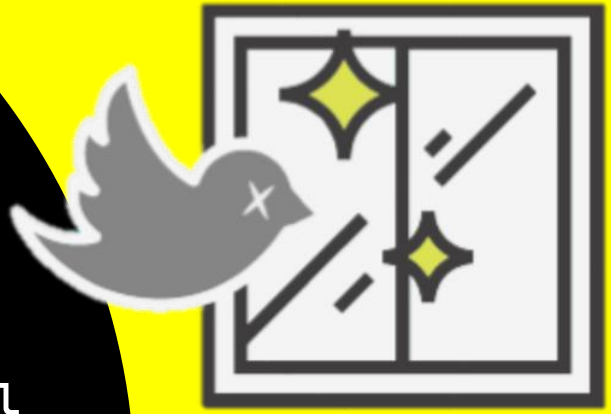
咚窗事發—談鳥類窗殺



王齡敏 /猛禽救傷站主任
社團法人台灣猛禽研究會

經歷

現任：

台灣猛禽研究會/猛禽救傷站主任

台灣特殊寵物暨野生動物醫學會/理事

曾任：

亞洲大學獸醫學系/兼任講師

亞馬森動物醫院禽鳥科/兼職獸醫師

金門縣野生動物救援暨保育協會/總幹事

金門同伴動物醫院/兼職獸醫師

明尼蘇達大學猛禽中心/獸醫師

特有生物研究保育中心野生動物急救站/獸醫師

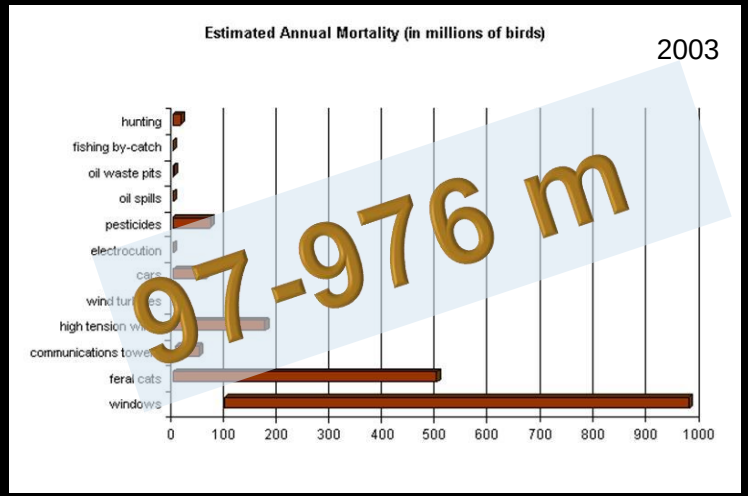
台灣猛禽研究會猛禽救傷站

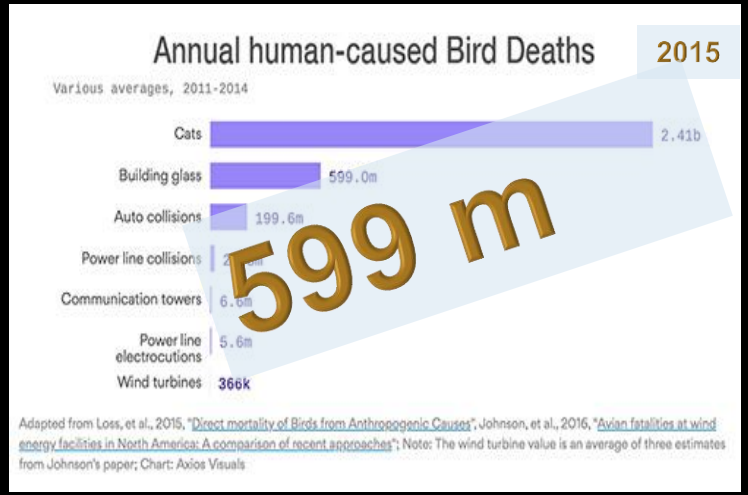
- 2017年三月成立，簡稱「猛禽救傷站」
- 以**救傷復健野生猛禽**為主要業務
- 主要受理台灣北部地區的傷病猛禽
- 推廣猛禽救傷與保育
- 撞玻璃受傷佔1/5

窗殺是啥?

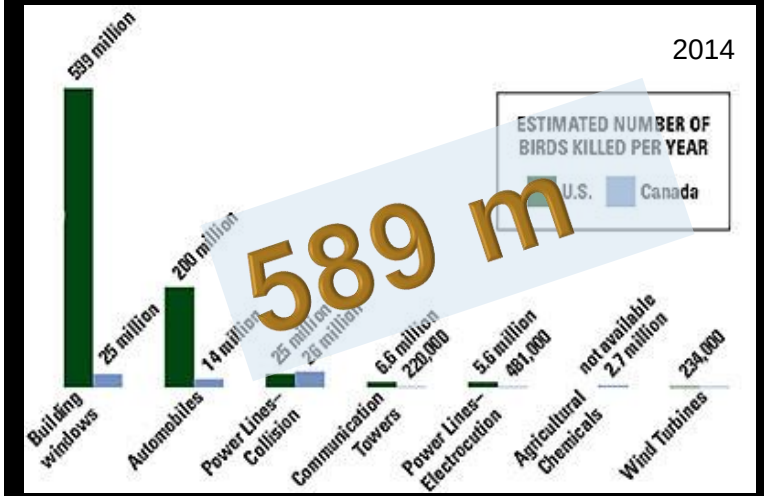
- 撞各種「**玻璃**」導致傷亡簡稱窗殺
- **野生鳥類**為高風險類群
- 美國每年平均**5億**隻野鳥窗殺死亡
- 南韓估計每年**800萬**隻野鳥窗殺死亡*
- 台灣鳥類資源不亞於南韓，住宅戶數亦有近9百萬，估計每年窗殺鳥數可能有**數百萬**。

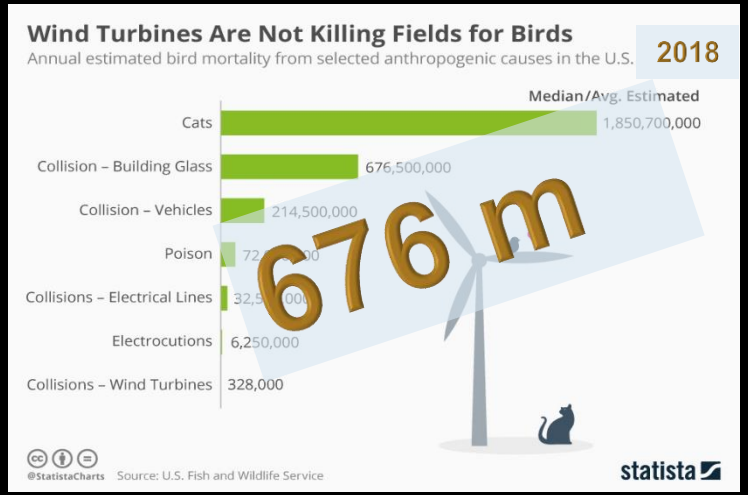
*Economic benefits of preventing bird collisions in South Korea: findings from a choice experiment survey
https://link.springer.com/article/10.1007/s11356-022-22343-y


Estimated Annual Mortality (in millions of birds)
2003
hunting
fishing by-catch
oil waste pits
oil spills
pesticides
electrocution
cars
wind turbines
high tension wires
communications towers
feral cats
windows
0
100
200
300
400
500
600
700
800
900
1000
97-976 m


Annual human-caused Bird Deaths
2015
Various averages, 2011-2014
Cats
2.41b
Building glass
599.0m
Auto collisions
199.6m
Power line collisions
Communication towers
6.6m
Power line electrocutions
5.6m
Wind turbines
366k
599 m
Adapted from Loss, et al., 2015, "Direct mortality of Birds from Anthropogenic Causes", Johnson, et al., 2016, "Avian fatalities at wind energy facilities in North America: A comparison of recent approaches"; Note: The wind turbine value is an average of three estimates from Johnson's paper; Chart: Axios Visuals

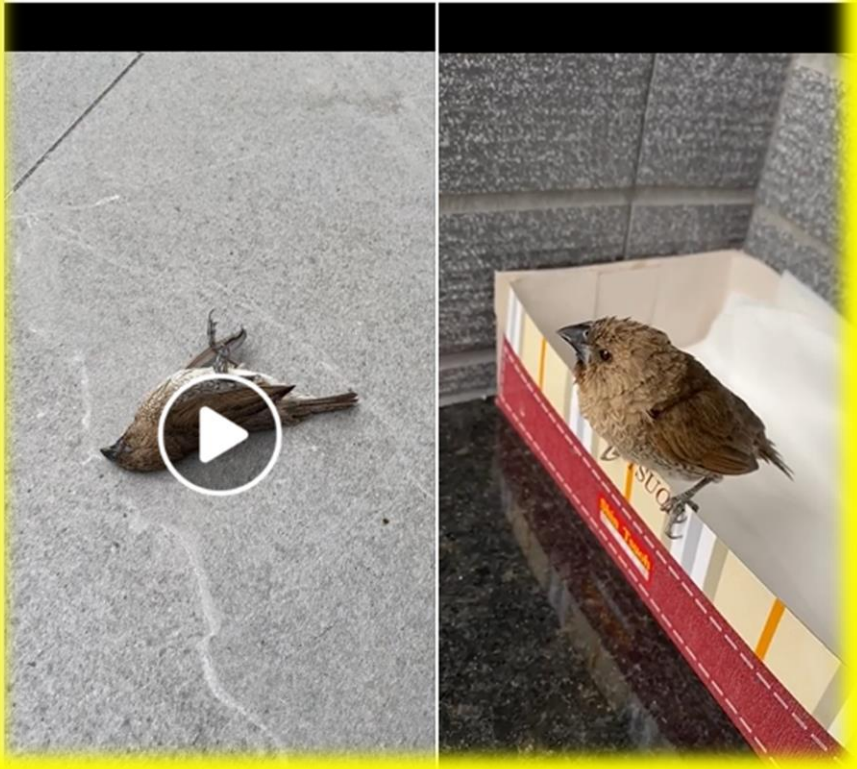

2.4 billion
196 million
Cats


2014
599 million
25 million
200 million
14 million
25 million
26 million
6.6 million
220,000
5.6 million
481,000
not available
2.7 million
234,000
ESTIMATED NUMBER OF BIRDS KILLED PER YEAR
U.S.
Canada
589 m
Building windows
Automobiles
Power Lines–Collision
Communication Towers
Power Lines–Electrocution
Agricultural Chemicals
Wind Turbines


Wind Turbines Are Not Killing Fields for Birds
Annual estimated bird mortality from selected anthropogenic causes in the U.S.
2018
Median/Avg. Estimated
Cats
1,850,700,000
Collision – Building Glass
676,500,000
Collision – Vehicles
214,500,000
Poison
Collisions – Electrical Lines
Electrocutions
6,250,000
Collisions – Wind Turbines
328,000
676 m
@StatistaCharts
Source: U.S. Fish and Wildlife Service
statista

剛剛看到他突然從天而降，外出查看就看到他躺在地上（左邊影片）有呼吸、心跳，準備紙盒要安置時，就可以站立，但完全不飛，目前安置觀察中已約一小時。

2. 拾獲縣市 ： 高雄市大坪頂
3. 拾獲日期時間 ： 4/23日 下午15:56
4. 環境地點 ： 銷售建案車庫
5. 傷病情況 ： 查看外觀無血漬、無傷口。



窗殺鳥特色：

- 建築物旁發現死/傷鳥。
- 鳥體外表常無可見外傷。
- 被掠食者吃掉或清潔人員移除而消失。


資料來源：台灣大學


八里國中/王俊凱老師提供

https://www.facebook.com/groups/birdwindowcollision


RRCT

每年受理超過

200隻猛禽

20%為撞窗受傷

鳳頭蒼鷹是最常撞窗的猛禽

後軀癱、雙腳僵直、脫糞

窗殺導致症狀

後軀癱瘓

頭部創傷

中樞性眼盲

Horner's syndrome
（霍納氏症候群）

呼吸/消化道出血

眼部創傷

三角骨骨折

野鳥撞玻璃回報 (Reports on Bird-Glass Collisions)

公開社團 · 4,021 位成員

野鳥撞玻璃回報
(Report on
Bird-Glass
Collisions)

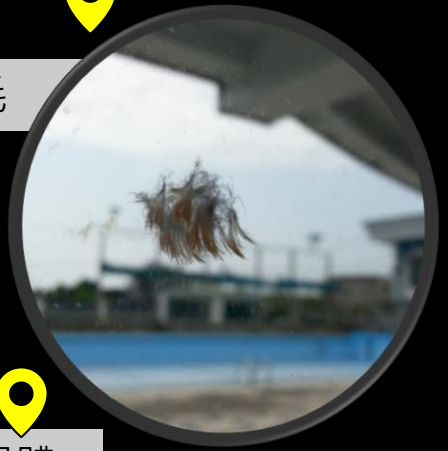
路殺社回報
(TaiRON)

至2022年底共自網路公開平台蒐集3,630件窗殺案例

血液或糞便痕跡

活鳥

黏羽毛



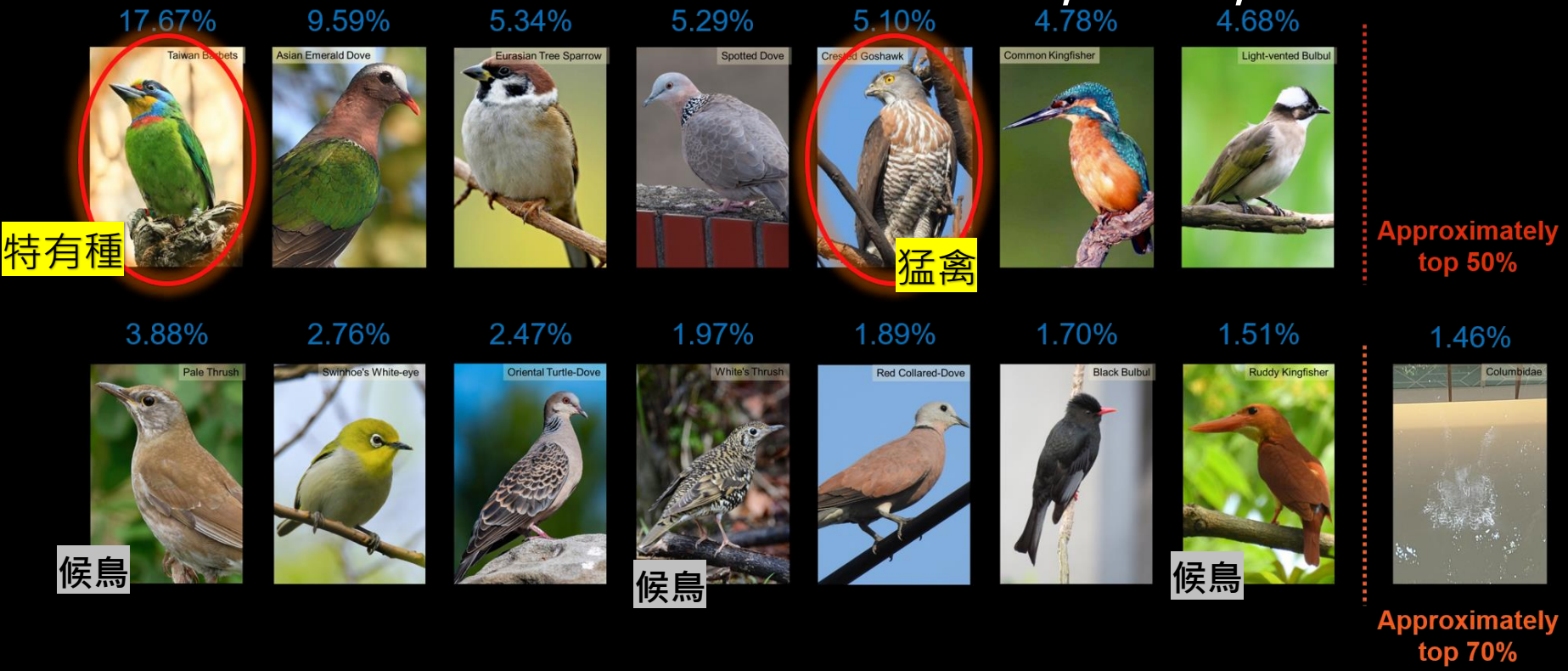
屍體

鳥拓印

五色鳥 翠翼鳩

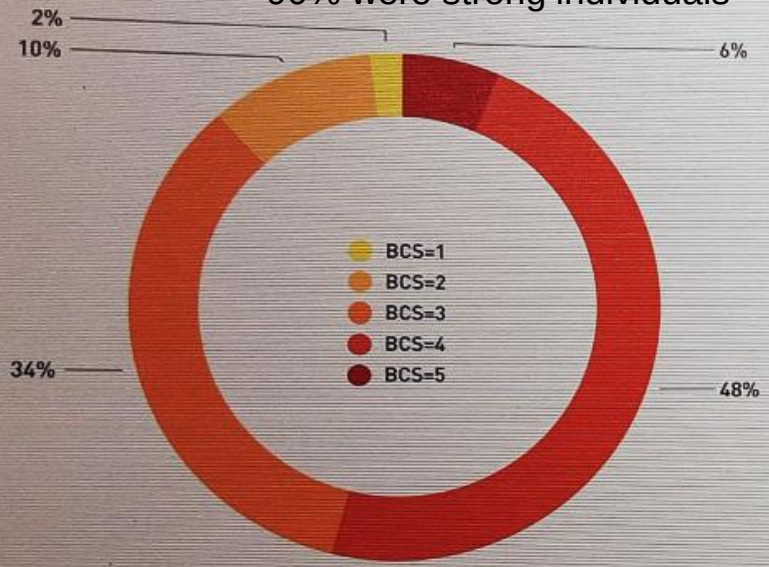
網路窗殺回報最多

Bird Window Collision Exhibition, RRGT, 2023



統計前14名的易撞窗鳥種

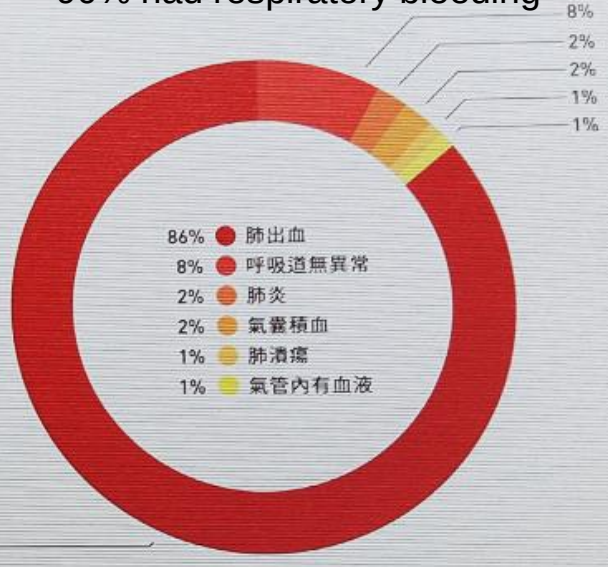
~90% were strong individuals



88%以上遭遇窗殺的鳥類都是擁有良好體態的個體(BCS指數 3+)。

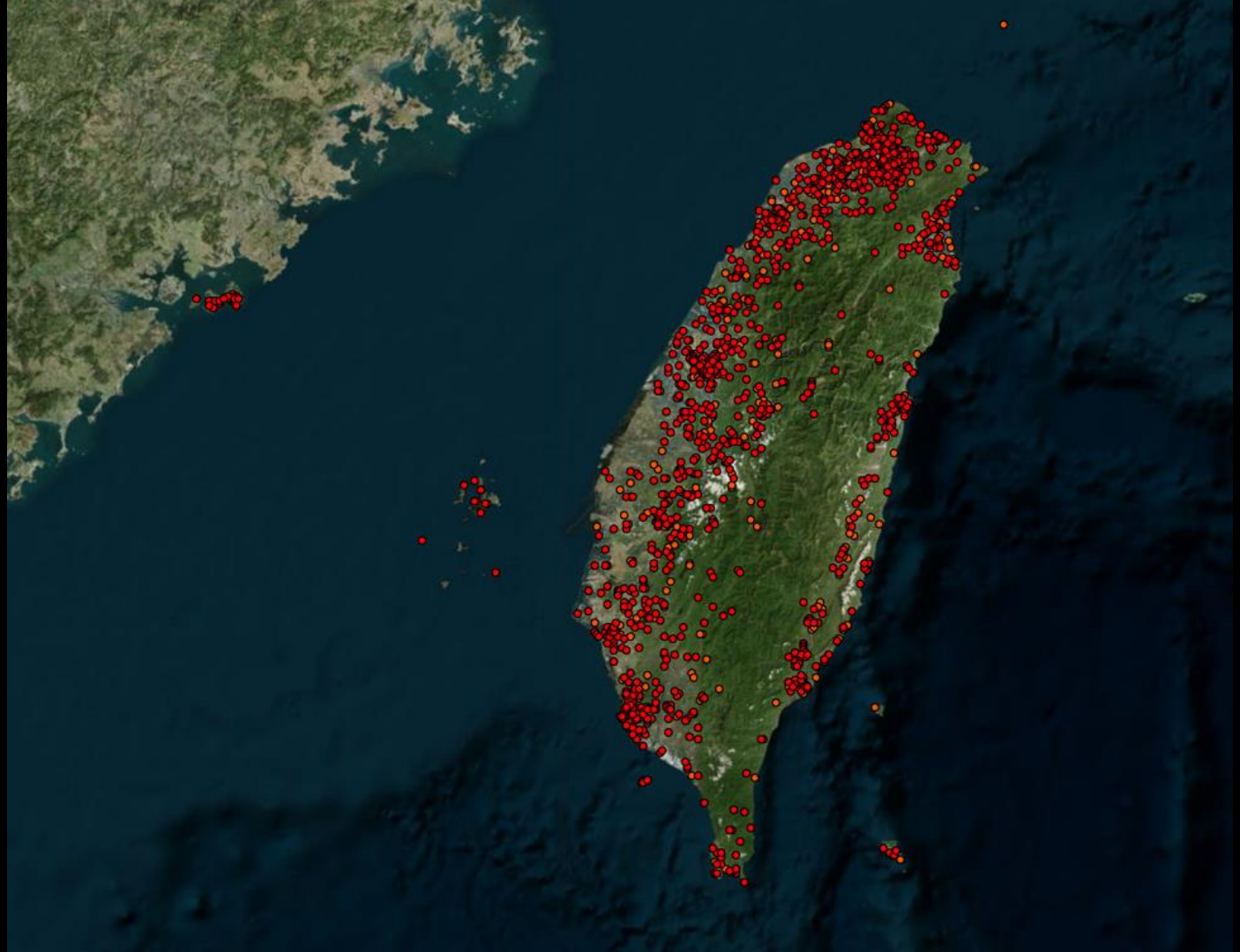
▲
BCS胸肌指數

~90% had respiratory bleeding



這些個體雖有良好外觀體態，絕大多數都有肺出血或呼吸道積血。

窗殺是在淘汰鳥類族群內最健壯的個體



造成窗殺原因

- 鏡像反射景物假象
- 可穿透的假象
- 鳥類無法辨識玻璃為隔離障礙物

我的字典裡沒有~玻璃

反射


住商不動產

來源：屏東縣長潘孟安臉書粉絲頁
https://www.facebook.com/pan.menan1/photos/pcb.10158424629360631/10158424624720631


Good Choices
& Good Life


2


穴吹

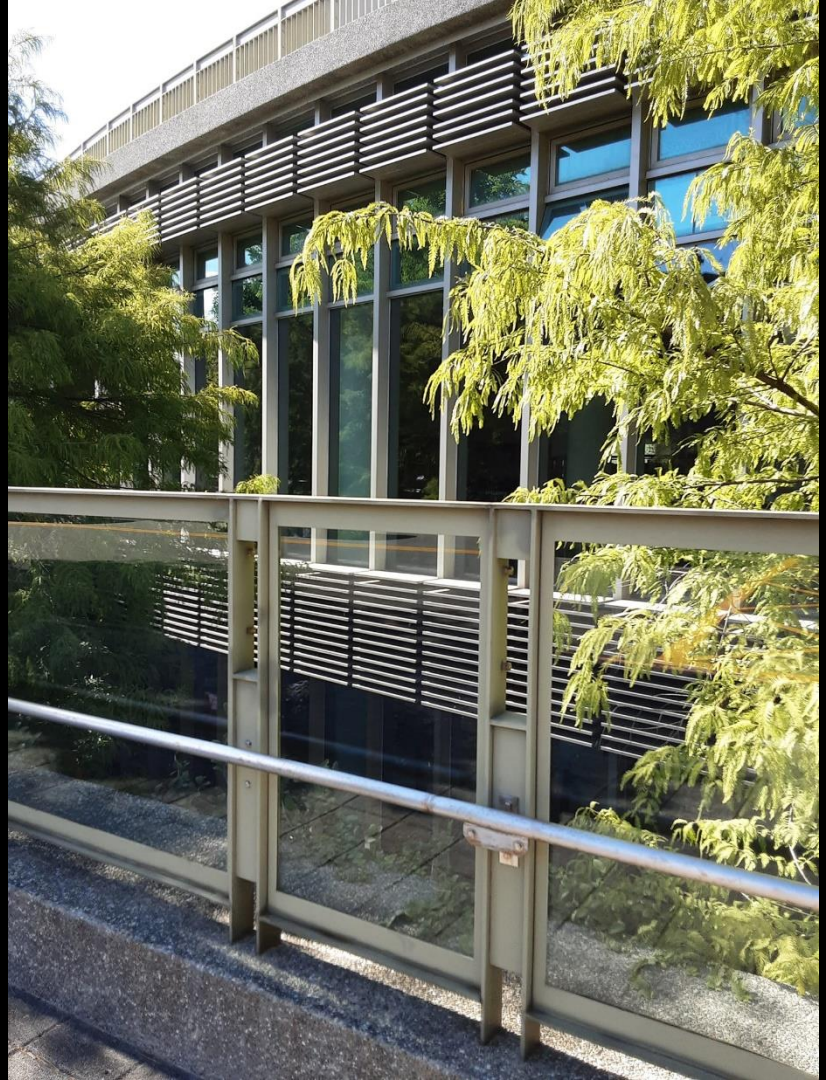
不鏽鋼鏡面建材


Toilet
茅山塔公廁
吉凶

穿透視覺

玻璃或透明的牆面營造出可以穿透的假象，讓鳥以為可以飛過去。透明隔音牆、建物連通道與溫室等常因玻璃穿透作用而讓鳥遭窗殺。

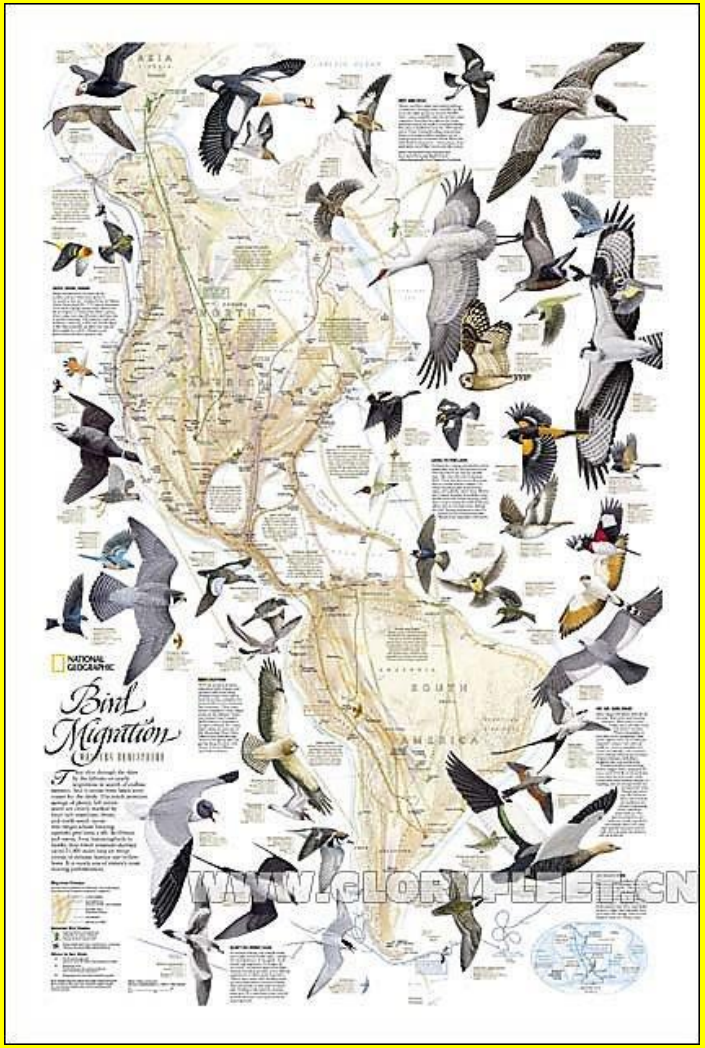

迦勒
廣告
0930
-030
檀悅
中悅新莊副都心
百坪SRC均質戶
8502-1688
324-2288



光汙染

- 夜晚遷徙的候鳥，依賴天空中的各式訊息來找到遷徙的方位，例如星光與月光。
- 尤其有霧霾或起霧的夜晚，讓候鳥更容易被市中心的燈光吸引而迷航。
- **燈光**加上**窗戶**成為窗殺高危險的組合。

候鳥夜間被
燈光誘導撞
擊建築物



http://www.flap.org/lights.php

國內有但不多，例如夜間受到棒球比賽燈光吸引亂入

Yahoo奇摩運動
8月8日下午8:28 ·
鳥群亂入洲際棒球場 比賽因此中斷數分鐘 20200808
鳥群亂入洲際棒球場.....
1,926 106則留言
讚 留言 分享
稍後播放
目前沒有其他為你推薦的影片
留言 顯示全部

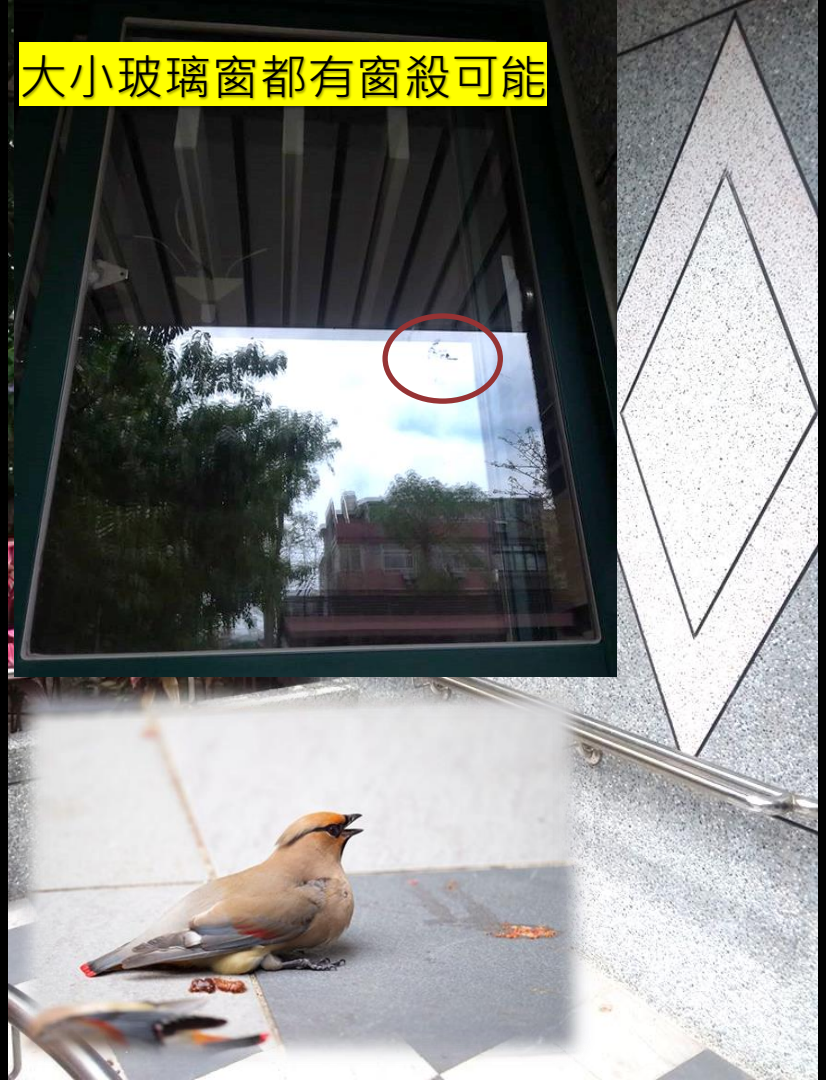
高窗殺風險建築特色：

1.新建築

2.具大片玻璃帷幕(如落地窗)

3.周遭具自然環境景觀

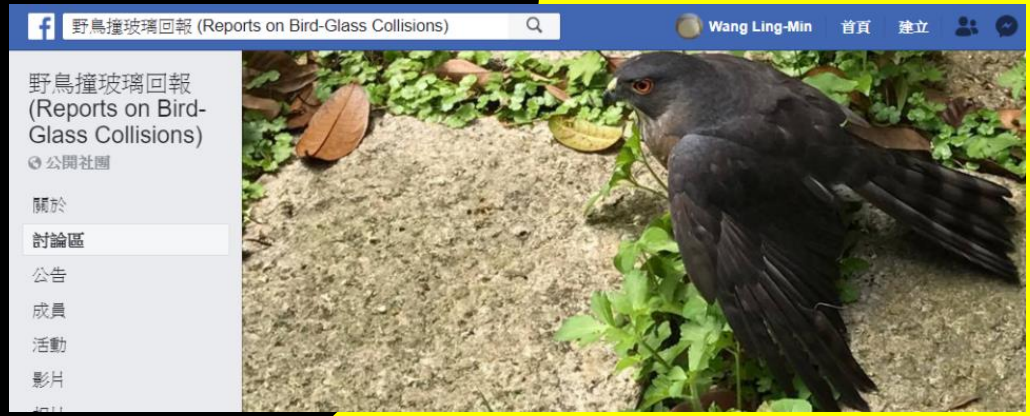

鳩鴿撞窗留下鳥拓


大小玻璃窗都有窗殺可能

窗殺事件回報平台

路殺社回報
QR CODE

野鳥撞玻璃回報
QR CODE



排泄物、血液

活體

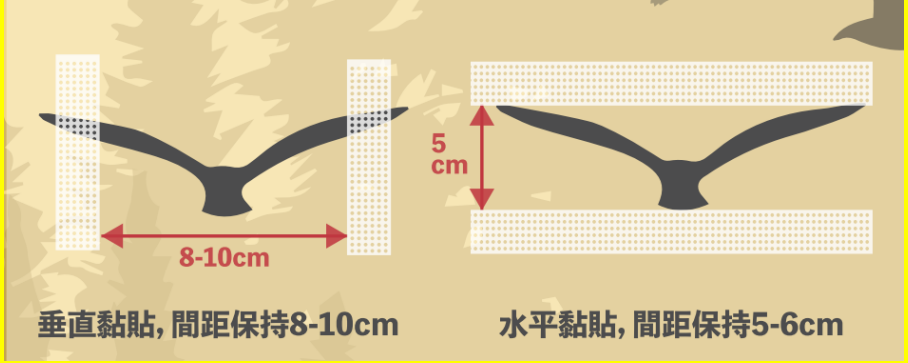
撞擊遺留下羽毛痕跡

屍體或殘骸

鳩鴿撞窗後留下印記

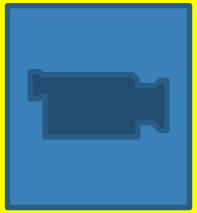
五色鳥 翠翼鳩

網路窗殺回報最多



重點在於密度高 且在外側布置

通道測試



滿

只貼一張猛禽貼紙無效

要貼就要貼滿才有防治效果

貼什麼圖案都可以，
猛禽或眼睛圖案並不會“嚇”鳥

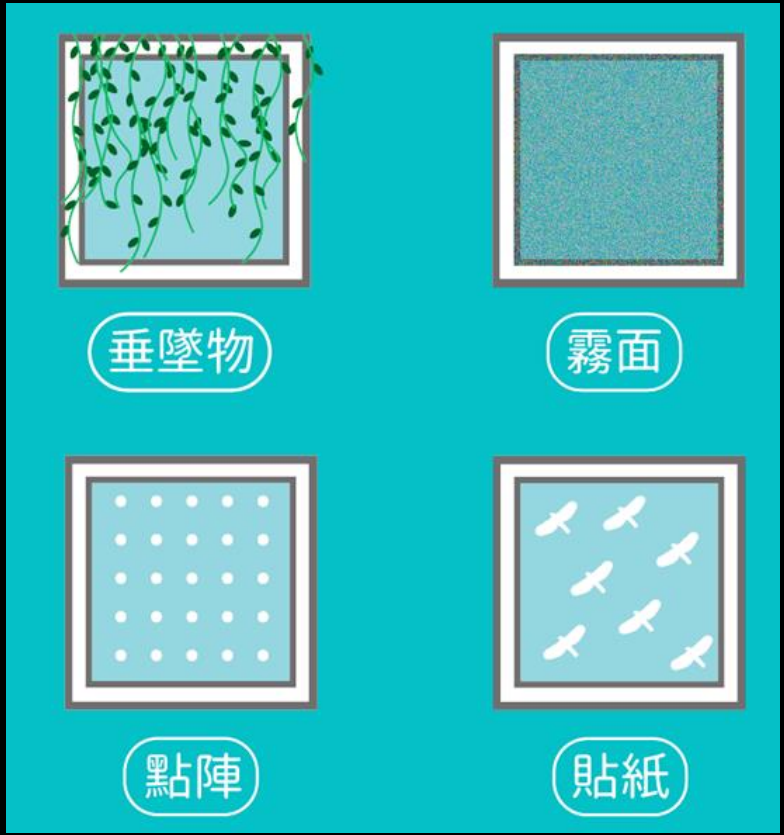
節錄自台灣動物社會研究會臉書照片

https://www.facebook.com/east.org.tw/photos/pcb.1071266176238433/1071265196238531/?type=3&theater

只貼一張猛禽貼紙無效！
只貼一張猛禽貼紙無效！
只貼一張猛禽貼紙無效！

原理：減少玻璃穿透與反射假象面積

“



在撞擊面佈置、5X10cm間隔原則下可以用各種素材來預防窗殺，
或直接使用雕花或表面蝕刻密集樣式的玻璃

姚正得攝影

Arenal observatory lodge & spa, Costa Rica

https://www.facebook.com/groups/308545713368523/?multi_permalinks=728126971410393

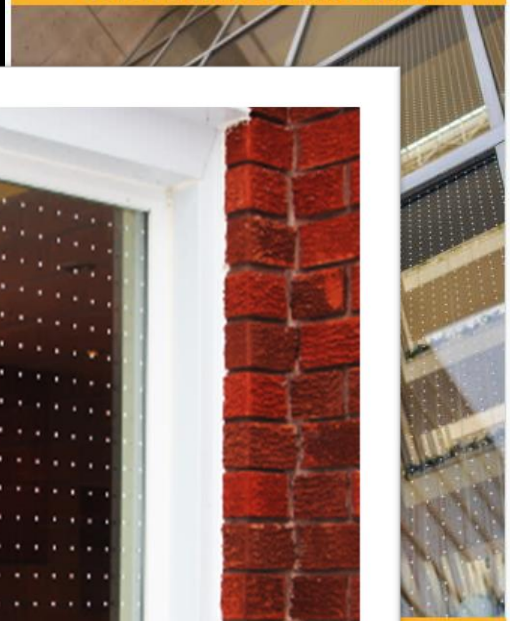
韓國仁川大學

3M

Feather Friendly® Commercial

Large-Format Bird Collision Deterrent for Commercial & Institutional Buildings

CLICK HERE TO LEARN MORE



velopers,
Planners

Feather Friendly® Residential

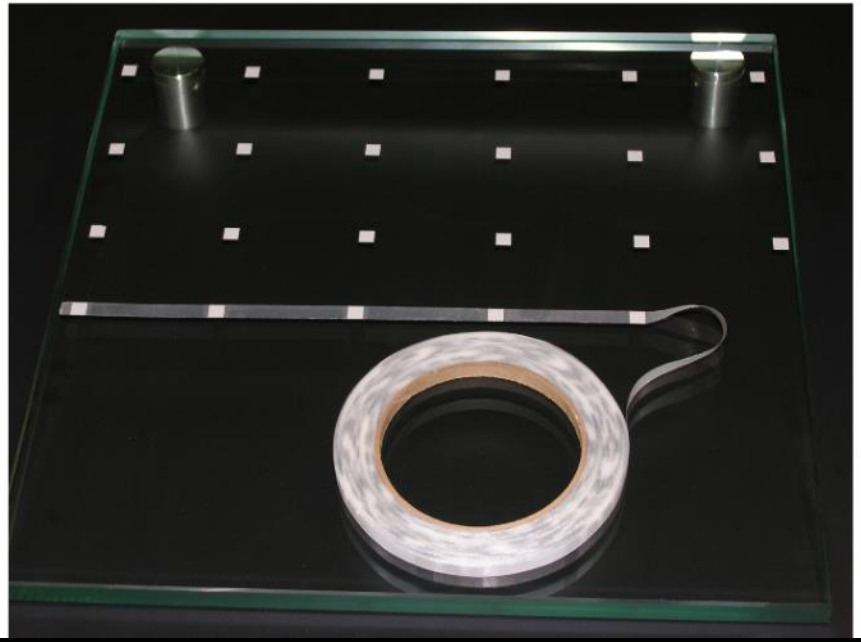
Bird Collision Deterrent Marker-Pattern DIY Tape Prevents Birds from Colliding With Windows

CLICK HERE BUY NOW

For Homeowners and Smaller Do-It-Yourself Installations

台灣3M沒有進口或生產

Feather Friendly® Solution for ‘Do it yourself’ Residential Applications



http://www.conveniencegroup.com/featherfriendly/feather-friendly/

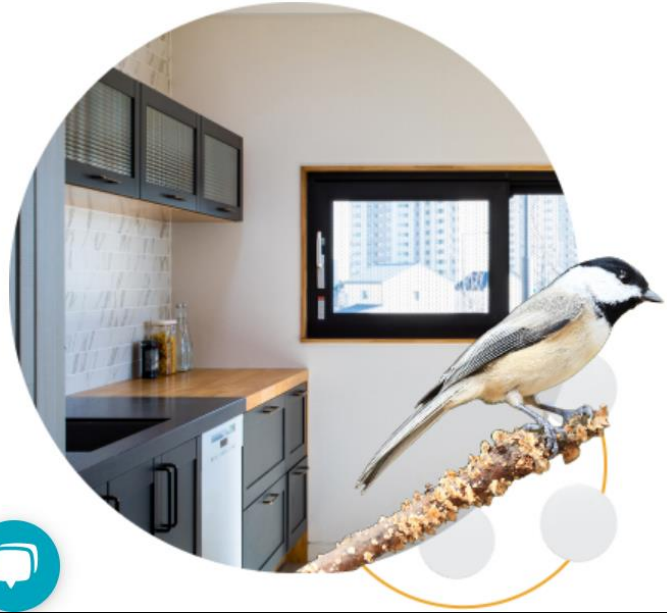
3M

特生中心施工案例

FeatherFriendly®

What's Included?

- DIY roll(s) in colour of choice (Light Grey or Black)
- 2 paper measuring tapes
- Application squeegee
- Installation instructions



Feather Friendly® window markers are an easy-to-use scientifically proven solution for preventing bird collisions with glass surfaces. Feather Friendly® window markers are highly effective in making the area visible to birds and preventing deadly collisions while remaining unobtrusive to humans.

APPROVED BY:

AMERICAN BIRD CONSERVANCY

FLAP CANADA

Audubon

kakao tv

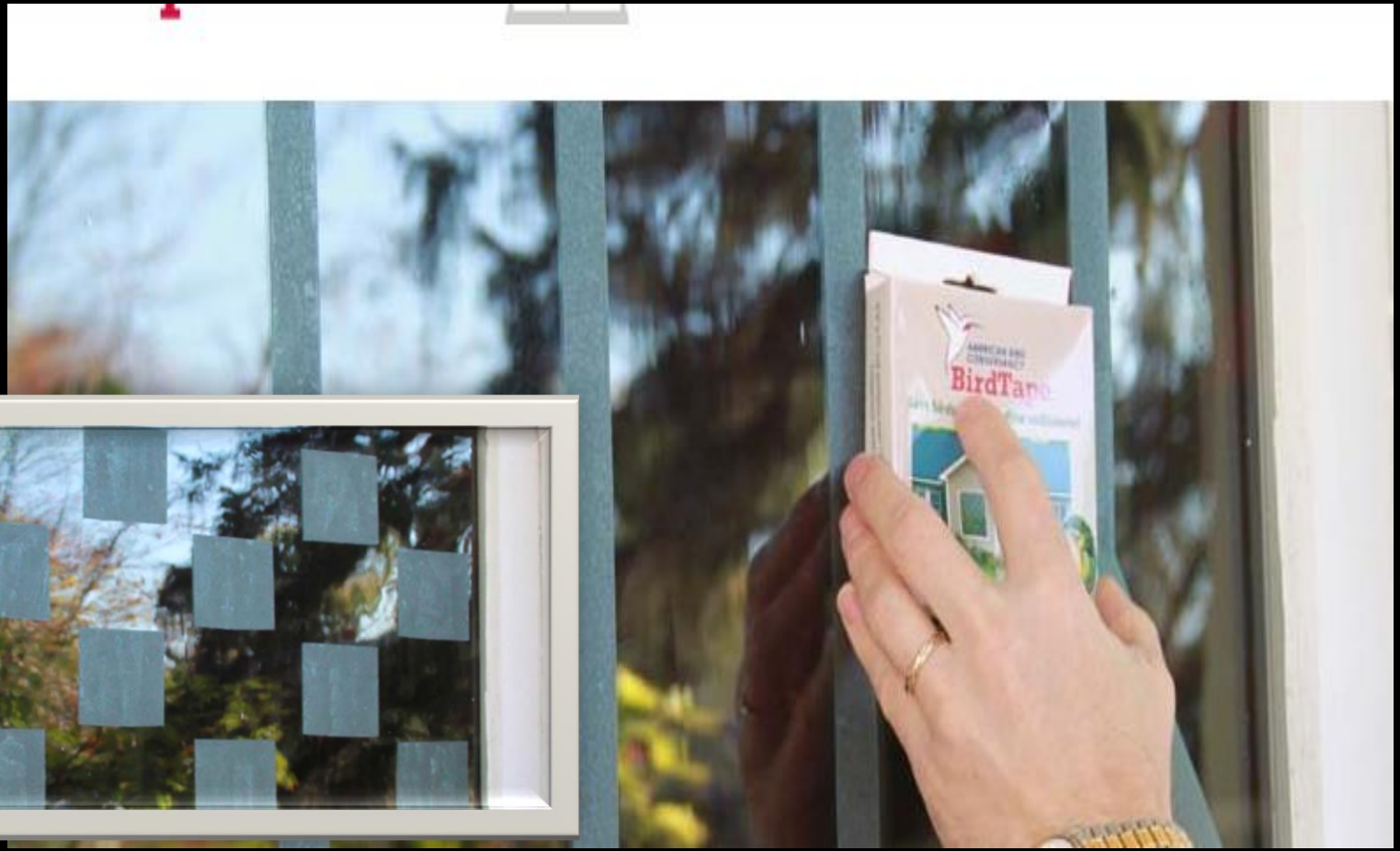
검색

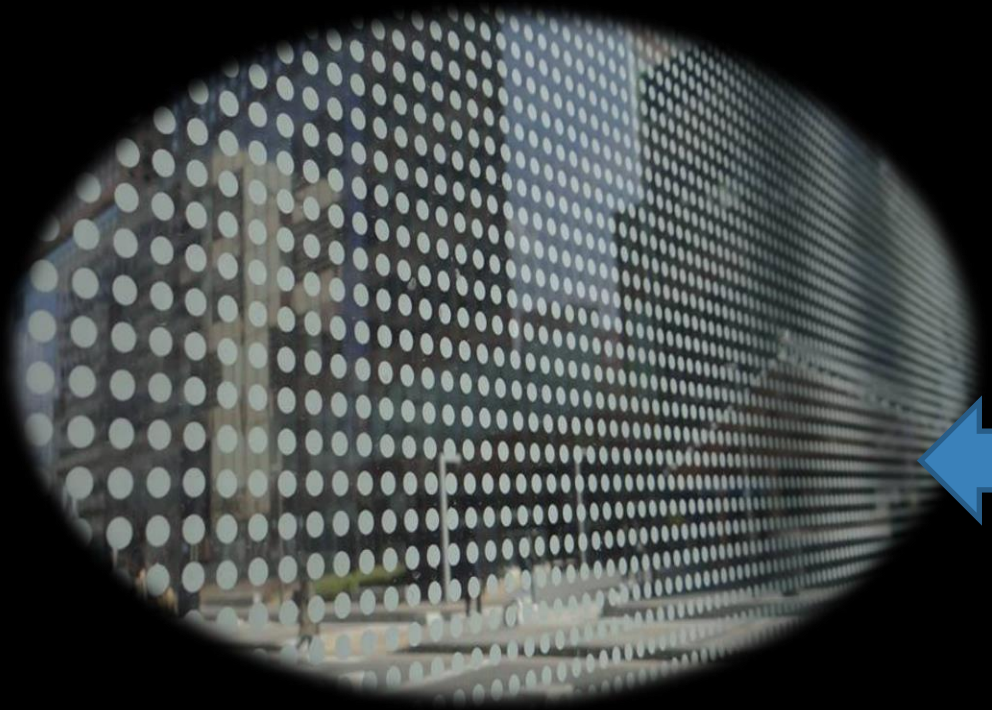
채널추가 업로드 방송하기 로그인

도로 방음벽에 손톱만 한 점들 붙였더니..'놀라운 변화'

0

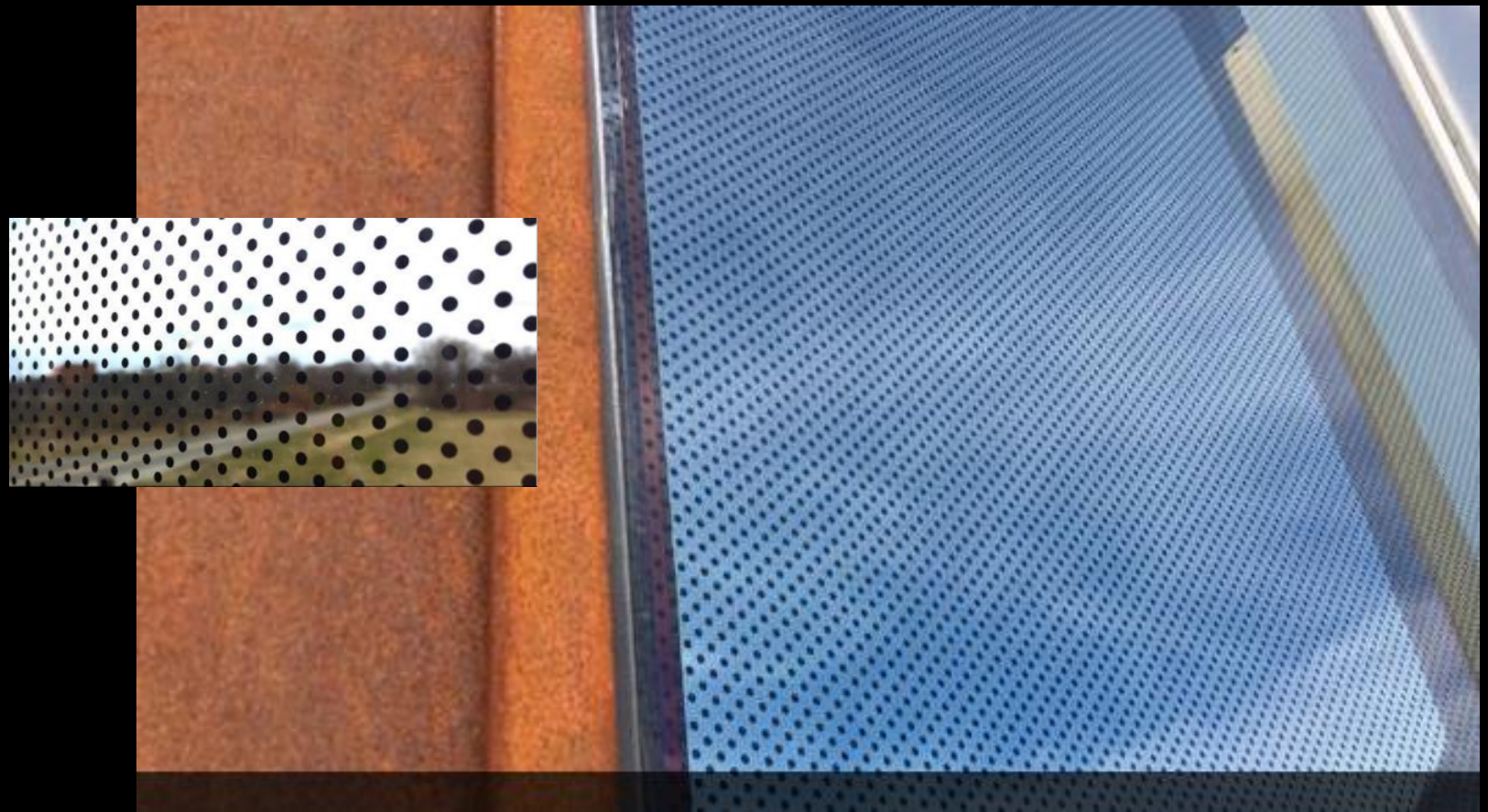
재생수 146,988 · 2019.02.17 22:22 자세히


BirdTape



韓國/玻璃蝕刻點陣圖後再裝設

美國貝爾自然史博物館/
玻璃蝕刻點陣圖後再裝設於建築

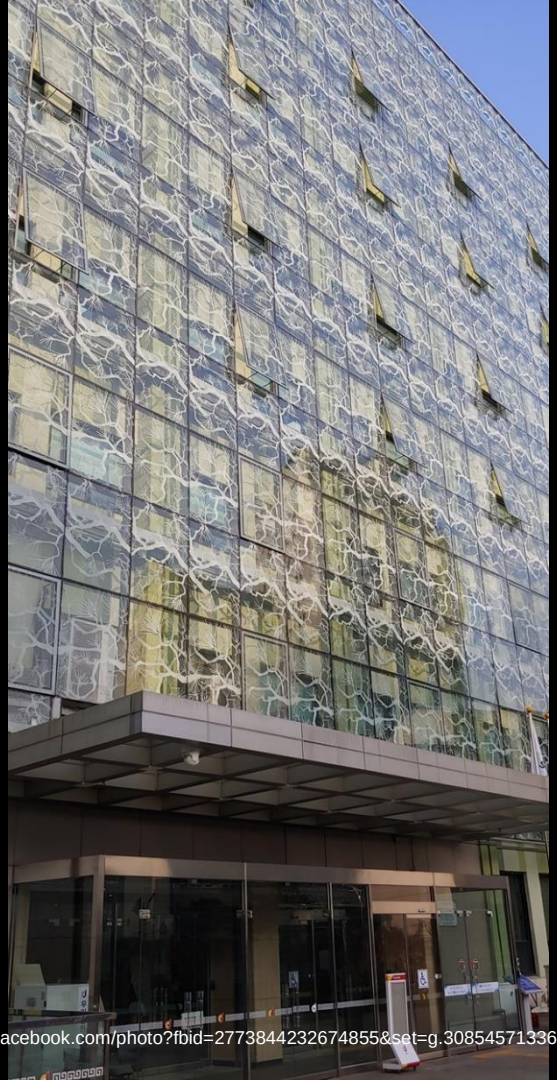


https://www.facebook.com/photo?fbid=10214128809452688&set=pcb.617672865789138

https://www.facebook.com/photo?fbid=10214156719510422&set=pcb.622308255325599

https://virginiazoo.org/2016/10/zoo-prevents-bird-deaths-applying-tape/

https://www.facebook.com/photo?fbid=3805493469544541&set=g.308545713368523



https://www.facebook.com/photo?fbid=2773844232674855&set=g.308545713368523

Google

bird window strike

全部 圖片 購物 影片 新聞 更多 工具

約有 29,600,000 項結果 (搜尋時間：0.30 秒)

Google

bird window collision

全部 圖片 購物 影片 新聞 更多 工具

約有 6,540,000 項結果 (搜尋時間：0.33 秒)

Google

bird hit window

全部 圖片 購物 影片 新聞 更多 工具

約有 75,400,000 項結果 (搜尋時間：0.31 秒)

Glass Collisions

Bird-Friendly Building Gallery

OPEN MENU

Introduction

Our gallery contains examples of bird-friendly buildings of all types. In addition, we've included bird-friendly versions of individual features, like railings, noise barriers, and building connectors, that can otherwise be especially deadly. Where available, we include links to case studies.

How to Search our Bird-Friendly Building Gallery

There are several ways to search our library. If you have a specific need in mind, you can use the dropdown menus below to sort by project type, bird-friendly strategy, and applicable LEED credit. You can also sort the galley features alphabetically or by inclusion date. If you already know the name of the building you are looking for, you can type it into the search bar below.

Search

Enter keywords

Consilium Towers

Toronto, Ontario

Adhesive Pattern, Window Adhesive

View Photos

Ryerson University Student Center

Toronto, Canada

Bird-friendly Glass, Patterned, Frit Markers, Patterned, Surface 1

View Photos

OVO Athletic Centre

Toronto, Canada

Bird-friendly Glass, Patterned, Etched Surface, Patterned, Surface 1

View Photos

https://abcbirds.org/glass-collisions/photo-gallery/

AMERICAN BIRD CONSERVANCY

Search Criteria

Are you a building professional or inte

-Choose One-

Product Listing

Viracon Screen 5620

Viracon

Threat Factor: 20

Prescriptive rating

ABC Approved: Yes **Marker Type:** Horizontal Stripe **Product Line:** Bird Friendly Glass

View More Info

Arnold Glas ORNILUX design chrome dots 9-X face 2

Arnold Glas

Threat Factor: 20

ABC Approved: Yes **Marker Type:** chrome markers **Product Line:** Ornilux

View More Info

TECGLASS: Dot Pattern

TECGLASS

Threat Factor: 20

Staggered array, 12.5 mm diameter dots, diagonal distance 50.4 mm

ABC Approved: Yes **Marker Type:** Dot Pattern **Product Line:** Ceramic Print

View More Info

Saint-Gobain 4Bird 4BF-5

Saint-Gobain

Threat Factor: 20

6 mm horizontal lines, spaced 2" (50mm - Frit design on face #2 - Coatings are behind the Frit patterns - Overal outdoor Reflection association of SG Coatings are <15% - Prescriptive evaluation BSBA

ABC Approved: Yes **Marker Type:** Horizontal Stripe **Product Line:** 4Bird

View More Info

Arnold Glas ORNILUX design chrome lines 5/95 face 2

Arnold Glas

Threat Factor: 20

vertical 5 mm stripes spaced 95 mm apart

Product Listing

Glass: Stained with External Insulation

Any

Threat Factor: 40

Prescriptive evaluation

ABC Approved: No **Cost Per Square Foot:** **Marker Type:** None

View More Info

Viracon Screen 5065 Color V951

Viracon

Threat Factor: 41

Tunnel tested at Carnegie Museum's Powdermill Avian Research Center

ABC Approved: No **Marker Type:** Dot Pattern **Product Line:** Bird Friendly Glass

View More Info

Walker Glass: Aviprotek® Pattern 713

Walker Glass Company

Threat Factor: 42

Horizontal 4 mm UV lines, 2" apart

ABC Approved: No **Marker Type:** UV Pattern **Product Line:** Aviprotek®

View More Info

Steel, Polished, mirror finish #8

Any

Threat Factor: 100

mirror: not bird-friendly; prescriptive rating

ABC Approved: No **Marker Type:** ASTM: Finish 8

View More Info

saflex

ASK AN EXPERT

EN

Saflex® FlySafe™ 3D

Bird friendly made beautiful

Countless birds die each year from collisions into windows and buildings with glass facades. An increasing number of cities are enacting regulations to address this problem. For example, in late 2019, the New York City Council passed a regulation to ensure that all new buildings include bird-friendly glass solutions. Similar measures are being adopted around the world.

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提供/欣昭實業股份有限公司

DIY

在菱形網的網格中間，
貼上標籤貼或油漆筆畫
上清晰圓點。

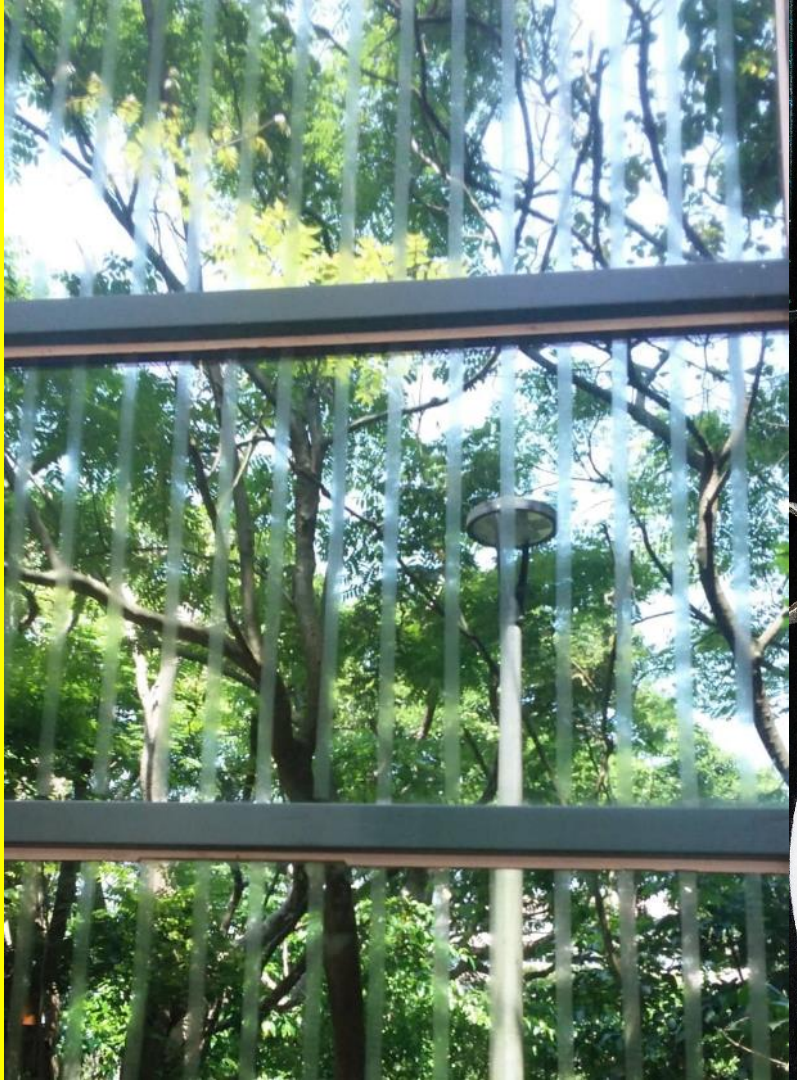

국민이 새를 살리는
5×10 점찍기
유리창에 5cm×10cm 규칙으로 8m 이상의
점을 아크릴물감으로 그리면 됩니다.
주의할 점은 반드시 건물 외부에 적용해야
합니다. 실내에 점을 찍을 경우, 외부
풍경의 반사는 막을 수 없습니다.

DIY

可畫

可貼

八里國中師生設計友善鳥類窗貼材料包




WILDLIFE MANAGEMENT
STRIKE OUT
防鳥撞圖貼 20mmX40m
NO MORE COLLISION-BIRD FRIENDLY
USES OF OUTDOORS

台中市國光國小客製化窗貼

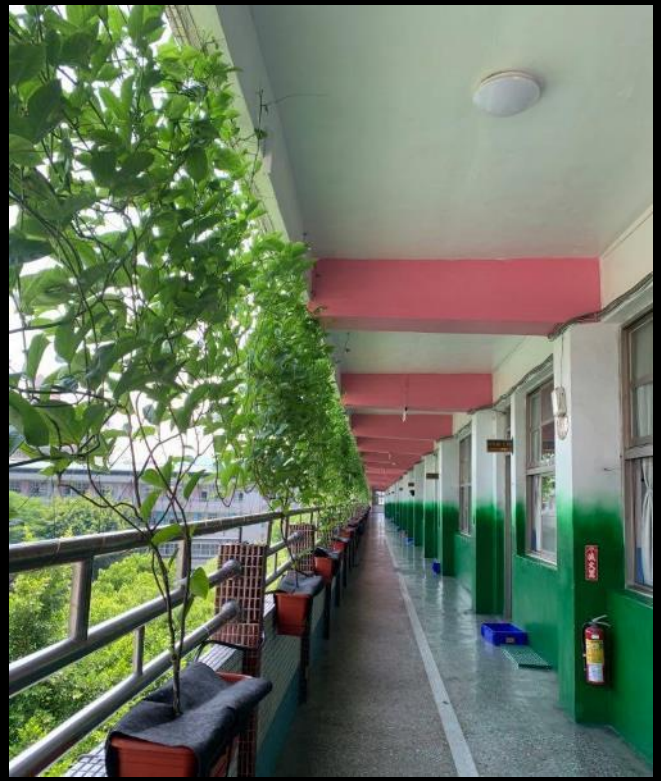
台北市立動物園展場之客製化窗貼

台北市捷運麟光站連通道之客製化窗貼


Hypsipetes leu
領角鴞
Otus lettia

私人餐廳戶外鏡面用懸掛繩子方式預防窗殺

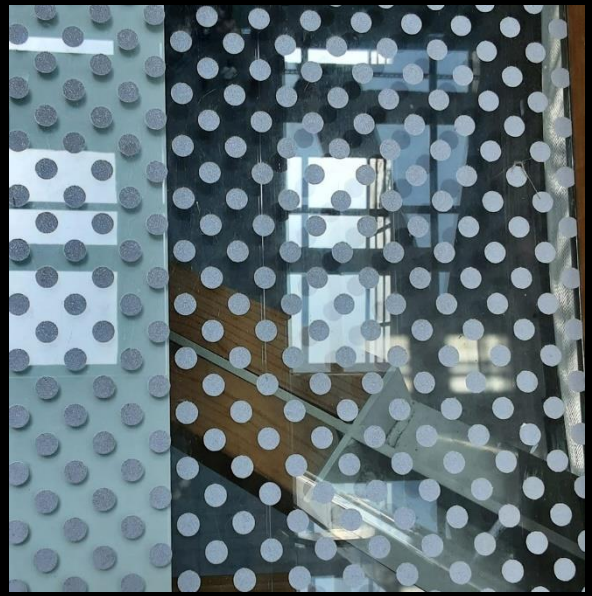
網友甄士隱提供



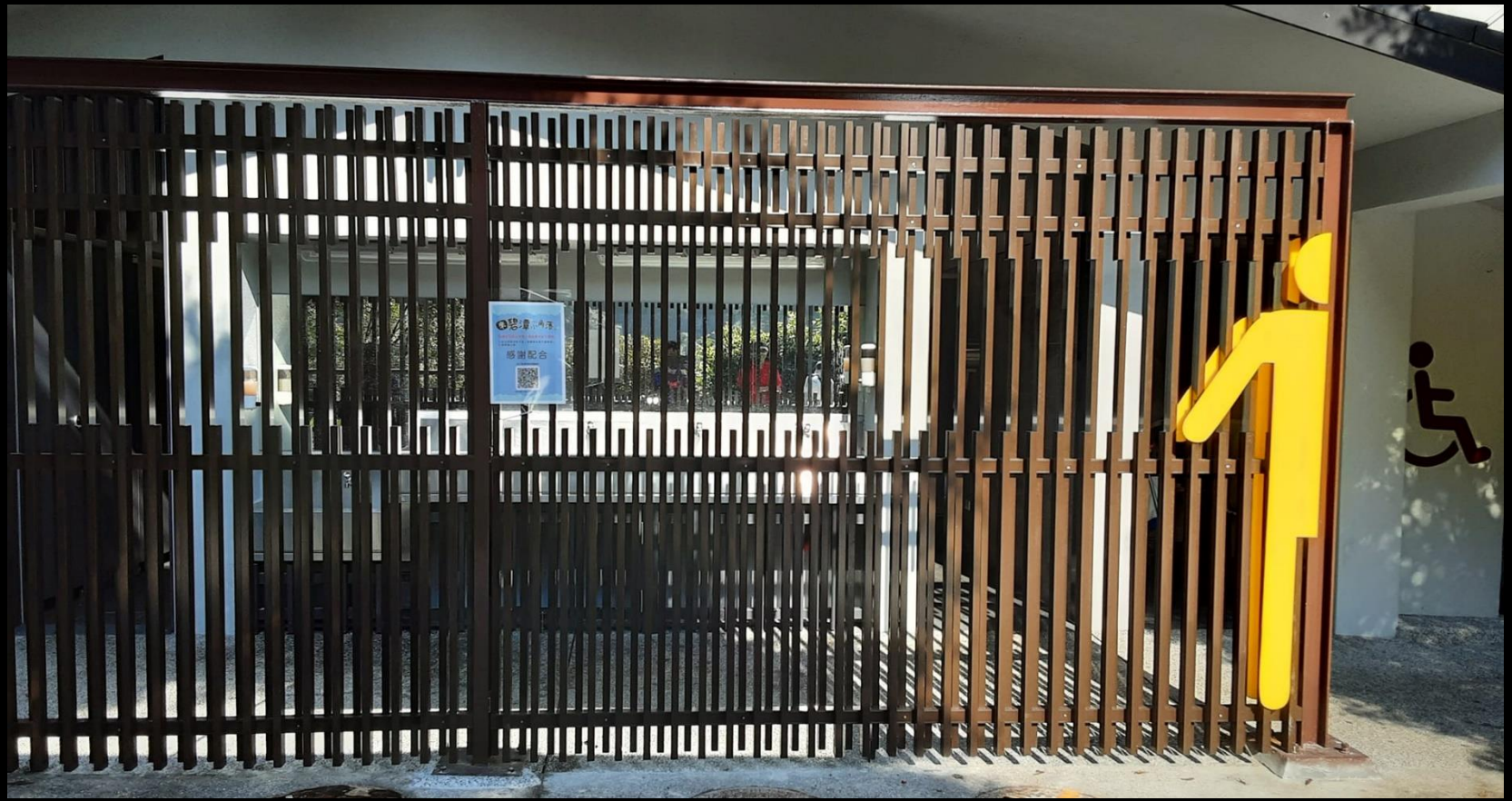
綠籬遮蓋玻璃/ 新北民安國小走廊種植爬藤植物

公車貼、
洞洞貼

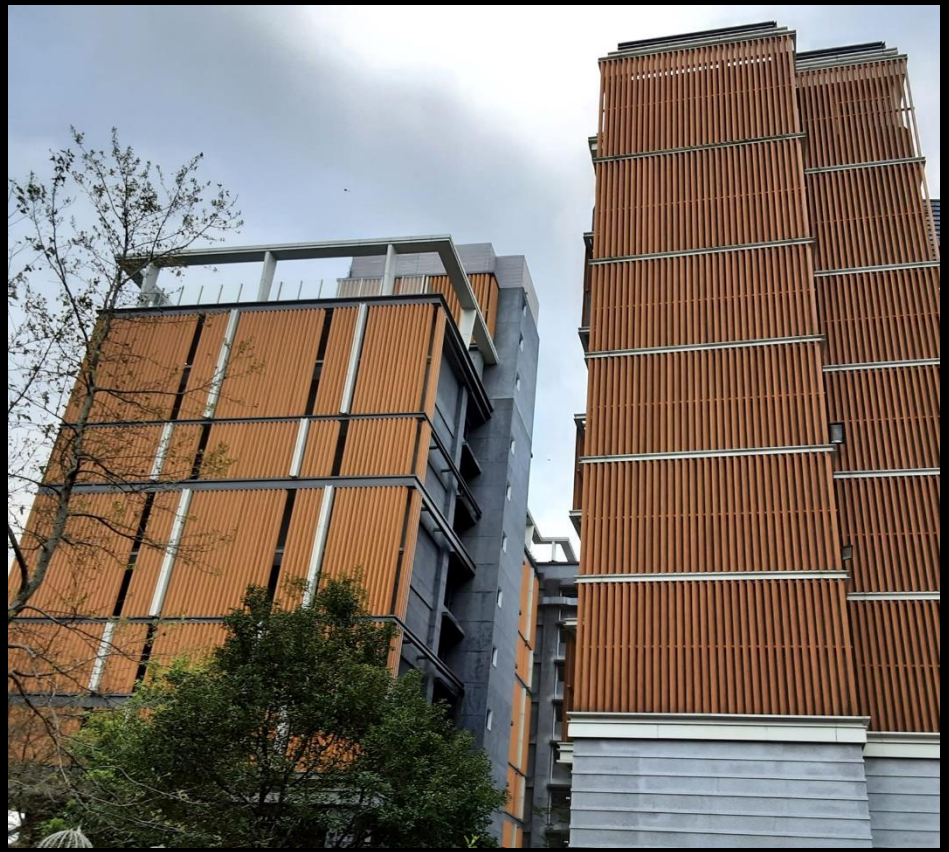
外側為不透明視覺、內側仍有部分可穿透視覺。

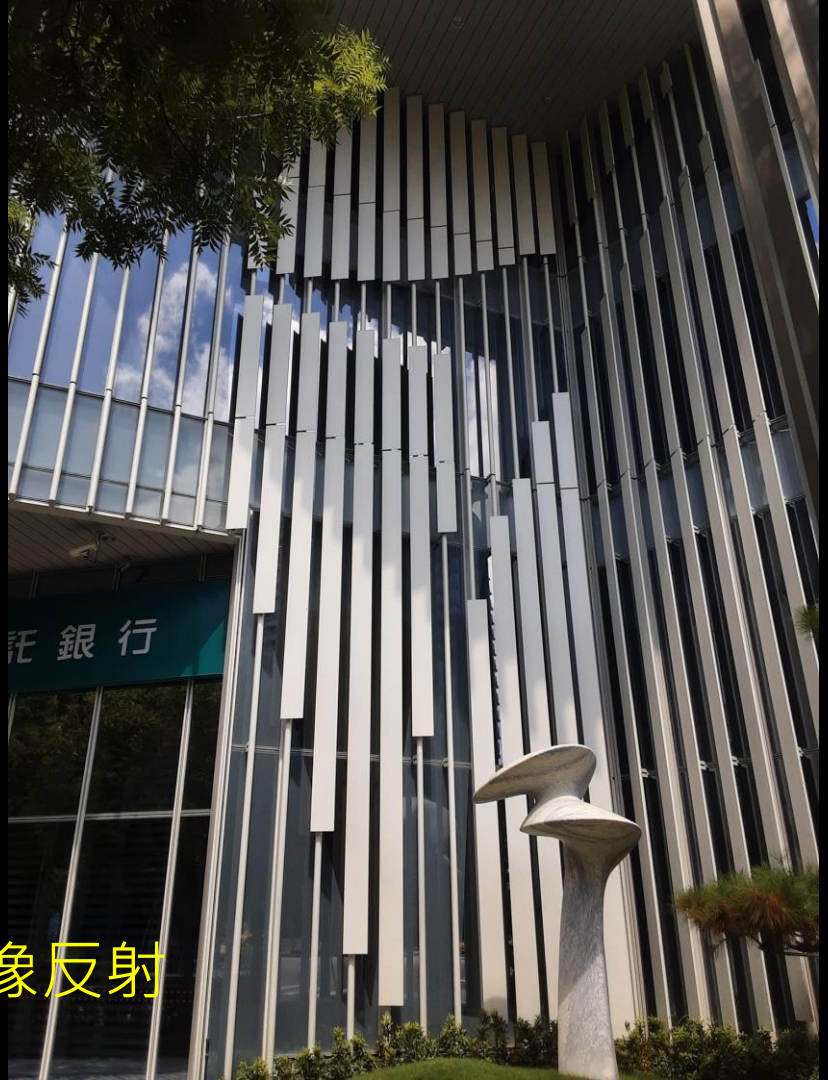


各種雕花、密集蝕刻、馬賽克、外側霧面玻璃與鐵花窗等
都是友善鳥類建材

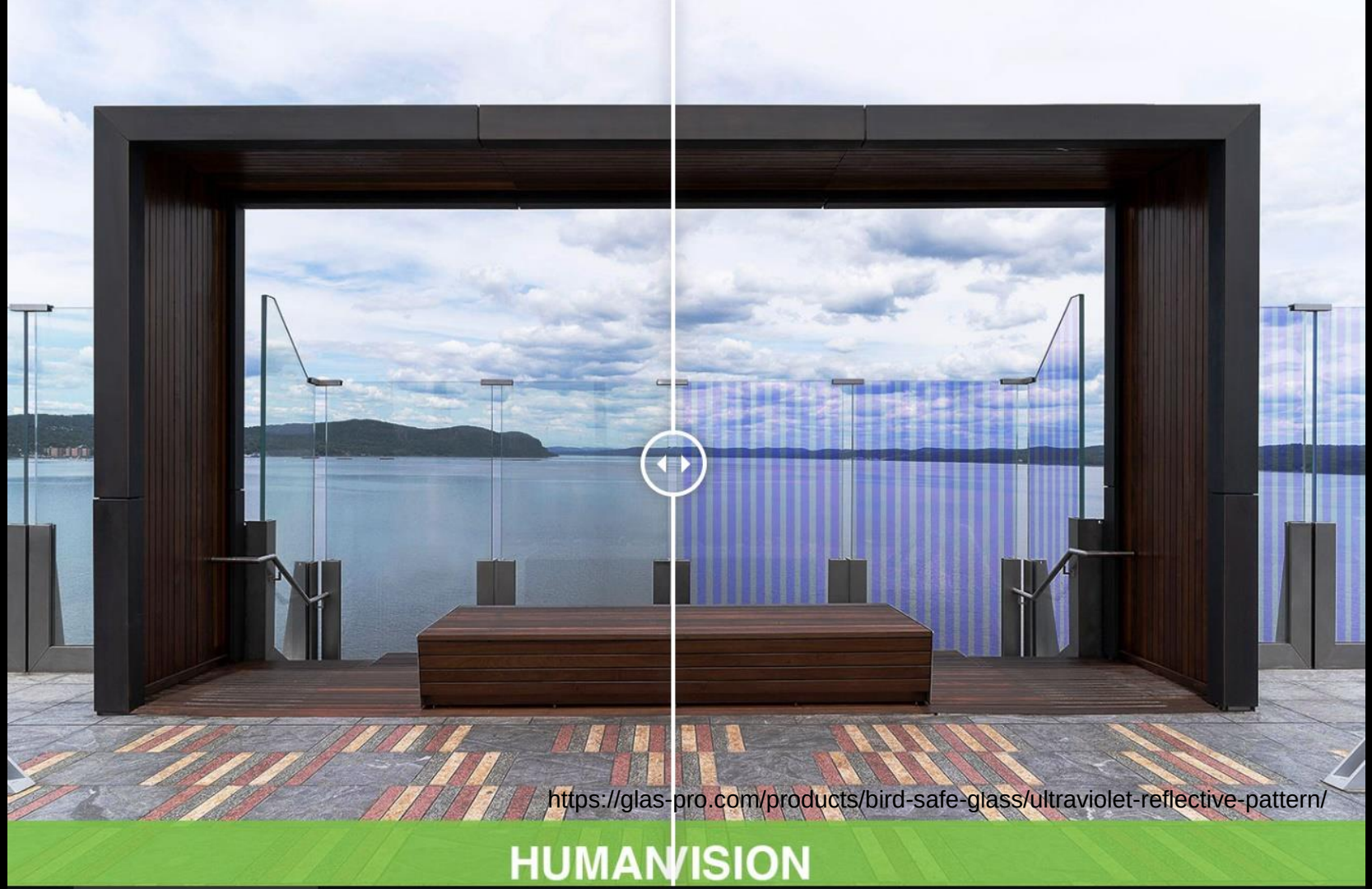


公廁鏡子外側以柵欄設計分割鏡像反射畫面





也可透過建物的設計來分割玻璃鏡像反射


https://glas-pro.com/products/bird-safe-glass/ultraviolet-reflective-pattern/
HUMANVISION

While some internal fritted glass patterns can be overcome by reflections, Frank Gehry's IAC headquarters in Manhattan is so dense that the glass appears opaque. Photo by Christine Sheppard, ABC

Ornilux Mikado's pattern reflects UV wavelengths. The spiderweb effect is visible only from very limited viewing angles. Photo courtesy of Arnold Glass

Asia, but is being offered by an increasing number of manufacturers in the United States. New technologies allowing printing of ceramic inks on the outside surface of glass may greatly increase options for bird-friendly design in the U.S.

More commonly, frit is applied to an internal surface of insulated glass units. This type of design may not be visible if the amount of light reflected by the frit is insufficient to overcome reflections on the outside surface of the glass or if frit is applied as dots below the visual threshold of birds. Some internal frits may only help break up reflections when viewed from some angles and in certain light conditions. However, with the right combination of surface reflectivity and frit application, a pattern on an inside surface can still be effective. The headquarters of the internet company IAC in New York City, designed by Frank Gehry, is composed entirely of fritted glass, most of high density and always visible. No collision mortalities have been reported at this building after two years of monitoring by New York City Audubon

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visible to birds" are frequently suggested as the optimal solution for many bird collision problems, but few such products are available commercially as of 2015. Progress in development of bird-friendly UV glass has been slow, but with legislation in multiple locations mandating bird-friendly design, glass manufacturers and distributors, as well as window-film manufacturers, are taking an active role in developing new solutions for this application. Research indicates that UV patterns need strong contrast to be effective, especially in the early morning and late afternoon, when UV in sunlight is at low levels. However, UV patterns may be ineffective for many species that have been reported as victims of collisions with glass, including hummingbirds, flycatchers, American Woodcock, and woodpeckers.

Opaque and Translucent Glass

Opaque, etched, stained, or frosted glass and glass block are excellent options to reduce or eliminate collisions, and many attractive architectural applications exist.

香港野生雀鳥保育關注組（Hong Kong Wild Bird Conservation Concern Group）· 追蹤

5月5日下午11:17 ·

#UV壓花玻璃

鳴禽、海鷗、鸚鵡等鳥種可以看到 #紫外線（#UV）光譜，但部分鳥類，包括 #猛禽、#翠鳥、#蜂鳥 和 #白鴿 對 #紫外線則不太敏感。

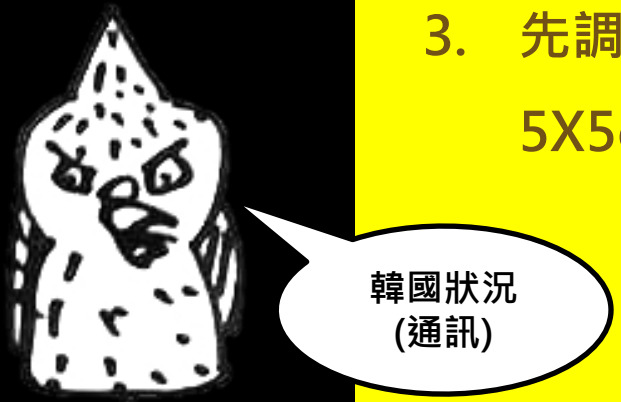
有研究表明，這種UV壓花玻璃需在紫外線強度高時，圖案才會明顯，而在 #清晨及黃昏，#紫外線強度在低水平時，這種紫外線圖案便會不明顯。

另外在美國發現UV壓花玻璃對多種經常發生鳥撞的鳥種，包括：蜂鳥，鶲、美洲山鷸和啄木鳥均無效。

韓國窗殺調查

「5X10cm原則布置真的有效嗎？」

1. 金永隼 獸醫師 Dr. YoungJun Kim
   Director, Division of Zoological Research and Management, National Institute of Ecology (國立生態院)
2. 2017/11~2019/11 調查隔音牆每2週3次。
3. 先調查一年後，再將樣區南側隔音牆一半貼上5X5cm間隔點狀圖，再調查一年比較。



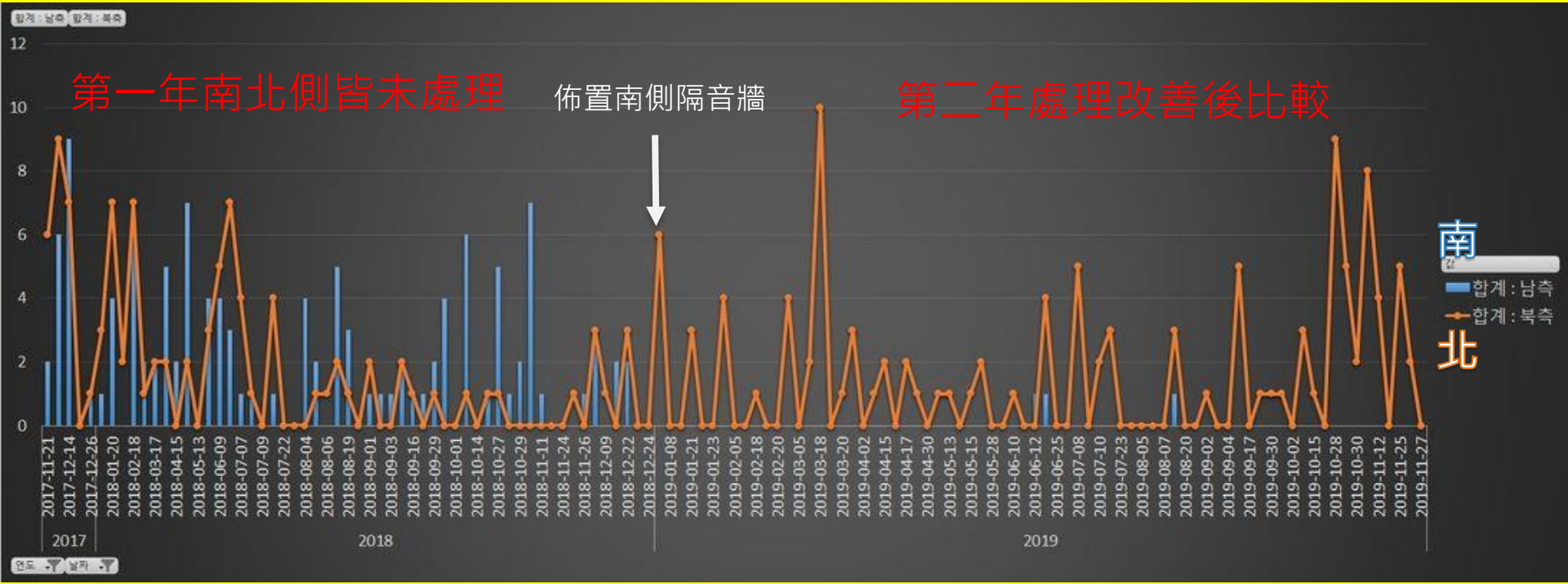
圖片來源：韓國野鳥窗殺FB社團/ 야생조류 유리창 충돌


將隔音牆分南側與北側


南側佈置5X5cm間格點陣圖
LEE&BRICKS


北側未做任何處理

實驗結果



以5x5cm點陣圖佈置隔音牆之窗殺案件減少九成以上

遇到窗殺鳥類如何處理?

鳥類存活

- 用紙箱安置。
- 記錄撿拾時間、地點等相關資訊並拍照。
- 連絡相關單位處理救傷(如台北鳥會、桃園鳥會等)。
- 回報野鳥窗傷記錄。

鳥類死亡

- 裝進雙層夾鏈袋/塑膠袋包好。
- 記錄撿拾時間/地點等資訊&拍照。
- 連絡相關單位冷凍寄送(如特生中心)或直接送交猛禽會。
- 腐爛或無法寄送可就地掩埋。
- 回報野鳥窗殺記錄。

記得保護自己，盡量不要徒手碰觸鳥兒，

處理後記得**勤洗手**！

撞窗影像挑戰

路殺社回報

窗殺博物館

野鳥撞玻璃回報

#友善鳥類建物
#窗殺不再發生

國內綠建築真的「綠」嗎?

usgbc.org/credits/new-construction-core-and-shell-schools-new-construction-retail-new-construction-data-41

Our work LEED Professionals Education Membership

LEED BD+C: New Construction • v4 - LEED v4

Bird collision deterrence

Pilot credits

SSpc55 | Possible 1 Points

Table 1: General material types: threat potential

	Material Type
Greatest Threat Potential	Glass: Highly reflective and/ or completely transparent surface
Less Threat Potential	Glass: Reflective or transparent surface interrupted by a visible pattern or shielded by screens, shutters, or louvers where the resultant exposed glass satisfies the 2 x 2 Rule*.
Least Threat Potential	Glass: Translucent with matte or textured surface
No Threat	Opaque, non-reflective surface

*The 2 x 2 Rule is defined as a collision deterrence module based upon the physical profile of a bird in flight. Current research has established maximum module dimensions of 2" high x 2" wide for effective visual markers.

[redacted]

5月14日 ·

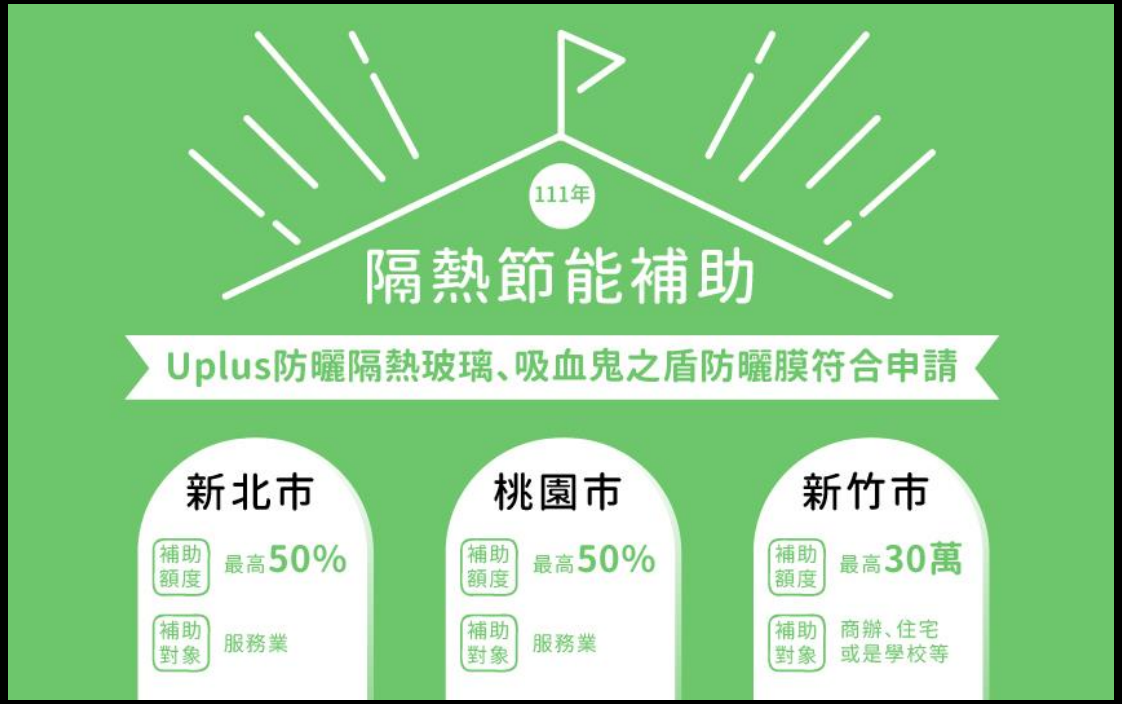
發現者與記錄者：[redacted]
日期：2023/05/10
地點：政大邊緣圖書館湖濱小屋二樓
物種：五色鳥
撞玻璃後自行飛走

附註：
拍攝於湖濱小屋佈置防撞貼紙前，再次證明只貼猛禽貼紙無效。

2023/05/12
與本校同學一同施作防撞佈置
（由於玻璃面積過大，之後會再把貼紙都補完）
施作成果記錄者：張心馨

https://playing.ltn.com.tw/article/19087/1


3M 科技改善生活™
省很大
台北市貼建築隔熱膜
最高補助 30,000元
112年9月18日起至11月30日止
(名額有限，先搶先贏)
10 YRS
最高十年保固
3M 極景 PR40/50/60/70 符合節能補助規範
隔熱降溫
室內有效溫差↓7.1℃
節能省電
全年省電最高↑28.1%
超強防曬
最高抗UV ↑99.9%


111年
隔熱節能補助
Uplus防曬隔熱玻璃、吸血鬼之盾防曬膜符合申請
新北市
補助額度 最高50%
補助對象 服務業
桃園市
補助額度 最高50%
補助對象 服務業
新竹市
補助額度 最高30萬
補助對象 商辦、住宅或是學校等

從建物設計、政策或法律來規範

buildings
2020-022
bulletin
TECHNICAL

ISSUANCE DATE
November 27, 2020

NYC Buildings

ISSUER: Gus Sirakis, P.E
First Deputy Commissioner

PURPOSE: Clarify applicability, design and filing requirements necessary to show compliance with Local Law 15 of 2020

SUBJECT(S): Local Law 15 of 2020, Bird Friendly Building Design and Construction Requirements, Bird Friendly Material, Exterior Wall Envelope, Fly Through Condition, Glazing, Green Roof System, Bird Hazard Installation, Threat Factor

RELATED CODE SECTIONS: BC 107, BC 107.6, BC 1403.8, AC 28-101.4.3, AC 28-103.36

I. Background

Local Law 15 of 2020 will become effective January 10, 2021. This local law establishes new requirements for installation of bird friendly materials in new design and construction, as well as alterations to buildings that include the replacement of all exterior glazing. Additionally, this local law mandates that bird friendly building design and construction requirements and information about compliance with Section BC 1403.8, be posted on DOB's website.

This Bulletin clarifies requirements set forth in LL 15 of 2020 and makes reference to the **Bird Friendly Building Design and Construction Requirements Guidance Document**, which outlines bird friendly building design and construction requirements and information about compliance with Section BC 1403.8. The bulletin clarifies the types of exterior glazing which are subject to the local law, the scope of work in new and existing buildings that trigger compliance, and defines terms used in the local law but not defined in the Building Code. The **Bird Friendly Building Design and Construction Requirements Guidance Document** was developed through a collaborative approach between the Department and members of the design, manufacturing, development and bird conservancy community. The guidance document further provides useful terms and associated commentary, elaborates on applicability as it applies to Bird Hazard Installations and provides figures, pictures and commentary to assist the designer, building owner and glazing manufacturer in understanding where Bird Friendly Material installation is required, how to verify a Threat Factor for a glazing assembly as well as how to obtain a Threat Factor for an assembly that has not yet been evaluated. The guidance document is located at **https://www1.nyc.gov/assets/buildings/bldgs_bulletins/bird_friendly_guidance_document.pdf**.

II. Applicability

Applicability to Existing Buildings

Certain alterations to existing buildings filed on or after January 10, 2021 are subject to the requirements of LL 15 of 2020 regardless of the use or occupancy of the building. Applications for approval of construction documents filed in the Buildings Information System (BIS) that have not reached job status D (application processed – completed) or greater as of January 10, 2021, will be subject to the requirements of LL15 of 2020. Applications filed in DOB NOW that have not reached a status of *Pending CPE/ACPE Assignment* or *Pending Prof Cert QA Assignment* as of January 10, 2021, will be subject to the requirements of LL15 of 2020.

Existing buildings will not be subject to the requirements of Local Law 15 of 2020, except where the scope of an alteration triggers compliance as described below. For the purpose of this bulletin, exterior glazing shall be

Mandatory Ordinances (Laws)

- Alameda, California (USA)
- Cook County, Illinois (USA)
- Emeryville, California (USA)
- Highland Park, Illinois (USA)
- Howard County, Maryland (USA)
- Illinois (State) (USA)
- Madison, Wisconsin (USA)
- Minneapolis, Minnesota (USA)
- Minnesota (State) (USA)
- Mountain View, California (USA)
- **NEW YORK CITY, NEW YORK (USA)**
- Oakland, California (USA)
- Palo Alto, California (USA)
- Portland, Oregon (USA)
- Richmond, California (USA)
- San Francisco, California (USA)
- Santa Cruz, California (USA)
- San Jose, California (USA)
- Toronto, Ontario (Canada)

WHAT ABOUT VOLUNTARY MUNICIPAL GUIDELINES???

https://www.youtube.com/watch?v=69LiMbvuU3g

강홍구
2022年8月12日 ·

우리나라 조류 유리창 충돌 저감의 경제적 혜택 분석 최근 연구가 있어 공유합니다. 2018년 국립생태원 연구보고서의 추정 통계치에 기반하고 1,000 가구를 대상으로한 선택실험(Choice Experiment)조사를 통해 경제적 가치를 환산한 것 같습니다. 고속도로(7%), 도로(4%), 공공건물(1%), 개인건물(0.1%)의 저감 시나리오에서 연간 1천 5백억 원의 경제적 혜택이 발생한다고 연구자들은 추정하고 있습니다.

翻譯年糕

LINK.SPRINGER.COM

Economic benefits of preventing bird collisions in South Korea: findings from a choice experiment survey - Environmental...

Bird deaths due to collisions with artificial structures, such as glass windows of buildings and transparent noise barriers, are continuing to occur in South Korea. The government is trying to prevent bird collisions by increasing the attachment of specially designed tapes to help birds avoid window...

野鳥撞玻璃回報 (Reports on Bird-Glass Collisions)

Wang Ling-Min
管理員 最常發言的成員 · 10月19日下午5:56 ·

訊騰科技公司在他們的大樓玻璃貼上點陣圖以防止野鳥窗殺，希望台灣的企業也能跟上野鳥窗殺防治的腳步。

#CSR_ESG_SDGs
#窗殺在中國稱鳥撞

https://twitter.com/...../status/1714438079254315175.....

Wild Beijing 北京自然
@BirdingBeijing
Following

Wow! Tencent, China's (and Asia's) largest tech company attaches special film to the glass windows of its headquarters in Shenzhen to tackle bird collisions with glass, one of the most avoidable sources of biodiversity loss. @MelissaBreyer See: mp.weixin.qq.com/s/ZG1DZ53ilcud...

8:27 PM · Oct 17, 2023 · **2,774** Views

SUSTAINABLE DEVELOPMENT GOALS

1 消除貧窮

2 消除飢餓

3 健康與福祉

4 優質教育

5 性別平等

6 淨水與衛生

7 可負擔能源

8 就業與經濟成長

9 工業、創新基礎建設

10 減少不平等

11 永續城市

12 責任消費與生產

13 氣候行動

14 海洋生態

15 陸地生態

16 和平與正義制度

17 全球夥伴

SUSTAINABLE DEVELOPMENT GOALS

※此表由CSRone永續智庫翻譯與製作

1. 紐約州友善鳥類建築法案與指南：
https://www.aiany.org/news/bird-friendly-glass-passes-nyc-city-council/
https://www1.nyc.gov/assets/buildings/bldgs_bulletins/bb_2020-022.pdf
https://www.nyc.gov/assets/buildings/bldgs_bulletins/bird_friendly_guidance_document.pdf

2. LEED #55/ Bird collision deterrence:
https://www.usgbc.org/credits/new-construction-core-and-shell-schools-new-construction-retail-new-construction-data-42?return=/credits/New%20Construction/v4.1

3. 美國鳥類保護協會窗殺防治網頁(內有友善鳥類建築物指南)：
https://abcbirds.org/glass-collisions/

4. FLAP/ 加拿大窗殺研究團體建議指南:
https://flap.org/stop-birds-from-hitting-windows/?fbclid=IwAR1k-loXdPiuY-J3n9f42mJ_c8vFGkE1YQ7f08SCfk1LgJoMcLf1e2pQE3E

5. 加拿大的友善鳥類建築標準指南 Canadian Standards Association's 2019 A460 Bird-Friendly Building Design (2019):
https://birdsafe.ca/design-standards/

6. 波蘭窗殺防治指南(2021英文版)：
https://swip-pta.com/wp-content/uploads/2021/10/Poradnik_Ochrona_ptakow_ENG.pdf

7. American Bird Conservancy線上演講介紹美國近期的窗殺與防治狀況
Bird Collisions 101: Making Your Home and Community Safer for Birds - ABC Webinar
https://www.youtube.com/watch?v=69LiMbvuU3g

延伸閱讀/各國窗殺防治指南與法案