2024臺灣陸域爬行類紅皮書名錄

The Red List of Terrestrial Reptiles of Taiwan, 2024

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目錄

Contents

封面照片 /

Cuora flavomarginata
食蛇龜
Yellow-margined Box Turtle
NCR A2cdB2b(ii,iii,iv,v)c(iv)
林德恩 / 攝

目錄照片 /

Diploderma brevipes
短肢攀蜥
Short-legged Japalure
NLC
林德恩 / 攝

2024 臺灣陸域爬行類紅皮書名錄

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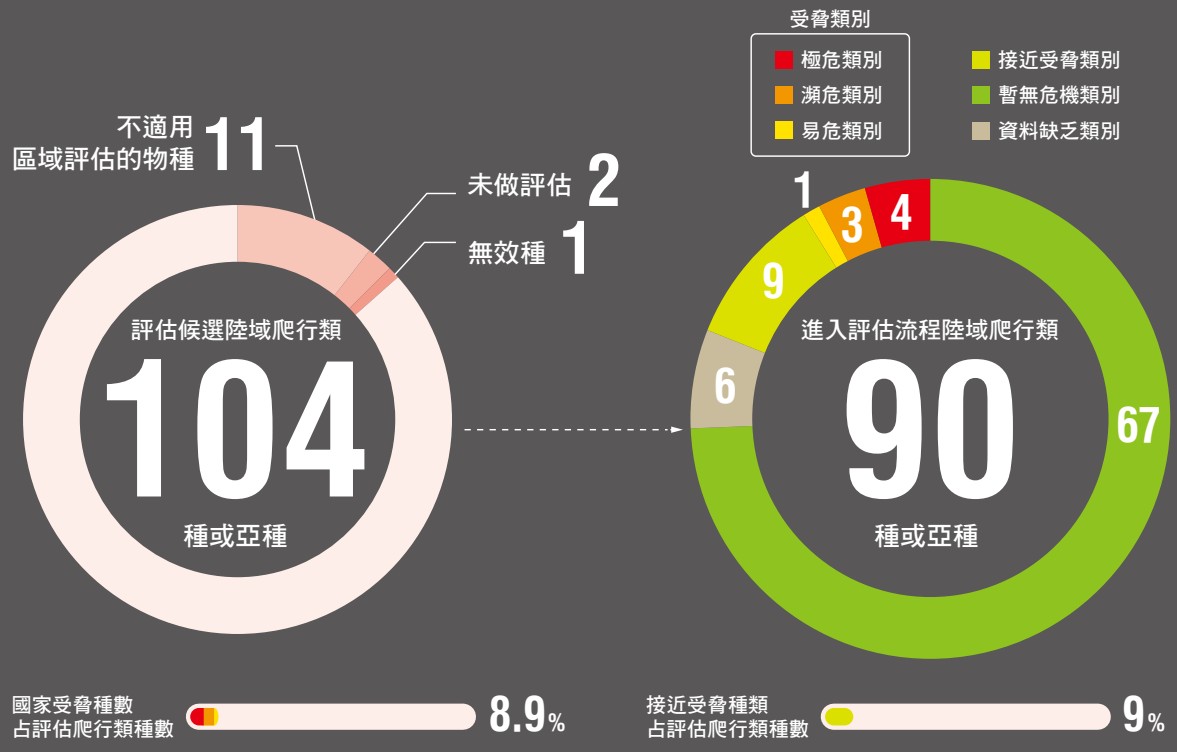
摘要

地球正面臨第六次生物大滅絕，想要減緩甚至扭轉生物受到的生存威脅，在人力資源和經費有限下，制定保育行動的優先性有其必要。為此定期依分類學、受脅情況和族群研究評估各類物種滅絕風險就至關重要。本報告為臺灣第 2 次依據國際自然保育聯盟 (International Union for Conservation of Nature, IUCN) 建議類別與標準對所有臺灣陸域爬行類動物進行國家陸域爬行類紅皮書名錄評估。本次報告中納入評估候選的陸域爬行類共有 104 種，其中 11 種外來入侵種被評定為不適用 (Not Applicable) 於區域評估，2 種未做評估 (Not Evaluated) 並刪除 1 種無效種，總計共有 90 種陸域爬行類進入評估流程。在臺灣國家受脅 (Nationally Threatened) 爬行類中，有 4 種屬於國家極危 (Nationally Critically Endangered) 類別，3 種為國家瀕危 (Nationally Endangered) 類別，以及 1 種國家易危 (Nationally Vulnerable) 類別，以上共 8 種受脅物種，占本次所有進入評估爬行類種數的 8.9%。其餘 82 種爬行類中，9 種屬於國家接近受脅 (Nationally Near-threatened) 類別，67 種屬於國家暫無危機 (Nationally Least Concern) 類別，6 種資料缺乏 (Data Deficient)。本報告相較於 2017 年的臺灣陸域爬行類紅皮書名錄新增了中國小頭蛇、龜山壁虎與梅氏壁虎，但在此次評估皆歸類於資料缺乏。23 種原屬於資料不足類別，本次已重新評定於其他紅皮書類別中。因獲得新文獻和資料重新詮釋，有 4 種滅絕風險提高而提升其紅皮書類別，金龜則因臺灣本島近百年來的族群與記錄確定非原生種，屬於外來引入和再消失，因而降低其滅絕風險為國家瀕危。未來仍需定期檢視最新研究報告與各方資料，以了解紅皮書類別的變動，是因不同時期所蒐集到生態背景資訊不同所致，或是物種真實受脅狀態改變的結果。



1. 前言

由 IUCN 物種存續委員會 (Species Survival Commission) 負責的 IUCN 紅皮書名錄 (IUCN Red List of Threatened Species)， 自 1964 年開始發布以來，已逐步成為評估全球物種保育狀況與變化趨勢最重要的參考依據 (Rodrigues et al. 2006; IUCN Standards and Petitions Committee 2024)，另其類別 (圖 1) 及評估標準 (criteria) (IUCN 2012b)，乃至後續發布的 IUCN 紅皮書名錄地區及國家級評估標準應用指南 (IUCN 2012a)，亦成為許多國家評估其國境內受脅物種名錄的首要參考依據 (Townsend et al. 2007)。藉此標準化的評估方法，不僅有助於各國立法與執法，也讓全球紅皮書評估涵蓋的物種更加完整 (Rodrigues et al. 2006)。

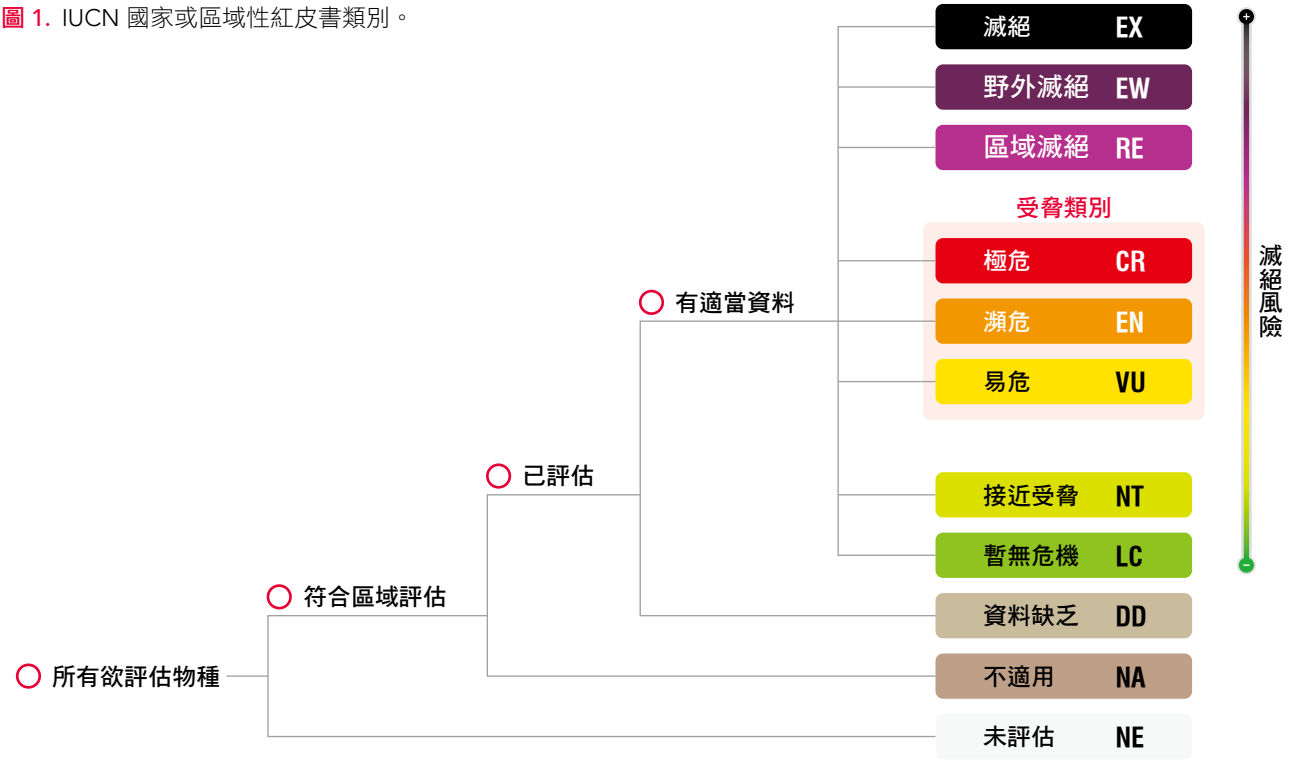
相較於兩棲類、鳥類和哺乳類動物在全球尺度和地方保育優先事項的了解與擬定，同為四足動物且物種多樣性占全球陸生脊椎動物將近三分之一的爬行類，其全球分布與受脅狀況卻是相對所知有限，不但阻礙了爬行類動物納入的保育規劃，也影響了全球陸生脊椎動物多樣性保育的成效，甚至可能在保育優先策略上產生偏差。這個困境在 2017 年 Roll 等 39 位學者合作，共同發表了全球 10,064 種爬行類 (占已知物種 99% 以上) 的全球分布模式及多樣性熱點後 (Roll et al. 2017)，彌補了全球生物多樣性保育優先策略考量不足之處。而後 Cox 等學者也在該研究基礎下，於 2022 年首次完成了近乎全球所有爬行動物全面性的滅絕風險評估 (10,196 種)，受脅情況不若兩棲類 (40.7%) 和哺乳類 (25.4%) 嚴重，但高於鳥類 (13.6%)，其中至少 1,829 個爬行類物種 (21.1%) 受到威脅 (包含極危、瀕危與易危類別)，和其他四足動物相同，爬行類受到的主要威脅同樣來自農業、伐木、城市發展和入侵物種 (Cox et al. 2022)。

Mauremys mutica
柴棺龜 Yellow Pond Turtle
NCR A2cdeB2b(ii,iii,iv)
陳惇聿 / 攝

Rhabdophis formosanus
臺灣赤煉蛇 Formosan Tiger Keelback
NLC
林德恩 / 攝

臺灣陸域爬行類物種的紅皮書評估作業，是 2015 年由農業部林業及自然保育署與農業部生物多樣性研究所共同推動，雖然當時的爬行類資料極度缺乏，2017 年仍首次發布了以臺灣為尺度的第一版臺灣陸域爬行類紅皮書名錄。近年來由於臺灣生態環境的快速變化，再加上公民科學的參與和推動，爬行類的分布點位資料得以大量且快速累積 (包含路死及活體目擊記錄)，許多物種的分類地位也被重新歸屬或新種發表，實有必要再以臺灣的地理層級角度，對所有陸域爬行類動物的滅絕風險重新進行評估與檢視。

圖 1. IUCN 國家或區域性紅皮書類別。



2. 評估流程

本報告之臺灣陸域爬行類受脅狀態的評估流程與方法簡述如下：

2.1 界定納入評估之分類單元

本報告評估的範圍為臺灣及所屬各離島的陸域爬行類物種，並以 2024 爬行類資料庫 (2024 The Reptile Database) 的學名及分類為依據 (Uetz et al. 2023)，再參酌 IUCN 2024 Red List 及 2024 臺灣物種名錄 (Catalogue of Life in Taiwan 2024, TaiCOL)，本次所有納入評估候選的爬行類共 104 種。依據 IUCN 紅皮書名錄地區及國家級評估標準應用指用的建議流程，排除 11 種外來入侵種，包含大守宮 (*Gekko gecko*)、白枕白環蛇 (*Lycodon capucinus*)、多線真稜蜥 (*Eutropis multifasciata*)、沙氏變色蜥 (*Anolis sagrei*)、紅耳泥龜 (*Trachemys scripta elegans*)、脊斑壁虎 (*Gekko monarchus*)、密疣蝎虎 (*Hemidactylus brookii*)、疣尾蝎虎 (*Hemidactylus frenatus*)、高冠變色龍 (*Chamaeleo calyptratus*)、綠水龍 (*Physignathus cocincinus*) 及綠鬣蜥 (*Iguana iguana*) 等 (Lee et al. 2019; 游崇瑋 2021)，屬不適用 (Not Applicable，NA) 區域評估的分類單元；另刪除無效種羽鳥氏帶紋赤蛇 (*Sinomicrurus hatori*)(Smart et al. 2021)，目前分類地位未明的排灣腹鏈蛇 (*Hebius sp.*) 和現存狀態不明的恆春大盲蛇 (*Argyrophis koshunensis*) 未評估 (Not Evaluated, NE)，最後計有 90 種爬行類進入評估流程。

2.2 資訊蒐集與初步評估

完成評估對象篩選後，則依照 IUCN 評估標準所需資訊 (IUCN Standards and Petitions Committee 2024)，廣泛蒐集各分類單元之學術報告、研究報告、資料庫或相關專家意見等資訊，製作成資料表。然後在彙整表中，填入生態數據，並標註引用資料的來源與說明。

每一受評分類群均依照 IUCN 紅皮書名錄類別與標準使用指南：16 版進行評估 (IUCN Standards and Petitions Committee 2024)。評估流程係由包括：A. 快速族群下降 (Rapid population reduction)、B. 分布侷限、碎裂化，同時存在族群下降或嚴重波動 (Small range and fragmented, declining, or extreme fluctuations)、C. 小族群且持續下降 (Small population and declining)、D. 非常小且分布侷之族群 (Very small or restricted population)，以及 E. 量化分析 (Quantitative analysis) 等五大標準及對應之次級標準 (Sub-

Diploderma polygonatum xanthostomum
黃口攀蜥 Ryukyu Japalure
NLC
林德恩 / 攝

criterion) 及資格限制 (Qualifiers) 所構成之決策樹 (logic tree) 進行 (表 1)。每個分類單元都會依所有準則進行評估，只要符合任一條準則者，即列入受脅物種的類別，並在文件報告中列出符合類別的準則及對應之次準則。某一物種經過評估後，無法符合國家極危 (Nationally Critically Endangered, NCR)、國家瀕危 (Nationally Endanered, NEN) 及國家易危 (Nationally Vulneable, NVU) 的類別，但已很接近或未來可能達到國家易危類別時，可列入國家接近受脅 (Nationally Near-threatened, NNT) 類別。

Mauremys sinensis
斑龜 Chinese Striped-necked Turtle
NNT A2cdeB2b(ii,iii,iv)
林德恩 / 攝

表 1. IUCN 紅皮書受脅 (極危、瀕危、易危) 及接近受脅類別評估標準簡要內容。修正自 IUCN Standards and Petitions Committee (2024).

受脅類別判斷標準 A-E	極危 (CR)	瀕危 (EN)	易危 (VU)	接近受脅 (NT)
A. 族群量下降 (時間區間為 10 年或 3 個世代，以較長者為準)				
A1	≥ 90%	≥ 70%	≥ 50%	≥ 30%
A2, A3 & A4	≥ 80%	≥ 50%	≥ 30%	≥ 20%

A1. 經由以下列舉任何方式所觀察、推估、推測或懷疑物種族群下降已經發生，而造成下降的原因明顯是可逆的且原因已知並且停止：
- (a) 直接觀察。〔A3 除外〕
- (b) 適合該分類群的物種豐度指數。
- (c) 分布範圍、占有面積或棲地品質減少或下降。
- (d) 實際或潛在的開發破壞。
- (e) 直接觀察受外來種、雜交種、病原、污染源、競爭者或寄生物之影響。

A2. 經由 A1 所列舉任何方式所觀察、推估、推測或懷疑物種族群降低已經發生，但造成降低的原因仍未停止、不明或不可逆。

A3. 經由 A1 所列舉任何方式所推估、推測或懷疑物種族群未來近期內會降低。(最長可達 100 年)。

A4. 經由 A1 所列舉任何方式所觀察、推估、推測或懷疑物種族群未來任何一段時間會降低， 造成降低的原因仍未停止、不明或不可逆。

B. 分布範圍之判定標準 (至少具備 B1 或 B2 其中之一的條件)				
B1. 分布範圍 (EOO)	< 100 km²	< 5,000 km²	< 20,000 km²	< 20,000 km²
B2. 占有面積 (AOO)	< 10 km²	< 500 km²	< 2,000 km²	< 2,000 km²

且族群需遭遇以下 3 種情況中的至少 2 種；僅符合 1 種情況時，可判定為 NT。

受脅類別判斷標準 A-E	極危 (CR)	瀕危 (EN)	易危 (VU)	接近受脅 (NT)
(a) 嚴重破碎化或居留區數目為右項數值者	= 1	≤ 5	≤ 10	≤ 10
(b) 經由觀察、推估、推測或預估，下列各項情況之一的數值仍持續下降者： (i) 分布範圍；(ii) 占有面積； (iii) 棲地之區域、實際面積或品質；(iv) 生長地點或亞族群之數目；(v) 能繁殖之成熟個體數				
(c) 下列各項情況其中之一的數值呈現劇烈變動時： (i) 分布範圍；(ii) 占有面積；(iii) 生長地點或亞族群之數目；(iv) 能繁殖之成熟個體數				
C. 族群量小且下降之判定標準				
族群內之成熟個體數	< 250	< 2,500	< 10,000	< 20,000
且具備 C1 或 C2 其中之一的條件				
C1. 經由觀察、推估或預估物種族群成熟個體數持續下降。(時間至少為未來 100 年)	3 年或一代 下降 25% (以長者為準)	5 年或二代 下降 20% (以長者為準)	10 年或三代 下降 10% (以長者為準)	10 年或三代 下降 10% (以長者為準)
C2. 經由觀察、推估或預估，能繁殖成熟個體數持續下降，而且其族群結構遭遇下列至少一種情況者：				
a(i) 每個亞族群能繁殖之成熟個體數	≤ 50	≤ 250	≤ 1,000	≤ 1,000
a(ii) 成熟個體都生長在一個單獨的小族群內所占比例	90%-100%	95%-100%	100%	100%
(b) 成熟個體呈現劇烈變動				
D. 族群數量極少且分布侷限之判定標準				
族群遭遇以下情況：				
D. 成熟個體數	< 50	< 250	D1. < 1,000	D1. < 2,500
且 / 或遭遇以下情況：				
D2. 出現面積受限或位於居留區的物種族群在未來有可能會面臨威脅，使之受脅程度提升至極危或瀕危類別 (此準則只用於評估易危及接近受脅類別)。	-	-	D2. 占有面積 < 20 km² 或分布地點數 ≤ 5	D2. 占有面積 < 50 km² 或分布地點數 ≤ 10
E. 量化分析				
在野外絕種之機率	10 年內或三個世代內在野外絕種之機率超過 50%	20 年內或五個世代內在野外絕種之機率超過 20%	100 年內在野外絕種之機率超過 10%	-

2.3 公開意見徵詢

上述程序得出的評估結果經由臺灣爬行類專家的嚴格評估，在確保所蒐集數據的完整性並補充遺漏的資料後，於 2024 年 09 月 30 日公開完整的資料與初版報告，並於 10 月 07 日辦理線上公開意見徵詢會議，廣泛徵求臺灣爬行類專家學者、政府部門、爬行類愛好人士及臺灣爬行類動物保育協會意見。最後依據線上公開會議更新後的資訊，將更新的數據集再次執行步驟 2.1 至 2.2 的評估流程後產生本報告。

3. 臺灣陸域爬行類紅皮書名錄評估結果

結果顯示在受評估 90 種臺灣陸域爬行類動物中，有 4 種屬國家極危 (Nationally Critically Endangered, NCR) 類別，有 3 種屬國家瀕危 (Nationally Endangered, NEN) 類別，有 1 種屬國家易危 (Nationally Vulnerable, NVU) 類別，以上 8 種受脅爬行類占本次所有評估爬行類種數的 8.9%。另 9 種屬於國家接近受脅 (Nationally Near-threatened) 類別，其餘 67 種屬於國家暫無危機 (Nationally Least Concern, NNT) 類別。

在以下的表格中，每個分類單元末有新增一欄 "2017 年臺灣紅皮書類別 "，以利不同年份兩次評估結果的檢視與比對。對於某些分類單元，這些類別的改變可能反映了其受威脅狀態隨著時間的真實變化。但對其他分類單元而言，這些改變可能源自於不同時期所蒐集生態背景資訊的落差，或對於數據重新詮釋所引起，這些並不能反映其真正受威脅狀態的變化。根據 IUCN 紅皮書名錄指數 - 國家和地區使用指南 (IUCN Red List Index - Guidance for National and Regional Use.) (Bubb et al. 2009) 的說明，對於不同時期的威脅狀況有所改善的分類單元，其紅皮書類別以粗體標示；對於那些滅絕風險增加的分類單元，其紅皮書類別則以下劃底線方式標示；至於紅皮書類別屬於非真實改變的分類單元，則不會有任何額外的標示。本報告重新檢視了每個分類單元兩次評估的結果，由於前一次評估的資料和文獻極度缺乏，本次評估結果的不同並非物種近幾年野外族群實質上的改善或風險增加，而是因為更多分布數據和新文獻報告的獲得並重新詮釋的結果，因此未有額外之標示。本報告也提供了 2024 年全球紅皮書名錄類別，以利於不同空間尺度紅皮書評估結果之比對與參考。本報告所有爬行類評估資料及結果可洽通訊作者索取。

Diploderma makii
牧氏攀蜥 Ota's Japalura
NNT B1b(iii)
林德恩 / 攝

3.1 臺灣受脅陸域爬行類物種（包含國家極危 NCR、國家瀕危 NEN 與國家易危 NVU 類別）名錄

分類單元	中文名	2024 臺灣紅皮書類別	2024 全球紅皮書類別	2017 臺灣紅皮書類別
Trimerodytes annularis (Hallowell, 1856)	赤腹游蛇	NCR A2abcdeB1b(i,ii,iii,iv) c(iii)C1	LC	DD
Cuora flavomarginata (Gray, 1863)	食蛇龜	NCR A2cdB2b(ii,iii,iv,v)c(iv)	EN A2cd+4cd	NEN B1b(iii,iv)c(iv)
Mauremys mutica Cantor, 1842	柴棺龜	NCR A2cdeB2b(ii,iii,iv)	CR A2cd+4cd	NNT B1ab(iii,iv)
Myrrophis chinensis (Gray, 1842)	唐水蛇	NCR A2acdeB1+2b(i,ii,iii) c(ii,iii)	LC	NEN B2ab(ii,iii,iv)c(ii,iii)
Hebius miyajimae (Maki, 1931)	金絲蛇	NEN B1b(ii,iii,iv)	VU B1ab(iii,iv)	NEN B1ab(iii,iv)
Mauremys reevesii (Gray, 1831)	金龜	NEN A2cdeB1b(ii,iii)C2a(i)	EN A2bcd+4bcd	NCR B1ab(iii,iv)
Hypsiscopus wettsteini * (Amaral, 1922)	韋氏水蛇	NEN A2acdeB1b(i,ii,iii)	LC	NVU B1b(iii,iv)c(iii)
Python bivittatus (Kuhl, 1820)	緬甸蟒	NVU C2a(ii)	VU A2acd	DD

* 分類說明：依 Bernstein 等人 (2024) 最新報告指出，越南紅河流域以西的鉛色水蛇 (*Hypsiscopus plumbea*) 應為全新種墨菲氏水蛇 (*Hypsiscopus murphyi*)，而臺灣和中國南部沿海及越南紅河流域以東的原鉛色水蛇，實為韋氏水蛇 (Bernstein et al. 2024)。2017 國家紅皮書名錄中的鉛色水蛇，2024 重新命名為韋氏水蛇，2024 IUCN Red List 尚未有韋氏和墨菲氏水蛇的評估資料，此處的 LC 實為分布於馬來半島、婆羅洲和印尼的鉛色水蛇全球評估結果。

Trimerodytes annularis
赤腹游蛇 Red-bellied Annulate Keelback
NCR A2acbdeB1b(i,ii,iii,iv)c(iii)C1
陳惇聿 / 攝

3.2 臺灣國家接近受脅 (NNT) 類別之陸域爬行類物種名錄

分類單元	中文名	2024 臺灣紅皮書類別	2024 全球紅皮書類別	2017 臺灣紅皮書類別
Trimerodytes percarinatus suriki (Maki, 1931)	白腹游蛇	NNT B1b(ii,iii)	LC	NNT B1ab(iii)
Diploderma luei Ota, Chen and Shang, 1998	呂氏攀蜥	NNT B1b(iii)	EN B1ab(iii)	DD
Emoia atrocostata (Lesson, 1830)	沿岸島蜥	NNT A2cdB2b(ii,iii)	LC	NNT B1ab(iii)
Diploderma makii Ota, 1989	牧氏攀蜥	NNT B1b(iii)	VU B1ab(iii)	NNT B1a
Takydromus sauteri Van Denburgh, 1909	梭德氏草蜥	NNT B1b(iii)	NT B1b(iii)	DD
Mauremys sinensis (Gray, 1834)	斑龜	NNT A2cdeB2b(ii,iii,iv)	CR A2cd+4cd	NLC
Pelodiscus sinensis (Wiegmann, 1835)	中華鱉	NNT B1b(ii,iii)	VU A1d+2d	NLC
Lepidodactylus yami Ota, 1987	雅美鱗趾虎	NNT D2	NT B1ab(iii)	DD
Daboia siamensis (Smith, 1917)	鎖蛇	NNT B2b(iii)	LC	NLC

3.3 臺灣數據缺乏 (DD) 類別之陸域爬行類物種名錄

分類單元	中文名	2024 臺灣紅皮書類別	2024 全球紅皮書類別	2017 臺灣紅皮書類別
Oligodon chinensis (Gunther, 1888)	中國小頭蛇 *	DD	LC	–
Plagiopholis styani (Boulenger, 1899)	福建頸斑蛇	DD	LC	DD
Gekko guishanicus Lin and Yao, 2016	龜山壁虎 *	DD	DD	–
Gekko melli (Vogt, 1922)	梅氏壁虎 *	DD	LC	–
Gehyra mutilata (Wiegmann, 1834)	截趾虎	DD	DD	DD
Hemiphyllodactylus typus Bleeker, 1860	半葉趾虎	DD	LC	DD

* 中國小頭蛇、龜山壁虎和梅氏壁虎皆為近年才在離島發現的新種或記錄種，2017 年出版的臺灣陸域爬行類紅皮書中皆尚未納入評估。

3.4 臺灣國家暫無危機 (NLC) 類別之陸域爬行類物種名錄

分類單元	中文名	2024 臺灣紅皮書類別	2024 全球紅皮書類別	2017 臺灣紅皮書類別
Boiga kraepelini Stejneger, 1902	大頭蛇	NLC	LC	NLC
Indotyphlops braminus (Daudin, 1803)	鉤盲蛇	NLC	LC	NLC
Calamaria pavimentata Duméril, Bibron & Duméril, 1854	鐵線蛇	NLC	LC	NLC
Pseudagkistrodon rudis (Boulenger, 1906)	擬龜殼花	NLC	LC	NLC
Elaphe carinata (Günther, 1864)	王錦蛇	NLC	LC	NLC
Pseudoxenodon stejnegeri stejnegeri Barbour, 1908	史丹吉氏斜鱗蛇	NLC	LC	NLC
Euprepiophis mandarinus (Cantor, 1842)	玉斑錦蛇	NLC	LC	NLC
Lycodon ruhstrati ruhstrati (Fischer, 1886)	白梅花蛇	NLC	LC	NLC
Gonyosoma frenatum (Gray, 1853)	灰腹綠錦蛇	NLC	LC	DD
Oligodon formosanus (Günther, 1872)	赤背松柏根	NLC	LC	NLC
Oligodon ornatus Van Denburgh, 1909	赤腹松柏根	NLC	LC	DD
Amphiesma stolatum (Linnaeus, 1758)	花浪蛇	NLC	LC	NLC
Cyclophiops major (Günther, 1858)	青蛇	NLC	LC	NLC
Ptyas mucosa (Linnaeus, 1758)	南蛇	NLC	LC	NLC
Oreocryptophis porphyraceus kawakamii (Oshima, 1911)	紅竹蛇	NLC	LC	NLC
Lycodon rufozonatus Cantor, 1842	紅斑蛇	NLC	LC	NLC
Pareas atayal You, Poyarkov & Lin, 2015	泰雅鈍頭蛇	NLC	–	DD
Pareas formosensis (Van Denburgh, 1909)	臺灣鈍頭蛇	NLC	LC	DD

分類單元	中文名	2024 臺灣紅皮書類別	2024 全球紅皮書類別	2017 臺灣紅皮書類別
Pareas komaii (Maki, 1931)	駒井氏鈍頭蛇	NLC	–	DD
Psammodynastes pulverulentus (Boie, 1827)	茶斑蛇	NLC	LC	NLC
Fowlea flavipunctatus (Hallowell, 1860)	草花蛇	NLC	LC	NLC
Hebius sauteri (Boulenger, 1909)	梭德氏游蛇	NLC	LC	NLC
Ptyas korros (Schlegel, 1837)	細紋南蛇	NLC	NT A2d	NLC
Rhabdophis swinhonis (Günther, 1868)	斯文豪氏頸槽蛇	NLC	LC	NLC
Sibynophis chinensis chinensis (Günther, 1889)	黑頭蛇	NLC	LC	NLC
Ptyas dhumnades (Cantor, 1842)	過山刀	NLC	LC	NLC
Rhabdophis formosanus (Maki, 1931)	臺灣赤煉蛇	NLC	–	NLC
Orthriophis taeniurus friesi (Werner, 1927)	臺灣黑眉錦蛇	NLC	VU A2d	NLC
Achalinus formosanus Boulenger, 1908	臺灣標蛇	NLC	LC	NLC
Achalinus niger Maki, 1931	標蛇	NLC	LC	NLC
Deinagkistrodon acutus (Günther, 1888)	百步蛇	NLC	VU A2d	NLC
Protobothrops mucrosquamatus (Cantor, 1839)	龜殼花	NLC	LC	NLC
Trimeresurus stejnegeri stejnegeri Schmidt, 1925	赤尾青竹絲	NLC	LC	NLC
Bungarus multicinctus Blyth, 1861	雨傘節	NLC	VU A2d	NLC
Sinomicrurus sauteri (Steindachner, 1913)	梭德氏帶紋赤蛇	NLC	LC	NLC
Sinomicrurus swinhoei Van Denburgh, 1912	斯文豪氏華珊瑚蛇	NLC	–	NLC
Naja atra Cantor, 1842	眼鏡蛇	NLC	VU A2d	NLC

分類單元	中文名	2024 臺灣紅皮書類別	2024 全球紅皮書類別	2017 臺灣紅皮書類別
Trimeresurus gracilis Oshima, 1920	菊池氏龜殼花	NLC	LC	NLC
Ovophis makazayazaya (Takahashi, 1922)	瑪家山龜殼花	NLC	LC	NLC
Diploderma swinhonis (GÜNTHER, 1864)	斯文豪氏攀蜥	NLC	LC	NLC
Diploderma brevipes (Gressit, 1936)	短肢攀蜥	NLC	VU A2cB1ab(iii,v)	NLC
Diploderma polygonatum xanthostomum (Ota, 1991)	黃口攀蜥	NLC	LC	NLC
Dopasia harti (Boulenger, 1899)	哈特氏蛇蜥	NLC	LC	DD
Plestiodon elegans (Boulenger, 1887)	麗紋石龍子	NLC	LC	NLC
Plestiodon leucostictus (Hikida, 1988)	白斑石龍子	NLC	NT A2e	DD
Plestiodon chinensis chinensis (Gray, 1838)	中國石龍子指名亞種	NLC	LC	DD
Plestiodon chinensis formosensis (Van Denburgh, 1912)	中國石龍子臺灣亞種	NLC	–	NLC
Ateuchosaurus chinensis Gray, 1845	中國光蜥	NLC	LC	DD
Sphenomorphus indicus (Gray, 1853)	印度蜓蜥	NLC	LC	NLC
Eutropis borealis (Brown & Alcala, 1980)	多稜真稜蜥	NLC	LC	DD
Sphenomorphus incognitus (Thompson, 1912)	股鱗蜓蜥	NLC	LC	NLC
Eutropis longicaudata (Hallowell, 1857)	長尾真稜蜥	NLC	LC	NLC
Eutropis cumingi (Brown & Alcala, 1980)	庫氏真稜蜥	NLC	LC	DD
Scincella formosensis (Van Denburgh, 1912)	臺灣滑蜥	NLC	LC	NLC
Sphenomorphus taiwanensis Chen & Lue, 1987	臺灣蜓蜥	NLC	LC	NLC
Hemidactylus bowringii (Gray, 1845)	無疣蝎虎	NLC	LC	NLC

分類單元	中文名	2024 臺灣紅皮書類別	2024 全球紅皮書類別	2017 臺灣紅皮書類別
Gekko kikuchii (Oshima, 1912)	菊池氏壁虎	NLC	LC	DD
Gekko hokouensis Pope, 1928	鉛山壁虎	NLC	LC	NLC
Hemidactylus stejnegeri Ota & Hikida, 1989	史丹吉氏蝎虎	NLC	LC	NLC
Lepidodactylus lugubris (Duméril & Bibron, 1836)	鱗趾虎	NLC	LC	DD
Takydromus viridipunctatus Lue & Lin, 2008	翠斑草蜥	NLC	LC	DD
Takydromus formosanus Boulenger, 1894	臺灣草蜥	NLC	LC	DD
Takydromus stejnegeri Van Denburgh, 1912	蓬萊草蜥	NLC	LC	NLC
Takydromus hsuehshanensis Lin & Cheng, 1981	雪山草蜥	NLC	LC	NLC
Takydromus luyeanus Lue & Lin, 2008	鹿野草蜥	NLC	LC	DD
Takydromus septentrionalis (Günther, 1864)	北草蜥	NLC	LC	DD
Takydromus kuehnei Van Denburgh, 1909	古氏草蜥	NLC	LC	NLC

4. 臺灣之全球受脅陸域爬行類

本報告納入評估候選之 90 種陸域爬行類中，有 14 種為全球受脅爬行類 (IUCN 2024)。此 14 種中有 5 種屬臺灣國家受脅類別 (包含 NCR, NEN 及 NVU)，4 種屬臺灣國家接近受脅類別 (NNT)，5 種屬臺灣國家暫無危機類別 (NLC)。

分類單元	中文名	2024 臺灣紅皮書類別	2024 全球紅皮書類別
Mauremys mutica Cantor, 1842	柴棺龜	NCR A2cdeB2b(ii,iii,iv)	CR A2cd+4cd
Mauremys sinensis (Gray, 1834)	斑龜	NNT A2cdeB2b(ii,iii,iv)	CR A2cd+4cd
Cuora flavomarginata (Gray, 1863)	食蛇龜	NCR A2cdB2b(ii,iii,iv,v)c(iv)	EN A2cd+4cd

分類單元	中文名	2024 臺灣紅皮書類別	2024 全球紅皮書類別
Mauremys reevesii (Gray, 1831)	金龜	NEN A2cdeB1b(ii,iii)C2a(i)	EN A2bcd+4bcd
Diploderma luei Ota, Chen and Shang, 1998	呂氏攀蜥	NNT B1b(iii)	EN B1ab(iii)
Pelodiscus sinensis (Wiegmann, 1835)	中華鱉	NNT B1b(ii,iii)	VU A1d+2d
Hebius miyajimae (Maki, 1931)	金絲蛇	NEN B1b(ii,iii,iv)	VU B1ab(iii,iv)
Orthriophis taeniurus friesi (Werner, 1927)	臺灣黑眉錦蛇	NLC	VU A2d
Naja atra Cantor, 1842	眼鏡蛇	NLC	VU A2d
Bungarus multicinctus Blyth, 1861	雨傘節	NLC	VU A2d
Deinagkistrodon acutus Günther, 1888	百步蛇	NLC	VU A2d
Python bivittatus (Kuhl, 1820)	緬甸蟒	NVU C2a(ii)	VU A2acd
Diploderma brevipes (Gressit, 1936)	短肢攀蜥	NLC	VU A2cB1ab(iii,v)
Diploderma makii Ota, 1989	牧氏攀蜥	NNT B1b(iii)	VU B1ab(iii)

5. 謝誌

感謝林春富、張仕緯、鄭錫奇、張簡琳玟、陳添喜、楊正雄在參與評估流程的討論並提供許多修正建議；張安瑜、蔡富安、陳宛均協助計算和製表臺灣爬行類 AOO、EOO 及 SDM，陳昱凱、林毅倫、陳惇聿協助文獻和相關資料的蒐集及整理，以及其他學者與專家於評估過程、爬行類紅皮書初評結果公開說明會意見和資料徵詢中，所提供的相關資訊與建議。

6. 參考文獻

行政院農業委員會林務局、行政院農業委員會特有生物研究保育中心。2022。2022 年金絲蛇保育行動計畫。臺灣。

毛俊傑。2024。2024 年瀕危物種赤腹游蛇保育行動計畫。農業部林業及自然保育署。臺灣。

毛俊傑、姜博仁。2014。陽明山國家公園兩棲類及爬蟲類生態資源調查。陽明山國家公園管理處委託辦理報告。

林思民。2012。金龜現況調查與保育策略規劃。行政院農業委員會林務局保育研究系列 100-32 號。

林俊聰、姚秋如。2016。臺灣宜蘭縣龜山島壁虎屬 (Gekko)(有鱗目：蜥蜴亞目：壁虎科) 一新種。國立臺灣博物館學刊 69(2:1-14)。

袁孝維。2022。大台北地區金絲蛇歷史點位紀錄複查期末報告書。 行政院農業委員會林務局林業發展計畫。111 林發 -09.3- 保 -26。

陳怡惠、毛俊傑。2021。陽明山國家公園友善農業生態監測暨生態服務給付策略規劃案。陽明山國家公園管理處委託報告。

陳添喜。2024。瀕危淡水龜族群監測 (尚未發表)。

陳添喜。2023。112 年度翡翠水庫食蛇龜野生動物保護區內瀕危食蛇龜與柴棺龜族群調查監測期末成果報告。臺北翡翠水庫管理局。

黃淑萍。2019。金絲蛇溫度生理研究及保育策略研擬 。108 年度國土生態保育綠色網絡建置之瀕危野生動物育優先性評估、行動計畫與推動。

陶善達、李承恩、楊懿如。2022。金門新紀錄之壁虎屬物種與分布現況。國家公園學報 32(1)：40-49。

游崇瑋。2021。潛在入侵蛇種白枕白環蛇在臺灣的首次紀錄。自然保育季刊 113:57-65.

楊懿如。2021。金門國家公園兩棲爬行動物調查 (2/2)。金門國家公園管理處委託辦理報告。

賴玉菁、毛俊傑。2012。赤腹游蛇、唐水蛇及鉛色水蛇之族群分布及棲地評估 (4/4)。計畫編號：101 林管 -02.1-保 -28。101 年度行政院農業委員會林務局補助計畫。

農業部林業及自然保育署、農業部生物多樣性研究所。2023。2023 年瀕危物種食蛇龜保育行動計畫。臺灣。

農業部林業及自然保育署、農業部生物多樣性研究所。2023。2023 年瀕危物種柴棺龜保育行動計畫。臺灣。

藍灣生態股份有限公司。2023。金絲蛇保育研究計畫期末報告書。行政院農業部林業自然保育署。

臺灣爬行類動物保育協會。2024。桃園龍潭地區赤腹游蛇族群調查及緊急移置計畫。113 年度農業部林業及自然保育署新竹分署。

Bernstein, Justin M., Robert W. Murphy, Amy Lathrop, Sang Ngoc Nguyen, Nikolai L. Orlov and Bryan L. Stuart. 2024. Incorporating new datatypes to enhance species delimitation: a case study in rice paddy snakes (Homalopsidae: *Hypsiscopus*). *Zootaxa* 5501(1): 039-055.

Bubb, P. J., S. H. Butchart, B. Collen, H. Dublin, V. Kapos, C. Pollock, S. N. Stuart, and J.-C.Vie. 2009. IUCN Red List Index - Guidance for National and Regional Use. Gland, Switzerland: IUCN.

Cox, N., B. E. Young, P. Bowles, M. Fernandez, J. Marin, G. Rapacciuolo, et al. 2022. A global reptile assessment highlights shared conservation needs of tetrapods. *Nature* 605(7909): 285-290. https://doi.org/10.1038/s41586-022-04664-7

Farooq, H., M. Harfoot, C. Rahbek and J. Geldmann. 2024. The threats to reptiles at global and regional scales. *Current Biology* 34(10): 2231-2237. https://doi.org/10.1016/j.cub.2024.04.007

Gumbs, R., C.L. Gray, M. Böhm, M. Hoffmann, R. Grenyer, W. Jetz, S. Meiri, U. Roll, N. R. Owen, and J. Rosindell. 2020. Global priorities for conservation of reptilian phylogenetic diversity in the face of human impacts. *Nature Communications* 11, 2616. https://doi.org/10.1038/s41467-020-16410-6

IUCN 2024. The IUCN Red List of Threatened Species. Version 2024-1. <https://www.iucnredlist.org>

IUCN Standards and Petitions Committee. 2024. Guidelines for using the IUCN Red List Categories and Criteria. Version 16. Prepared by the Standards and Petitions Committee. Downloadable from https://www.iucnredlist.org/documents/RedListGuidelines.pdf.

IUCN. 2012a. Guidelines for application of IUCN Red List criteria at regional and national levels: version 4.0. IUCN. Gland, Switzerland and Cambridge, UK.

IUCN. 2012b. IUCN Red List categories and criteria: version 3.1. Second edition. IUCN. Gland, Switzerland and Cambridge, UK.

Kurita, Kazuki, Yukiko Nakamura, Taku Okamoto, Si-Ming Lin and Tsutomu Hikida. 2017. Taxonomic reassessment of two subspecies of Chinese skink in Taiwan based on morphological and molecular investigations (Squamata, Sincidae). *Zookeys* 687: 131-148.

Lee, Ko-Huan, Tien-Hsi Chen, Gaus Shang, Simon Clulow, Yi-Ju Yang, Si-Ming Lin. 2019. A Check list and population trends of invasive amphibians and reptiles in Taiwan. *Zookeys* 829: 85-130.

Lee, Y., J.-W. Lin, S.-P. Tseng, T.-S. Chen and S.-M. Lin. 2019. Human disturbances as a possible cause of genetic introgression from exotic into native *Mauremys* turtles. *Animal Conservation* 22: 556-567.

Luedtke, J. A., J.Chanson, K. Neam, et al. 2023. Ongoing declines for the world' s amphibians in the face of emerging threats. *Nature* 622, 308–314. https://doi.org/10.1038/s41586-023-06578-4.

Pimm, S. L., C. N. Jenkins, R. Abell, T. M Brooks, J. L. Gittleman, L. N. Joppa, P. H. Raven, C. M. Roberts, and J. O. Sexton. 2014. The biodiversity of species and their rates of extinction, distribution, and protection. *Science* 344(6187): 1246752.

Rodrigues, A. S. L., J. D. Pilgrim, J. F. Lamoreux, M. Hoffmann, and T. M. Brooks. 2006. The value of the IUCN Red List for conservation. *Trends in Ecology and Evolution* 21: 71-76.

Roll, U., Feldman, A., Novosolov, M. *et al.* The global distribution of tetrapods reveals a need for targeted reptile conservation. 2017. *Nature Ecology and Evolutionj* 1, 1677–1682. https://doi.org/10.1038/s41559-017-0332-2

Smart, Utpal., Matthew J. Ingrasci, Goutam C. Sarker, Hmartlawmte Lalremsanga, Robert W. Murphy, Hidetoshi Ota, Ming Chung Tu, Yogesh Shouche, Nikolai L. Orlov and Eric N. Smith. 2021. Acomprehensive appraisal of evolutionary diversity in venomous Asian coralsnakes of the genus *Sinomicrurus* (Serpentes: Elapidae) using Bayesian coalescent inference and supervised machine learning. *Jounral of Zoological Systematics and Evolutionary Research* 59: 2212-2277.

Townsend, A. J., P. J. de Lange, C. A. J. Duffy, C. M. Miskelly, J. Molloy, and D. A. Norton. 2007. New Zealand Threat Classification System Manual. Science & Technical Publishing, Department of Conservation, Wellington, New Zealand.

Uetz, P., Freed, P, Aguilar, R., Reyes, F., Kudera, J. and Hošek, J. (eds.) 2024. The Reptile Database, http://www.reptile-database.org.

You Chung-Wei, Yen-Po Lin, Yen-Hsueh Lai, You-Ling Chen, Yao Tang, Shih-Ping Chou, Hong-Yi Chang, Robert Zappalorti and Si-Ming Lin. 2013. Return of the pythons: first formal records, with a special note on recovery of the Burmese python in the demilitarized Kinmen islands. Zoological Studies 52:8.

The Red List of Terrestrial Reptiles of Taiwan, 2024

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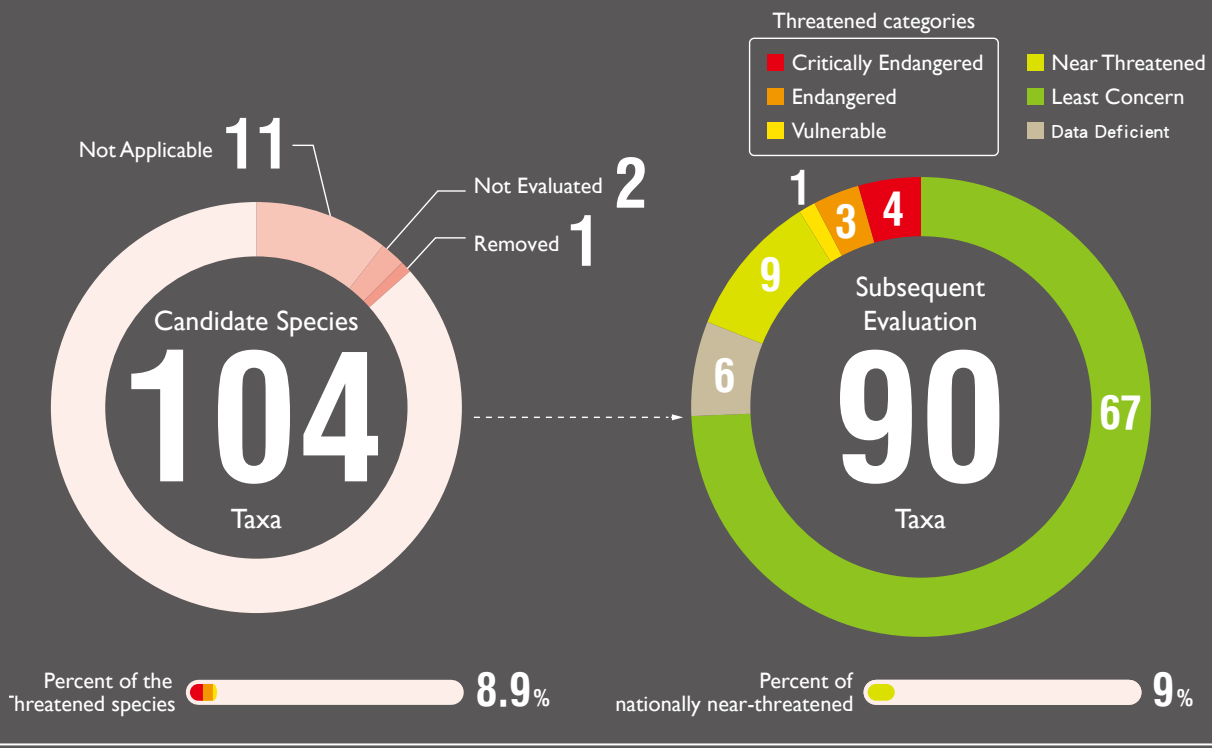
Abstract

Earth is currently facing the sixth mass extinction, and it is necessary to determine the priority of conservation efforts under human resource and funding limitations to delay or even reverse threats to species survival. Therefore, it is vital to periodically evaluate the extinction risk of various species based on taxonomy, threat status, and population studies. This is Taiwan's second national evaluation of its terrestrial reptiles' red list, based on the International Union for Conservation of Nature (IUCN) recommended categories and standards. A total of 104 candidate terrestrial reptiles were included for evaluation in this report, of which 11 invasive alien species were classified as not applicable for regional evaluation, 2 species were not evaluated, and 1 invalid species was removed. A total of 90 terrestrial reptile species were included in the evaluation process. Among nationally threatened reptile species in Taiwan, four were nationally critically endangered, three were nationally endangered, and one was nationally vulnerable. There were eight threatened species, accounting for 8.9% of all reptile species included in this evaluation. Of the remaining 82 reptile species, 9 were nationally near-threatened, 67 were of nationally least concern, and data was deficient for 6 species. Compared with the 2017 Red List of Terrestrial Reptiles of Taiwan, the Chinese kukri snake, Guishan's gecko, and Mell's gecko were added in this report but were classified as data deficient. In total, 23 species were originally classified as data deficient but were re-evaluated to be in other Red List categories. Due to the acquisition of new literature and re-interpretation of data, the extinction risk of four species was increased, and their Red List category changed. As the Chinese pond turtle population and record in mainland Taiwan was confirmed as a non-native species and is considered an alien introduction and disappearing, its extinction risk was decreased to nationally endangered. Periodic inspections of the latest study reports and various data sources are required to understand whether changes in Red List categories were caused by differences in background ecological data collected at different times or actual changes in the threat status of the species.



1. Introduction

The IUCN Red List of Threatened Species of the Species Survival Commission has been published since 1964 and has gradually become the most important reference basis for global species conservation status and variation trends (Rodrigues et al. 2006; IUCN Standards and Petitions Committee 2024). In addition, its categories (Figure 1) and evaluation criteria (IUCN 2012b) and the subsequently published IUCN Red List regional and national evaluation criteria standard application guidelines (IUCN 2012a) have also become the primary reference basis for evaluation of various threatened species in many countries (Townsend et al. 2007). This standardized evaluation method helps in legislation and law enforcement in different countries and makes the species included in the World Red List more comprehensive (Rodrigues et al. 2006).

Although reptiles are tetrapods and their species diversity accounts for nearly one-third of global terrestrial vertebrates, knowledge on their global distribution and threat status is relatively limited compared with the understanding and formulation of amphibians, birds, and mammals at the global scale and local conservation priority. This restricts the inclusion of reptiles in conservation plans, reduces the effectiveness of global terrestrial vertebrate diversity conservation, and may even lead to errors in conservation priority strategies. Due to this dilemma, Roll et al. (2017) published the global distribution model and diversity hotspots of 10,064 reptile species (accounting for 99% of known species), which addressed deficiencies in global biodiversity conservation priority strategies. Cox, N., Young, B.E., Bowles, P. et al. (2022) used this study as a foundation and were the first to complete a comprehensive extinction risk evaluation of nearly all global reptilian species (10,196 species). Their threat status was not as severe as that of amphibians (40.7%) and mammals (25.4%) but was greater than that of birds(13.6%). At least 1,829 reptilian species (21.1%) are threatened (including critically endangered, endangered, and vulnerable). Similar to other tetrapods, reptiles are mainly threatened by agriculture, deforestation, urban development, and invasive species (Cox et al. 2022).

Evaluation work for The Red List of Taiwan Terrestrial Reptiles was jointly carried out by the Forestry and Nature Conservation Agency and the Taiwan Biodiversity Research Institute in 2015. Although there was a severe lack of reptile data at that time, the first edition of the Red List of Terrestrial Reptiles of Taiwan was first published in 2017. Due to rapid changes in Taiwan's ecological environment and citizen science participation and promotion in recent years, there has been a large-scale and rapid accumulation of reptile distribution data (including roadkill and live witness records). The taxonomic classification of many species have been revised, and new species have been described. Therefore, it is necessary to re-evaluate and assess the extinction risk of all terrestrial reptiles at a geographic scale in Taiwan.

Lepidodactylus yami
雅美鱗趾虎
Lanyu Scalty-toed Gecko
NNT D2
林德恩 / 攝

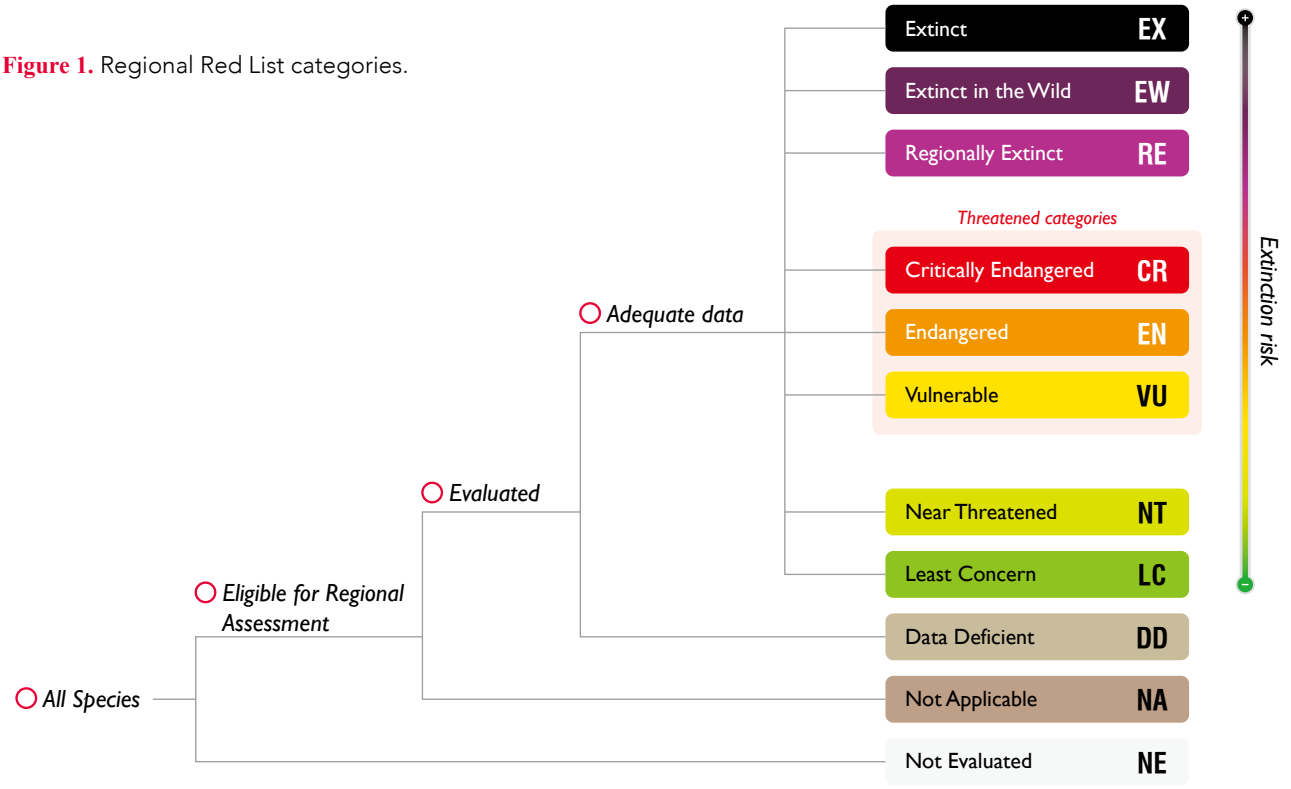


Figure 1. Regional Red List categories.

2. Assessment process

The assessment process and methodology for evaluating the threatened status of terrestrial reptiles in Taiwan are summarized as follows:

2.1 Defining the Taxa Included in the Evaluation

The evaluation scope of this report is terrestrial reptiles in mainland Taiwan and its outlying islands. The scientific names and classification in 2024 The Reptile Database were used as a basis (Uetz et al. 2024), with the IUCN 2024 Red List and Catalogue of Life in Taiwan (2024, TaiCOL) used as additional references. A total of 104 candidate reptilian species were included in this evaluation. In total, 11 invasive alien species, i.e., tokay gecko (*Gekko gecko*), common wolf snake (*Lycodon capucinus*), many-striped skink (*Eutropis multifasciata*), brown anole (*Anolis sagrei*), Red-eared Slider (*Trachemys scripta elegans*), spotted house gecko (*Gekko monarchus*), Brooke's house gecko (*Hemidactylus brookii*), common house gecko (*Hemidactylus frenatus*), veiled chameleon (*Chamaeleo calyptratus*), Chinese water dragon (*Physignathus cocincinus*), and green iguana (*Iguana iguana*), were excluded based on the procedure recommended for IUCN Red List regional and national evaluation standards (Lee et al. 2019; Yu 2021) as these were not applicable (NA) taxa for regional evaluation. In addition, an invalid species, Hatori's coral snake (*Sinomicrurus hatori*) (Smart et al. 2021), was excluded, and *Hebius sp.* with unclear taxonomic status and Koshun worm snake (*Argyrophis koshunensis*) with unclear current survival status were not evaluated (NE). Therefore, a total of 90 reptilian species were included in the evaluation procedure.

2.2 Data Collection and Preliminary Evaluation

After species were selected for assessment, ecological information was collected from academic reports, research papers, databases, and relevant expert opinions on each taxonomic unit following the IUCN assessment standards (IUCN 2012b; IUCN Standards and Petitions Committee 2024). Ecological data were obtained, and citations and explanations of sources used were provided.

Every targeted species was assigned a preliminary threat category in accordance with the guidelines in the *Red List Categories and Criteria Version 16* (IUCN Standards and Petitions Committee 2024). The assessment process involved constructing a logic tree in accordance with the following criteria: A. Rapid population reduction; B. Geographic range; C. Small population size and decline; D. Very small or restricted population; and E. Quantitative analysis. Each criterion also comprised several subcriteria and qualifiers (Table 1). A taxon was Nationally Critically Endangered when the best available evidence indicated that it met any of the criteria A to E for Critically Endangered, and it was therefore considered to be facing an extremely high risk of extinction in the wild. A taxon was Nationally Endangered when the best available evidence indicated that it met any of the criteria A to E for Endangered, and it was therefore considered to be facing a very high risk of extinction in the wild. A taxon was Nationally Vulnerable when the best available evidence indicated that it met any of the criteria A to E for Vulnerable, and it was therefore considered to be facing a high risk of extinction in the wild. Nationally threatened species were those in categories NCR, NEN and NVU. A taxon was Nationally Near-Threatened when it had been evaluated against the criteria but does not qualify for Critically Endangered, Endangered or Vulnerable now, but is closed to qualifying for or was likely to qualify for a threatened category in the near future. A taxon was Nationally Least Concern when it had been evaluated against the criteria and does not qualify for Critically Endangered, Endangered, Vulnerable or Near-Threatened. A taxon was Data Deficient when there was inadequate information to make a direct, or indirect, as-sessment of its risk of extinction based on its distribution or population status. Each taxon was analyzed against each criterion and was considered to be threatened if they satisfied one or more of the criteria. The taxa were then listed under the appropriate categories, and corresponding criteria and subcriteria were listed under each taxon

Sibynophis chinensis chinensis
黑頭蛇 Chinese Many-tooth Snake
NLC
林德恩 / 攝

Table 1. Overview of Red List criteria adopted in this study. Modified from IUCN Standards and Petitions Committee (2024).

Use any of the criteria A-E	Critically Endangered	Endangered	Vulnerable	Near Threatened
A. Population size reduction (declines measured over the longer of 10 years or 3 generations)				
A1	≥ 90%	≥ 70%	≥ 50%	≥ 30%
A2, A3 & A4	≥ 80%	≥ 50%	≥ 30%	≥ 20%

A1. Population reduction observed, estimated, inferred, or suspected in the past where the causes of the reduction are clearly reversible AND understood AND have ceased, based on and specifying any of the following:

(a) direct observation. [except A3]

(b) an index of abundance appropriate to the taxon.

(c) a decline in area of occupancy (AOO), extent of occurrence (EOO) and/or habitat quality.

(d) actual or potential levels of exploitation.

(e) effects of introduced taxa, hybridization, pathogens, pollutants, competitors or parasites.

A2. Population reduction observed, estimated, inferred, or suspected in the past where the causes of the reduction may not have ceased OR may not be understood OR may not be reversible.

A3. Population reduction projected, inferred or suspected to be met in the future (up to a maximum of 100 years) [(a) cannot be used for A3]

A4. An observed, estimated, inferred, projected or suspected population reduction where the time period must include both the past and the future (up to a max. of 100 years in the future), and where the causes of reduction may not have ceased OR may not be understood OR may not be reversible.

B. Geographic range in the form of either B1 (extent of occurrence) AND/OR B2 (area of occupancy)				
B1. Extent of occurrence (EOO)	< 100 km²	< 5,000 km²	< 20,000 km²	< 20,000 km²
B2. Area of occupancy (AOO)	< 10 km²	< 500 km²	< 2,000 km²	< 2,000 km²
AND at least 2 of the following 3 conditions (one for Near-threatened category):				
(a) Severely fragmented OR # locations	= 1	≤ 5	≤ 10	≤ 10
(b) Continuing decline observed, estimated, inferred or projected in any of: (i) extent of occurrence; (ii) area of occupancy; (iii) area, extent and/or quality of habitat; (iv) number of locations or sunpopulations; (v) number of mature individuals				
(c) Extreme fluctuations in any of: (i) extent of occurrence; (ii) area of occupancy; (iii) number of locations or sunpopulations; (iv) number of mature individuals				

Takydromus sauteri
梭德氏草蜥 Koshun Grass Lizard
NNT B1b(iii)
林德恩 / 攝

Use any of the criteria A-E	Critically Endangered	Endangered	Vulnerable	Near Threatened
C. Small population size and decline				
Number of mature individuals	< 250	< 2,500	< 10,000	< 20,000
AND at least one of C1 or C2				
C1. An observed, estimated or projected continuing decline of at least (up to a max. of 100 years in future):	25% in 3 years or 1 generation	20% in 5 years or 2 generations	10% in 10 years or 3 generations	10% in 10 years or 3 generations
C2. An observed, estimated, projected or inferred continuing decline AND at least one of the following 3 conditions:				
a(i) Number of mature individuals in each subpopulation	≤ 50	≤ 250	≤ 1,000	≤ 1000
a(ii) % of mature individuals in one subpopulation =	90%	95%	100%	100%
(b) Extreme fluctuations in the number of mature individuals				
D. Very small or restricted population Either:				
D. Number of mature individuals	< 50	< 250	D1. < 1,000	D1. < 2,500
AND/OR				
D2. Only applies to the VU and NT category. Restricted area of occupancy or number of locations with a plausible future threat that could drive the taxon to CR or EX in a very short time	-	-	AOO < 20 km² or number of locations ≤ 5	AOO < 50 km² or number of locations ≤ 10
E. Quantitative analysis				
Indicating the probability of extinction in the wild to be:	≥ 50% in 10 years or 3 generations (100 years max.)	≥ 20% in 20 years or 5 generations (100 years max.)	≥ 10% in 100 years	-

2.3 Expert opinions

The evaluation results obtained from the aforementioned procedure were strictly evaluated by Taiwan's reptile experts. After ensuring the integrity of the collected data and filling in missing data, the complete data and initial report were published on 30 September 2024, and an open opinion solicitation meeting was held on 7 October to solicit, opinions from Taiwan's reptile experts, governmental agencies, reptile lovers, and the Reptile Conservation Association of Taiwan. Finally, the updated dataset, based on the updated information from the online public meeting, was used to conduct steps 2.1 and 2.2 of the evaluation procedure to generate this report.

3. Red List of Terrestrial Reptiles of Taiwan

The results showed that among 90 Taiwan terrestrial reptile species, 4 were nationally critically endangered, 3 were nationally endangered, and 1 was nationally vulnerable. The above eight threatened reptile species accounted for 8.9% of all reptile species included in this evaluation. In addition, 9 were nationally near-threatened and 67 were of nationally least concern.

In the following table, a new field "Taiwanese Red List Category in 2017" was added at the end of each taxon to facilitate the inspection and comparison of evaluation results in two different years. Changes in certain taxons may reflect actual changes in threat status with time. However, these changes may also be due to differences in collected background ecological information at different times or caused by data re-interpretation and do not actually reflect changes in their threat status. According to the description in the IUCN Red List Index - Guidance for National and Regional Use (Bubb et al. 2009), the red list category for taxons with improvements in threat status at different times can be indicated with bold text. The red list category of taxons with increased extinction risks should be indicated using underlined text. There should not be additional labels for taxons with non-actual red list category changes. In this report, we re-examined the two evaluation results of each taxon. Due to an extreme lack of data and literature in the previous evaluation, the differences in the results of this evaluation were not actual improvements or risk increases of wild species populations in recent years but rather due to the availability of more distribution data and re-interpreted results from new literature reports. Therefore, there were no additional labels. This report also provided the categories in the 2024 global red list to facilitate the comparison and referencing of red list evaluation results at different spatial scales. All reptile evaluation data and results in this report can be obtained from the corresponding author.

Gonyosoma frenatum
灰腹綠錦蛇
Gray-bellied Green Snake
NLC
林德恩 / 攝

3.1 List of National Threatened Terrestrial Reptile Taxa in Taiwan (Incl.: Nationally Critically Endangered, Nationally Endangered, and Nationally Vulnerable)

Taxon	Common Name	Taiwanese Red List Category in 2024	Global Red List Category in 2024	Taiwanese Red List Category in 2017
Trimerodytes annularis (Hallowell, 1856)	Red-bellied Annulate Keelback	NCR A2abcdeB1b(i,ii,iii,iv)c(iii) C1	LC	DD
Cuora flavomarginata (Gray, 1863)	Yellow-margined Box Turtle	NCR A2cdB2b(ii,iii,iv,v)c(iv)	EN A2cd+4cd	NEN B1b(iii,iv)c(iv)
Mauremys mutica Cantor, 1842	Yellow Pond Turtle	NCR A2cdeB2b(ii,iii,iv)	CR A2cd+4cd	NNT B1ab(iii,iv)
Myrrophis chinensis (Gray, 1842)	Chinese Mud Snake	NCR A2acdeB1+2b(i,ii,iii)c(ii,iii)	LC	NEN B2ab(ii,iii,iv)c(ii,iii)
Hebius miyajimae (Maki, 1931)	Maki's Keelback	NEN B1b(ii,iii,iv)	VU B1ab(iii,iv)	NEN B1ab(iii,iv)
Mauremys reevesii (Gray, 1831)	Reeves' Turtle (Chinese Pond Tutle)	NEN A2cdeB1b(ii,iii)C2a(i)	EN A2bcd+4bcd	NCR B1ab(iii,iv)
*Hypsiscopus wettsteini** (Amaral, 1922)	Wettstein's Mud Snake	NEN A2acdeB1b(i,ii,iii)	LC	NVU B1b(iii,iv)c(iii)
Python bivittatus (Kuhl, 1820)	Burmese Python	NVU C2a(ii)	VU A2acd	DD

* Classification description: The latest report by Bernstein et al. (2024) pointed out that the rice paddy snake (*Hypsiscopus plumbea*) in Vietnam's Red River Delta should be a different species, Murphy's mud snake (*Hypsiscopus murphyi*), while the original rice paddy snake in coastal regions in southern China and east of Vietnam's Red River Delta is actually Wettstein's water snake (*Hypsiscopus wettsteini*. The rice paddy snake in the 2017 National Red List was renamed as Wettstein's water snake in 2024. The 2024 IUCN Red List did not include Wettstein's water snake or Murphy's mud snake. The LC is actually the global evaluation results for the rice paddy snake in the Malay Peninsula, Borneo, and Indonesia.

Diploderma makii
牧氏攀蜥 Ota's Japalura
NNT B1b(iii)
林德恩 / 攝

3.2 List of National Near-Threatened Terrestrial Reptile Taxa in Taiwan

Taxon	Common Name	Taiwanese Red List Category in 2024	Global Red List Category in 2024	Taiwanese Red List Category in 2017
Trimerodytes percarinatus suriki (Maki, 1931)	Eastern Water Snake	NNT B1b(ii,iii)	LC	NNT B1ab(iii)
Diploderma luei Ota, Chen and Shang, 1998	Lue's Japalura	NNT B1b(iii)	EN B1ab(iii)	DD
Emoia atrocostata (Lesson, 1830)	Mangrove Skink	NNT A2cdB2b(ii,iii)	LC	NNT B1ab(iii)
Diploderma makii Ota, 1989	Ota's Japalura	NNT B1b(iii)	VU B1ab(iii)	NNT B1a
Takydromus sauteri Van Denburgh, 1909	Koshun Grass Lizard	NNT B1b(iii)	NT B1b(iii)	DD
Mauremys sinensis (Gray, 1834)	Chinese Striped-necked Turtle	NNT A2cdeB2b(ii,iii,iv)	CR A2cd+4cd	NLC
Pelodiscus sinensis (Wiegmann, 1835)	Chinese Softshell Turtle	NNT B1b(ii,iii)	VU A1d+2d	NLC
Lepidodactylus yami Ota, 1987	Lanyu Scalty-toed Gecko	NNT D2	NT B1ab(iii)	DD
Daboia siamensis (Smith, 1917)	Eastern Russell's Viper	NNT B2b(iii)	LC	NLC

3.3 List of Data Deficient Terrestrial Reptile Taxa in Taiwan

Taxon	Common Name	Taiwanese Red List Category in 2024	Global Red List Category in 2024	Taiwanese Red List Category in 2017
Oligodon chinensis (Gunther, 1888)	Chinese Kukri Snake*	DD	LC	–
Plagiopholis styani (Boulenger, 1899)	Chinese Mountain Snake	DD	LC	DD
Gekko guishanicus Lin and Yao, 2016	Guishan's Gecko*	DD	DD	–
Gekko melli (Vogt, 1922)	Mell's Gecko*	DD	LC	–
Gehyra mutilata (Wiegmann, 1834)	Four-clawed Gecko	DD	DD	DD

Taxon	Common Name	Taiwanese Red List Category in 2024	Global Red List Category in 2024	Taiwanese Red List Category in 2017
Hemiphyllodactylus typus Bleeker, 1860	Tree Gecko	DD	LC	DD

* Chinese kukri snake, Guishan's gecko , and Mell's gecko are new species discovered or recorded only recently in outlying islands and were not included for evaluation in the 2017 Red List of Terrestrial Reptiles of Taiwan.

3.4 List of National Least Concern Terrestrial Reptile Taxa in Taiwan

Taxon	Common Name	Taiwanese Red List Category in 2024	Global Red List Category in 2024	Taiwanese Red List Category in 2017
Boiga kraepelini Stejneger, 1902	Square-headed Cat Snake	NLC	LC	NLC
Indotyphlops braminus (Daudin, 1803)	Brahminy Blind Snake	NLC	LC	NLC
Calamaria pavimentata Duméril, Bibron & Duméril, 1854	Brown Reed Snake	NLC	LC	NLC
Pseudagkistrodon rudis (Boulenger, 1906)	False Habu	NLC	LC	NLC
Elaphe carinata (Günther, 1864)	Taiwan Stink Snake	NLC	LC	NLC
Pseudoxenodon stejnegeri stejnegeri Barbour, 1908	Stejneger's Bamboo Snake	NLC	LC	NLC
Euprepiophis mandarinus (Cantor, 1842)	Mandarin Ratsnake	NLC	LC	NLC
Lycodon ruhstrati ruhstrati (Fischer, 1886)	Red-banded Snake	NLC	LC	NLC
Gonyosoma frenatum (Gray, 1853)	Gray-bellied Green Snake	NLC	LC	DD
Oligodon formosanus (Günther, 1872)	Formosan Kukri Snake	NLC	LC	NLC
Oligodon ornatusVan Denburgh, 1909	Ornate Kukri Snake	NLC	LC	DD
Amphiesma stolatum (Linnaeus, 1758)	Buff Striped Keelback	NLC	LC	NLC

Taxon	Common Name	Taiwanese Red List Category in 2024	Global Red List Category in 2024	Taiwanese Red List Category in 2017
Cyclophiops major (Günther, 1858)	Greater Green Snake	NLC	LC	NLC
Ptyas mucosa (Linnaeus, 1758)	Oriental Rat snake	NLC	LC	NLC
Oreocryptophis porphyraceus kawakamii(Oshima, 1911)	Red Bamboo Snake	NLC	LC	NLC
Lycodon rufozonatus Cantor, 1842	Red Large-toothed Snake	NLC	LC	NLC
Pareas atayal You, Poyarkov & Lin, 2015	Atayal Slug-eating Snake	NLC	–	DD
Pareas formosensis (Van Denburgh, 1909)	Formosa Slug Snake	NLC	LC	DD
Pareas komaii (Maki, 1931)	Komai's Slug Snake	NLC	–	DD
Psammodynastes pulverulentus (Boie, 1827)	Common Mock Viper	NLC	LC	NLC
Fowlea flavipunctatus (Hallowell, 1860)	Asiatic Water Snake	NLC	LC	NLC
Hebius sauteri (Boulenger, 1909)	Sauter's Keelback	NLC	LC	NLC
Ptyas korros (Schlegel, 1837)	Indo-Chinese Rat Snake	NLC	NT A2d	NLC
Rhabdophis swinhonis (Günther, 1868)	Taiwan Keelback	NLC	LC	NLC
Sibynophis chinensis chinensis (Günther, 1889)	Chinese Many-tooth Snake	NLC	LC	NLC
Ptyas dhumnades (Cantor, 1842)	Keel-backed Rat Snake	NLC	LC	NLC
Rhabdophis formosanus (Maki, 1931)	Formosan Tiger Keelback	NLC	–	NLC
Orthriophis taeniurus friesi (Werner, 1927)	Taiwan Beauty Snake	NLC	VU A2d	NLC
Achalinus formosanus Boulenger, 1908	Formosa Odd-scaled Snake	NLC	LC	NLC
Achalinus niger Maki, 1931	Black Odd-scaled Snake	NLC	LC	NLC

Taxon	Common Name	Taiwanese Red List Category in 2024	Global Red List Category in 2024	Taiwanese Red List Category in 2017
Deinagkistrodon acutus (Günther, 1888)	Chinese Moccasin	NLC	VU A2d	NLC
Protobothrops mucrosquamatus (Cantor, 1839)	Brown Spotted Pitviper	NLC	LC	NLC
Trimeresurus stejnegeri stejnegeri Schmidt, 1925	Stejneger's Bamboo Pit Viper	NLC	–	NLC
Bungarus multicinctus Blyth, 1861	Many-banded Krait	NLC	VU A2d	NLC
Sinomicrurus sauteri (Steindachner, 1913)	Oriental Coral Snake	NLC	LC	NLC
Sinomicrurus swinhoei Van Denburgh, 1912	Swinhoe's Temperate Asian Coralsnake	NLC	–	NLC
Naja atra Cantor, 1842	Chinese Cobra	NLC	VU A2d	NLC
Trimeresurus gracilis Oshima, 1920	Taiwan Pit Viper	NLC	LC	NLC
Ovophis makazayazaya (Takahashi, 1922)	Taiwan Mountain Pitviper	NLC	LC	NLC
Diploderma swinhonis (GÜNTHER, 1864)	Taiwan Japalure	NLC	LC	NLC
Diploderma brevipes (Gressit, 1936)	Short-legged Japalure	NLC	VU A2cB1ab(iii,v)	NLC
Diploderma polygonatum xanthostomum (Ota, 1991)	Ryukyu Japalure	NLC	LC	NLC
Dopasia harti (Boulenger, 1899)	Hart's Glass Lizard	NLC	LC	DD
Plestiodon elegans (Boulenger, 1887)	Shanghai Elegant Skink	NLC	LC	NLC
Plestiodon leucostictus (Hikida, 1988)	White-spotted Skink	NLC	NT A2e	DD
Plestiodon chinensis chinensis (Gray, 1838)	Chinese Blue-tailed Skink	NLC	LC	DD
Plestiodon chinensis formosensis (Van Denburgh, 1912)	Formosan Chinese Skink	NLC	–	NLC
Ateuchosaurus chinensis Gray, 1845	Chinese Short-limbed Skink	NLC	LC	DD

Taxon	Common Name	Taiwanese Red List Category in 2024	Global Red List Category in 2024	Taiwanese Red List Category in 2017
Sphenomorphus indicus (Gray, 1853)	Indian Forest Skink	NLC	LC	NLC
Eutropis borealis (Brown & Alcala, 1980)	Multi-keeled Mabuya	NLC	LC	DD
Sphenomorphus incognitus (Thompson, 1912)	Taiwan Smooth Skink	NLC	LC	NLC
Eutropis longicaudata (Hallowell, 1857)	Longtail Mabuya	NLC	LC	NLC
Eutropis cumingi (Brown & Alcala, 1980)	Cuming's Mabuya	NLC	LC	DD
Scincella formosensis (Van Denburgh, 1912)	Van Denburgh's Ground Skink	NLC	LC	NLC
Sphenomorphus taiwanensis Chen & Lue, 1987	Taiwan Alpine Skink	NLC	LC	NLC
Hemidactylus bowringii (Gray, 1845)	Sikkimese Dark-spotted Gecko	NLC	LC	NLC
Gekko kikuchii (Oshima, 1912)	Bowring's Smooth Gecko	NLC	LC	DD
Gekko hokouensis Pope, 1928	Kwangsi Gecko	NLC	LC	NLC
Hemidactylus stejnegeri Ota & Hikida, 1989	Hokou Gecko	NLC	LC	NLC
Lepidodactylus lugubris (Duméril & Bibron, 1836)	Mourning Gecko	NLC	LC	DD
Takydromus viridipunctatus Lue & Lin, 2008	Grass Lizard	NLC	LC	DD
Takydromus formosanus Boulenger, 1894	Formosa Grass Lizard	NLC	LC	DD
Takydromus stejnegeri Van Denburgh, 1912	Stejneger's Grass Lizard	NLC	LC	NLC
Takydromus hsuehshanensis Lin & Cheng, 1981	Hsuehshan's Grass Lizard	NLC	LC	NLC
Takydromus luyeanus Lue & Lin, 2008	Luyea Grass Lizard	NLC	LC	DD
Takydromus septentrionalis (Günther, 1864)	China Grass Lizard	NLC	LC	DD
Takydromus kuehnei Van Denburgh, 1909	Kuhne's Grass Lizard	NLC	LC	NLC

4. Globally Threatened Terrestrial Reptile Species of Taiwan

Of the 90 candidate species, 14 were classified as Globally Threatened by the IUCN in 2024 (IUCN 2024). Of these, 5 were classified as Nationally Threatened, 4 was classified as Nationally Near-Threatened, and 4 was classified as Nationally Least Concern.

Taxon	Common Name	Taiwanese Red List Category in 2024	Global Red List Category in 2024
Mauremys mutica Cantor, 1842	Yellow Pond Turtle	NCR A2cdeB2b(ii,iii,iv)	CR A2cd+4cd
Mauremys sinensis (Gray, 1834)	Chinese Striped-necked Turtle	NNT A2cdeB2b(ii,iii,iv)	CR A2cd+4cd
Cuora flavomarginata (Gray, 1863)	Yellow-margined Box Turtle	NCR A2cdB2b(ii,iii,iv,v)c(iv)	EN A2cd+4cd
Mauremys reevesii (Gray, 1831)	Reeves' Turtle (Chinese Pond Turtle)	NEN A2cdeB1b(ii,iii)C2a(i)	EN A2bcd+4bcd
Diploderma luei Ota, Chen and Shang, 1998	Lue's Japalura	NNT B1b(iii)	EN B1ab(iii)
Pelodiscus sinensis (Wiegmann, 1835)	Chinese Softshell Turtle	NNT B1b(ii,iii)	VU A1d+2d
Hebius miyajimae (Maki, 1931)	Maki's Keelback	NEN B1b(ii,iii,iv)	VU B1ab(iii,iv)
Orthriophis taeniurus friesi (Werner, 1927)	Taiwan Beauty Snake	NLC	VU A2d
Naja atra Cantor, 1842	Chinese Cobra	NLC	VU A2d
Bungarus multicinctus Blyth, 1861	Many-banded Krait	NLC	VU A2d
Deinagkistrodon acutus Günther, 1888	Chinese Moccasin	NLC	VU A2d
Python bivittatus (Kuhl, 1820)	Burmese Python	NVU C2a(ii)	VU A2acd
Diploderma brevipes (Gressit, 1936)	Short-legged Japalure	NLC	VU A2cB1ab(iii,v)
Diploderma makii Ota, 1989	Ota's Japalura	NNT B1b(iii)	VU B1ab(iii)

5. Acknowledgements

We would like to thank Chun-Fu Lin, Shih-Wei Chang, His-Chi Cheng, Lin-Wen ChangChien, Tien-His Chen, and Cheng-Hsiung Yang for participating in the discussion on the evaluation process and providing many suggestions for revisions; An-Yu Chang, Fu-An Tsai, and Wan-Jyun Chen for assisting in calculating and tabulating Taiwan reptile AOO, EOO, and SDM; Yu-Kai Chen, Yi-Lun Lin, and Tun-Yu Chen for helping in literature and related material collection and compilation; and other researchers and experts for providing relevant information and recommendations in the evaluation process, opinion and information solicitation in the public briefing for the preliminary results of the Red List of Reptiles.

6. References

Bernstein, Justin M., Robert W. Murphy, Amy Lathrop, Sang Ngoc Nguyen, Nikolai L. Orlov and Bryan L. Stuart. 2024. Incorporating new datatypes to enhance species delimitation: a case study in rice paddy snakes (Homalopsidae: *Hypsiscopus*). *Zootaxa* 5501(1): 039-055.

Bubb, P. J., S. H. Butchart, B. Collen, H. Dublin, V. Kapos, C. Pollock, S. N. Stuart, and J.-C.Vie. 2009. IUCN Red List Index - Guidance for National and Regional Use. Gland, Switzerland: IUCN.

Cox, N., B. E. Young, P. Bowles, M. Fernandez, J. Marin, G. Rapacciuolo, et al. 2022. A global reptile assessment highlights shared conservation needs of tetrapods. *Nature* 605(7909): 285-290. https://doi.org/10.1038/s41586-022-04664-7

Farooq, H., M. Harfoot, C. Rahbek and J. Geldmann. 2024. The threats to reptiles at global and regional scales. *Current Biology* 34(10): 2231-2237. https://doi.org/10.1016/j.cub.2024.04.007

Gumbs, R., C.L. Gray, M. Böhm, M. Hoffmann, R. Grenyer, W. Jetz, S. Meiri, U. Roll, N. R. Owen, and J. Rosindell. 2020. Global priorities for conservation of reptilian phylogenetic diversity in the face of human impacts. *Nature Communications* 11, 2616. https://doi.org/10.1038/s41467-020-16410-6

IUCN 2024. The IUCN Red List of Threatened Species. Version 2024-1. <https://www.iucnredlist.org>

IUCN Standards and Petitions Committee. 2024. Guidelines for using the IUCN Red List Categories and Criteria. Version 16. Prepared by the Standards and Petitions Committee. Downloadable from https://www.iucnredlist.org/documents/RedListGuidelines.pdf.

IUCN. 2012a. Guidelines for application of IUCN Red List criteria at regional and national levels: version 4.0. IUCN. Gland, Switzerland and Cambridge, UK.

IUCN. 2012b. IUCN Red List categories and criteria: version 3.1. Second edition. IUCN. Gland, Switzerland and Cambridge, UK.

Kurita, Kazuki, Yukiko Nakamura, Taku Okamoto, Si-Ming Lin and Tsutomu Hikida. 2017. Taxonomic reassessment of two subspecies of Chinese skink in Taiwan based on morphological and molecular investigations (Squamata, Sincidae). *Zookeys* 687: 131-148.

Lee, Ko-Huan, Tien-Hsi Chen, Gaus Shang, Simon Clulow, Yi-Ju Yang, Si-Ming Lin. 2019. A Check list and population trends of invasive amphibians and reptiles in Taiwan. *Zookeys* 829: 85-130.

Lee, Y., J.-W. Lin, S.-P. Tseng, T.-S. Chen and S.-M. Lin. 2019. Human disturbances as a possible cause of genetic introgression from exotic into native *Mauremys* turtles. *Animal Conservation* 22: 556-567.

Luedtke, J. A., J.Chanson, K. Neam, et al. 2023. Ongoing declines for the world's amphibians in the face of emerging threats. *Nature* 622, 308–314. https://doi.org/10.1038/s41586-023-06578-4.

Pimm, S. L., C. N. Jenkins, R. Abell, T. M Brooks, J. L. Gittleman, L. N. Joppa, P. H. Raven, C. M. Roberts, and J. O. Sexton. 2014. The biodiversity of species and their rates of extinction, distribution, and protection. *Science* 344(6187): 1246752.

Rodrigues, A. S. L., J. D. Pilgrim, J. F. Lamoreux, M. Hoffmann, and T. M. Brooks. 2006. The value of the IUCN Red List for conservation. *Trends in Ecology and Evolution* 21: 71-76.

Roll, U., Feldman, A., Novosolov, M. *et al*. The global distribution of tetrapods reveals a need for targeted reptile conservation. 2017. *Nature Ecology and Evolutionj* 1, 1677–1682. https://doi.org/10.1038/s41559-017-0332-2

Smart, Utpal., Matthew J. Ingrasci, Goutam C. Sarker, Hmartlawmte Lalremsanga, Robert W. Murphy, Hidetoshi Ota, Ming Chung Tu, Yogesh Shouche, Nikolai L. Orlov and Eric N. Smith. 2021. Acomprehensive appraisal of evolutionary diversity in venomous Asian coralsnakes of the genus *Sinomicrurus* (Serpentes: Elapidae) using Bayesian coalescent inference and supervised machine learning. *Jounral of Zoological Systematics and Evolutionary Research* 59: 2212-2277.

Townsend, A. J., P. J. de Lange, C. A. J. Duffy, C. M. Miskelly, J. Molloy, and D. A. Norton. 2007. New Zealand Threat Classification System Manual. Science & Technical Publishing, Department of Conservation, Wellington, New Zealand.

Uetz, P., Freed, P, Aguilar, R., Reyes, F., Kudera, J. and Hošek, J. (eds.) 2024. The Reptile Database, http://www.reptile-database.org.

You Chung-Wei, Yen-Po Lin, Yen-Hsueh Lai, You-Ling Chen, Yao Tang, Shih-Ping Chou, Hong-Yi Chang, Robert Zappalorti and Si-Ming Lin. 2013. Return of the pythons: first formal records, with a special note on recovery of the Burmese python in the demilitarized Kinmen islands. Zoological Studies 52:8.

2024 臺灣陸域爬行類紅皮書名錄

The Red List of Terrestrial Reptiles of Taiwan, 2024

發行人 楊嘉棟、林華慶

作者 許富雄、林思民、楊淳凱、林德恩

出版 農業部生物多樣性研究所
農業部林業及自然保育署

地址 552005 南投縣集集鎮民生東路 1 號

美編印刷 天晴文化事業

地址 708013 臺南市安平區健康路三段 326 號

電話 06-2933266

出版年月 2024 年 12 月

ISBN 978-626-7454-91-6

GPN 1011301703

定價 新臺幣 100 元

Publisher Jia-Dong Yang, Hwa-Ching Lin

Authors Fu-Hsiung Hsu, Si-Min Lin, Chun-Kai Yang and Te-En Lin

Published by Taiwan Biodiversity Research Institute, Ministry of Agriculture, R.O.C. (Taiwan)
Forestry and Nature Conservation Agency, Ministry of Agriculture, R.O.C. (Taiwan)

Address No. 1, Ming-Shen East Road, Jiji Township, Nantou County, 552005, Taiwan

Art Designed and Printed by Dawn Cultural Enterprises

Address No. 326, Sec. 3, Jiankang Road, Anping District, Tainan City, 708013, Taiwan

Telphone 06-2933266

Published Date December 2024

ISBN 978-626-7454-91-6

GPN 1011301703

Price NT100

引用方式 許富雄、林思民、楊淳凱、林德恩。2024。2024 臺灣陸域爬行類紅皮書名錄。農業部生物多樣性研究所、農業部林業及自然保育署。南投。

Citation Fu-Hsiung Hsu, Si-Min Lin, Chun-Kai Yang and Te-En Lin. 2024. The Red List of Terrestrial Reptiles of Taiwan, 2024. Taiwan Biodiversity Research Institute and Forestry and Nature Conservation Agency, Ministry of Agriculture. Nantou, Taiwan.

封底照片 /

1 *Mauremys mutica*
柴棺龜 Yellow Pond Turtle
NCR A2cdeB2b(ii,iii,iv)
陳惇聿 / 攝

2 *Takydromus sauteri*
梭德氏草蜥 Koshun Grass Lizard
NNT B1b(iii)
林德恩 / 攝

3 *Sibynophis chinensis chinensis*
黑頭蛇 Chinese Many-tooth Snake
NLC
林德恩 / 攝

4 *Diploderma makii*
牧氏攀蜥 Ota's Japalura
NNT B1b(iii)
林德恩 / 攝

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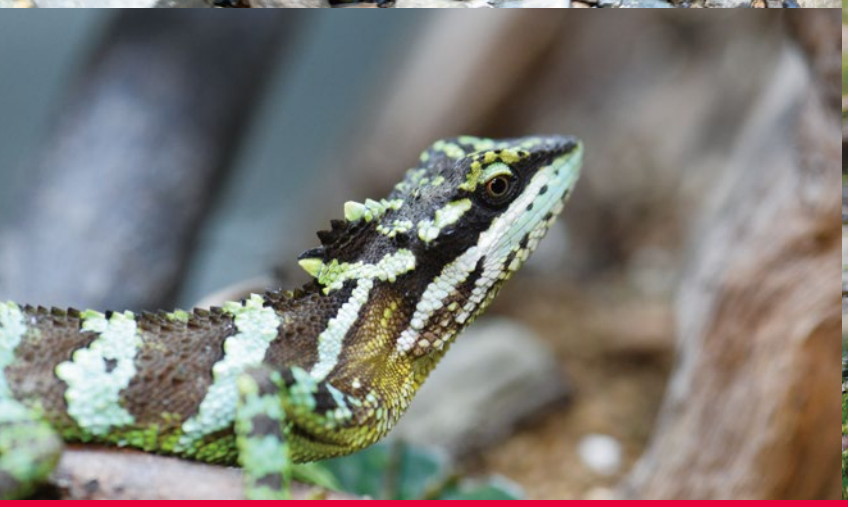

ISBN-13: 978-626-7454-91-6

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