蘭水鳥數量大減的「感覺」，在「臺灣新年數鳥嘉年華」調查團隊的分析下也獲得證實。蘭陽平原

蘭陽平原近 15 年來房子蓋太多，且幾乎蓋在田中央，造成嚴重的「棲地破碎化」，是壓縮野鳥棲地，使鳥類數量急遽減少的元兇。

直接被點名是全臺水鳥數量下滑最嚴重的地區；亟需關注，並著手進行保育行動。

由於深刻感受到農藥及棲地開發等問題，加上「田董」一董雞在新南現身，牽起了我們與在地的連結，於是，2014 年，「田董米」在新南社區成立了。新南田董米與在地農民合作，轉型無農藥無化肥耕種 (也就是友善環境耕種)，合作土地從第一年的 2.3 甲擴增為 2022 年的 9 甲，並有望在 2023 年

邁向 10 甲；除了友善環境耕種，田董米在合作田區也做了五年的「棲地營造」，提供多樣的環境及食物給鳥兒使用。一路走來雖面臨許多挑戰，但農民及消費者的支持與熱情不減，讓田董米持續進步，從跌跌撞撞走向穩定。今年春天，團隊把多年來的調查資料進行分析，證明做的事情是對的，一切都值得了！相當感動。

新南田董米不僅產出健康無毒的優質米食，田區內更打造出與鳥類共存的多贏局面；圖為今年夏天的美麗稻穗。

咦，不灑農藥、無化肥的耕種難道不夠嗎？為什麼還要棲地營造呢？還有，為什麼資料要累積這麼多年才分析，不能一兩年就證實有效嗎？沒錯，這正是野生動物保育辛苦之處，也是今天要跟大家分享的主題。讓我們先來打個比方吧！

田董米創辦人兼老闆林哲安，不吃木瓜，是真的不能吃，一吃就會馬上嘔吐。今天你塞一顆木瓜給老闆，跟老闆說這是友善環境耕種的木瓜、滿滿的愛心與熱情！老闆…當然還是不吃。

「喂，這裡頭有滿滿的愛耶！努力種出來的耶！」

「嗚嗚嗚，不能吃就是不能吃啊……」

每個人喜歡的不同、能吃的東西不一樣，同樣的道理，每種鳥需要的也不盡相同；就像圖中左邊的再生稻及草生地，與右邊的空曠泥灘地，會棲息的鳥種肯定是截然不同。

正是類似這樣的概念，每種鳥喜歡東西不一樣、排斥的東西不一樣，需求當然也就大不相同。

我們的田是有 9 甲轉型成無農藥耕種，但有些鳥個性很害羞，牠要有足夠的隱蔽物 (草叢) 才願意光顧；有些鳥腳很短又不會游泳，水一高起來牠就沒辦法棲息；還有些鳥，牠愛吃的東西其實水田能給的很有限，所以吃完了就會馬上跑走。以上原因都讓「友善環境耕種」只能成為水鳥保育的基本盤，而真正的成敗關鍵則落在「棲地營造」身上。

藏身田董田草叢的稀有過境鳥：小桝雞；牠的個性非常害羞，一定需要有足夠的草叢給牠躲，牠才有可能光顧我們田區唷！

鷸鴴類家族中，許多成員腳短短又不會游泳，水田的水位若高於 5 公分就沒辦法活動；圖為田董田的特色鳥：長趾濱鷸（雲雀鷸）。

田董米自 2014 年成立，在 2017 獲得足夠面積的友善環境合作土地（7.5 甲），便著手開始棲地營造工作。

我們針對個性害羞的鳥進行「田埂拓寬及植被營造」，加寬了五條田埂，並在田埂上種植芭蕉及野薑花，形成良好的隱蔽處及繁殖點；秋季時，大量腳短卻又不會游泳鷸鴴類水鳥前來度冬，我們便進行「水位管理」，將休耕田的水位控制為 5 公分

田埂拓寬，種上野薑花，使田區綠意盎然，吸引害羞鳥夥伴光臨；圖中的鳥為小水鴨。

以下的「泥灘地」，讓牠們方便棲息；此外，也有部分田區在夏季收割後不進行翻耕，讓留在田裡的稻子再次成長，並於秋季結穗，這稱為「再生稻」，是麻雀及文鳥的最愛；最後，我們於秋冬季在廣大的田區施灑粗糠（稻殼）及米糠。田董米自產自銷，自己碾米，因此產出許多粗糠及米糠，將它們撒回田裡，不僅是最天然的養分循環，更可以提供鳥類充足的食源。且米糠發酵、發臭後會長蟲，所以不僅是吃米糠的鳥，就連吃蟲的鳥也會前來覓食，形成天然的田區食物鏈。

田埂植被經營：芭蕉。這排芭蕉正好遮住了後方的馬路，讓野鳥覺得安心，就一起來田裡吃飯囉！圖為尖尾鴨。

將水位控制在 5 公分以下的「泥灘地」，提供腳短又不游泳的鷸鴴類水鳥棲息；圖中一粒一粒白白的都是鳥喔！是黑腹濱鷸與東方環頸鴴。

秋季保留「再生稻」，是麻雀及文鳥的重要食源。

合作農民秋冬季在田裡撒下田董米自產的米糠，提供鳥兒最天然的食物，同時也是最佳的肥料。

除了米糠，我們也將自產的粗糠（稻殼）灑回田裡。

撒了米糠及粗糠的田區，不僅能吸引吃米糠的鳥，連吃蟲的鳥也會光顧；圖為鷹斑鷸。

進行棲地營造後，麻雀數量逐年增加且穩定增加，已從 2018 年的 500 隻增加為 2021 年的 2000 隻以上。

由於棲地營造帶來足夠的隱蔽處與豐富的食物，在短時間內會讓野鳥「聚集」，但野鳥聚集並不能代表保育成功，牠們很可能只是從四面八方「聞香下馬來」而已。這就是棲地營造成果不能一兩年就下定論的原因。我們必須確定牠們真的是逐漸增加、穩定增加，而不是短時間的群聚所帶來的「高觀賞性」而已。

因此，我們分析了整整四年的資料，以科學的方式統計並探討，數據說有增加的，我們才能說成功。本來其實有點小緊張，結果數據出來，證實棲地營造對超過 10 種野鳥有效，令人振奮與欣慰。

其中，保育成果最顯著的為：麻雀、長趾濱鷸、田鷸、秧雞科鳥類；次顯著的有：鷹斑鷸、黑腹濱鷸、東方環頸鴴；還有未曾在田董米田區繁殖，因棲地營造而開始在田內繁殖的褐頭鷦鶯；以及從未在新南出現、因棲地營造而首次被記錄到的：雙眉葦鶯、赤胸鷸。另外也有一些是許多鳥友看了都說有增加，但數據還不夠明顯的，如：紅隼、黑翅鳶、彩鷸、黑頭文鳥；這些就要再累積幾年的資料後，再來進行一次分析才會明朗。希望能真的帶來「大家都說有，數據也說有」的美好局面。

「麻雀沙塵暴」再現田董田；連老農民都說：這就是我小時候看到的畫面啊！

粗糠米糠是長趾濱鷸的最愛。這四年數量明顯增加，且從「飄忽不定」成為「一定能看見」的鳥。

可愛但害羞的田鷸也是棲地營造的最大受惠者之一，數量明顯增加。

秧雞科成員手牽手一起變多！這是田董田最常見的紅冠水雞。

除了在田裡繁殖的紅冠水雞、白腹秧雞，田埂植被也成功吸引稀有冬候鳥一東亞秧雞年年來訪，已經變成穩定的「食客」了。

麻雀、長趾濱鷸、田鷸、秧雞科鳥類，是田董米田區保育最成功的「四大天王」。（繪圖：玉子日子）

田埂植被經營起來後，褐頭鷦鶯繁殖就變得很常見；這是以往經營植被前看不到的畫面。

未曾在新南出現過，因田董田棲地營造而被「變出來」的社區新紀錄：雙眉葦鶯。

有著可愛大頭與迷人金眼眶的小環頸鴴，在新南數量明顯下降，目前原因不明，是我們接下來重要的關注對象。

不少鳥種，尤其是猛禽類，如紅隼、黑翅鳶、東方澤鵟，包含我們在內的許多賞鳥人都認為牠們在田董田數量有增加，但因為累積時間不夠長，加上牠們數量本身也不夠多，所以科學數據上尚不能證實保育成功。圖為紅隼，在再生稻田區麻雀大量增加後，牠們也經常在附近伺機狩獵。

上千水鳥在水稻田群飛（許多人稱為「鳥雲」）的畫面在蘭陽平原已越來越難見到；這是整體棲地流失所造成的問題，不是新南一個村子做友善耕種及棲地營造就能解決的。

努力這麼多年，看到科學數據支持保育成果，真的非常欣慰，也確定了我們會繼續走下去。

不過，這條路還是非常漫長遙遠，因為並不是所有水鳥都保育順利，像小環頸鴴，近年數量就明顯下降。此外，整個蘭陽平原依然存在農藥及毒藥問題，且水稻田還是不斷被開發、還是持續消失中，棲地破碎化的難題未解，過去一些「鳥雲」畫面如太平洋金斑鴴、小水鴨，在宜蘭已越來越難見到。如何守護整體棲地甚至整條候鳥遷徙路線？會是個巨大難關。

綜合上述內容，我們可以得知：水稻田推動友善環境耕種及棲地營造，是可以成功守護部分水鳥的，甚至能「變出」田區及社區新紀錄種。但整個「大尺度」的環境問題未解，還是需要從法律及整體面向通盤檢討並著手改變，否則在村子裡所有「尺度較小」的努力都很可能功虧一簣。

保育成果及大尺度問題擺在眼前，田董米也不知不覺走了 8 年，我們期許自己能再走不只 8 年，同時更希望土地小、人口多、生物多樣性超高的寶島臺灣，能有更多人投入保育行動，讓「人與自然共存共榮」不再只是口號。

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賞鳥望遠鏡選擇與保養

文圖 By 尤信翰 歐帝生光學產品經理

望遠鏡光學性能

越“清晰”的望遠鏡，就可以理解為光學性能越好。望遠鏡的功能，就是讓我們肉眼無法觀察的目標，透過光學的放大觀察，但什麼是“清晰”呢？雖然望遠鏡廠商都會提供產品規格，但目前的規格中的項目，都無法具體說明望遠鏡是否清晰。拿下圖 Fig. 1 來說明，左方為 13,400 元的 10×42 望遠鏡之規格，而右方為 3,705 元 10×42 的另一款望遠鏡，顯著的價差，應有明顯的光學性能差異，但卻難以在規格上表現出這個差異。那一般使用者如何選擇呢？

Fig. 1

其實我們可以拿起兩台不同的望遠鏡，同時觀察同一個目標，比較以下這五個指標：

1. **亮度：**比較亮的望遠鏡，一般就比較清晰。Fig. 2 是兩台不同望遠鏡觀，看時的左右對比示意圖，左方明顯視野較亮，而右方較暗。光線從觀察的鳥類折反射，透過層層玻璃折反射，成像到肉眼時，會有許多能量耗損，比較好的望遠鏡，會嘗試透過鏡片、鍍膜提高光線透過率，讓更多的光線能成像到人眼，而達到更清晰的觀察效果。

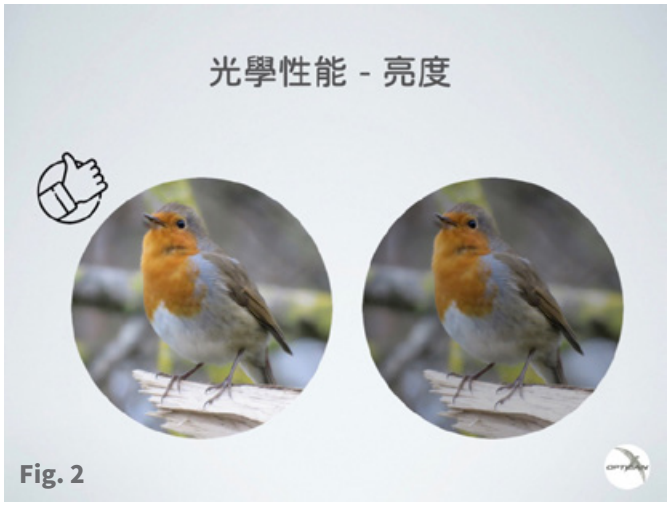

Fig. 2

2. **顏色：**成像顏色越接近真實的望遠鏡，就是更清晰的望遠鏡。下方 Fig. 3，可以看出，右側的視野稍微偏藍，左側的較接近真實，可以說明左側的望遠鏡較清晰。真實的顏色，可以參考肉眼觀察到的顏色來比較。通常單價越高的望遠鏡，顏色就會越真實，另外同樣都是高單價的望遠鏡，也可能比較出顏色的差異，當兩台望遠鏡在不同人眼的可見光波長範圍（約 380nm~800nm）的透過率不同時，就可能導致觀察顏色的差異。

Fig. 3

3. 解像力：能夠分辨更多細節的望遠鏡，就是更清晰的望遠鏡。下方 Fig. 4，可以看出，左側的鐵尺上的線條在 29-30cm 之間的 0.1cm 格線仍清晰可見，而右側的線條格線已無法辨識。比較望遠鏡時，可以找有紋路的物體，如樹葉來比較觀察，可以看出細節多少的差異。

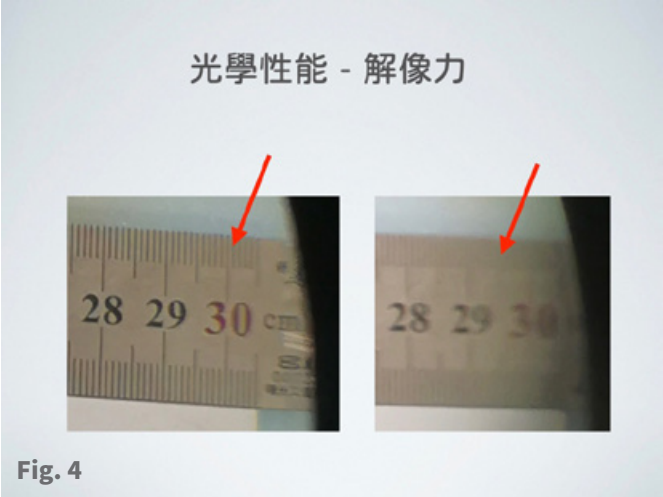

Fig. 4

4. 形變 / 曲變：變形越少，更能還原真實物體形狀的，就是更清晰的望遠鏡。下方 Fig. 5 可以看出，右側的的建築邊緣，明顯比左側同一位置更加彎曲，左方的望遠鏡就為清晰的望遠鏡。因望遠鏡透鏡成像的原理，一般邊緣的變形會比中心嚴重，比較時可以選擇一個直的物體（物品、建築物邊緣），從中心慢慢移動至視野邊緣，觀察變形的狀況，再比較另一台望遠鏡，就可以觀察出兩台的差異。

Fig. 5

5. 色散：色散是因為波長不同的光折射後而在物體周圍產生的異常顏色，可能為紫、黃、藍色都有可能。觀察時色散現象越輕微，越接近真實物體顏色，就是更清晰的望遠鏡。下方 Fig. 6 可以看出，同樣的目標物，米白色建築物牆面的邊緣，在右方的視野中透出紫、黃等非建築物的原色，而左方的視野就無明顯額外的顏色。

Fig. 6

以上的五項指標，是可以透過肉眼做初步的望遠鏡光學性能比較。在比較時，應該選擇同樣倍率、同時間觀察同一個目標，得到的結果才比較客觀。原則上單價有明顯差異的望遠鏡，就可以在這些指標上肉眼看得出差異。

望遠鏡結構性能

望遠鏡的光學性能可以用“清晰”為原則來分析比較，而結構方面可以用“舒適”與“壽命”兩點來進一步分析比較。使用起來越舒適、壽命越長的望遠鏡，應該就是比較好的望遠鏡。

其實我們可以拿起兩台不同的望遠鏡，同時觀察同一個目標，比較以下這五個指標：

1. 重量：我遇過許多客戶，因為望遠鏡太重而不想帶出門，賞鳥的過程多少都需要背著望遠鏡這個工具，重量是我覺得比光學性能更需要優先考量的選擇因子。從規格可以直接瞭解重量，同一個品牌同系列，物鏡越大，重量就會越重 （例：同一系列的 8×42 會比 8×32 重量重），物鏡越大則最終成像的光越多視野會更亮，但大物鏡也會造成重量更重。筆者是建議，小孩或女性可以

考慮 300-400g 左右的雙筒望遠鏡就好，而男性可以考慮 550-650g 左右的雙筒望遠鏡，如果更重，可以另外配上 X 型的減壓肩帶，減輕脖子的負擔。

2. **運動部位：**透過轉動望遠鏡可以運動的部位，可以間接理解望遠鏡的結構設計、用料、組裝工藝品質。望遠鏡是由一些金屬、塑膠零件，將光學零件（透鏡、稜鏡）固定在設計的位置上，透過零件的移動，達成焦距調整、眼距調整的功能。我們可以透過轉動眼罩、雙筒軸、中央調焦手輪、視度調整輪這些可以運動的部位來瞭解望遠鏡結構品質的好壞。運動的越“順暢”，就可以理解為品質越好。順暢也可以具體從以下的幾個指標比較：

   A. 手感輕重整段一致、無空轉：轉動的整段行程，從頭到尾，手感輕重應該一致，雖然輕、重的舒適感可能在設計者、使用者的主觀認知上會有點不同，但轉動時整段的手感應該要一致，不應該轉動中有空轉的狀況。

   B. 手感輕重不應該影響其他功能：例如轉動視度補償輪時，不應該影響雙軸眼距的距離；轉動中央調焦時，不應該影響視度補償。

Fig. 7

3. **壽命與保固條款：**望遠鏡在現有的工藝水準上，已經可以使用非常長的時間，歐帝生於 2014 在台灣銷售的防水望遠鏡，仍常會在戶外遇到正在使用的鳥友，沒有明顯問題。雖然壽命無法在購買選擇時有客觀的評價，但可以依據上一點運動部位的使用體驗，當作一個間接參考，使用越“順暢”的產品，有更高的機率是使用比較好的結構零件以及組裝工藝，就有比較高的機會是使用壽命長的產品。但不熟悉各種望遠鏡的一般消費者怎麼分辨呢？其實我覺得最好的分辨方式不是在比較順暢度上糾結，而是直接依廠商給出的保固條款來做參考。早年德國、奧地利的廠商就已經願意給出 10+ 年的保固條款，展示對產品設計生產的信心。我所工作的歐帝生光學，是提供非人為損傷，功能性部分終身保固。只要沒有摔、撞倒，歐帝生就會幫您免費維修或更換望遠鏡。維修時間也是困擾鳥友的一個問題，望遠鏡大多問題都無法由消費者自行維修，而維修需求又沒有大到代理、經銷商積極的庫存維修零件、學習維修技能。因此大多數望遠鏡需要退回原廠維修，需要退回歐美、日本維修而產生的工具使用空窗期，非常令人困擾。歐帝生做為台灣的品牌，參考了國外比較好的服務策略，除了台灣就可以安排檢測維修，部分無法馬上修復的問題，也會直接使用新品或良品與客戶更換，不造成鳥友們空等數個月無望遠鏡可使用的困擾。

望遠鏡使用注意事項與保養重點

1. **不要對太陽、強光觀察：**望遠鏡與放大鏡都有聚光的效果，對太陽或強光觀察，可能導致眼睛受傷，在教初次使用的鳥友或小朋友時，一定要注意提醒。

2. **不要摔、撞：**望遠鏡是由一群金屬、塑膠零件固定鏡片的工具，掉落或撞擊都可能造成內部零件移位或脫落，因此使用上要記得背好肩帶，避免掉落。

3. **不泡水：**就算是規格上已說明密封防水，也不建議望遠鏡沖水或泡水清潔。原因是如果玻璃鏡片沾到水，需要使用擦鏡布主動擦乾，否則留下水痕會比油漬更難清理。另外沖水可能導致密封失效的望遠鏡進水或起霧，可能讓望遠鏡直接無法使用。使用水質的不確定性，也可能造成玻璃鏡

片的磨損或鍍膜磨損。下方兩點我們再具體說明玻璃與外觀的建議保養清潔方式。

4. 鏡片保養清潔：望遠鏡使用的玻璃鏡片，大家最常遇到刮痕或表面髒污這兩個問題，以下就分別與大家說明保養與清潔的方式：

A. 刮痕：鏡片刮痕是無法透過清潔修復的，只能拆下重新更換鏡片，而密封防水的望遠鏡，拆卸後組裝的工序麻煩，許多廠商會收取比較高的維修費用，或甚至無法維修。避免刮痕，可以在清潔鏡片前，使用氣吹 (Fig. 8) 或軟毛刷的產品，將粉塵清除，避免使用擦鏡布清潔時反而把工業粉塵刮傷鏡片。我也建議戶外使用如果還不會影響視野時，不用刻意一直清潔鏡片。

Fig. 8

B. 髒污：玻璃上常見的髒污有油漬（手摸到）或水痕（液體乾燥後留下的痕跡），這類的髒污，都可以在將粉塵吹（掃）後，使用擦鏡布清潔，如果發現無法清潔乾淨，可以使用少量酒精，慢慢擦拭嘗試帶起髒污，並且要記得在酒精乾燥之前，使用乾的擦鏡布將酒精擦乾。擦拭鏡片時，可以參考下圖 Fig. 9，使用星形的手法，會比圓形轉動的手法更好，避免油漬髒污的擴散。

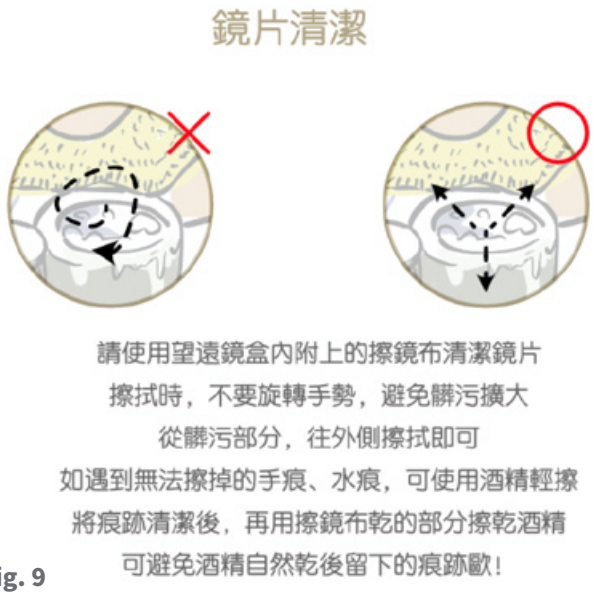

Fig. 9

5. 外觀保養清潔：望遠鏡為了維持光軸的穩定，一般內部鏡體會使用金屬或特殊硬度的塑膠，外部為了使用者的舒適，則會另外貼上橡膠或橡塑的覆皮，讓使用者有比較好的手感。日常的保養，可以使用一般的布擦拭表面即可，如果遇到難以清除的髒污也是建議使用酒精嘗試清潔。稍微老舊的望遠鏡也常遇到表面白化，或黏手的問題。如果白化並不黏，那應該是橡膠硫化後發白的正常現象，使用布沾清水就可以清除。如果遇到表面黏手，可能是產品使用了一種噴漆老化後的現象，這個時候可以拿不會掉碎屑的布，沾上酒精多次擦拭就可以清除沾手的漆層，清潔後會發現表面的顏色、反光稍微有點不同。

希望以上的資訊，能夠讓大家更瞭解這個賞鳥必備的工具，更能在野外沈浸在觀察野生動物的樂趣。下一季再繼續跟各位鳥友分享望遠鏡的常見問題，如果各位對望遠鏡有什麼想要瞭解的問題，也歡迎私訊歐帝生光學或中華鳥會的 FB 粉絲團提問歐！

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草蛉的幼蟲利用獵物偽裝

被誤為優曇婆羅花的草蛉卵及負蝂的故事 下

文圖 By 李璟泓

草蛉的幼蟲在孵化後，就會利用發達的鉗狀前口式大顎獵食。幼蟲取食時，將鉗狀口器刺入獵物體內，吸管狀的大顎會將獵物體液吸盡，草蛉幼蟲也因此被稱為蚜獅。在吸食完獵物後，幼蟲就會把被吸乾的獵物 (乾屍) 放在胸腹的上方作為偽裝。

觀察幼蟲的胸腹部上方可以看到有許多的瘤突，瘤突上各有數根的棘刺，當幼蟲將獵物的乾屍丟到腹部上方時，這些棘刺就會卡住這些獵物的外殼。當堆疊到一個程度的時候，幼蟲的身體就會被這堆「獵物垃圾」遮蓋住，形成一個很好的偽裝。

在兩千多年前的《爾雅》釋蟲第十五篇曾經提過：傅，負版。描述的是昆蟲背負東西在背上的行為。在背上會背負東西的昆蟲並不多，以台灣常見的種類來看，大概就是草齡幼蟲、避債蛾、水中的負子蟲以及較少被觀察的獵椿若蟲。而其中草齡幼蟲及獵椿若蟲都是背負獵物的屍體做偽裝，負子蟲是背負自身的卵塊，避債蛾則是背負以樹葉草枝碎片製作的蟲巢躲在裡面躲避天敵用。

草蛉幼蟲豐富上方有許多的瘤突

一千多年前，唐代文學家柳宗元被貶到偏遠的湖南永州，寫下一篇寓言《蝜蝂傳》。短短的描述，卻以貪重負以至墜地而亡的蝜蝂諷刺了當時的貪官汙吏。

蝜蝂傳：

蝜蝂者，善負小蟲也。行遇物，輒持取，卬其首負之。背愈重，雖困劇不止也。其背甚澀，物積因不散，卒躓仆不能起。人或憐之，爲去其負。苟能行，又持取如故。又好上高，極其力不已，至墜地死。

今世之嗜取者，遇貨不避，以厚其室，不知爲己累也，唯恐其不積。及其怠而躓也，黜棄之，遷謫之，亦以病矣。苟能起，又不艾。日思高其位，大其祿，而貪取滋甚，以近於危墜，觀前之死亡，不知戒。雖其形魁然大者也，其名人也，而智則小蟲也。亦足哀夫！

柳宗元所描述的蝜蝂很明顯的是指會不斷把東西丟到背上去的小蟲，因為越背越多，所以蝜蝂才會力竭墜地而死。至於裡面提到「人或憐之，爲去其負。苟能行，又持取如故。」，如果將蚜獅背上的負載物移除，牠是真的會又繼續把東西堆在背上的。我們真的無法從這樣的描述知道到底是草蛉幼蟲還是獵椿若蟲，但是如果以普遍性來看，草蛉幼蟲的機會是比較高的。

至於獵椿若蟲的背負行為，剛好也在南投蓮華池觀察過兩次，小小的蟲體上同樣是背負著一些螞蟻的屍骸及部分的葉子碎片。等到成蟲之後，這種背負的行為才會消失。

草蛉在化蛹時會以腹部的末端特化的馬氏管吐出繭絲，並在樹皮或葉下或土中形成一個繭，羽化後成為草蛉，再繼續飛到人家的衣架或燈罩上產下令人誤解的優曇婆羅花。也因為幼蟲的主食就是一些經常危害農作的蚜蟲及介殼蟲，所以行政院農業委員會苗栗農業改良場也積極地利用在田間施放草蛉卵片的方式來消滅蚜蟲及介殼蟲，也就是說，如果想要擁有三千年一遇的草蛉卵，只要找苗栗農業改良場，你就會有非常多的千年之遇了。

獵椿若蟲

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從 1999 年註冊專利至今獲獎無數的 LENSPEN 神奇拭鏡筆，

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Lenspen 美國註冊專利 U.S. Patent 5,993,560 的碳合成物清潔技術，
是為專業及一般數位產品用家解決昂貴光學產品鏡頭及螢幕清潔的需要。

其特色如下：

- 碳合成物清潔技術，為國際認可最有效的光學鏡片清潔技術，可處理落在鏡面帶油性指印及髒汙問題，比其他鏡頭清潔產品更有效，更簡便易用，深受用專業用戶歡迎。
- 獨家非液態清潔技術，沒有一般清潔劑溢出及乾涸的問題，不會因液態浸漏而造成的機件故障，安全可靠。
- 曾跟多家專業及國際大廠合作，可於多層鍍膜的鏡頭及螢幕上應用，清潔效果得到專業用家認可。
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