

2024臺灣淡水魚類 紅皮書名錄

The Red List of Freshwater Fishes of Taiwan, 2024



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■ *Squalidus ijimae*
飯島氏銀鮡 Taiwan gudgeon
NCR B1ab(ii)+B2ab(ii)
周銘泰 / 攝

目錄照片 /

■ *Rhinogobius lanyuensis*
蘭嶼吻鰕虎 Lanyu Island Rhinogoby
NEN B1ab(iv,v)c(ii)+B2ab(iv,v)c(ii), C1, D
楊正雄 / 攝

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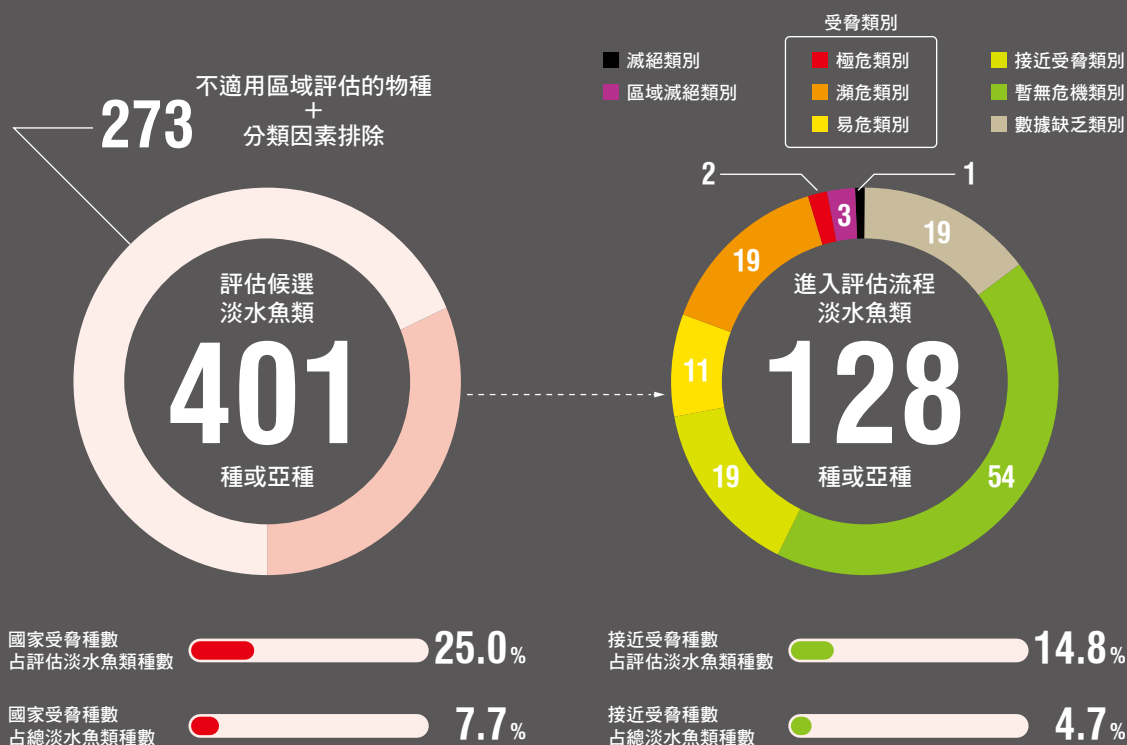
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摘要

本報告為臺灣第二次依據國際自然保育聯盟 (International Union for Conservation of Nature) 的紅皮書受脅與評估系統 (IUCN Red List of Threatened Species™) 的建議類別與標準對所有原生淡水魚類進行國家淡水魚類紅皮書名錄評估。納入評估候選種類共 401 種，其中 269 種不適用 (Not Applicable) 區域評估篩選門檻及 4 種因分類因素排除，128 種進入評估流程。結果臺灣有 4 種淡水魚類已經滅絕，其中 1 種屬於滅絕 (Extinct)，3 種屬於地區性滅絕 (Regionally Extinct)。32 種或亞種國家受脅 (Nationally Threatened) 淡水魚類，其中屬國家極危 (Nationally Critical) 類別有 2 種，屬國家瀕危 (Nationally Endangered) 類別有 19 種，屬國家易危 (Nationally Vulnerable) 類別有 11 種，另有 19 種歸於國家接近受脅 (Nationally Near-threatened)。國家受脅及接近受脅淡水魚類種數分別占評估淡水魚種數的 25.0% 及 14.8%，以及總淡水及河口魚種數的 7.7% 及 4.7%。54 種列為暫無危機 (Least Concern)；19 種列為資料缺乏 (Data Deficient)。出現於臺灣的全球受脅及接近威脅淡水魚類共有 9 種，其中 5 種屬國家受脅，3 種屬國家接近威脅，1 種為資料缺乏。





1. 前言

由國際自然保育聯盟 (International Union for Conservation of Nature, IUCN) 物種存續委員會 (Species Survival Commission) 所執行的 IUCN 紅皮書名錄 (IUCN Red List of Threatened Species) 作業流程，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的最重要參考依據 (Rodrigues *et al.* 2006；IUCN 2016)；其後續發布的 IUCN 紅皮書名錄地區及國家級評估準則應用指南，也成為許多國家評估其境內受脅物種名錄的重要遵循標準 (Townsend *et al.* 2007；IUCN 2012a)，該項評估的結果，不僅有助於了解地區及國家級的物種受脅狀況，也讓全球紅皮書所涵蓋的物種更加地完整 (Rodrigues *et al.* 2006)。

如果一個國家或地區稱其國家或區域紅皮書的產生是依據 IUCN 系統，那麼就必須無偏差地根據 IUCN 紅皮書類別及標準 (IUCN Red List Categories and Criteria) 進行評估 (IUCN 2012b)。而所謂區域 (region) 指的是地球範圍內，任何一個可明確界定的空間範圍，如大陸、國家及州省等 (IUCN 2012a)。由全球至區域時，對受脅物種評估而言，自然會產生原生或外來種，繁殖或非繁殖物種，或如先前曾經分布，但已局部滅絕的區域現象 (IUCN 2012a)。本報告採用的評估標準與類別係依據 IUCN 紅皮書

名錄類別與標準：3.1 版 (IUCN 2012b)。然而，由於空間尺度的關係，當前述標準應用於分布不完全侷限於評估範圍的物種時，評估流程與標準設定的閾值可能並不適當，因此必須有所有調整。IUCN 紅皮書名錄地區及國家級評估標準應用指南提供調整建議 (IUCN 2012a)。

在臺灣，陳義雄、曾晴賢與邵廣昭曾針對淡水魚類進行過受脅程度的分析，並且在 2012 年透過當時林務局 (農業部林業及自然保育署前身) 正式出版「臺灣淡水魚紅皮書」(陳等 2012)，是臺灣首份淡水魚類紅皮書報告。該版本共評估 115 個物種，依據「野生動物評估分類作業要點」的淡水魚類附表，以野生族群分布模式、棲地內優勢度現況、野生族群族群趨勢、分類地位及面臨威脅等五大指標進行初評，並且參考專家學者意見後，最後共列出 52 種受脅魚類，其中極危 (Critical Endangered, CR) 有 3 種，瀕危 (Endangered, EN) 有 3 種，易危 (Vulnerable, VU) 有 31 種，近危 (Near Threatened, NT) 有 15 種。其中並且有 10 種被列為國家法定的保育類野生動物。

■ *Sicyopus auxilimentus*
砂棲瓢眼鰕虎 Red-lip sicyopus
NNT D1[-1]
周銘泰 / 攝

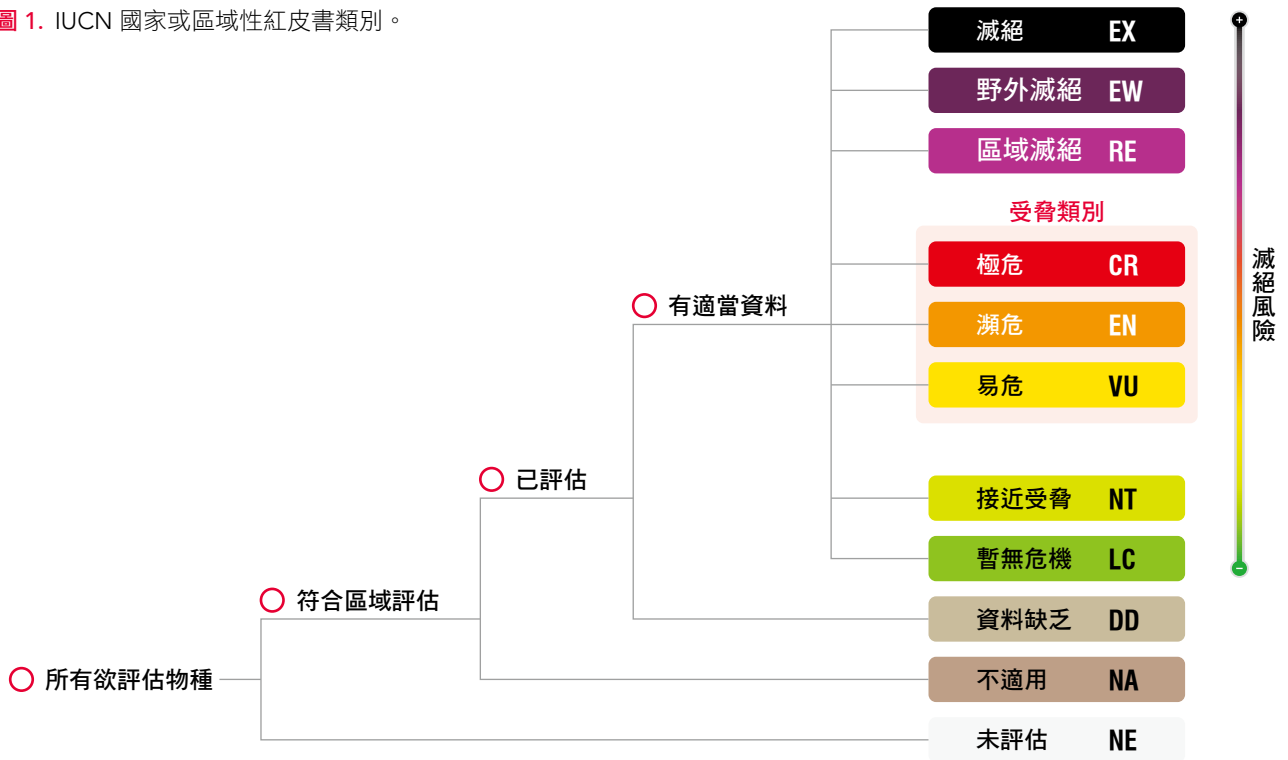


該報告雖非完全依照 IUCN 的準則進行評估，但在五大指標內已經涵蓋 IUCN 的精神與評估模式在內，其評估結果並且與保育類名錄的修正互相配合，為臺灣淡水魚類受脅的種類與狀態評估奠定基礎。楊正雄等則蒐集及更新臺灣所有原生淡水魚的分布範圍、族群趨勢、數量與受脅原因等資訊，出版 2017 臺灣淡水魚紅皮書名錄，是臺灣首次依據 IUCN 類別與標準評估各淡水魚種的受脅狀態 (楊等 2017)。後續為因應全球及臺灣地區生物多樣性喪失與全球環境及氣候變遷等危機，農業部林業及自然保育署與農業部生物多樣性研究所一致認為物種保育狀況的評估應制度化且定期性進行評估，此次報告即為繼 2017 年後，再次依循前次同樣方法進行臺灣所有淡水魚類的受脅評估的結果。



| *Lentipes mindanaoensis*
 棉蘭老韌鰕虎 Goby
 DD
 周銘泰 / 攝

圖 1. IUCN 國家或區域性紅皮書類別。





2. 評估流程

本報告執行臺灣各淡水魚種或亞種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群

使用臺灣物種名錄 (Chung and Shao 2024)(Catalogue of Life in Taiwan, TaiCol, <https://taicol.tw/>) 中取得臺灣目前已發表之所有魚類名錄，再依據臺灣淡水及河口魚類誌 (陳與方 1999) 及臺灣淡水及河口魚蝦圖鑑 (高等 2020)、臺灣保育類及其他稀有河海洄游鰕虎科魚種鑑定手冊 (黃 2023)、Catalog of fishes (Eschmeyer et al. 2024) (<https://research.calacademy.org/research/ichthyology/catalog/fishcatmain.asp>) 和臺灣魚類資料庫 (Shao 2024) (<https://fishdb.sinica.edu.tw/>) 中對於生活史的資料與描述，選擇可以或曾經在淡水域出現過的所有種類。

本名錄使用中文名與學名以臺灣物種名錄為主，輔以臺灣魚類資料庫 (Shao 2024) 與 Catalog of fishes (Eschmeyer et al. 2024) 對各物種學名狀態之整理進行資料訂正。部份 2017 年評估納入物種因分類變遷、尚未命名或其他佐證資料而有調整名稱或排除，調整物種有 2 種，為圓吻鰕 (*Distoechodon tumirostris*) 更改為扁圓吻鰕 (*Distoechodon compressus*)，及柯勒氏鰕鮓 (*Gobiobotia kollerii*) 更改為中間鰕鮓 (*Gobiobotia intermedia*)。排除物種為寬頰瓢鰭鰕虎 (*Sicyopterus macrostetholepis*)、美麗枝牙鰕虎 (*Stiphodon elegans*)、頰斑細鰕虎 (*Stenogobius* sp.) 與羅氏裂身鰕虎 (*Schismatogobius roxasi*) 等 4 種。

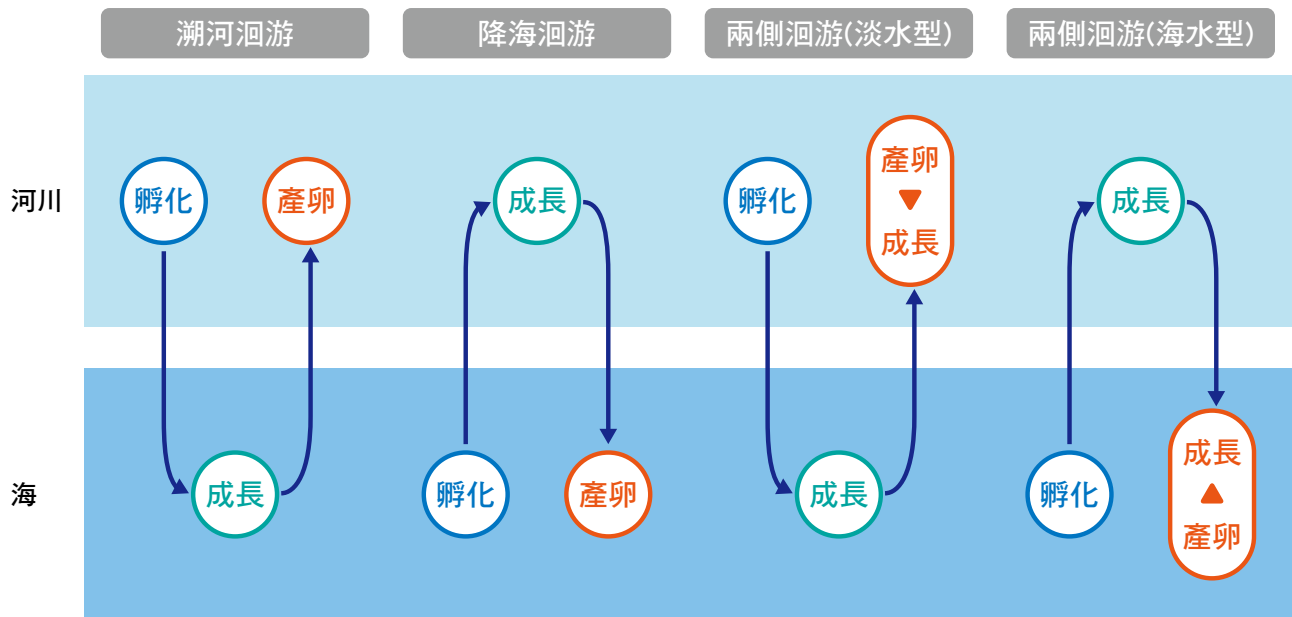
依照上述條件所初步篩選得到的魚類種類清單共計有 401 種，經分類變遷等因素排除 4 種後有 397 種。因淡水魚類的生活史原本就十分多樣，因此初步篩選出來的這些種類包含會在純淡水環境，以及河海之間的半淡鹹水出現的所有種類；在洄游習性上面，則包含有河海洄游的種類 (降海、溯河以及兩側洄游種類)，以及不會進行洄游，或是僅在河川內移動的種類。由於本次紅皮書在淡水魚類所設定的目標為評估淡水魚類在淡水域環境內的變動狀況，因此必須先針對這 401 種淡水魚再做過一些篩選。

廣義的淡水魚如果以鹽度耐受性可以分成三種，分別是：(1) 初級淡水魚 (primary freshwater fish)：指終其一生都僅棲息在淡水環境的種類。(2) 次級淡水魚 (secondary freshwater fish)：幾乎只生活在淡水水域，但可耐受，或偶爾可進入鹹淡水或海水中活動或棲息。(3) 周緣性淡水魚 (peripheral freshwater fish)：主要在海或半淡鹹水環境中棲息，但其生活史可能會游進淡水中生存，或是進入鹹淡水中活動，這包含部分溯河性魚類、降海性魚類以及偶見於河川的汽水域 (brackish water) 魚類。這些可以在河海之間移動的種類，可以再依照其不同生活史階段所在環境與移動方向分成以下三類，包含：(1) 溯河洄游 (anadromous) 淡水魚：由海洋上溯至河川裡進行繁殖的種類，例如：洄游型鮭魚。(2) 降海洄

游 (catadromous) 淡水魚：由河川下降至海洋裡進行繁殖的種類，例如：花鰻鱺。(3) 兩側洄游 (amphidromous) 淡水魚：並非為了生殖目的，但可由海洋上溯至河川，或是由河川下降至海洋的種類。例如：絕大多數的鰕虎科魚類

等即屬此類。其中兩側洄游的魚類眾多，且其生活史型態更為多樣，亦有研究依照其生殖地點再細分為淡水性兩側洄游 (指在淡水環境繁殖的種類)，以及海洋性兩側洄游 (指在海水環境繁殖的種類)。其分類說明如圖 2 所示。

圖 2. 洄游型態分類示意圖 (修改自後藤等 1994)。



由上述說明，定義本次紅皮書所欲納入評估的淡水魚將包含：(1) 可在淡水環境完成整個生活史的種類，亦即初級淡水魚，沒有在河海之間洄游移動的魚類。(2) 可在河海之間洄游移動，但是在淡水環境進行繁殖行為 (產卵及孵化) 的魚類，亦即溯河洄游與淡水型的兩側洄游種類。(3) 降海洄游種類的魚類也納入評估，因其雖未在河川中繁殖，但其所有個體都必須在淡水環境中成長，且停留時間並不算短，如以降海洄游的鰻魚來說，達數年數十年。相對來說，海水型的兩側洄游種類，通常僅族群中的少數個體會進入到淡水中，且其在淡水域的時間不會太久，有時需要在特定季節才會淡水

環境中見到。因此本報告在評估時，將海水性兩側洄游種類排除掉。

雖然兩側洄游是評估名單的篩選條件，但在臺灣周邊或是河川內可以紀錄到的兩側洄游種類，有不少種類其實際的生活史狀況並不清楚，在參考臺灣淡水魚紅皮書 (陳等 2012) 及臺灣淡水及河口魚蝦圖鑑 (高等 2020)、其他公開與未公開的觀察資料及參考同屬內其他物種的生活史後，將以下可在河川內發現成熟個體的種類也納入評估清單內，包含具有育兒囊的海龍亞科 (Syngnathinae)、鰕虎科的枝牙鰕虎屬 (*Stiphodon*)、裂身鰕虎屬



(*chismatogobius*)、韌鰕虎屬 (*Lentipes*)、棘鰕塘鱧屬 (*Belobranchus*)、瓢眼鰕虎屬 (*Sicyopus*)、及長絲瓢鰕鰕虎 (*Sicyopterus longifilis*)、琉球竿鰕虎 (*Luciogobius ryukyuensis*)、阿部氏輻鰕虎 (*Mugilogobius abei*)、黏皮輻鰕虎 (*Mugilogobius myxodermus*)、糙體銳齒鰕虎 (*Smilosicyopus leprurus*) 等。

評估的分類單元原則為「種」，但國土範圍內同時有特有亞種及其他亞種出現時則分別評估。另繁殖與訪問 (遷徙且無繁殖) 族群可區分時，亦依據 IUCN 國家或區域紅皮書標準應用指南 (IUCN 2012a) 之建議分別評估。若同時有外來種與原生種族群分布於國土範圍內，僅針對原生種族群進行評估。

其中香魚 (*Plecoglossus altivelis altivelis*) 因為在臺灣的原生族群已經滅絕，目前族群是 1984 年自日本再引進成功。由於臺灣的香魚並未確定特有性，與日本及其他地方的族群有相同的學名，這些現存香魚屬於再引入的外來族群 (Re-introduced population)，因此本報告依照 IUCN 文件的規範建議 (IUCN Standard and Petitions Subcommittee 2024)，將此種納入在評估名單之中，但不使用現生族群資料。

除了遷留屬性 (洄游與否) 的考量之外，IUCN 在地區性評估名單條件篩選上也可設定數量門檻，遷徙性物種的數量若沒有超過預設的門檻的話，就可能被視為是偶然發生的狀況 (Vagrant)。本報告因為已彙集的淡水魚資料中，並無足夠或是基準一致的定量族群資料可以比較。因此並不設定門檻數量作為篩選條件。

依據上述對淡水魚生活史的類別說明，依照 IUCN 國家或區域紅皮書標準應用指南 (IUCN 2012a) 的建議流程，排除具表 1 所列特性的魚種或亞種，其餘出現於我國國土涵蓋範圍內之初級淡水魚 (包含再引入的已滅絕種類)、溯河洄游淡水魚、兩側洄游河川型淡水魚、降海洄游淡水魚等都納入評估清單中，合計共有 128 種。

■ *Gobiobotia cheni*

陳氏鰕鰕 Taiwan eight-barbel gudgeon

NEN B1ab(i,ii)c(i)+B2ab(i,ii)c(i)

洪芷盈 / 繪

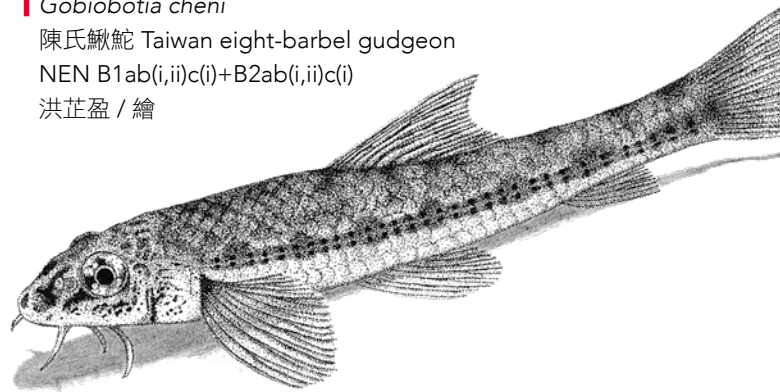


表 1. 排除正式評估之篩選條件

遷留屬性	其他條件
繁殖	1、外來種 (包含水族觀賞或是養殖逸出，或是人為放養的非原生種類) 2、兩側洄游種類，其生活史目前無法確定是海水型或淡水型的種類。
洄游 (遷徙) 且無繁殖	1、兩側洄游海水型種類。有些兩側洄游種類，並不確定是否有淡水繁殖狀況者，暫不列入此次評估清單。 2、通常視為海水魚，但仍有部分族群會進入淡水域活動的種類。

2.2 資訊蒐集與初步評估

依據 IUCN Red List Categories and Criteria: Version 3.1 (IUCN 2012b) 與 IUCN 國家或區域紅皮書標準應用指南 (IUCN 2012a) 兩份文件，建立資料表，並進行上述列入評估名單物種的各項資料。

每一受評分類群均依照 IUCN 紅皮書指南第 16 版進行評估 (IUCN Standard and Petitions Subcommittee 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. 非常小的族群 (Very small population)，以及 E. 量化分析

(Quantitative analysis) 等五大準則 (Criterion) 及對應次要準則 (Sub-criterion) 及方式 (Qualifiers) 所構成之決策樹 (decision tree) 進行 (表 2)。

某一物種經過準則的評估後，無法符合國家極危 (Nationally Critical, NCR)、國家瀕危 (Nationally Endangered, NEN) 及國家易危 (Nationally Vulnerable, NVU) 的等級，但已很接近或未來可能達到國家易危等級時，可列入國家接近受脅 (Nationally Near-threatened, NNT) 等級。由於 IUCN 紅皮書分級及標準 (IUCN Red List Categories and Criteria) 並無明確的接近受脅 (Near Threatened, NT) 標準，本報告根據前述原則並參考 IUCN 紅皮書分級及標準設定本評估 NNT 的標準 (表 2)。

表 2 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%
<p>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：</p> <p>(a) 直接觀察。〔A3 除外〕</p> <p>(b) 適合該分類群的物種豐度指數。</p> <p>(c) 分布範圍、占有面積或棲地品質減少或下降。</p> <p>(d) 實際或潛在的開發破壞。</p> <p>(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。</p> <p>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。</p> <p>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)。</p> <p>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。</p>				



受脅類別判斷標準 A-E	極危 (CR)	瀕危 (EN)	易危 (VU)	接近受脅 (NT)
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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 km ²	< 5,000 km ²	< 20,000 km ²	< 20,000 km ²
B2. 占有面積 (AOO)	< 10 km ²	< 500 km ²	< 2,000 km ²	< 2,000 km ²

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。

(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
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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)
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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
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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 km ² 或分布地點數 ≤ 5	D2. 占有面積 < 50 km ² 或分布地點數 ≤ 10
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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%	100 年內在野外絕種 之機率超過 5%
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2.3 類別調整原則

依據資料完成初步評估後，需進一步考慮受評估分類群的區域滅絕機率受到評估範圍外相同分類群其他族群的影響程度 (IUCN 2012a)。其目的主要在於瞭解評估區域內的族群在特定時間內 (通常是 10 年或 3 代內) 與範圍外族群是否有交流情況，當無交流情況時，則維持步驟 2.2 所評估等級結果。但若有交流情況，則遷入 (或是以任何形式) 個體預期不會減少且本地族群也沒有持續下降的情況時 (sink population)，其滅絕機率預期應會降低，故受脅等級將調降一級。

依照上述的說明，以及依照 IUCN(2012a) 建議流程，說明臺灣淡水魚類評估時的地區調整流程與原則如下：

1. 特有種或特有亞種，除非有特殊狀況，不然不予調整等級，維持步驟 2.2 之評估等級結果。
2. 非屬特有 (亞) 種，則依據其移動能力及與範圍外族群的交流狀況調整。此部分包含兩種考量，分別是生活史類型，以及是否有放流活動補充族群。分別說明如下：
 - (1) 生活史類型中具有洄游時期的種類，若為降海洄游的種類，因為其繁殖地點並非在河川中，因此族群會每年因補充量多寡而有所差異。因此會依據本地所佔全球族群比例，進行調整。如果臺灣族群有超過全球 5% 以上的族群，則其評估等級將會提高；若為 1 ~ 5% 以內，則維持原評估不變；若 <1%，則將等級降低。
 - (2) 除了自然擴散，或是洄游性魚類會有自然補充族群的狀況外，許多淡水魚類都會面臨人為放流的狀況，因此在地區性評估時，也將此點納入考量。復育放流，視情況而定，若為原棲地放流，或是歷史棲地放流，則將等級調降一級 (以 [-1] 表示)。若非復育放流 (如養殖或是放生性，或是可能會有水族或養殖逸出的情況)，或是可能會有雜交的情況時，視依據實際情況，調降一至二級 (以 [-1] 或 [-2] 表示)。
3. 在最後評估名錄中，各種淡水魚類所列等級為調整之後的等級。若有經地區性調整的種類，在評估標準欄位中，將另外註記。如受脅等級提高一級則以 [1] 表示，受脅等級調降 1 級者以 [-1] 表示。依此類推。降級後物種，依據國家接近受脅 (NNT) 定義，區別屬於 NNT 或國家暫無危機 (National Least Concern, LC) 等級。

2.4 公開意見徵詢

經由步驟 2.1 ~ 2.3 產生的評估結果於 2024 年 9 月至 2024 年 11 月間，由臺灣相關專家仔細審視收錄資料的正確性及補充闕失資訊，並於 2024 年 11 月 21 日辦理公開論壇，廣泛徵求魚類學家、民間團體及政府部門意見，最後再依據更新之資訊，再次執行步驟 2.1 ~ 2.3 產生本評估報告初稿。



3. 國家受脅及接近受脅淡水魚類評估結果

結果臺灣有 4 種淡水魚類已經滅絕，其中 1 種屬於滅絕 (Extinct)，3 種屬於地區性滅絕 (Regionally Extinct)。32 種或亞種國家受脅 (Nationally Threatened) 淡水魚類，其中屬國家極危 (Nationally Critical) 類別有 2 種，屬國家瀕危 (Nationally Endangered) 類別有 19 種，屬國家易危 (Nationally Vulnerable) 類別有 11 種，另有 19 種歸於國家接近受脅 (Nationally Near-threatened)。國家受脅及接近受脅淡水魚類種數分別占評估淡水魚種數的 24.0% 及 14.8%，以及總淡水及河口魚種數的 7.7% 及 4.7%。54 種列為暫無危機 (Least Concern)；19 種列為資料缺乏 (Data Deficient)。與前次 2017 臺灣淡水魚類紅皮書名錄比較 (楊等 2017)，共

有 12 種或亞種提高受脅類別，另外 12 種或亞種降低受脅類別。各分類群的學名依據為臺灣物種名錄 (Chung and Shao 2024；Catalogue of Life in Taiwan, TaiCol, <https://taicol.tw/>)。本報告所有淡水魚評估資料及結果請聯繫作者索取。

為了比較本次與前次評估結果的差異，本次報告書新增「2017 臺灣類別」欄位作為對照，也更新全球紅皮書類別資訊在「2023 全球類別」(IUCN 2023)。各淡水魚物種兩次評估結果的變化，可能來自於受脅狀態的真實趨勢 (改善或惡化)，也可以是知識增加或對於資料重新詮釋所造成，本報告依據 Bubb et al.(2009) 的建議，逐一檢視後以**粗體字**標示屬於真實改善者，以劃底線方式標示屬於真實惡化者。

3.1 滅絕 (EX) 類別淡水魚類名錄

分類群	俗名	繁殖 (B) 非繁殖 (V)	評估標準 [類別調整]	2024 全球類別	2017 臺灣類別
<i>Salanx acuticeps</i> Regan, 1908	銳頭銀魚	B	-	-	EX

3.2 地區性滅絕 (RE) 類別淡水魚類名錄

分類群	俗名	繁殖 (B) 非繁殖 (V)	評估標準 [類別調整]	2024 全球類別	2017 臺灣類別
<i>Sinobdella sinensis</i> (Bleeker, 1870)	中華刺鰍	B	-	LC	RE
<i>Plecoglossus altivelis altivelis</i> (Temminck & Schlegel, 1846)	香魚	B	-	DD	RE
<i>Myersina yangii</i> (Chen, 1960)	楊氏鋤突鰕虎	V	-	LC	RE

3.3 國家極度瀕危 (NCR) 類別淡水魚類名錄

分類群	俗名	繁殖 (B) 非繁殖 (V)	評估標準 [類別調整]	2024 全球類別	2017 臺灣類別
<i>Aphyocypris amnis</i> Liao, Kullander & Lin, 2011	溪流細鯽	B	C1, D	–	NCR
<i>Squalidus iijimae</i> (Oshima, 1919)	飯島氏銀鮡	B	B1ab(ii)+B2ab(ii)	–	DD

3.4 國家瀕危 (NEN) 類別淡水魚類名錄

分類群	俗名	繁殖 (B) 非繁殖 (V)	評估標準 [類別調整]	2024 全球類別	2017 臺灣類別
<i>Anguilla japonica</i> Temminck & Schlegel, 1846	日本鰻鱺	V	A2bcde, B2ab(i,v) [1]	EN	NCR
<i>Liobagrus formosanus</i> Regan, 1908	臺灣魮	B	B1ab(ii)+B2ab(ii)	–	NEN
<i>Tachysurus adiposalis</i> (Oshima, 1919)	長脂瘋鱮	B	B1ab(ii)+B2ab(ii)	LC	<u>NVU</u>
<i>Stiphodon imperorientis</i> Watson & Chen, 1998	明仁枝牙鰕虎	B	D [-1]	VU	NE
<i>Smilosicyopus leprurus</i> (Sakai & Nakamura, 1979)	尾鱗銳齒鰕虎	B	C1 [-1]	LC	DD
<i>Rhinogobius lanyuensis</i> Chen, Miller & Fang, 1998	蘭嶼吻鰕虎	B	B1ab(iv,v)c(ii)+ B2ab(iv,v)c(ii), C1, D	–	NCR
<i>Rhinogobius delicatus</i> Chen & Shao, 1996	細斑吻鰕虎	B	B1ab(i,iv,v)c(ii)+ B2ab(i,iv,v)c(ii)	–	NEN
<i>Rhinogobius henchuenensis</i> Chen & Shao, 1996	恆春吻鰕虎	B	B1ab(i,ii)+B2ab(i,ii)	–	NEN
<i>Sinogastromyzon puliensis</i> Liang, 1974	埔里中華爬岩鰕	B	B1ab(ii)c(i)+ B2ab(ii)c(i)	VU	<u>NNT</u>
<i>Hemimyzon taitungensis</i> Tzeng & Shen, 1982	臺東間爬岩鰕	B	B1ab(ii)+B2ab(ii)	VU	NEN
<i>Hemimyzon yushanensis</i> Chen, Harefa, Chang & Han, 2022	玉山間爬岩鰕	B	B1ab(ii)+B2ab(ii)	–	NE



分類群	俗名	繁殖 (B) 非繁殖 (V)	評估標準 [類別調整]	2024 全球類別	2017 臺灣類別
<i>Metzia formosae</i> (Oshima, 1920)	臺灣梅氏鱚	B	B1ab(ii)+B2ab(ii)	LC	NEN
<i>Aphyocypris kikuchii</i> (Oshima, 1919)	菊池氏細鯽	B	B1ab(i)+B2ab(i)	–	NEN
<i>Candidia pingtungensis</i> Chen, Wu & Hsu, 2008	屏東鬚鱚	B	B1ab(i,ii)c(iii)+ B2ab(i,ii)c(iii)	–	DD
<i>Opsariichthys kaopingensis</i> Chen & Wu, 2009	高屏馬口鱚	B	B1ab(i,iv)c(iii)+ B2ab(i,iv)c(iii)	–	NVU
<i>Parasbora moltrechti</i> Regan, 1908	臺灣副細鯽	B	B1ab(ii)+B2ab(ii)	–	NEN
<i>Gobiobotia cheni</i> Banarescu & Nalbant, 1966	陳氏鰍鮔	B	B1ab(i,ii)c(i)+ B2ab(i,ii)c(i)	–	NEN
<i>Gobiobotia intermedia</i> Banarescu & Nalbant, 1968	中間鰍鮔	B	B1ab(i,iv)c(i,ii)+ B2ab(i,iv)c(i,ii)	–	NNT
<i>Squalidus banarescui</i> Chen & Chang, 2007	巴氏銀鮡	B	B1ab(ii,iv,v)+ B2ab(ii,iv,v)	–	NCR

I *Stiphodon percnopterygius*

黑鰭枝牙鰍虎 Goby

NLC

孫文謙 / 攝



3.5 國家易危 (NVU) 類別淡水魚類名錄

分類群	俗名	繁殖 (B) 非繁殖 (V)	評估標準 [類別調整]	2024 全球類別	2017 臺灣類別
<i>Anguilla bicolor pacifica</i> Schmidt, 1928	太平洋雙色鰻鱺	V	B1ab(i,ii)+B2ab(i,ii) [-1]	NT	DD
<i>Tachysurus brevianalis</i> Regan, 1908	短臀瘋鱺	B	B2c(i,ii)	-	<u>NLC</u>
<i>Sicyopus zosterophorus</i> (Bleeker, 1856)	環帶瓢眼鰕虎	B	B1ab(i)+B2ab(i) [-1]	LC	NLC
<i>Rhinogobius nantaiensis</i> Aonuma & Chen, 1996	南台吻鰕虎	B	B1ab(i,ii)+B2ab(i,ii)	-	NEN
<i>Channa asiatica</i> (Linnaeus, 1758)	七星鱧	B	B2ab(i,ii) [-1]	LC	NVU
<i>Oryzias sinensis</i> (Temminck & Schlegel, 1846)	中華青鱒	B	B1ab(i)+B2ab(i) [-1]	LC	NVU
<i>Metzia mesembrinum</i> (Jordan & Evermann, 1902)	大鱗梅氏鰻	B	A2abe [-1]	-	NVU
<i>Microphysogobio alticorpus</i> Banareescu & Nalbant, 1968	高身小鰻鰂	B	B2c(i)	-	<u>NLC</u>
<i>Microphysogobio brevirostris</i> (Günther, 1868)	短吻小鰻鰂	B	B2ab(ii)	-	<u>NNT</u>
<i>Distoechodon compressus</i> (Nichols, 1925)	扁圓吻鰻	B	B1ab(i,ii)+B2ab(i,ii) [-1]	LC	NVU
<i>Cobitis sinensis</i> Sauvage & Dabry de Thiersant, 1874	中華鰻	B	B2ab(ii)	LC	<u>NLC</u>

3.6 國家接近受脅 (NNT) 類別淡水魚類名錄

分類群	俗名	繁殖 (B) 非繁殖 (V)	評估標準 [類別調整]	2024 全球類別	2017 臺灣類別
<i>Oncorhynchus masou formosanus</i> (Jordan & Oshima, 1919)	臺灣櫻花鉤吻鮭	B	D2 [-1]	CR	NEN
<i>Clarias fuscus</i> (Lacepède, 1803)	鬍鯰	B	B2c(ii)	LC	NE



分類群	俗名	繁殖 (B) 非繁殖 (V)	評估標準 [類別調整]	2024 全球類別	2017 臺灣類別
<i>Sicyopterus japonicus</i> (Tanaka, 1909)	日本瓢鰭鰕虎	B	A2de	–	NLC
<i>Sicyopus auxilimentus</i> Watson & Kottelat, 1994	砂棲瓢眼鰕虎	B	D1 [-1]	DD	NE
<i>Lentipes armatus</i> Sakai & Nakamura, 1979	棘鱗鰕鰕虎	B	A4cde, B1b(i)+B2b(i)	–	NNT
<i>Rhinogobius formosanus</i> Oshima, 1919	臺灣吻鰕虎	B	B1a+B2a	VU	NNT
<i>Macropodus opercularis</i> (Linnaeus, 1758)	蓋斑鬥魚	B	B2ac(i,ii) [-2]	LC	NNT
<i>Anabas testudineus</i> (Bloch, 1792)	攀鱸	B	B2a	LC	DD
<i>Sinogastromyzon nantaiensis</i> Chen, Han & Fang, 2002	南臺中華爬岩鰕	B	B1a+B2a	–	NNT
<i>Hemimyzon formosanus</i> (Boulenger, 1894)	臺灣間爬岩鰕	B	B2b(i,ii)	–	NVU
<i>Formosania lacustre</i> (Steindachner, 1908)	纓口臺鰕	B	B1a	–	NVU
<i>Onychostoma alticorpus</i> (Oshima, 1920)	高身白甲魚	B	B2a	EN	NNT
<i>Onychostoma barbatulum</i> (Pellegrin, 1908)	臺灣白甲魚	B	A2	DD	NNT
<i>Sinibrama macrops</i> (Günther, 1868)	大眼華鯿	B	B1a+B2a	LC	NVU
<i>Puntius semifasciolatus</i> (Günther, 1868)	半紋小鯿	B	B2a	LC	NEN
<i>Puntius snyderi</i> Oshima, 1919	斯奈德小鯿	B	B1a+B2a	–	NEN
<i>Paratanakia himantegus</i> (Günther, 1868)	臺灣石鮒	B	B2b(v)	–	NLC
<i>Paratanakia chii</i> (Miao, 1934)	齊氏石鮒	B	B2a	–	DD
<i>Pseudorasbora parva</i> (Temminck & Schlegel, 1846)	羅漢魚	B	B2b(ii)	LC	<u>NLC</u>

3.7 國家無危 (NLC) 類別淡水魚類名錄

分類群	俗名	繁殖 (B) 非繁殖 (V)	評估標準 [類別調整]	2024 全球類別	2017 臺灣類別
<i>Anguilla marmorata</i> Quoy & Gaimard, 1824	花鰻鱺	V	-	LC	NLC
<i>Gymnothorax polyuranodon</i> (Bleeker, 1853)	豹紋裸胸鯔	B	-	LC	NA
<i>Silurus asotus</i> Linnaeus, 1758	鯰	B	-	LC	NNT
<i>Monopterus albus</i> (Zuiew, 1793)	黃鱔	B	B2c(ii) [-1]	LC	NLC
<i>Rhyacichthys aspro</i> (Valenciennes, 1837)	溪鱧	B	B2c(ii) [-1]	DD	NLC
<i>Belobranchus belobranchus</i> (Valenciennes 1837)	棘鰓塘鱧	B	B2b(i) [-1]	LC	NE
<i>Belobranchus segura</i> Keith, Hadiaty & Lord, 2012	黃鰭棘鰓塘鱧	B	B1b(i)+B2b(i) [-1]	LC	NE
<i>Eleotris fusca</i> (Forster, 1801)	褐塘鱧	B	-	LC	NLC
<i>Eleotris acanthopoma</i> Bleeker, 1853	刺蓋塘鱧	B	-	LC	NLC
<i>Glossogobius celebius</i> (Valenciennes, 1837)	盤鰭叉舌鰕虎	B	-	LC	NLC
<i>Awaous melanocephalus</i> (bleeker, 1849)	黑頭阿胡鰕虎	B	-	-	NLC
<i>Awaous ocellaris</i> (Broussonet, 1782)	眼斑厚唇鯊	B	-	LC	NA
<i>Oligolepis acutipennis</i> (Valenciennes, 1837)	尖鰭寡鱗鰕虎	B	B2c(ii) [-1]	LC	NLC
<i>Redigobius bikolanus</i> (Herre, 1927)	拜庫雷鰕虎	B	-	LC	NLC
<i>Stiphodon percnopterygionus</i> Watson & Chen, 1998	黑鰭枝牙鰕虎	B	-	DD	NLC
<i>Stiphodon atropurpureus</i> (Herre, 1927)	黑紫枝牙鰕虎	B	-	LC	NLC
<i>Stiphodon alcedo</i> Maeda, Mukai & Tachihara, 2012	皇枝牙鰕虎	-	-	-	NE
<i>Mugilogobius abei</i> (Jordan & Snyder, 1901)	阿部氏鰕鰕虎	B	B2b(i,ii) [-1]	LC	NLC



分類群	俗名	繁殖 (B) 非繁殖 (V)	評估標準 [類別調整]	2024 全球類別	2017 臺灣類別
<i>Mugilogobius myxodermus</i> (Herre, 1935)	黏皮鯿鰕虎	B	B1a+B2a [-1]	–	NLC
<i>Schismatogobius ampluvinculus</i> Chen, Shao & Fang, 1995	寬帶裂身鰕虎	V	–	DD	NLC
<i>Schismatogobius saurii</i> Keith, Lord, Hadiaty & Hubert, 2017	薩氏裂身鰕虎	–	B1a+B2a [-1]	–	NE
<i>Sicyopterus lagocephalus</i> (Pallas, 1770)	兔頭瓢鰕鰕虎	B	–	LC	NLC
<i>Sicyopterus longifilis</i> de Beaufort, 1912	長絲瓢鰕鰕虎	–	B1a+B2a [-1]	LC	NE
<i>Stenogobius genivittatus</i> (Valenciennes, 1837)	頰斑細鰕虎	B	–	LC	NLC
<i>Stenogobius ophthalmoporus</i> (Bleeker, 1853)	眼帶狹鰕虎	B	–	LC	NE
<i>Lentipes kijimuna</i> Maeda & Kobayashi, 2021	奇吉木納韌鰕虎	–	–	–	NE
<i>Lentipes bunagaya</i> Maeda & Kobayashi, 2021	布納加亞韌鰕虎	–	–	–	NE
<i>Rhinogobius rubromaculatus</i> Lee & Chang, 1996	短吻紅斑吻鰕虎	B	–	–	NLC
<i>Rhinogobius similis</i> (Gill, 1859)	極樂吻鰕虎	B	–	LC	NLC
<i>Rhinogobius maculafasciatus</i> Chen & Shao, 1996	斑帶吻鰕虎	B	–	–	NLC
<i>Rhinogobius candidianus</i> (Regan, 1908)	明潭吻鰕虎	B	–	–	NLC
<i>Rhinogobius gigas</i> Aonuma & Chen, 1996	大吻鰕虎	B	–	–	NLC
<i>Channa maculata</i> (Lacepède, 1801)	斑鱧	B	B2c(i)(ii) [1]	LC	NLC
<i>Acrossocheilus paradoxus</i> (Günther, 1868)	臺灣石鱮	B	–	–	NLC
<i>Candidia barbata</i> (Regan, 1908)	臺灣鬚鱮	B	–	–	NLC
<i>Opsariichthys pachycephalus</i> Günther, 1868	粗首馬口鱮	B	–	LC	NLC

分類群	俗名	繁殖 (B) 非繁殖 (V)	評估標準 [類別調整]	2024 全球類別	2017 臺灣類別
<i>Opsariichthys evolans</i> (Jordan & Evermann, 1902)	長鰭馬口鱮	B	-	LC	NLC
<i>Chanodichthys erythropterus</i> (Basilewsky 1855)	紅鰭鮃	B	-	LC	NLC
<i>Carassius auratus auratus</i> (Linnaeus, 1758)	鯽	B	-	LC	NLC
<i>Spinibarbus hollandi</i> Oshima, 1919	何氏棘鮃	B	B2a [1]	DD	NLC
<i>Rhodeus ocellatus ocellatus</i> (Kner, 1867)	高體鰱鯪	B	-	DD	NNT
<i>Cyprinus carpio carpio</i> Linnaeus, 1758	鯉	B	-	LC	NLC
<i>Culter alburnus</i> Basilewsky, 1855	翹嘴鮃	B	-	LC	NLC
<i>Hemibarbus labeo</i> (Pallas, 1776)	唇鮃	B	B1a+B2a [-1]	LC	NLC
<i>Hemiculter leucisculus</i> (Basilewsky, 1855)	鰲	B	-	LC	NLC
<i>Paramisgurnus dabryanus</i> Dabry de Thiersant, 1872	大鱗副泥鰍	B	B2c(i,ii) [-1]	LC	NLC
<i>Misgurnus anguillicaudatus</i> (Cantor, 1842)	泥鰍	B	B2c(i,ii) [-1]	LC	NLC
<i>Microphis brachyurus</i> <i>brachyurus</i> (Bleeker, 1853)	短尾腹囊海龍	B	-	LC	NA
<i>Microphis manadensis</i> (Bleeker, 1856)	印尼腹囊海龍	B	-	LC	NA
<i>Microphis leiaspis</i> (Bleeker, 1853)	無棘腹囊海龍	B	B1c(i,ii)+B2c(i,ii) [-1]	LC	NA
<i>Microphis retzii</i> (Bleeker, 1856)	雷氏腹囊海龍	B	-	LC	NA
<i>Hippichthys heptagonus</i> Bleeker, 1849	前鰭多環海龍	-	B1a+B2a [-1]	LC	NA
<i>Hippichthys spicifer</i> (Rüppell, 1838)	帶紋多環海龍	-	-	LC	NA
<i>Hippichthys penicillus</i> (Cantor, 1849)	筆狀多環海龍	-	-	LC	NA



3.8 數據缺乏 (DD) 類別

分類群	俗名	繁殖 (B) 非繁殖 (V)	評估標準 [類別調整]	2024 全球類別	2017 臺灣類別
<i>Anguilla celebesensis</i> Kaup, 1856	西里伯斯鰻鱺	V	-	DD	DD
<i>Anguilla luzonensis</i> Watanabe, Aoyama & Tsukamoto, 2009	呂宋鰻鱺	V	-	VU	DD
<i>Luciogobius ryukyuensis</i> Chen, Suzuki & Senou, 2008	琉球竿鰻虎	-	-	-	NA
<i>Stiphodon chlorestes</i> Jhuang, Dimaquibo & Liao, 2024	青蜂枝牙鰻虎	B	-	-	NE
<i>Stiphodon maculidorsalis</i> Maeda & Tan, 2013	背點枝牙鰻虎	-	-	DD	NE
<i>Stiphodon ornatus</i> Meinken, 1974	飾妝枝牙鰻虎	-	-	DD	NE
<i>Stiphodon pelewensis</i> Herre, 1936	帛琉枝牙鰻虎	V	-	LC	NE
<i>Stiphodon rutilaureus</i> Watson, 1996	淺紅枝牙鰻虎	-	-	LC	NE
<i>Stiphodon surrufus</i> Watson & Kottelat, 1995	桔紅枝牙鰻虎	-	-	LC	NE
<i>Schismatogobius baitabag</i> Keith, Lord & Larson, 2017	白大巴裂身鰻虎	-	-	LC	NE
<i>Schismatogobius marmoratus</i> (Peters, 1868)	斑紋裂身鰻虎	-	-	LC	NA
<i>Schismatogobius sapoliensis</i> Keith, Darhuddin, Limmon & Hubert, 2018	薩波立裂身鰻虎	-	-	-	NE
<i>Lentipes palawanirufus</i> Maeda & Palla, 2021	巴拉望紅韌鰻虎	-	-	-	NE
<i>Lentipes mindanaoensis</i> Chen, 2004	棉蘭老韌鰻虎	-	-	DD	NE
<i>Lentipes multiradiatus</i> Allen, 2001	多輻韌鰻虎	-	-	-	NE
<i>Lentipes kaaea</i> Watson, Keith & Marquet, 2002	新喀里多尼亞韌鰻虎	-	-	LC	NE
<i>Rhinogobius yangminshanensis</i> Chen, Wang & Shao, 2022	陽明山吻鰻虎	B	-	-	NE
<i>Hemimyzon sheni</i> Chen & Fang, 2009	沈氏間爬岩鰻	B	-	-	DD
<i>Squalidus argentatus</i> (Sauvage & Dabry de Thiersant, 1874)	銀鰻	B	-	DD	DD

4. 臺灣全球受脅淡水魚類

本報告納入評估候選之401種淡水魚中有9種為全球受脅及接近威脅淡水魚種，5種屬國家受脅，3種屬國家接近受脅。

分類群	俗名	繁殖 (B) 非繁殖 (V)	2024 臺灣類別	2024 全球類別	臺灣占全球 數量百分比 (種)
<i>Anguilla bicolor pacifica</i> Schmidt, 1928	太平洋雙色鰻鱺	V	NVU	NT	<1
<i>Anguilla luzonensis</i> Watanabe, Aoyama & Tsukamoto, 2009	呂宋鰻鱺	V	DD	VU	<1
<i>Anguilla japonica</i> Temminck & Schlegel, 1846	日本鰻鱺	V	NEN	EN	<20
<i>Oncorhynchus masou formosanus</i> (Jordan & Oshima, 1919)	臺灣櫻花鉤吻鮭	B	NNT	CR	>70
<i>Stiphodon imperiorientis</i> Watson & Chen, 1998	明仁枝牙鰕虎	B	NEN	VU	<1
<i>Rhinogobius formosanus</i> Oshima, 1919	臺灣吻鰕虎	B	NNT	VU	>70
<i>Sinogastromyzon puliensis</i> Liang, 1974	埔里中華爬岩鰕	B	NEN	VU	>70
<i>Hemimyzon taitungensis</i> Tzeng & Shen, 1982	臺東間爬岩鰕	B	NEN	VU	>70
<i>Onychostoma alticorpus</i> (Oshima, 1920)	高身白甲魚	B	NNT	EN	>70

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The Red List of Freshwater Fishes of Taiwan, 2024

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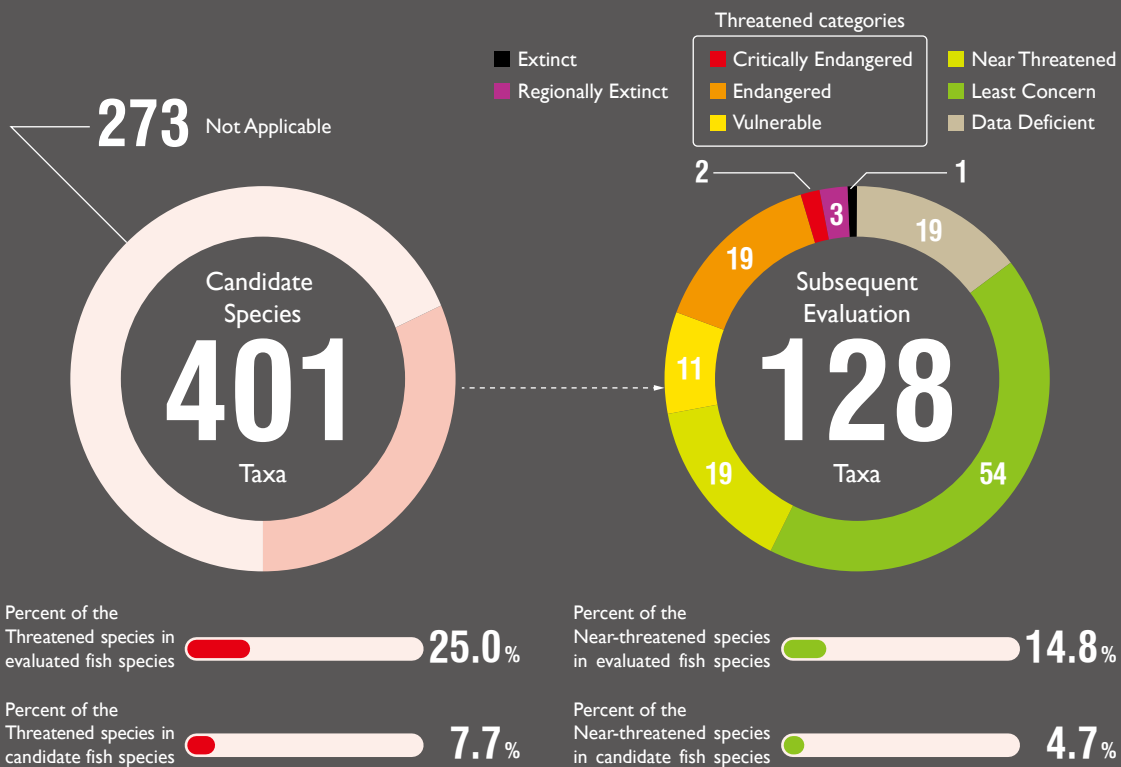
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Abstract

This report is the second national Red List evaluation of most native freshwater fish species in Taiwan according to the categories and criteria recommended by the International Union for Conservation of Nature Red List of Threatened Species™. Among all 401 candidate species, 273, including four taxonomic concerns species were identified as not applicable for the regional-level Red List assessments, and only the 128 remaining species were evaluated. According to the results of evaluation, among 4 extinct species of freshwater fish, one was identified as Extinct and the other three were identified as Regionally Extinct. In addition, among 32 Nationally Threatened freshwater fish species (or subspecies), 2 Nationally Critical species, 19 Nationally Endangered species, 8 Nationally Vulnerable species, and 19 Nationally Near-Threatened (NNT) species were identified. A further examination indicated that Nationally Threatened and NNT species accounted for 25.0% and 14.8% of the total freshwater fish species and 7.7% and 4.7% of the total freshwater and estuarine fish species, respectively. In addition, 54 were categorized as National Least Concern species, and 19 were listed as data deficient. Nine species were listed as globally threatened and Near-threatened freshwater fish species by IUCN, and among them, 5 were Nationally Threatened, and 3 were Nationally Near-threatened, and one was data deficient in Taiwan.





1. Introduction

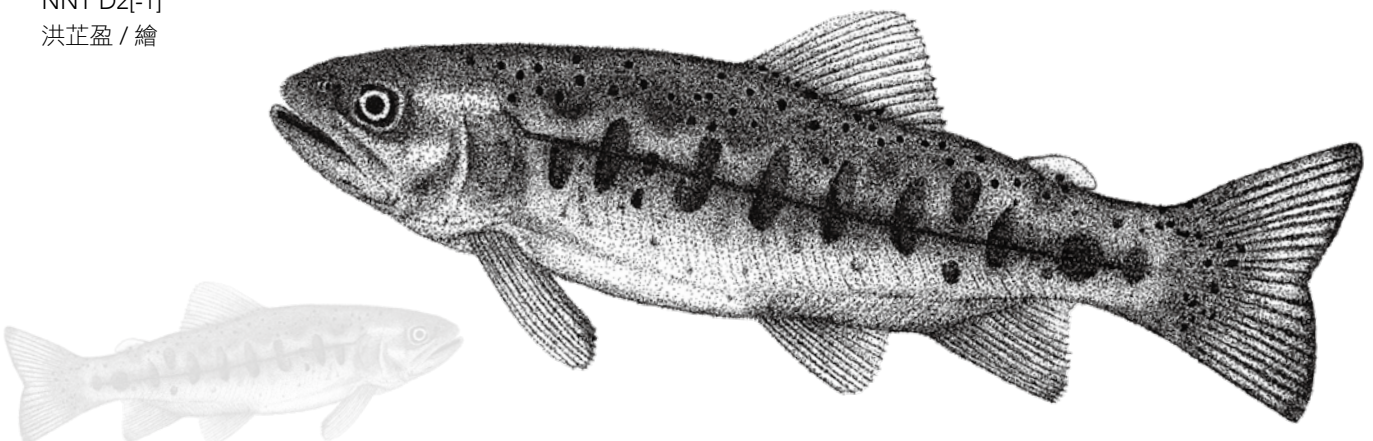
The risk of extinction faced by a species or taxon is an essential topic of conservation management. Concise listings of taxa according to threat levels provide a basis for prioritizing recovery programs and research, monitoring the adequacy of conservation measures, gaining support for habitat protection, and facilitating resource allocation (Townsend *et al.* 2007).

The Species Survival Commission of the International Union for Conservation of Nature (IUCN) is responsible for compiling the IUCN Red List of Threatened Species. Since its first publication in 1964, the list has gradually become a key reference for assessing the conditions and trends of threatened species on a global scale (Rodrigues *et al.* 2006; IUCN 2016). Moreover, the categories (Fig.1), assessment criteria as well as the regional guidelines published by the IUCN have been adopted by many countries as the primary basis for listing threatened species in their own territories (Townsend *et al.* 2007; IUCN 2012a). The standardized assessment method of the IUCN Red List not only facilitates formulating and executing conservation policies worldwide, but also improves the comprehensiveness of the assessment of the global conservation status of plant and animal species (Rodrigues *et al.* 2006).

When a country or region claims that its red list is compiled in accordance with the IUCN system, the classification process of the list must completely follow the IUCN Red List Categories and Criteria (IUCN 2012b). A regional-level assessment pertains to any region on Earth with a clearly defined boundary, such as a continent, country, or state (IUCN 2012a). When the status assessment is redirected from the global scale to a local level, issues such as native or alien species, breeding or nonbreeding populations, and locally extinct species naturally emerge. (IUCN 2012a). The present report is compiled using the IUCN Red List Categories and Criteria: Version 3.1 (IUCN 2012b). However, the assessment process and thresholds of the criteria might be inadequate for evaluating species whose distribution ranges extend beyond the defined spatial area; thus, adjustments were made using the Guidelines for Application of IUCN Red List Criteria at Regional and National Levels (IUCN 2012a).

Chen *et al.*(2012) investigated the conservation status of freshwater fish species and published the first official Red List of freshwater fish in Taiwan supported by the Forestry Bureau of Taiwan. In that report, a total of 115 freshwater fish species were evaluated according to the five criteria

■ *Oncorhynchus masou formosanus*
臺灣櫻花鉤吻鮭 Formosan landlocked salmon
NNT D2[-1]
洪芷盈 / 繪

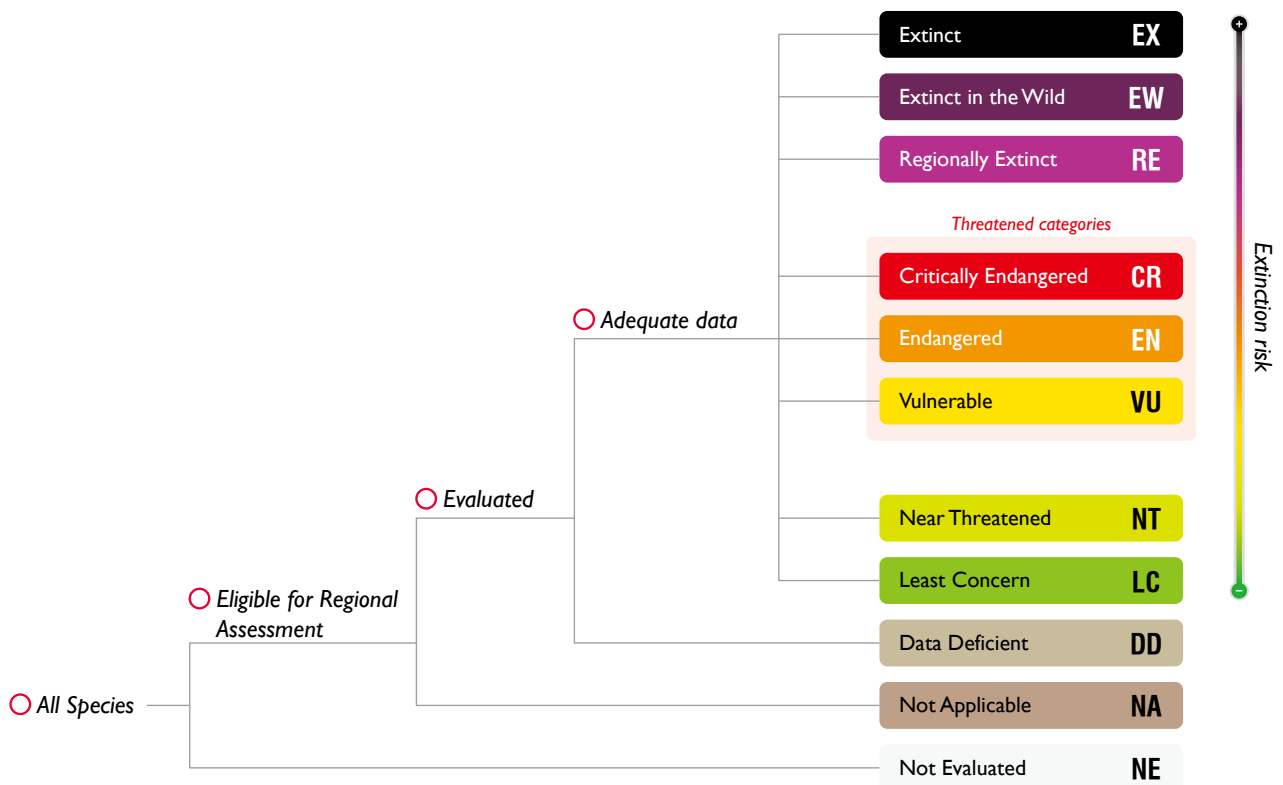


of the Operation Regulation for assessment and classification of wild freshwater fish (i.e., distribution pattern, degree of dominance in habitat, population trends, taxonomic status, and risk of extinction) by the Council of Agriculture and assessed through consultation with experts in Taiwan. Among the 52 threatened freshwater fishes specified in the report, 3 critically endangered (CR) species, 3 endangered (EN) species, 31 vulnerable (VU) species, and 15 near-threatened (NT) species were identified. In addition, 10 among all 52 specified species were classified as nationally protected.

The results of Chen *et al.*'s (2012) report did not fully follow the IUCN Red Book guidelines.

However, their five selected indicators were based on the concepts and assessment criteria of IUCN and were accomplished through expert assessment. Therefore, Chen *et al.*'s (2012) report underlies our assessment. Yang *et al.* (2017) created data table and standard operation procedure (S.O.P.) of assessment based on the IUCN Red List of Threatened Species™ that collects and updates information on the distribution, population trends, numbers and causes of threat of all native freshwater fish species in Taiwan, enabling the development of a system of conservation status assessment incorporating both international and local perspectives in the report *The red lists of freshwater fishes of Taiwan, 2017*.

Figure 1. IUCN Red List criteria at the regional and national levels





2. Assessment process

The process and method employed for assessing the conservation status of freshwater fish species or subspecies in Taiwan were as follows:

2.1 Taxonomic Standards of Assessment

A list of all fish species in Taiwan was first retrieved through a previously published catalog (TaiBNET, <http://taibnet.sinica.edu.tw/home.php>). All freshwater fish species were subsequently selected using related data and life history descriptions from *Freshwater and Estuarine Fishes of Taiwan* (Chen and Fang 1999), *The Freshwater Estuarine Fish and Shrimp of Taiwan* (Kao et al. 2020), *Catalog of Fishes* (Eschmeyer et al. 2024) (Online Version, Updated 1 October 2024, (<https://research.calacademy.org/research/ichthyology/catalog/fishcatmain.asp>), and the Fish Database of Taiwan (Shao 2024)(<https://fishdb.sinica.edu.tw/>).

All scientific names in this report were mainly inferred from the Fish Database of Taiwan and *Catalog of Fishes*. Some species in the 2017 assessment were not included in the present report due to changes in their taxonomic status, undescribed species, or new supporting data. There are two species that have been adjusted: *Distoechodon tumirostris* has been changed

to *Distoechodon compressus*, and *Gobiobotia kollerii* was changed to *Gobiobotia intermedia*. The four excluded species are *Sicyopterus macrostetholepis*, *Stiphodon elegans*, *Stenogobius* sp. and *Schismatogobius roxasi*.

A total of 401 fish species were established based on the aforementioned catalogs. Because of the diverse life history among freshwater fishes, these initially selected species list included all freshwater and brackish water fishes, disregarding their migratory habits (i.e., catadromous, anadromous, and amphidromous). In addition, the retrieved species list was further screened because this report was intended to evaluate the patterns of freshwater fishes that spend most of their lives in freshwater environments.

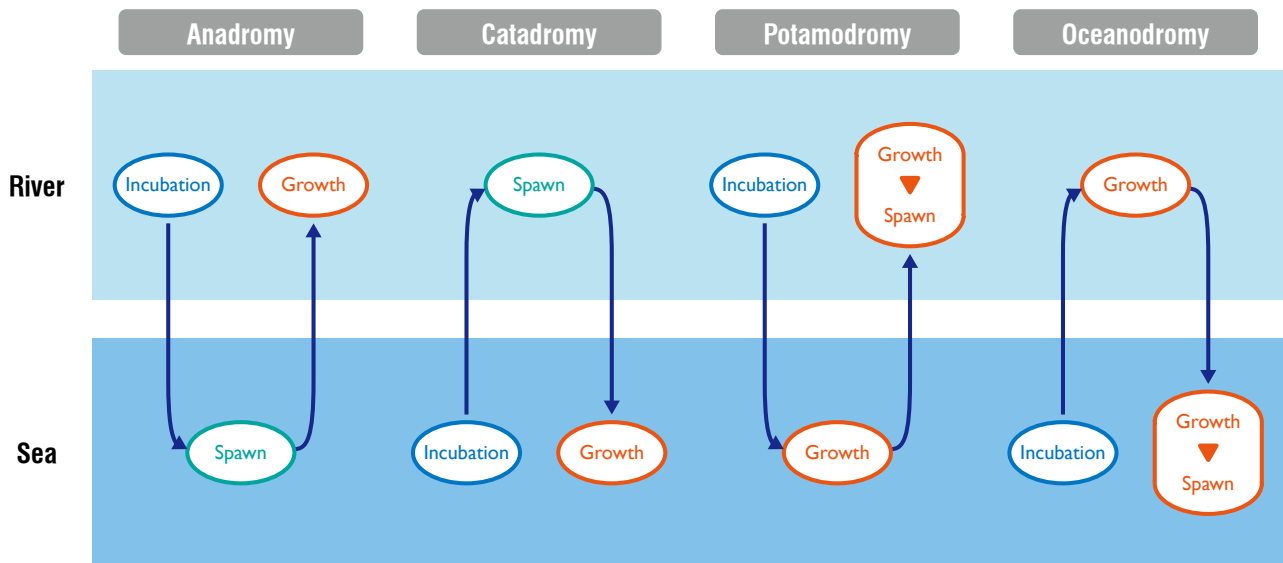
■ *Metzia formosae*
臺灣梅氏鰱 Taiwan lesser-bream
NEN B1ab(ii)+B2ab(ii)
孫文謙 / 攝



Life history patterns of freshwater fishes can be divided into three types according to salinity tolerance: (1) primary freshwater fish: species that inhabit only freshwater environments in their life history; (2) secondary freshwater fish: species that inhabit freshwater almost exclusively, but are saline-tolerant and occasionally inhabit or are active in saltwater; (3) peripheral freshwater fish: species that mainly inhabit saltwater and brackish water, but may also exist in freshwater or enter brackish water in their life history, most peripheral freshwater fishes are considered marine species, and some are anadromous and catadromous species. Moreover, species that migrate between fresh and salt waters can be further classified into three subtypes based on their migratory patterns, including: (1)

catadromous freshwater fish: species that migrate downstream to the sea for reproduction (e.g., Japanese eel); (2) anadromous freshwater fish: species that migrate upstream from the sea to rivers for reproduction (e.g., migratory salmon) (3) amphidromous freshwater fish: species that also migrate upstream or downstream between the sea and freshwater, but their migration is irrelevant to the purpose of reproduction, for instance, most amphidromous gobies listed in this report. Some research classified amphidromous migration patterns into potamodromy and oceanodromy according to location of reproduction. Graphic classifications of catadromous, anadromous, and amphidromous are shown in Fig. 2.

Figure 2. Classification of fish migration (modified from Goto *et al.* 1994)



The target species of this report were defined as follows: (1) primary freshwater fish; (2) anadromous, catadromous and amphidromous species that spawn in freshwater. Despite not reproducing in freshwater, catadromous fishes were included in the assessment because catadromous fish undergoes a considerably long life history. For instance, Japanese eels may inhabit in freshwater for years. By contrast, oceanodromous fishes usually do not appear in freshwaters for a long period, and

were therefore excluded from the subsequent assessment.

In addition to migratory patterns, population size was also considered in the IUCN Red List criteria for regional-level assessment. When population sizes are lower than a certain level, migratory species may be considered vagrants and, therefore, not included in the assessment. However, in our report, population size is not considered due to lack of population-size thresholds.



Although criteria for inclusion of amphidromous fish in the assessment were defined in previous section, the criteria are actually not applicable to most amphidromous species in the Taiwanese waters due to that their life history traits remain unknown. However, inferred from the *Red List of Freshwater Fish of Taiwan* (Chen et al. 2012) and *The Freshwater Estuarine Fish and Shrimp of Taiwan* (Kao et al. 2020), mature adults of fish taxon are commonly found in freshwaters and, therefore, included in the assessment. They are the Syngnathinae, *Stiphodon*, *Schismatogobius*, *Lentipes*, *Belobranchus*, *Sicyopus*, *Sicyopterus longifilis*, *Luciogobius ryukyuensis*, *Mugilogobius abei*, *Mugilogobius myxodermus*, *Smilosicyopus leprurus* etc.

“Species” was the unit for IUCN evaluation. However, when there are subspecies, each of them was evaluated respectively. When breeding and visiting (migration without breeding) populations were distinguishable, they were evaluated separately according to the Guidelines for Application of IUCN Red List Criteria at Regional and National Categories (IUCN 2012a). When both alien and native conspecific populations were found to

appear within the defined region, only the native population was evaluated.

Plecoglossus altivelis altivelis, a native species once extinct from Taiwan, has been successfully reintroduced from Japan since 1984. It was categorized as a reintroduced exotic population because its characteristics are unspecified and it shares the same scientific name with other groups of the species in Japan and other regions.

Plecoglossus a. altivelis was thus included in this report according to the recommended standards of the IUCN Standards and Petitions subcommittee (2024), but do not use the existed population data. According to these life history classifications and the process recommended in the Guidelines for Application of the IUCN Red List Criteria at Regional and National Categories (IUCN 2012a), species or subspecies that exhibit the listed characteristics in Table 1 were excluded from subsequent assessment. Other remaining primary freshwater fish within the national territory of Taiwan including anadromous, amphidromous, and catadromous species were considered amounting to a total of 128 freshwater fish species.

Table 1. Criteria for exclusion from the assessment.

Migration Characteristics	Other Criteria
Reproduction	1. Non-native species, including invasive ornamental and aquacultural fishes, and artificial released species.
	2. Amphidromous species, due to lack of knowledge of life history traits to determine whether they are oceanodromous or potamodromous.
Migration (excluding reproduction)	1. Oceanodromous species without record of reproductive behavior in freshwater environments are temporarily excluded from this evaluation.
	2. Species that are often considered as marine fishes, but occasionally enter freshwaters are temporarily excluded from this evaluation.

2.2 Data Collection and Initial Evaluation

A species list was prepared based on the *IUCN Red List Categories and Criteria: Version 3.1* (IUCN 2012b) and the *Guidelines for Application of the IUCN Red List Criteria at Regional and National Levels* (IUCN 2012a). Each species on the list was evaluated according to the process described below.

Every listed species was assigned to a preliminary threat category in accordance with the *Guidelines for Using the IUCN Red List Categories and Criteria, Version 16* (IUCN Standard and Petitions Subcommittee 2024). The evaluation process involved using a logic tree constituted of the following criteria: A. Rapid population reduction; B.

Small range and fragmented, declining, or extreme fluctuations; C. Small population and declining; D. Very small population; and E. Quantitative analysis. Each criterion also contained several subcriteria and qualifiers. When a species currently cannot be assigned to Nationally Critical (NCR), Nationally Endangered (NEN), or Nationally Vulnerable (NVU), but is likely to reach the NVU level in the near future, it can be classified as Nationally Near-threatened (NNT). Because the IUCN Red List Categories and Criteria does not provide a clear standard for Near Threatened, the present report applies the aforementioned criteria and refers to the IUCN Red List Categories and Criteria to define NNT (Table 2).

Table 2. 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%
<p>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:</p> <ul style="list-style-type: none"> (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. <p>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.</p> <p>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]</p> <p>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.</p>				



Use any of the criteria A-E	Critically Endangered	Endangered	Vulnerable	Near Threatened
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B. Geographic range in the form of either B1 (extent of occurrence) AND/OR B2 (area of occupancy)

B1. Extent of occurrence (EOO)	< 100 km ²	< 5,000 km ²	< 20,000 km ²	< 20,000 km ²
B2. Area of occupancy (AOO)	< 10 km ²	< 500 km ²	< 2,000 km ²	< 2,000 km ²

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				

C. Small population size and decline

Number of mature individuals	< 250	< 2,500	< 10,000	< 20,000
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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
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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
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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	NA	NA	AOO < 20 km ² or number of locations ≤ 5	AOO < 50 km ² or number of locations ≤ 10
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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	≥ 5% in 100 years
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2.3 Categories adjusting

After the initial evaluation, further assessment was required to evaluate the effects of other populations outside the assessed range of a given taxon on the regionally extinct risk of evaluated populations (IUCN 2012a). The purpose was to understand whether a population of a given taxon within an assessed range and specified time (usually within 10 years or 3 generations) interacts with other populations beyond the range. When no interaction is observed, the analysis results of Process 2.2 are maintained; if an interaction can be identified, the number of recruited (or in any other form) individuals and likewise the population size are not expected to decline, and the risk of extinction and the threat level should consequently decrease.

From this explanation and the recommended process of the IUCN (2012a), the modified process and criteria adopted for the assessment of freshwater fish in Taiwan was as follows:

1. Levels of endemic species and subspecies remained as assessed in Process 2.2, except for special conditions.
2. Levels of non-endemic species or subspecies were modified regarding mobility and interaction with other populations beyond their assessed ranges. In addition, life history traits and stock enhancement are two additional concerns. First, due to spawning in the sea, the amount of juvenile recruitment for catadromous species may vary each year and, therefore, their threat level will be adjusted according to the regional–global proportion of the assessed species. If a taxon in Taiwan represents over 5% of the global population, the assessment level increases; if it is within 1–5%, the level remains unchanged; and if it is below 1%, the level decreases. Second, in addition to natural expansion or recruitment of migratory species, some freshwater fishes may have experienced stock enhancement, and this should also be considered in regional-level evaluation. When stock enhancement occurs in an original or historical habitat, the level will be lowered by one;; in the cases not aimed at stock enhancement (e.g., artificial breeding, religious release, or species released from domestication) or potential crossings, the level will be lowered by one or two (indicated as [-1] or [-2]) according to the actual circumstances.
3. In the final listing, the levels recorded for each freshwater fish species were the results of modification. Additional notes were taken in the assessment columns for species that were adjusted for regional assessment. An enhanced threat level was denoted as [1] and a lowered threat level was [-1]. Species with lowered levels were categorized as NNT or National Least Concern.

2.4 Expert opinions

The categorization results obtained through the aforementioned procedures were examined by experts from September, 2024 to November, 2024, ensuring the adequacy of data collection and adding missing information. Knowledgeable individuals from the wider ornithological community were invited to an online workshop in late November, 2024 to discuss the status of all candidate taxa. At the same time, the draft list and data for assessment were disseminated among the birdwatching community to solicit comments. Finally, the updated data were used to repeat Steps 2.1 – 2.3 to revise the categorization results and create this report.



3. Assessment results of freshwater fish species of Taiwan

As a result, four species of freshwater fish in Taiwan are considered extinct, one of which is Extinct and the other three are Regionally Extinct. There are 32 species or subspecies of nationally threatened freshwater fish, of which 2 species are in the Nationally Critical category, 19 species are in the Nationally Endangered category, and 11 species are in the Nationally Vulnerable categories, and another 19 are classified as Nationally Near-threatened. The nationally threatened and near-threatened freshwater fish species account for 25.0% and 14.8% of the assessed freshwater fish species, respectively, and 7.7% and 4.7% of the total freshwater and estuarine fish species. Fifty four species are classified as Least Concern; 19 species are classified as Data Deficient. Compared with the previous 2017 Taiwan Freshwater Fish Red Data List (Yang et al. 2017), a total of 12 species or subspecies have increased their threat category, and 12 species or subspecies have had their threat category reduced.

The scientific name of each taxon is based on the Catalog of Life in Taiwan (Chung and Shao 2024)(Catalogue of Life in Taiwan, TaiCol, <https://taicol.tw/>). Please contact the author to obtain all freshwater fish assessment data and results in this report.

In order to compare the differences between this and the previous assessments, this report adds a new "National Red List Category in 2017" column for comparison, and also updates the Global Red Book category information in the "Global Red List Category in 2023" (IUCN 2023). The changes in the two assessment results of each freshwater fish species may come from the real trend of the threat status (improvement or deterioration), or may be caused by increased knowledge or reinterpretation of data. This report reviewed each item one by one, marked those in **bold fonts** that are truly improving, and used underlined fonts to mark those that are truly deteriorating inferred from Bubbs et al. (2009).



| *Stiphodon imperioorientis*
明仁枝牙鰕虎 Akihito's stiphodon
NEN D[-1]
周銘泰 / 攝

3.1 List of Extinct freshwater fish taxa in Taiwan

Taxon	Common Name	Breeder(B) Visitor(V)	Criteria [Category adjusting]	Global Red List Category in 2024	National Red List Category in 2017
<i>Salanx acuticeps</i> Regan, 1908	Icefish	B	–	–	EX

3.2 List of Regionally Extinct in the wild freshwater fish taxa in Taiwan

Taxon	Common Name	Breeder(B) Visitor(V)	Criteria [Category adjusting]	Global Red List Category in 2024	National Red List Category in 2017
<i>Sinobdella sinensis</i> (Bleeker, 1870)	Lesser spiny eel	B	–	LC	RE
<i>Plecoglossus altivelis</i> <i>altivelis</i> (Temminck & Schlegel, 1846)	Ayu sweetfish	B	–	DD	RE
<i>Myersina yangii</i> (Chen, 1960)	Goby	V	–	LC	RE

3.3 List of Nationally Critically Endangered freshwater fish taxa in Taiwan

Taxon	Common Name	Breeder(B) Visitor(V)	Criteria [Category adjusting]	Global Red List Category in 2024	National Red List Category in 2017
<i>Aphyocypris amnis</i> Liao, Kullander & Lin, 2011	Stream minnow	B	C1, D	–	NCR
<i>Squalidus iijimae</i> (Oshima, 1919)	Taiwan gudgeon	B	B1ab(ii)+ B2ab(ii)	–	DD

3.4 List of Nationally Endangered freshwater fish taxa in Taiwan

Taxon	Common Name	Breeder(B) Visitor(V)	Criteria [Category adjusting]	Global Red List Category in 2024	National Red List Category in 2017
<i>Anguilla japonica</i> Temminck & Schlegel, 1846	Japanese eel	V	A2bcde, B2ab(i,v) [1]	EN	NCR
<i>Liobagrus formosanus</i> Regan, 1908	Formosan troent catfish	B	B1ab(ii)+B2ab(ii)	–	NEN
<i>Tachysurus adiposalis</i> (Oshima, 1919)	Bagrid catfish	B	B1ab(ii)+B2ab(ii)	LC	<u>NVU</u>
<i>Stiphodon imperorientis</i> Watson & Chen, 1998	Akihito's stiphodon	B	D [-1]	VU	NE



Taxon	Common Name	Breeder(B) Visitor(V)	Criteria [Category adjusting]	Global Red List Category in 2024	National Red List Category in 2017
<i>Smilosicyopus leprurus</i> (Sakai & Nakamura, 1979)	Caudal-scale smile goby	B	C1 [-1]	LC	DD
<i>Rhinogobius lanyuensis</i> Chen, Miller & Fang, 1998	Lanyu Island Rhinogoby	B	B1ab(iv,v)c(ii)+ B2ab(iv,v)c(ii), C1, D	–	NCR
<i>Rhinogobius delicatus</i> Chen & Shao, 1996	Tiny-spotted Rhinogoby	B	B1ab(i,iv,v) c(ii)+B2ab(i,iv,v)c(ii)	–	NEN
<i>Rhinogobius henchuenensis</i> Chen & Shao, 1996	Henchuen Rhino- goby	B	B1ab(i,ii)+B2ab(i,ii)	–	NEN
<i>Sinogastromyzon puliensis</i> Liang, 1974	Pulin river loach	B	B1ab(ii)c(i)+B2ab(ii)c(i)	VU	<u>NNT</u>
<i>Hemimyzon taitungensis</i> Tzeng & Shen, 1982	Taitung river loach	B	B1ab(ii)+B2ab(ii)	VU	NEN
<i>Hemimyzon yushanensis</i> Chen, Harefa, Chang & Han, 2022	Yushan river loach	B	B1ab(ii)+B2ab(ii)	–	NE
<i>Metzia formosae</i> (Oshima, 1920)	Taiwan lesser-bream	B	B1ab(ii)+B2ab(ii)	LC	NEN
<i>Aphyocypris kikuchii</i> (Oshima, 1919)	Taiwan Venus fish	B	B1ab(i)+B2ab(i)	–	NEN
<i>Candidia pingtungensis</i> Chen, Wu & Hsu, 2008	Pingtung stripe dace	B	B1ab(i,ii) c(iii)+B2ab(i,ii)c(iii)	–	DD
<i>Opsariichthys kaopingensis</i> Chen & Wu, 2009	Kao-ping freshwater minnow	B	B1ab(i,iv) c(iii)+B2ab(i,iv)c(iii)	–	NVU
<i>Parasbora moltrechti</i> Regan, 1908	Taiwan white minnow	B	B1ab(ii)+B2ab(ii)	–	NEN
<i>Gobiobotia cheni</i> Banarescu & Nalbant, 1966	Taiwan eight-barbel gudgeon	B	B1ab(i,ii)c(i)+B2ab(i,ii) c(i)	–	NEN
<i>Gobiobotia intermedia</i> Banarescu & Nalbant, 1968	intermedia eight- barbel gudgeon	B	B1ab(i,iv) c(i,ii)+B2ab(i,iv)c(i,ii)	–	NNT
<i>Squalidus banarescui</i> Chen & Chang, 2007	Central Taiwan gudgeon	B	B1ab(ii,iv,v)+ B2ab(ii,iv,v)	–	NCR

3.5 List of Nationally Vulnerable freshwater fish taxa in Taiwan

Taxon	Common Name	Breeder(B) Visitor(V)	Criteria [Category adjusting]	Global Red List Category in 2024	National Red List Category in 2017
<i>Anguilla bicolor pacifica</i> Schmidt, 1928	Indian short-finned eel	V	B1ab(i,ii)+B2ab(i,ii) [-1]	NT	DD
<i>Tachysurus brevianalis</i> Regan, 1908	Bagrid catfish	B	B2c(i,ii)	–	<u>NLC</u>
<i>Sicyopus zosterophorus</i> (Bleeker, 1856)	Ornate goby	B	B1ab(i)+B2ab(i) [-1]	LC	NLC
<i>Rhinogobius nantaiensis</i> Aonuma & Chen, 1996	Nantai goby	B	B1ab(i,ii)+B2ab(i,ii)	–	NEN
<i>Channa asiatica</i> (Linnaeus, 1758)	Small snakehead	B	B2ab(i,ii) [-1]	LC	NVU
<i>Oryzias sinensis</i> (Temminck & Schlegel, 1846)	Japanese rice fish	B	B1ab(i)+B2ab(i) [-1]	LC	NVU
<i>Metzia mesembrinum</i> (Jordan & Evermann, 1902)	Large-scale lesser- bream	B	A2abe [-1]	–	NVU
<i>Microphysogobio alticorpus</i> Banareescu & Nalbant, 1968	Deep-body gudgeon	B	B2c(i)	–	<u>NLC</u>
<i>Microphysogobio brevirostris</i> (Günther, 1868)	Short-nose gudgeon	B	B2ab(ii)	–	<u>NNT</u>
<i>Distoechodon compressus</i> (Nichols, 1925)	Round snout	B	B1ab(i,ii)+B2ab(i,ii) [-1]	LC	NVU
<i>Cobitis sinensis</i> Sauvage & Dabry de Thiersant, 1874	Siberian spiny loach	B	B2ab(ii)	LC	<u>NLC</u>



3.6 List of Nationally Near-threatened freshwater fish taxa in Taiwan

Taxon	Common Name	Breeder(B) Visitor(V)	Criteria [Category adjusting]	Global Red List Category in 2024	National Red List Category in 2017
<i>Oncorhynchus masou formosanus</i> (Jordan & Oshima, 1919)	Formosan landlocked salmon	B	D2 [-1]	CR	NEN
<i>Clarias fuscus</i> (Lacepède, 1803)	Hong Kong Catfish	B	B2c(ii)	LC	NE
<i>Sicyopterus japonicus</i> (Tanaka, 1909)	Goby	B	A2de	–	NLC
<i>Sicyopus auxilimentus</i> Watson & Kottelat, 1994	Red-lip sicyopus	B	D1 [-1]	DD	NE
<i>Lentipes armatus</i> Sakai & Nakamura, 1979	Spiny scale notch- lip	B	A4cde, B1b(i)+B2b(i)	–	NNT
<i>Rhinogobius formosanus</i> Oshima, 1919	Goby	B	B1a+B2a	VU	NNT
<i>Macropodus opercularis</i> (Linnaeus, 1758)	Paradisefish	B	B2ac(i,ii) [-2]	LC	NNT
<i>Anabas testudineus</i> (Bloch, 1792)	Climbing perch	B	B2a	LC	DD
<i>Sinogastromyzon nantaiensis</i> Chen, Han & Fang, 2002	Southern Taiwan Chinese stream loach	B	B1a+B2a	–	NNT
<i>Hemimyzon formosanus</i> (Boulenger, 1894)	Formosan river loach	B	B2b(i,ii)	–	NVU
<i>Formosania lacustre</i> (Steindachner, 1908)	River loach	B	B1a	–	NVU
<i>Onychostoma alticorpus</i> (Oshima, 1920)	Taiwan ku fish	B	B2a	EN	NNT
<i>Onychostoma barbatulum</i> (Pellegrin, 1908)	Taiwan shoveljaw carp	B	A2	DD	NNT
<i>Sinibrama macrops</i> (Günther, 1868)	Large-eye Chinese bream	B	B1a+B2a	LC	NVU
<i>Puntius semifasciolatus</i> (Günther, 1868)	Chinese barb	B	B2a	LC	NEN
<i>Puntius snyderi</i> Oshima, 1919	Snyder's barb	B	B1a+B2a	–	NEN

Taxon	Common Name	Breeder(B) Visitor(V)	Criteria [Category adjusting]	Global Red List Category in 2024	National Red List Category in 2017
<i>Paratanakia himantegus</i> (Günther, 1868)	Taiwan bitterling	B	B2b(v)	–	NLC
<i>Paratanakia chii</i> (Miao, 1934)	Chi's bitterling	B	B2a	–	DD
<i>Pseudorasbora parva</i> (Temminck & Schlegel, 1846)	Stone moroko	B	B2b(ii)	LC	<u>NLC</u>

3.7 The freshwater fish in category of Least Concern in Taiwan

Taxon	Common Name	Breeder(B) Visitor(V)	Criteria [Category adjusting]	Global Red List Category in 2024	National Red List Category in 2017
<i>Anguilla marmorata</i> Quoy & Gaimard, 1824	Giant mottled eel	V	–	LC	NLC
<i>Gymnothorax polyuranodon</i> (Bleeker, 1853)	Freshwater moray	B	–	LC	NA
<i>Silurus asotus</i> Linnaeus, 1758	Amur catfish	B	–	LC	NNT
<i>Monopterus albus</i> (Zuiew, 1793)	Asian swamp eel	B	B2c(ii) [-1]	LC	NLC

| *Aphyocypris kikuchii*
菊池氏細鯽 Taiwan Venus fish
NEN B1ab(i)+B2ab(i)
張大慶 / 攝





Taxon	Common Name	Breeder(B) Visitor(V)	Criteria [Category adjusting]	Global Red List Category in 2024	National Red List Category in 2017
<i>Rhyacichthys aspro</i> (Valenciennes, 1837)	Loach goby	B	B2c(ii) [-1]	DD	NLC
<i>Belobranchus belobranchus</i> (Valenciennes 1837)	throat-spine gudgeon	B	B2b(i) [-1]	LC	NE
<i>Belobranchus segura</i> Keith, Hadiaty & Lord, 2012	Freshwater sleeper	B	B1b(i)+B2b(i) [-1]	LC	NE
<i>Eleotris fusca</i> (Forster, 1801)	Dusky sleeper	B	–	LC	NLC
<i>Eleotris acanthopoma</i> Bleeker, 1853	Spinecheek gudgeon	B	–	LC	NLC
<i>Glossogobius celebius</i> (Valenciennes, 1837)	Celebes goby	B	–	LC	NLC
<i>Awaous melanocephalus</i> (bleeker, 1849)	Largesnout goby	B	–	–	NLC
<i>Awaous ocellaris</i> (Broussonet, 1782)	Eyespotted Goby	B	–	LC	NA
<i>Oligolepis acutipennis</i> (Valenciennes, 1837)	Sharptail goby	B	B2c(ii) [-1]	LC	NLC
<i>Redigobius bikolanus</i> (Herre, 1927)	Speckled goby	B	–	LC	NLC
<i>Stiphodon percnopterygionus</i> Watson & Chen, 1998	Goby	B	–	DD	NLC
<i>Stiphodon atropurpureus</i> (Herre, 1927)	Goby	B	–	LC	NLC
<i>Stiphodon alcedo</i> Maeda, Mukai & Tachihara, 2012	Goby	–	B2a [-1]	–	NE
<i>Mugilogobius abei</i> (Jordan & Snyder, 1901)	Mangrove goby	B	B2b(i,ii) [-1]	LC	NLC
<i>Mugilogobius myxodermus</i> (Herre, 1935)	Mucus mugilogoby	B	B1a+B2a [-1]	–	NLC

Taxon	Common Name	Breeder(B) Visitor(V)	Criteria [Category adjusting]	Global Red List Category in 2024	National Red List Category in 2017
<i>Schismatogobius ampluvinculus</i> Chen, Shao & Fang, 1995	Goby	V	–	DD	NLC
<i>Schismatogobius saurii</i> Keith, Lord, Hadiaty & Hubert, 2017	Goby	–	B1a+B2a [-1]	–	NE
<i>Sicyopterus lagocephalus</i> (Pallas, 1770)	Red-tailed goby	B	–	LC	NLC
<i>Sicyopterus longifilis</i> de Beaufort, 1912	Longfin goby	–	B1a+B2a [-1]	LC	NE
<i>Stenogobius genivittatus</i> (Valenciennes, 1837)	Chinstripe Goby	B	–	LC	NLC
<i>Stenogobius ophthalmoporus</i> (Bleeker, 1853)	Eye-band goby	B	–	LC	NE
<i>Lentipes kijimuna</i> Maeda & Kobayashi, 2021	Kijimuna goby	–	–	–	NE
<i>Lentipes bunagaya</i> Maeda & Kobayashi, 2021	Bunagaya goby	–	–	–	NE
<i>Rhinogobius rubromaculatus</i> Lee & Chang, 1996	Redspotted goby	B	–	–	NLC
<i>Rhinogobius similis</i> (Gill, 1859)	Barcheek Goby	B	–	LC	NLC
<i>Rhinogobius maculafasciatus</i> Chen & Shao, 1996	Goby	B	–	–	NLC
<i>Rhinogobius candidianus</i> (Regan, 1908)	Goby	B	–	–	NLC
<i>Rhinogobius gigas</i> Aonuma & Chen, 1996	Giant goby	B	–	–	NLC
<i>Channa maculata</i> (Lacepède, 1801)	Snakehead	B	B2c(i,ii) [1]	LC	NLC
<i>Acrossocheilus paradoxus</i> (Günther, 1868)	Taiwan torrent carp	B	–	–	NLC



Taxon	Common Name	Breeder(B) Visitor(V)	Criteria [Category adjusting]	Global Red List Category in 2024	National Red List Category in 2017
<i>Candidia barbata</i> (Regan, 1908)	Formosan stripe dace	B	–	–	NLC
<i>Opsariichthys pachycephalus</i> Günther, 1868	Taiwan freshwater minnow	B	–	LC	NLC
<i>Opsariichthys evolans</i> (Jordan & Evermann, 1902)	Formosan pale chub	B	–	LC	NLC
<i>Chanodichthys erythropterus</i> (Basilewsky 1855)	Predatory carp	B	–	LC	NLC
<i>Carassius auratus auratus</i> (Linnaeus, 1758)	Golden carp	B	–	LC	NLC
<i>Spinibarbus hollandi</i> Oshima, 1919	Holland's crap	B	B2a [1]	DD	NLC
<i>Rhodeus ocellatus ocellatus</i> (Kner, 1867)	Rosy bitterling	B	–	DD	NNT
<i>Cyprinus carpio carpio</i> Linnaeus, 1758	Common carp	B	–	LC	NLC
<i>Culter alburnus</i> Basilewsky, 1855	Lookup	B	–	LC	NLC
<i>Hemibarbus labeo</i> (Pallas, 1776)	Barbel steed	B	B1a+B2a [-1]	LC	NLC
<i>Hemiculter leucisculus</i> (Basilewsky, 1855)	Sharpbelly	B	–	LC	NLC
<i>Paramisgurnus dabryanus</i> Dabry de Thiersant, 1872	Weatherfish	B	B2c(i,ii) [-1]	LC	NLC
<i>Misgurnus anguillicaudatus</i> (Cantor, 1842)	Pond loach	B	B2c(i,ii) [-1]	LC	NLC
<i>Microphis brachyurus brachyurus</i> (Bleeker, 1853)	Opossum Pipefish	B	–	LC	NA

Taxon	Common Name	Breeder(B) Visitor(V)	Criteria [Category adjusting]	Global Red List Category in 2024	National Red List Category in 2017
<i>Microphis manadensis</i> (Bleeker, 1856)	Manado pipefish	B	–	LC	NA
<i>Microphis leiaspis</i> (Bleeker, 1853)	Barhead pipefish	B	B1c(i,ii)+B2c(i,ii) [-1]	LC	NA
<i>Microphis retzii</i> (Bleeker, 1856)	Ragged-tail pipefish	B	–	LC	NA
<i>Hippichthys heptagonus</i> Bleeker, 1849	Reticulated freshwater pipefish	–	B1a+B2a [-1]	LC	NA
<i>Hippichthys spicifer</i> (Rüppell, 1838)	Bellybarred pipefish	–	–	LC	NA
<i>Hippichthys penicillus</i> (Cantor, 1849)	Beady pipefish	–	–	LC	NA



| *Plecoglossus altivelis altivelis*
 香魚 Ayu sweetfish
 RE
 楊正雄 / 攝



3.8 The freshwater fish in category of Data Deficient in Taiwan

Taxon	Common Name	Breeder(B) Visitor(V)	Criteria [Category adjusting]	Global Red List Category in 2024	National Red List Category in 2017
<i>Anguilla celebesensis</i> Kaup, 1856	Celebes longfin eel	V	–	DD	DD
<i>Anguilla luzonensis</i> Watanabe, Aoyama & Tsukamoto, 2009	Luzon mottled eel	V	–	VU	DD
<i>Luciogobius ryukyuensis</i> Chen, Suzuki & Senou, 2008	Worm goby	–	–	–	NA
<i>Stiphodon chlorestes</i> Jhuang, Dimaquibo & Liao, 2024	Goby	B	–	–	NE
<i>Stiphodon maculidorsalis</i> Maeda & Tan, 2013	Goby	–	–	DD	NE
<i>Stiphodon ornatus</i> Meinken, 1974	Goby	–	–	DD	NE
<i>Stiphodon pelewensis</i> Herre, 1936	Goby	V	–	LC	NE
<i>Stiphodon rutilaureus</i> Watson, 1996	Goby	–	–	LC	NE
<i>Stiphodon surrufus</i> Watson & Kottelat, 1995	Goby	–	–	LC	NE
<i>Schismatogobius baitabag</i> Keith, Lord & Larson, 2017	Goby	–	–	LC	NE
<i>Schismatogobius marmoratus</i> (Peters, 1868)	Goby	–	–	LC	NE
<i>Schismatogobius sapoliensis</i> Keith, Darhuddin, Limmon & Hubert, 2018	Goby	–	–	–	NE
<i>Lentipes palawanirufus</i> Maeda & Palla, 2021	Goby	–	–	–	NE

Taxon	Common Name	Breeder(B) Visitor(V)	Criteria [Category adjusting]	Global Red List Category in 2024	National Red List Category in 2017
<i>Lentipes mindanaoensis</i> Chen, 2004	Goby	–	–	DD	NE
<i>Lentipes multiradiatus</i> Allen, 2001	Goby	–	–	–	NE
<i>Lentipes kaaea</i> Watson, Keith & Marquet, 2002	Goby	–	–	LC	NE
<i>Rhinogobius yangminshanensis</i> Chen, Wang & Shao, 2022	Goby	B	–	–	NE
<i>Hemimyzon sheni</i> Chen & Fang, 2009	Shen's river loach	B	–	–	DD
<i>Squalidus argentatus</i> (Sauvage & Dabry de Thiersant, 1874)	Silver gudgeon	B	–	DD	DD





4. Globally Threatened freshwater fish species of Taiwan

Of the 401 candidate species, 9 species were listed as Globally Threatened and Near-threatened by IUCN in 2024 (IUCN 2024). Of them, 5 were Nationally Threatened and 3 were Nationally Near-threatened in Taiwan.

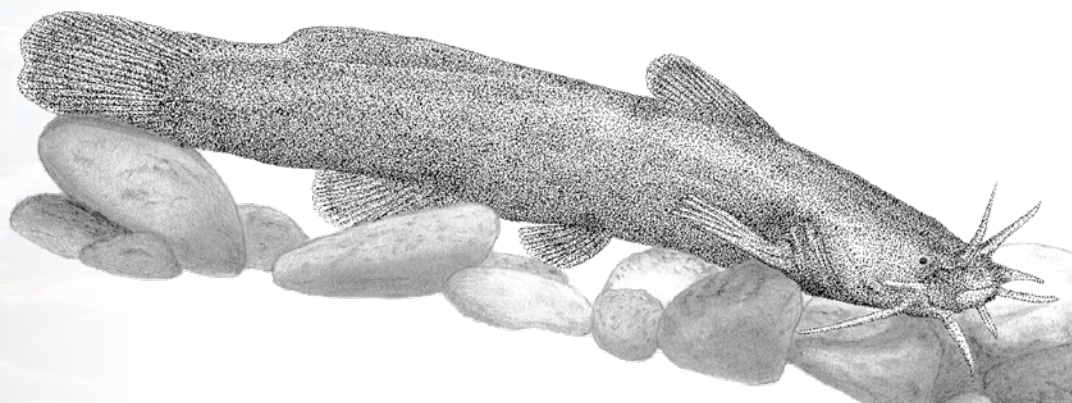
Taxonz	Common Name	Breeder(B) Visitor(V)	National Red List Category in 2024	Global Red List Category in 2024	Proportion (%) of Global population
<i>Anguilla bicolor pacifica</i> Schmidt, 1928	Indian short-finned eel	V	NVU	NT	<1
<i>Anguilla luzonensis</i> Watanabe, Aoyama & Tsukamoto, 2009	Luzon mottled eel	V	DD	VU	<1
<i>Anguilla japonica</i> Temminck & Schlegel, 1846	Japanese eel	V	NEN	EN	<20
<i>Oncorhynchus masou formosanus</i> (Jordan & Oshima, 1919)	Formosan landlocked salmon	B	NNT	CR	>70
<i>Stiphodon imperiorientis</i> Watson & Chen, 1998	Akihito's stiphodon	B	NEN	VU	<1
<i>Rhinogobius formosanus</i> Oshima, 1919	Goby	B	NNT	VU	>70
<i>Sinogastromyzon puliensis</i> Liang, 1974	Pulin river loach	B	NEN	VU	>70
<i>Hemimyzon taitungensis</i> Tzeng & Shen, 1982	Taitung river loach	B	NEN	VU	>70
<i>Onychostoma alticorpus</i> (Oshima, 1920)	Taiwan ku fish	B	NNT	EN	>70

左 /

| *Oncorhynchus masou formosanus*
臺灣櫻花鉤吻鮭 Formosan landlocked salmon
NNT D2[-1]
楊正雄 / 攝

右 /

| *Liobagrus formosanus*
臺灣𩺰 Formosan troont catfish
NEN B1ab(ii)+B2ab(ii)
洪芷盈 / 繪



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■ *Rhinogobius henchuenensis*
恆春吻鰕虎 Henchuen Rhinogoby
NEN B1ab(i,ii)+B2ab(i,ii)
孫文謙 / 攝





2024 臺灣淡水魚類紅皮書名錄

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3
4

封底照片 /

- 1** | *Squalidus banarescui*
巴氏銀鮡 Central Taiwan gudgeon
NEN B1ab(ii,iv,v)+B2ab(ii,iv,v)
楊正雄 / 攝
- 2** | *Lentipes armatus*
棘鱗鰕虎 Spiny scale notch-lip goby
NNT A4cde, B1b(i)+B2b(i)
周銘泰 / 攝
- 3** | *Metzia mesembrinum*
大鱗梅氏鰱 Large-scale lesser-bream
NVU A2abe[-1]
周銘泰 / 攝
- 4** | *Sinogastromyzon nantaiensis*
南臺中華爬岩鰕
Southern Taiwan Chinese stream loach
NNT B1a+B2a
孫華 / 攝

