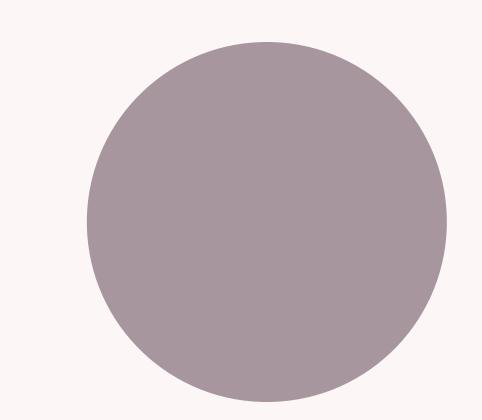
# 2025家燕繁殖調查



2025 Barn Swallow Breeding Survey

組員:幸怡 禹安 妍心 凱竣 依柔 琦瑛 皓鈞 宗承 翊喬 晨悅





臺中市長安國小

Chang-An Elementary School, Taichung City

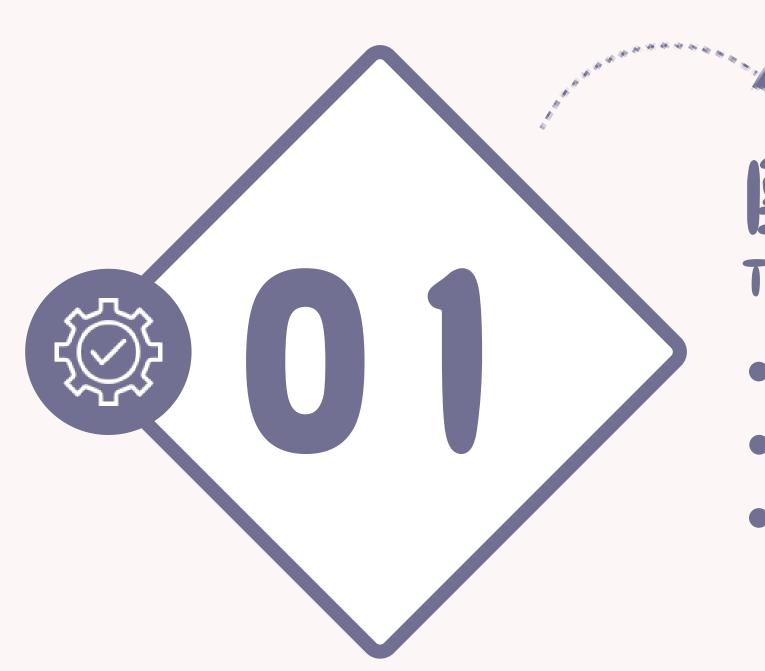
# 月錄 CONTENTS

2.研究發現與結果 Research Findings and Results

3. 家燕日記 Diary of a Barn Swallow



4. 家燕推廣行動
Promoting Awareness
of Barn Swallows



# 副隊與調查方法

#### Team and Research Methods

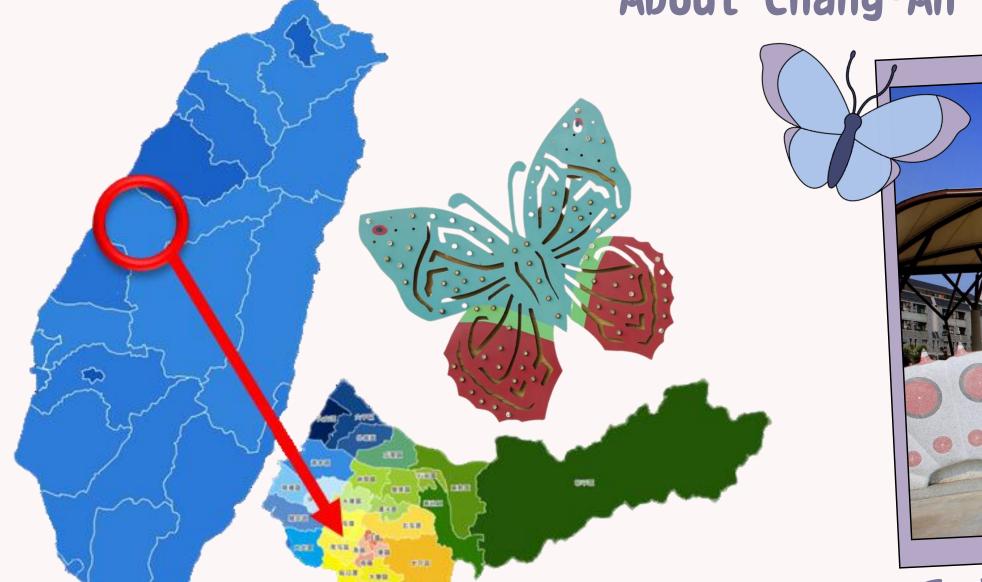
- 長安家燕組 Chang-An Barn Swallow Group.
- ●調查樣區 Survey Area
- ●調查方法 Survey Methodology





### 認識長安

About Chang-An





長安國小位於臺中這座城市,是一所以蝴蝶為意象的生態小學

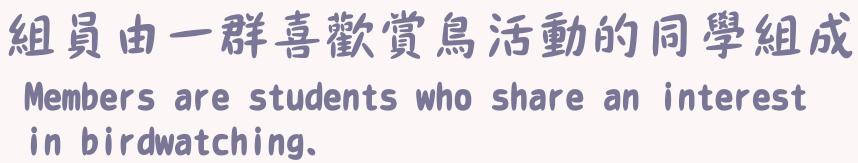
Chang-An Elementary School is located in Taichung City. It's an ecological elementary school that features butterfly images throughout its campus.



#### 家燕組的組成 Barn Swallow Group Formation









家燕組成員都是五年級學生 All members are fifth-grade students.

# 是安家燕組



每月全員調查外,每天也有組員輪流調查樣區 A full-staff study is conducted once a month and the members take turns conducting surveys every day.







#調查面積≒0.42km² Survey area≒0.42km²

#高度都市化的環境
Highly urbanized environment.

#黎明溝支線是覓食區
The Liminggou Branch Line
is located in a forging
area.



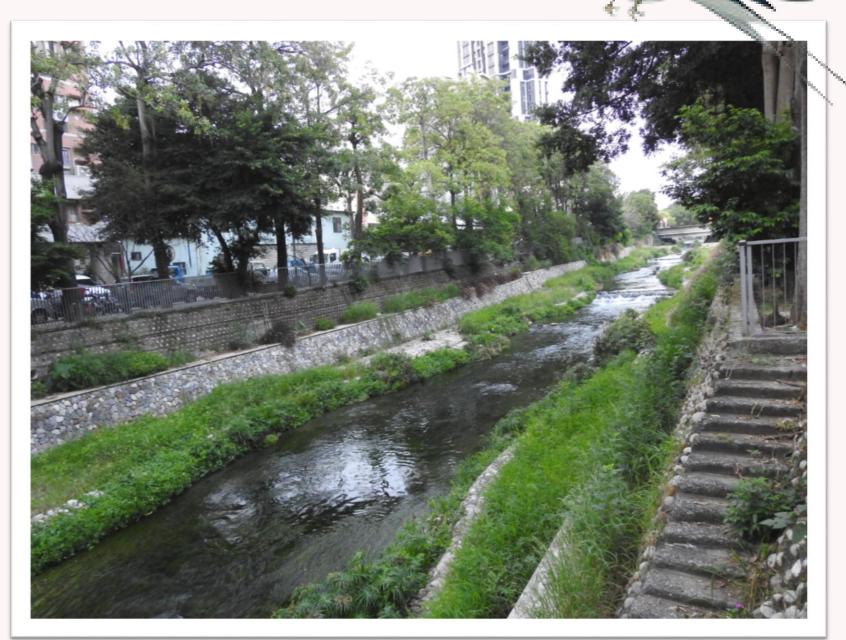


#### 樣區的都市化程度

Degree of Urbanization of the Survey Area



都市化程度較高,家燕的食物較少 The higher the level of urbanization, the less food is available for barn swallows.



黎明溝支線是家燕的覓食區 The Liminggou Branch Line is located in a forging area.



### 樣區的都市化程度

Degree of Urbanization of the Survey Area

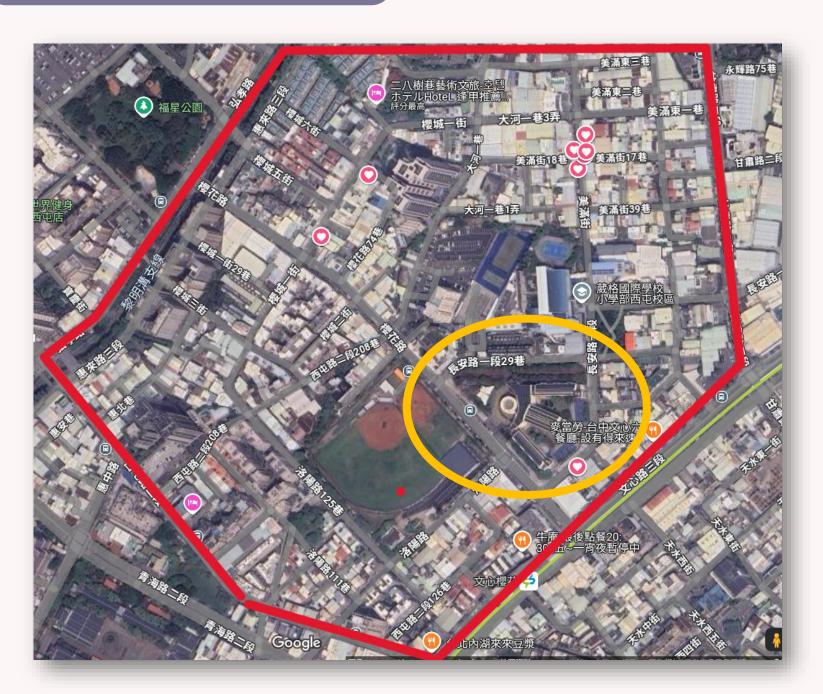


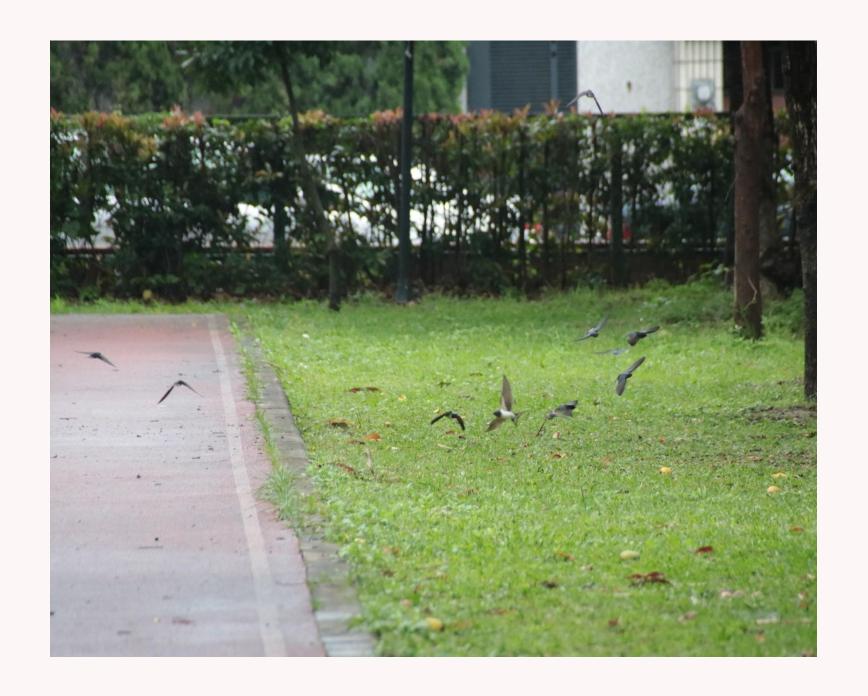
自天家燕聚集在黎明滯支線覓食

During the daytime, barn swallows gather on the branch to forage for food.



#### 家燕線飛場 Training Area for Barn Swallows





校園跑道和校園對面的櫻花棒球場,都是家燕練習飛行與覓食的場所 The campus runway and the baseball field across from the campus serve as both training and foraging areas for the barn swallows.



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# 题的方法

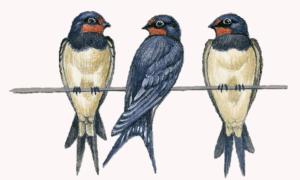
運用望遠鏡觀察燕巢 Observe barn swallow nests with telescopes

# 多元化的調查方式

Multiple Survey Techniques



利用鏡子反射觀察巢內 Mirrors were used to examine the inside of nests.





# 透過訪問住戶,了解家燕的繁殖狀況

Interview residents to gather information on barn swallow breeding

# 節調查方法



# 使用相機記錄燕巢中的繁殖變化

Use cameras to document reproductive changes in barn swallow nests.

# 紀錄方法

#### Recording Methods

#### 2025 家燕觀察紀錄

♥ ♥ Q巢 依柔 幸怡 璿瑛 晨悅

【3/4=75%, 估4/21產卵, 5/3孵化, 5/28離巢/26日】

【?/4, 6/13產卵,】

114.03.23 未繁殖

114.03.03 一對家燕返巢

114.04.09 無繁殖

114.04.20 無壑殖

114.04.26 無家燕活動

114.05.02 一對返巢休息

114.05.06 未產卵(此紀錄有誤,應該巢內雛鳥因光線過暗而沒有觀察到。反推回來,5/6應該是解化4天)

114.05.13 幼雛已經孵出,有4隻,從之後的喉部羽色反推,應該孵出第11天

114.05.14 4隻幼雛,很容易因為外界聲音就張大嘴巴索食。喉部仍然是黑色(推估12日齡)

114.05.15 4隻幼雛對聲音敏感,一有聲音就直覺張大嘴巴,發出聲音索食。雛鳥喉部出現淡淡的紅色,因此推估為13日齡

114.05.16 雛鳥3隻在巢中,1隻雛鳥掉落死亡(14日齡)

|114.05.17 3隻幼雛,但有一隻無精打采,似乎狀況不佳,對環境聲音不反應(估 15日齡)

114.05.18 3隻幼雛的喉部有紅色。屋主提及一隻在日前掉落死亡

114.05.19 巢3隻幼鳥(估17日齡)

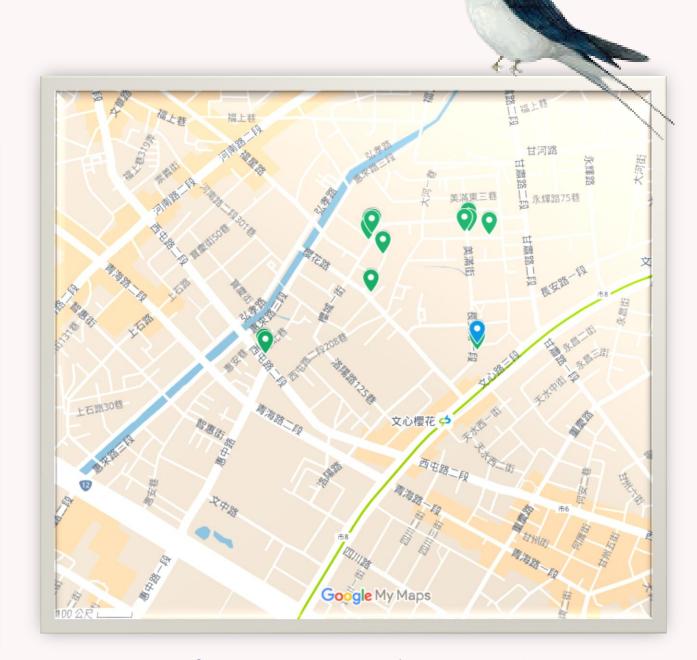
114.05.20 3隻幼雛 (18日齡)

114.05.21 3隻幼雛 (19日齡)

1105222#45# (/+200 #6

# 創建LINE群組記錄家蒸繁殖狀況

Create a LINE group to record and share updates on barn swallow breeding status.



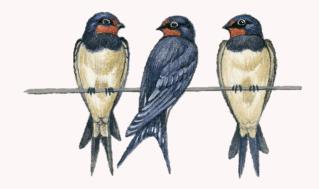
將家燕巢的繁殖資訊 標記在Google Map中 Mark barn swallow breeding information on Google Maps.



# 研究發現與結果

Research Findings and Results

- 巢位探討 Nest Location Discussion
- 產卵分析 Spawning Analysis
- 繁殖成功率 Reproductive Success Rate





#### 2025年總共有13個繁殖第 There are 13 active breeding nests in 2025

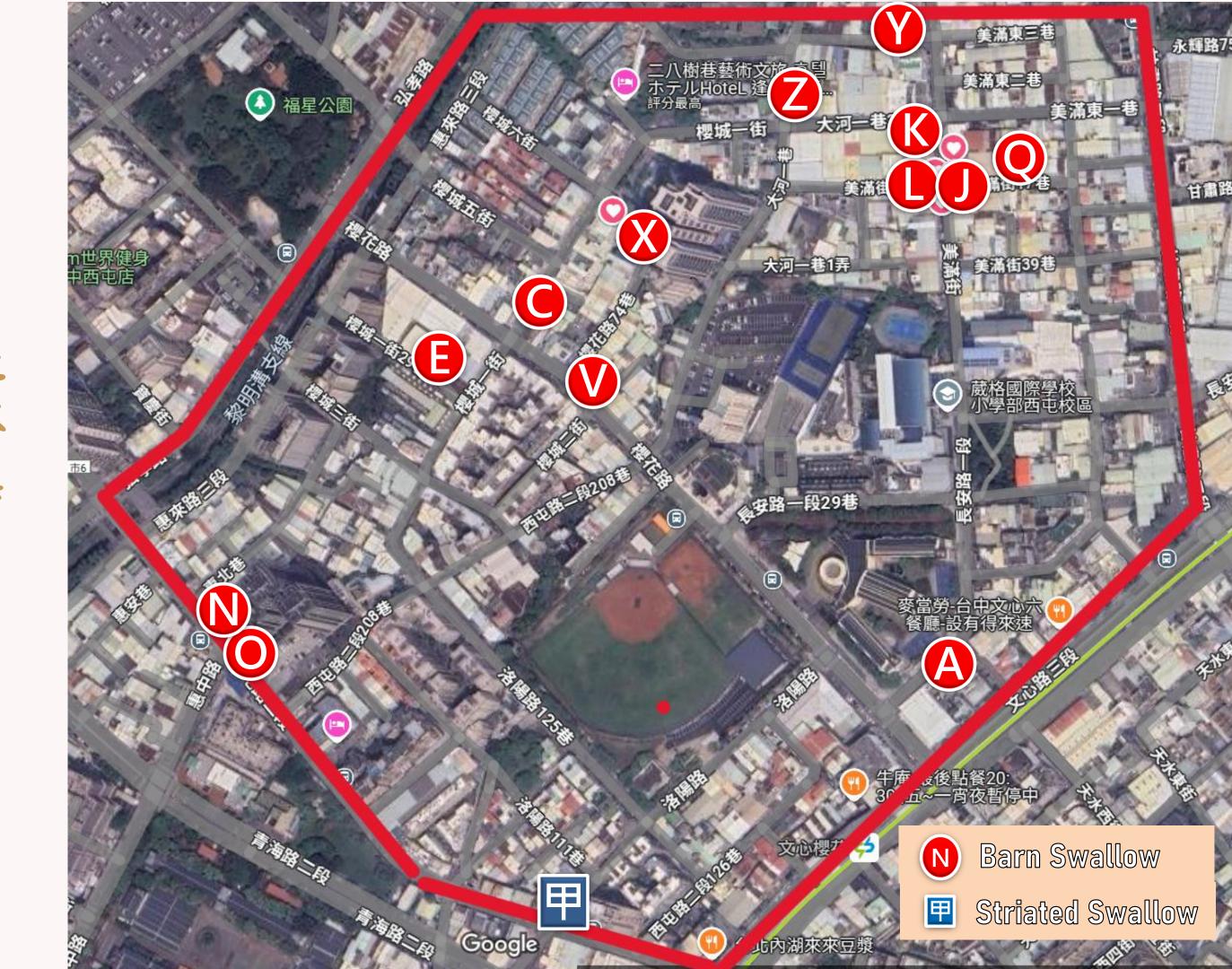




# 学等信贷款

大部分燕巢集中在2個縣中在2個區域,但每個巢位 之間又各自分散在不同的街角,而且各縣 距離在100M以上

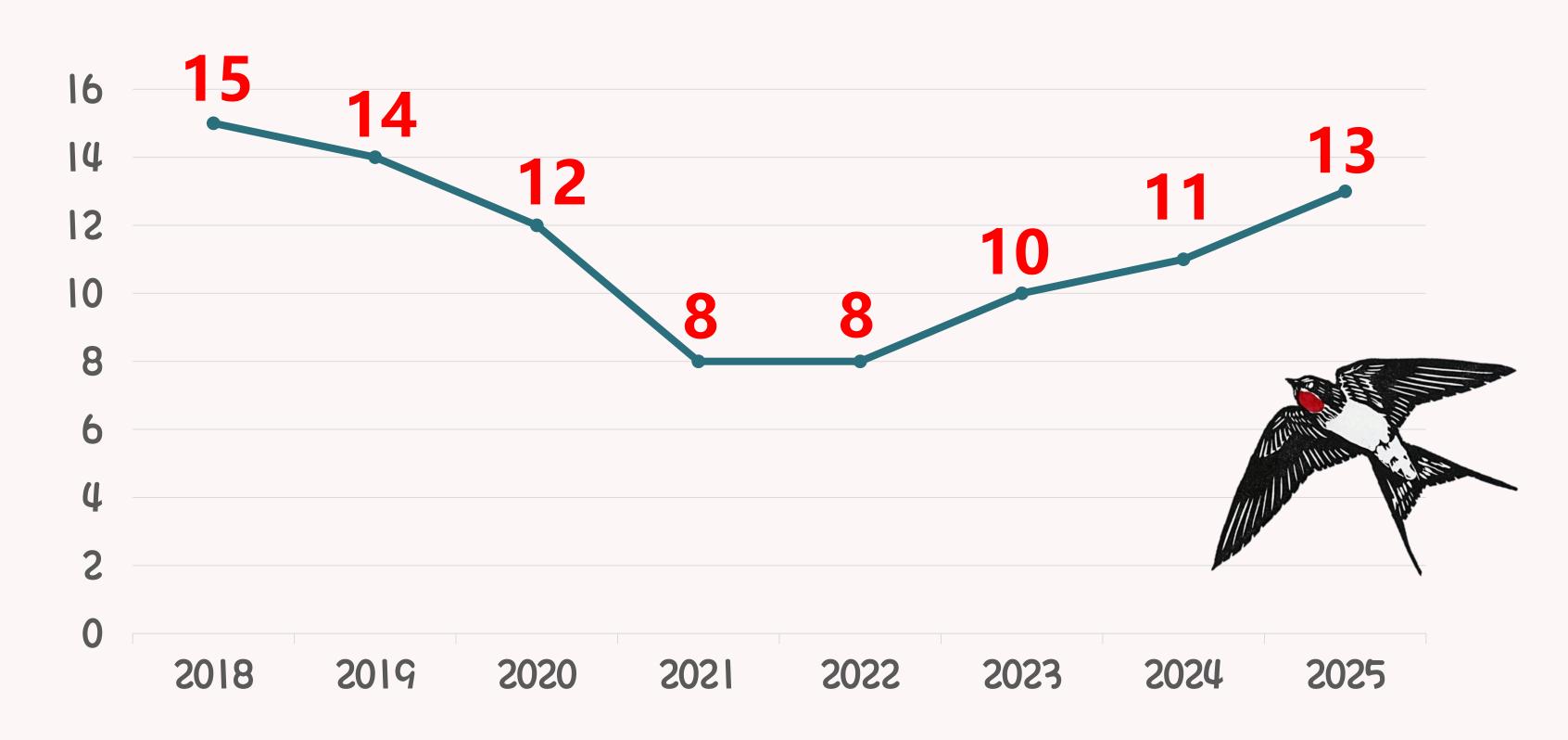
Most nests are concentrated in two main areas, with each nest located more than 100 meters apart.





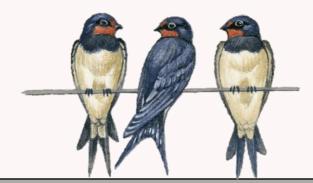
### 2018-2025年第位數量%化

Changes in the Number of Nests from 2018 to 2025





#### 2025年 紫殖桃沉線表 2025 Breeding Overview



	A	С	E	J	K	L	N	0	Q	V	X	Y	S	總計	成功率/産卵數
第一巢産卵數	1	4	4	3		5	5		4	5	4	4	3	42	① 工. 産卵數: 42顆
雄巢홟	0	3	3	3		4	1		3	2	4	0	1	24	工.離巢率:57% ②工.産卵數:19顆
第二巢産卵數		3			4			4	4		4			19	工.離巢率:? ③均産卵數:3.8顆
雄巢홟		?			3			?	?		?			?	均離 <b>樂率:5</b> 9%

備註:由於繁殖仍未結束,統計時已經扣除相關數據(紅色問號)。

Note: Data marked with red question marks was excluded because the breeding season is still ongoing.

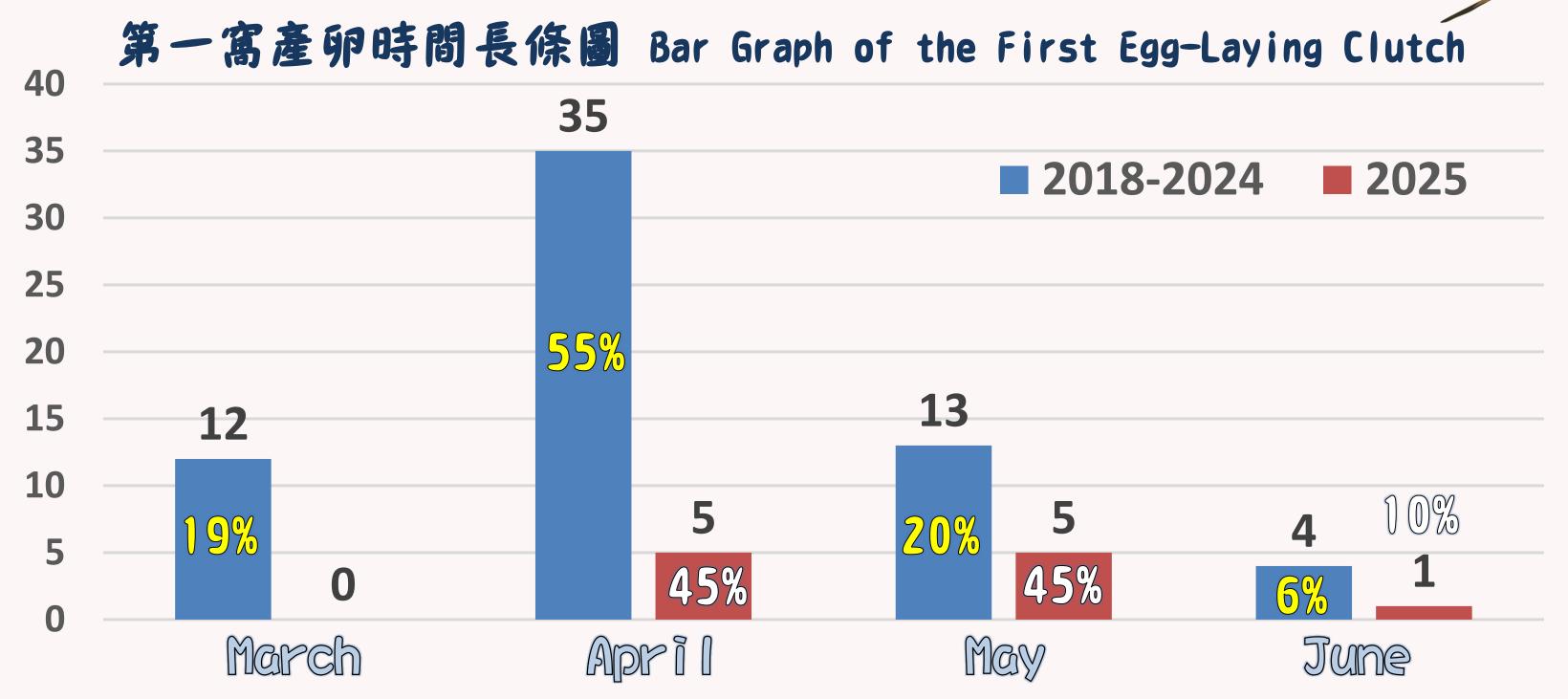
#### 雨窩的平均產卵數都是3.8顆,沒有差別。

There was no difference in the average number of eggs laid between the two times (3.8). 2025年的離巢成功率是59%

The fledging success rate in 2025 is 59%.



#### 第一部的產師時間 The First Egg-laying Time of the First Clutch



今年的繁殖時間較歷年來說,延遲了將近一個月 Breeding began nearly a month later this year than it did last year.

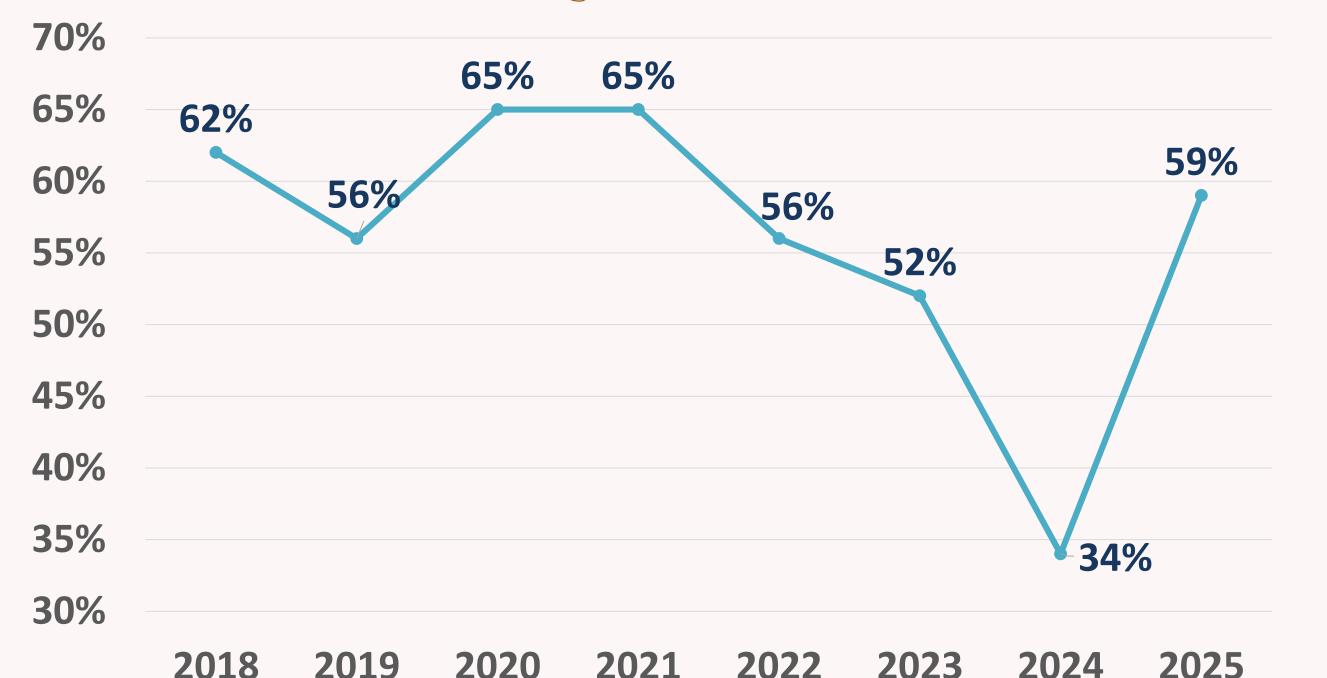
# 普遍卵分析

#### 平均為高達卵數比較表 Comparison of the Number of Eggs per Clutch





#### 歷年繁殖成功率折線圖 Breeding Success Rate Over the Years(Line Chart)



今年的繁殖成功率為59%,與歷年相近(2024年因天候因素,成功率較低)

This year's breeding success rate is 59%, with no significant difference compared to previous years. (The success rate was lower in 2024 due to unfavorable weather conditions.)

# 等類類的等

#### 歷年的2次裝殖比較

#### Comparison of First and Second Breeding Over the Years

	2019	2020	2021	2022	2023	2024	2025
First nest Nest leaving success rate	51%	60%	58%	61%	54%	39%	57%
Average number of eggs laid in first clutch	3.4	3.9	3.9	3.8	4.4	3.5	3.8
Second nest Nest leaving success rate	69%	89%	86%	50%	46%	17%	?
Average number of eggs laid in second clutch	3.3	2.2	2.3	4.4	3.3	4	3.8

分析2019-2025年的數據,兩窩間無論產卵數或離巢率似乎沒有絕對的規律 Analyzing data from 2019-2025, there doesn't seem to be an absolute pattern in the fledging success rate between two breeding attempts.



### 意卵數量與蘇第的關係

Relationship Between Number of Eggs laid and Fledging Success Rate

#### 2018-2025 各巢產卵數量與離巢數統計表

Statistics on Number of Eggs Laid and Fledging Success Rate from 2018 to 2025

	5 eggs	4 eggs	3 eggs	2 eggs
	19	32	30	3
離果隻數/	39/85	69/128	65/90	5/6
第二章	41%	54%	72%	84%

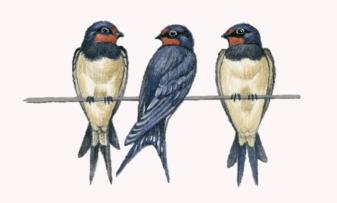
The table shows that nests with fewer eggs tend to have a higher fledging success rate. In Taiwan, fledging success is not necessarily linked to the order of the clutch (first or second), but more closely related to clutch size. When more eggs are laid, food becomes less sufficient, which can result in a higher mortality rate among chicks.



#### 各等均識等目的分析

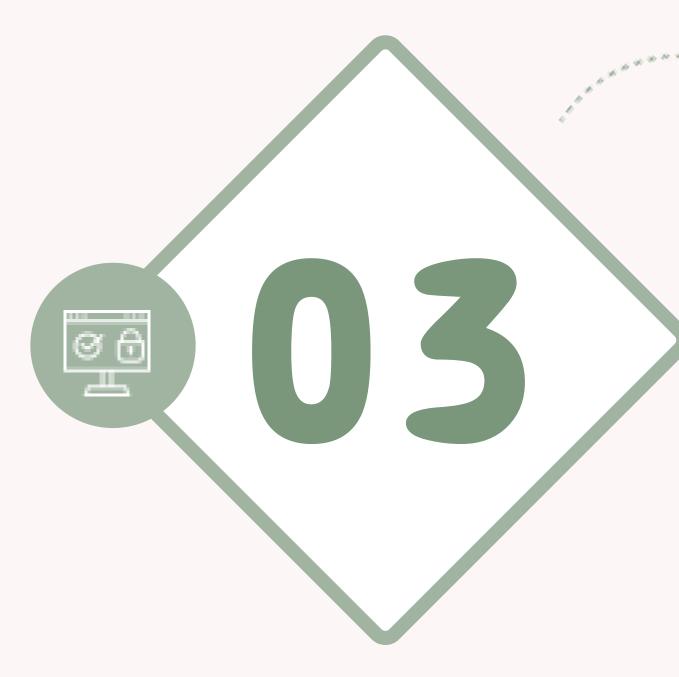
Analysis of Fledged Nests and Nest-Leaving Dates

	C	E	J	K	L	N	Q1	V	<b>X</b> 1	Z
蜂巢鶴	3	3	3	3	4	1	3	2	4	1
離巢日	24	25	23	25	26	27	26	25	23	27



今年的離巢日範圍落在23~27日。我們採用「加權平均數」的方式,算出樣區中,家燕的平均離巢日為24.7日(總日數669/離巢雛鳥數27),與其他地區的研究結果接近。

This year, the fledging period ranged from 23 to 27 days. We used the weighted average method to calculate that the average fledging period of the house swallows in the sample area was 24.7 days.





Weekly Growth of Barn Swallows

- ●成長週記 Growth Weekly Diary
- 父母難為 The Hard Work of Parenthood:Adult Swallows Raising Offspring
- ●調查困境 Daily Life of the Chicks
- ●雛鳥的生活日常 The Challenges of Conducting a Field Survey



#### 幼雞的日齡變化(以為為例) Daily Growth of the Chick (nest X)















#### 幼雞的日齡變化(以X巢為例) Daily Growth of the Chick (nest X)











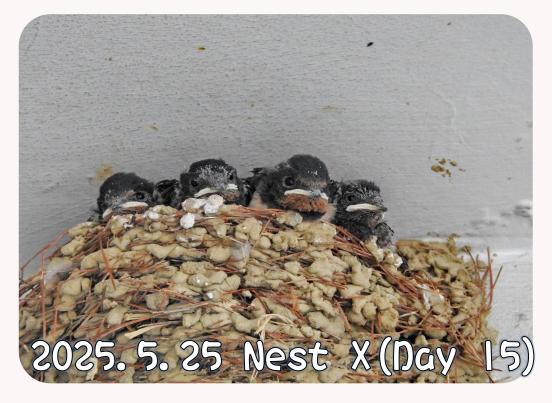




#### 幼雞的日齡變化(以X巢為例) Daily Growth of the Chick (nest X)















#### 幼雞的日齡變化(以X巢為例) Daily Growth of the Chick (nest X)















### 觀察重點(第一週)

Key Observation Points (week 1)







- ☆為了維持巢內整潔,親鳥會啣走雛鳥排出的糞棗 To keep the nest clean, the parent birds remove the fecal sacs excreted by the chicks.
- ★雛鳥出生後會迅速長大,至少第5日後幼雛便可抬頭索食 The chicks grow rapidly and begin lifting their heads to beg for food by around the fifth day after hatching.





### 觀察重點(第二週)

Key Observation Points (week 2)





#### 文幼雞喜歡趴在巢口等待親鳥返巢餵食

Young birds often rest their heads at the nest entrance, waiting for their parents to return with food.

#### 文雜鳥對聲音敏感,常把周圍的噪音認為是親鳥返巢

Sensitive to all sounds, young birds often mistake other noises for the sound of their parents returning.



# 觀察重點一條部變紅(第二週)

Key Observation Point-Redness of the Throat (Week 2)









13日的幼雞喉部羽

色逐漸轉紅,部分

較慢孵化的雛鳥可









### 觀察重點(第三週)

Key Observation Points (week 3)





第三週起,雞鳥的成長落差逐漸拉大,發育的差異越來越明顯 By the third week after hatching, the gap in growth among the chicss widens significantly, showing clear individual differences.



# 觀察重點(第三週)

Key Observation Points (week 3)





# 第3週起雛鳥可以自行排便,牠們會將屁股朝外便便。過程中我們驚訝地發現,雛鳥也會有便秘的狀況

After the third week of hatching, young birds are able to defecate on their own, typically positioning their bodies with their buttocks facing outward. Surprisingly, we also observed that some chicks experienced constipation.



### 觀察重點(第四週)

Key Observation Points (week 4)





此時幼雞外型與成鳥相似,約23-27日齡(平均24、7日齡)時就可以離巢 During this stage, the young birds begin to resemble their parents in appearance. They are able to leave the nest between 23 and 27 days after hatching (average: 24.7 days).



# 觀察重點(第四週)

Key Observation Points (week 4)



accidents. In such cases, we carefully move them to safer locations.



幼雛離巢後會在巢附近練飛,累的時候會在電線上或返回巢中休息。但有時體力不支的幼鳥會停在危險的地方,造成意外。所以我們嘗試將牠移至安全處After fledging, young birds begin practicing flight near the nest. They often rest on wires or return to the nest area. However, weaker chicks may land in unsafe spots and are at risk of



#### 家燕親鳥睡哪裡?

Where Do Parent Barn Swallows Sleep?







隨著雞鳥長大,巢內空間不足,親鳥只好在巢位附近另覓場所休息,巢旁的鐵釘、電線或監視器上,都可以看見牠們的蹤影

As the chicks grow, space inside the nest becomes increasingly limited. The parent swallows are forced to find places to rest and can often be seen perching on nearby nails, wires, or even surveillance cameras.



### 家燕鄉鳥吃進塵?

What Do Baby Barn Swallows eat?





我們觀察到家燕幼雞的食物有:蒼蠅、台灣家白蟻、紅姬綠椿象等但有趣的是家燕幼雞居然也會有挑食的壞習慣

We discovered that baby barn swallows eat flies, Formosan termites, Leptocoris Abdominalis, and other insects, Interestingly, some chicks appear to be picky eaters.



#### 打盹篇 Babies Taking a Nap

2025.6.11 Nest J (Day 15)

J巢幼雞睡得太沉,以為發生意外

The chicks in Nest J were sleeping so soundly

that we thought they might be dead.



其實,幼雞只是在休息 In fact, the chicks are just resting.

# 多調查周境

## 觀察時的限制

The Limits of Observation





由於巢內陰暗,加上鏡子反射角度的限制,導致觀測的困難需要反覆確認以免遺漏

Due to the darkness inside the nest and the limited reflection angle of the mirror, repeated observations are necessary to avoid missing important details.

## 透調查周鏡

## 到底生了沒? Did She Really Give Birth?





剛孵化的幼雛過於瘦小,不利觀察,透過親鳥啣糞棗或整理巢內的動作來判斷 The newly hatched chicks are so small that they are difficult to observe directly. We can only confirm their birth by observing the parent birds carrying fecal sacs and tidying up the nest.

## 正調查周境

#### 到底生了沒? Did She Really Give Birth?





由於巢內光線較昏暗,因此幼雞剛出生時不易觀察,但我們發現,可以透過看不看得到蛋殼,來判斷幼雞是否已經出生。
Due to the darkness in the nest, the newly hatched chicks are difficult to observe.

We discovered that we can confirm their birth by spotting the eggshells.

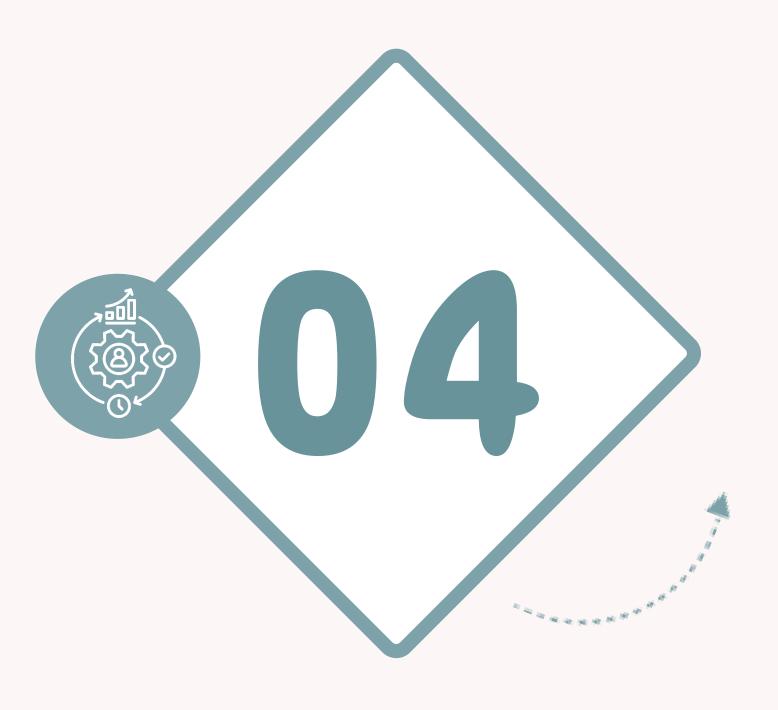
## 了調查周境

#### 待解的謎團 Unsolved Mystery





原先有五顆蛋的V巢,過程中有兩隻幼雛不明消失原因並非落雛,因此成功離巢的幼雛只有三隻 There were five eggs in nest V, but two of the chicks disappeared. It wasn't because they fell from the nest. Only three chicks successfully fledged.



## 家燕推廣行動

**Promoting Awareness of Barn Swallows** 

- 家燕讀書會 Barn Swallow Reading Club.
- SBS 專欄 SBS Column
- 科博館參訪 Visit to the National Museum of Natural Science
- 夏一站幸福 Happiness of the Summer Station









A reading club is held once a week to help us better understand the ecology of barn swallows through literature. The picture shows a moment from the reading club when one of the members was giving a presentation.

## SBS # APP



老師利用有獎徵答的競賽方式,讓觀察家燕的活動更加熱絡與有趣

The teacher held a Q&A contest with prizes to make the barn swallow observation activity more lively and engaging.

#### 【SBS家燕專欄/No.3】

本週家燕各巢都是在等待孵化的狀況, 所以SBS要來考考大家家燕的小常識, 以下問題的答案是什麼呢?, 凡是答對一半以上, 就算過關, 可獲得小獎品。最高分者可得到本週紀念品-翠鳥刺繡喔!

- 1 截至6/9, 今年長安樣區中, 一共有幾巢燕巢有繁殖紀錄呢? (無論成功失 b, 產卵即代表繁殖喔)
- 2 通常家燕幼鳥在第幾天起,喉嚨會出現紅色的羽毛呢?
- 以我們的樣區紀錄,家燕一窩大概產下幾個蛋呢?(如:2-4顆,A巢狀況特殊,可以排除)
- 編鳥大概幾天左右可以離巢呢? 請回答合理的答案都可以算對
- 5 Y巢繁殖失敗的原因,是因為該巢可能遭受誰的攻擊的緣故呢:
- ⑥ 家燕的繁殖中,親鳥會在第二窩時改用另一個繁殖。請判斷L巢的第二個繁殖 巢,代號是什麼喔?
- 77 本週有哪幾巢是處在卵得的狀態,正等著孵化呢?(回答巢位代號)

以上7題,答對4題以上即算過關喔 截止日期至星期四晚上9:00~~ 請家燕組同學私訊回覆喔!

加油~~

#### 利用LINE公布題目與活動的獎品 (美味的冰棒和精美的文創小物)

The questions were announced on LINE, and the prizes included popsicles and exquisite cultural and creative items.

2

## 小科博館参訪



組員到科博館觀察燕科和雨燕科的鳥類標本 The team members visited the National Science Museum to observe swallow specimens of Hirundo and Swifts.





活動內容 Activity content

· 家燕生態大解密
Decoding the ecology of barn swallows

• 家燕育雞問答 Barn Swallow Breeding Q&A

· 繪本說故事-燕子回家 Picture book story-Barn Swallows Coming Home

• 彩繪體「燕」+有獎徵答
Painted Yan and the Prize-Winning Q&A

• 社區賞燕巡禮 Community Tour to Appreciate the Beauty of Barn Swallows





painted Barn painted yan sual lous-painted







野社區探訪 英樂 Visiting bird's nests in the community





#### 活動連籌 Activity response







活動大受歡迎,民眾自備相機拍攝家燕,小朋友回到家也開始為家人彩繪家燕The activity was very popular.People brought their cameras to photograph the barn swallows.

After the children went home, they painted barn swallows on their family members.

