

## Global Conservation Status of Turtles and Tortoises (Order Testudines)

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**ABSTRACT.** – We present a review and analysis of the conservation status and International Union for Conservation of Nature (IUCN) threat categories of all 360 currently recognized species of

extant and recently extinct turtles and tortoises (Order Testudines). Our analysis is based on the 2018 IUCN Red List status of 251 listed species, augmented by provisional Red List assessments by the IUCN Tortoise and Freshwater Turtle Specialist Group (TFTSG) of 109 currently unlisted species of tortoises and freshwater turtles, as well as re-assessments of several outdated IUCN Red List assessments. Of all recognized species of turtles and tortoises, this combined analysis indicates that 20.0% are Critically Endangered (CR), 35.3% are Critically Endangered or Endangered (CR+EN), and 51.9% are Threatened (CR+EN+Vulnerable). Adjusting for the potential threat levels of Data Deficient (DD) species indicates that 56.3% of all data-sufficient species are Threatened. We calculated percentages of imperiled species and modified Average Threat Levels (ATL; ranging from Least Concern = 1 to Extinct = 8) for various taxonomic and geographic groupings. Proportionally more species in the subfamily Geoemydinae (Asian members of the family Geoemydidae) are imperiled (74.2% CR+EN, 79.0% Threatened, 3.89 ATL) compared to other taxonomic groupings, but the families Podocnemididae, Testudinidae, and Trionychidae and the superfamily Chelonioidae (marine turtles of the families Cheloniidae and Dermochelyidae) also have high percentages of imperiled species and ATLs (42.9–50.0% CR+EN, 73.8–100.0% Threatened, 3.44–4.06 ATL). The subfamily Rhinoclemmydinae (Neotropical turtles of the family Geoemydidae) and the families Kinosternidae and Pelomedusidae have the lowest percentages of imperiled species and ATLs (0%–7.4% CR+EN, 7.4%–13.3% Threatened, 1.65–1.87 ATL). Turtles from Asia have the highest percentages of imperiled species (75.0% CR+EN, 83.0% Threatened, 3.98 ATL), significantly higher than predicted based on the regional species richness, due to much higher levels of exploitation in that geographic region. The family Testudinidae has the highest ATL (4.06) of all Testudines due to the extinction of several species of giant tortoises from Indian and Pacific Ocean islands since 1500 CE. The family Testudinidae also has an ATL higher than all other larger polytypic families ( $\geq 5$  species) of Reptilia or Amphibia. The order Testudines is, on average, more imperiled than all other larger orders ( $\geq 20$  species) of Reptilia, Amphibia, Mammalia, or Aves, but has percentages of CR+EN and Threatened species and an ATL (2.96) similar to those of Primates and Caudata (salamanders).

**KEY WORDS.** – IUCN Red List; chelonians; imperiled; endangered; threatened; Average Threat Level; Asia; Geoemydinae; Testudinidae; Reptilia; extinction

The International Union for Conservation of Nature (IUCN) Red List of Threatened Species™ ([www.iucnredlist.org](http://www.iucnredlist.org)) is the global standard for threat assessments and determination of conservation status of all species of animals and plants on Earth. Assessments of threats, extinction risk, and conservation status of all tortoises and freshwater turtles are officially provided to the IUCN Red List by the IUCN Tortoise and Freshwater Turtle Specialist Group (TFTSG; [www.iucn-tftsg.org](http://www.iucn-tftsg.org)), which has produced status assessments for unevaluated and re-evaluated taxa on a continuous basis since 1982. Documenting the overall conservation status and percentage of threatened species of tortoises and freshwater turtles is important to understanding how seriously these taxa are threatened with extinction, how they compare with other imperiled taxa, and how threat levels for individual species and groups change through time. The global turtle conservation community needs these assessments to conduct analyses of the current conservation status of all turtles, but especially species with rapidly changing status levels, to help guide both prescriptive and reactive conservation policies and strategies for time-sensitive implementation of effective conservation efforts. Due to lengthy production times between draft assessments by the TFTSG via regional workshops and their eventual

publication as official IUCN Red List accounts, many of these TFTSG provisional status assessments have languished for years and have not yet appeared on the IUCN Red List; nearly one third of all turtle and tortoise species are not yet included on the current IUCN Red List. To make these provisional TFTSG assessments available in a more timely fashion, the Turtle Taxonomy Working Group (a committee of the TFTSG) has published brief, updated conservation status assessments based on these drafts (Turtle Taxonomy Working Group [TTWG] 2010, 2011, 2012, 2014, 2017). Previous provisional TFTSG Red List assessments have also been published as recommendations ahead of formal IUCN Red List publication (TFTSG 1989; TFTSG and Asian Turtle Trade Working Group [ATTWG] 2000; Horne et al. 2012).

To further assess and more effectively summarize the current conservation status of all turtles and tortoises in a single, comprehensive analysis, we provide here a combined review of the current official 2018 IUCN Red List (including published marine turtle assessments as determined by the IUCN Marine Turtle Specialist Group) and a review and analysis of the most current TFTSG Provisional Red List assessments of the conservation status of all previously unevaluated or re-evaluated tortoise and freshwater turtle species. This augmented TFTSG Red

List 2018 is the first assessment to consider the global conservation status of all species in the Order Testudines, at present generally recognized to include about 360 species (TTWG 2017; TTWG, unpubl. data, 2018). This review and analysis has been undertaken by the TFTSG (its current and former Chairs, Red List Coordinators, Executive and Steering Committees, Regional Vice-Chairs, and other key contributors); it is based on a series of regional, TFTSG-led IUCN Red Listing workshops and subsequent reviews involving members of the TFTSG and other specialists.

## METHODS AND RESULTS

Our overarching goal was to summarize the best available science to inform policy and strategic conservation action. We used the most current taxonomy (TTWG 2017; TTWG, unpubl. data, 2018) to create species richness lists for turtles in a variety of geographic regions of the world and calculated percentages of imperiled species and Average Threat Levels (ATL; see definition and methodology below) for these and various taxonomic groupings. We compared these analyses with those of other threatened vertebrate groups (all other Reptilia and all Amphibia, Mammalia, and Aves). The limitations of these analyses are the limitations of the taxonomy and are the same for any use of species richness. As noted by Kiester (2013, p. 707), “As a practical matter, calculating species richness depends on the taxonomy available and hence on the taxonomic philosophy of the practitioners for a given taxon.” We believe that the taxonomic philosophies used in these different vertebrate groups are sufficiently similar to make valid comparisons.

There were 356 species of modern (post-1500 CE) turtles and tortoises (Order Testudines) recognized in the most recent global checklist (TTWG 2017). Four new species of freshwater turtles have been described or elevated from subspecies since then: *Kinosternon vogti*, *Sternotherus intermedius*, *Sternotherus peltifer*, and *Trachemys medemi* (Vargas-Ramírez et al. 2017; López-Luna et al. 2018; Scott et al. 2018), bringing the total to 360 (TTWG, unpubl. data, 2018). Of these, 7 are marine turtles, leaving 353 tortoise and freshwater turtle species.

The current official IUCN Red List (version 2018.1) formally includes only 251 of the 360 recognized turtle and tortoise species (plus 8 separate subspecies and 24 regional subpopulations), using a slightly outdated taxonomy from the one presented in TTWG (2017) and used in this review. Of the 251 species listed, 8 are assessed as Extinct (EX) (including *Pelusios seychellensis*, considered a subspecies by TTWG [2014, 2017] and herein), 1 Extinct in the Wild (EW), 1 Critically Endangered (Possibly Extinct) (CR(PE)), 42 Critically Endangered (CR), 44 Endangered (EN), 66 Vulnerable (VU), 32 Near Threatened (NT), 1 Lower Risk/Conservation Dependent (LR/cd; an outdated threat category being phased out by

IUCN), 45 Least Concern (LC), and 11 Data Deficient (DD) (see Table 1).

By IUCN Red List protocol, Threatened species are defined as the combination of all those in the three status categories of CR, EN, and VU. Therefore, as of the published 2018 IUCN Red List, 153 species (61.0% of the included species) are officially regarded by the IUCN as Threatened, with 87 species (34.7%) considered CR+EN and 43 species (17.1%) considered CR. If one excludes the 11 DD species, then 63.8% of the remaining 240 data-sufficient species included are considered Threatened. Unfortunately, because only 251 of all 360 recognized species of turtles and tortoises are currently included on the 2018 IUCN Red List, these numbers are not as accurate as they need to be and, while representative, they only apply to about two thirds of the world’s turtle fauna and are therefore imprecise. By including the additional 109 TFTSG Provisional Red List assessments with these official assessments, we arrive at more precise estimates of the global conservation status of all turtles and tortoises.

Of the total of 360 species, 109 (30.3%) are not yet included on the official IUCN Red List. Nevertheless, all these unlisted (Not Evaluated) species have already been evaluated by the TFTSG. Status assessments of all tortoises and freshwater turtles are being accomplished on an ongoing basis through specialist consultations and regional IUCN Turtle Red Listing workshops organized and led by the TFTSG. These workshops consistently assess previously unevaluated species and re-assess outdated previously evaluated species. Since 1999, the TFTSG has held IUCN Red Listing workshops in and for species in Asia three times, India twice, Australia and New Guinea twice, South America twice, and Mexico, United States, Sub-Saharan Africa, Madagascar, the Galápagos Islands, and the Mediterranean region once each. Most of these TFTSG assessments have been finalized and published on the IUCN Red List while many others remain provisional and were recorded in TTWG (2017).

The third Asian IUCN Red Listing workshop, held by the TFTSG in Singapore in 2018, considered new and updated evaluations for nearly 100 Asian and New Guinean taxa, and additional Australian and Chinese taxa are currently in the process of being re-assessed. Further, a recent supplementary session was held in the United States for any remaining DD or Not Evaluated species. More than 50 of these new assessments have progressed to a state where their categorization could be added to this report. However, many remain in early review and are not yet recorded here; for these species we use the provisional TFTSG assessments from earlier workshops in Australia and Asia (Horne et al. 2012; TTWG 2017).

As such, all turtles and tortoises (Order Testudines) have now been assessed using the IUCN Red List categories and criteria. Although not yet officially published on the IUCN Red List, we can use these TFTSG Provisional Red List assessments to update and

**Table 1.** Actual numbers of listed species and percentages of number of species listed and of all turtle and tortoise species recognized for several previous IUCN Red Lists (1982–2011), the current IUCN Red List (version 2018.1), as well as the current TFTSG Red List 2018. Data for IUCN from Groombridge (1982), Baillie and Groombridge (1996), and data downloads from the IUCN Red List website ([www.iucnredlist.org](http://www.iucnredlist.org)) in 2004–2018. IUCN conservation status threat categories: EX = Extinct; EW = Extinct in the Wild; CR = Critically Endangered; EN = Endangered; VU = Vulnerable; NT = Near Threatened; LC = Least Concern; DD = Data Deficient; NE = Not Evaluated; NL = Not Listed. Threatened species = CR+EN+VU species. The total number of species recognized at the time of each dated listing extrapolated from Pritchard (1979), Iverson (1992a), Fritz and Havaš (2007), and Turtle Taxonomy Working Group (2011, 2017).

|  | EX  | EW  | CR   | EN   | VU   | NT   | LC                  | DD   | (CR+EN) | Threatened<br>(CR+EN+VU) | EX+EW+<br>CR+EN+VU | No. data-<br>sufficient | No.<br>species<br>listed | NE/NL | No. of<br>species<br>recognized | No. of<br>subsp.<br>listed |
|--|-----|-----|------|------|------|------|---------------------|------|---------|--------------------------|--------------------|-------------------------|--------------------------|-------|---------------------------------|----------------------------|
| <b>Actual numbers</b>                    |     |     |      |      |      |      |                     |      |         |                          |                    |                         |                          |       |                                 |                            |
| IUCN Red List 1982 <sup>a</sup>          | 0   | 0   | 3    | 8    | 10   | 9    | —                   | 24   | 11      | 21                       | 21                 | 30                      | 54                       | 183   | 237                             | 5                          |
| IUCN Red List 1996                       | 6   | 0   | 10   | 28   | 58   | 48   | [53] <sup>b</sup>   | 23   | 38      | 96                       | 102                | 150                     | 173                      | 102   | 275                             | 13                         |
| IUCN Red List 2004                       | 7   | 1   | 25   | 46   | 57   | 42   | 14                  | 13   | 71      | 128                      | 136                | 192                     | 205                      | 107   | 312                             | 16                         |
| IUCN Red List 2007                       | 7   | 1   | 26   | 46   | 60   | 43   | 19                  | 10   | 72      | 132                      | 140                | 202                     | 212                      | 107   | 319                             | 16                         |
| IUCN Red List 2011                       | 6   | 1   | 32   | 44   | 58   | 37   | 39                  | 11   | 76      | 134                      | 141                | 217                     | 228                      | 102   | 330                             | 19                         |
| IUCN Red List 2018                       | 8   | 1   | 43   | 44   | 66   | 33   | 45                  | 11   | 87      | 153                      | 162                | 240                     | 251                      | 109   | 360                             | 8                          |
| TFTSG Red List 2018                      | 7   | 0   | 72   | 55   | 60   | 40   | 98                  | 28   | 127     | 187                      | 194                | 332                     | 360                      | 0     | 360                             | 21                         |
| <b>Percent of listed species</b>         |     |     |      |      |      |      |                     |      |         |                          |                    |                         |                          |       |                                 |                            |
| IUCN Red List 1982 <sup>a</sup>          | 0.0 | 0.0 | 5.6  | 14.8 | 18.5 | 16.7 | —                   | 44.4 | 20.4    | 38.9                     | 38.9               | 55.6                    | —                        | 338.9 | —                               | —                          |
| IUCN Red List 1996                       | 3.5 | 0.0 | 5.8  | 16.2 | 33.5 | 27.7 | [30.6] <sup>b</sup> | 13.3 | 22.0    | 55.5                     | 59.0               | 86.7                    | —                        | 59.0  | 59.0                            | —                          |
| IUCN Red List 2004                       | 3.4 | 0.5 | 12.2 | 22.4 | 27.8 | 20.5 | 6.8                 | 6.3  | 34.6    | 62.4                     | 66.3               | 93.7                    | —                        | 52.2  | 52.2                            | —                          |
| IUCN Red List 2007                       | 3.3 | 0.5 | 12.3 | 21.7 | 28.3 | 20.3 | 9.0                 | 4.7  | 34.0    | 62.3                     | 66.0               | 95.3                    | —                        | 50.5  | 50.5                            | —                          |
| IUCN Red List 2011                       | 2.6 | 0.4 | 14.0 | 19.3 | 25.4 | 16.2 | 17.1                | 4.8  | 33.3    | 58.8                     | 61.8               | 95.2                    | —                        | 44.7  | 44.7                            | —                          |
| IUCN Red List 2018                       | 3.2 | 0.4 | 17.1 | 17.5 | 26.3 | 13.1 | 17.9                | 4.4  | 34.7    | 61.0                     | 64.5               | 95.6                    | —                        | 43.4  | 43.4                            | —                          |
| TFTSG Red List 2018                      | 1.9 | 0.0 | 20.0 | 15.6 | 16.1 | 11.4 | 26.9                | 8.1  | 35.6    | 51.7                     | 53.6               | 91.9                    | —                        | 0.0   | 0.0                             | —                          |
| <b>Percent of all recognized species</b> |     |     |      |      |      |      |                     |      |         |                          |                    |                         |                          |       |                                 |                            |
| IUCN Red List 1982 <sup>a</sup>          | 0.0 | 0.0 | 1.3  | 3.4  | 4.2  | 3.8  | —                   | 10.1 | 4.6     | 8.9                      | 8.9                | 12.7                    | 22.8                     | 77.2  | —                               | —                          |
| IUCN Red List 1996                       | 2.2 | 0.0 | 3.6  | 10.2 | 21.1 | 17.5 | [19.3] <sup>b</sup> | 8.4  | 13.8    | 34.9                     | 37.1               | 54.5                    | 62.9                     | 37.1  | 37.1                            | —                          |
| IUCN Red List 2004                       | 2.2 | 0.3 | 8.0  | 14.7 | 18.3 | 13.5 | 4.5                 | 4.2  | 22.8    | 41.0                     | 43.6               | 61.5                    | 65.7                     | 34.3  | 34.3                            | —                          |
| IUCN Red List 2007                       | 2.2 | 0.3 | 8.2  | 14.4 | 18.8 | 13.5 | 6.0                 | 3.1  | 22.6    | 41.4                     | 43.9               | 63.3                    | 66.5                     | 33.5  | 33.5                            | —                          |
| IUCN Red List 2011                       | 1.8 | 0.3 | 9.7  | 13.3 | 17.6 | 11.2 | 11.8                | 3.3  | 23.0    | 40.6                     | 42.7               | 65.8                    | 69.1                     | 30.9  | 30.9                            | —                          |
| IUCN Red List 2018                       | 2.2 | 0.3 | 11.9 | 12.2 | 18.3 | 9.2  | 12.5                | 3.1  | 24.2    | 42.5                     | 45.0               | 66.7                    | 69.7                     | 30.3  | 30.3                            | —                          |
| TFTSG Red List 2018                      | 1.9 | 0.0 | 20.0 | 15.6 | 16.1 | 11.4 | 26.9                | 8.1  | 35.6    | 51.7                     | 53.6               | 91.9                    | 100.0                    | 0.0   | 0.0                             | —                          |

<sup>a</sup> Outdated 1982 categories converted to current categories as follows: E (Endangered) = CR+EN; V (Vulnerable) = VU; R (Rare) = NT; I (Indeterminate) = K (Insufficiently Known) = DD.

<sup>b</sup> Species assessed as LC in 1996 were not formally included on the Red List.



better determine the overall global conservation status of turtles and tortoises.

This updated and augmented TFTSG Red List 2018 (Table 1; Appendix 1) encompasses all 360 currently recognized species of turtles and tortoises. Of these, 332 are data-sufficient and categorized as follows: 7 EX, 1 CR(PE), 71 CR, 55 EN, 60 VU, 40 NT, and 98 LC. A total of 187 species are officially categorized as Threatened (CR+EN+VU), and an additional 28 species lack sufficient data to categorize their status and are DD.

We adjusted the percentages of Threatened species to potentially account for those DD species that may also be Threatened. We followed the calculation method of determining percentage of data-sufficient Threatened species utilized by Hoffmann et al. (2010) and Böhm et al. (2013) whereby the number of Threatened species (187) is divided by the number of data-sufficient species (332; i.e., the total number of recognized species [360] minus those that are DD [28]). This adjustment assumes that DD species may have the same approximate percentage of Threatened species as of data-sufficient species.

About 20 separate subspecies of turtles have also been assessed and listed by IUCN and the TFTSG (Appendix 2) but are not further analyzed here other than to note that some are CR and Possibly Extinct in the Wild (PEW). There is increased conservation value in also assessing all subspecies of turtles for the Red List; there are currently 121 additional turtle and tortoise subspecies recognized, for a total of 481 turtle and tortoise taxa (TTWG 2017; TTWG, unpubl. data, 2018). We recommend that status evaluations of all recognized taxa be undertaken.

*Average Threat Levels (ATL).* — Expanding on similar previous quantitative analyses of regional threat levels for turtles and tortoises developed by Stuart and Thorbjarnarson (2003) and Rhodin (2006), we expanded and modified the ranking system of Rhodin (2006) to calculate global ATL for polytypic taxonomic groupings (e.g., classes, orders, superfamilies, families, or subfamilies) or broad geographic groupings, and we used these ATL values for comparisons among turtles and tortoises and with other vertebrate groups.

We assigned numerical threat levels per individual species in each selected grouping, with LC = 1, NT = 2, VU = 3, EN = 4, CR = 5, EW = 6, CR(PE) = 7, and EX = 8. DD species were assigned a value of 2.5 based on the potential predicted average threat level after evaluation (see Hoffmann et al. 2010). We then summed all species values per selected grouping and calculated the ATL for each group (where ATL equals the total summed threat value per grouping divided by the total number of species per grouping).

### Patterns and Comparative Analyses

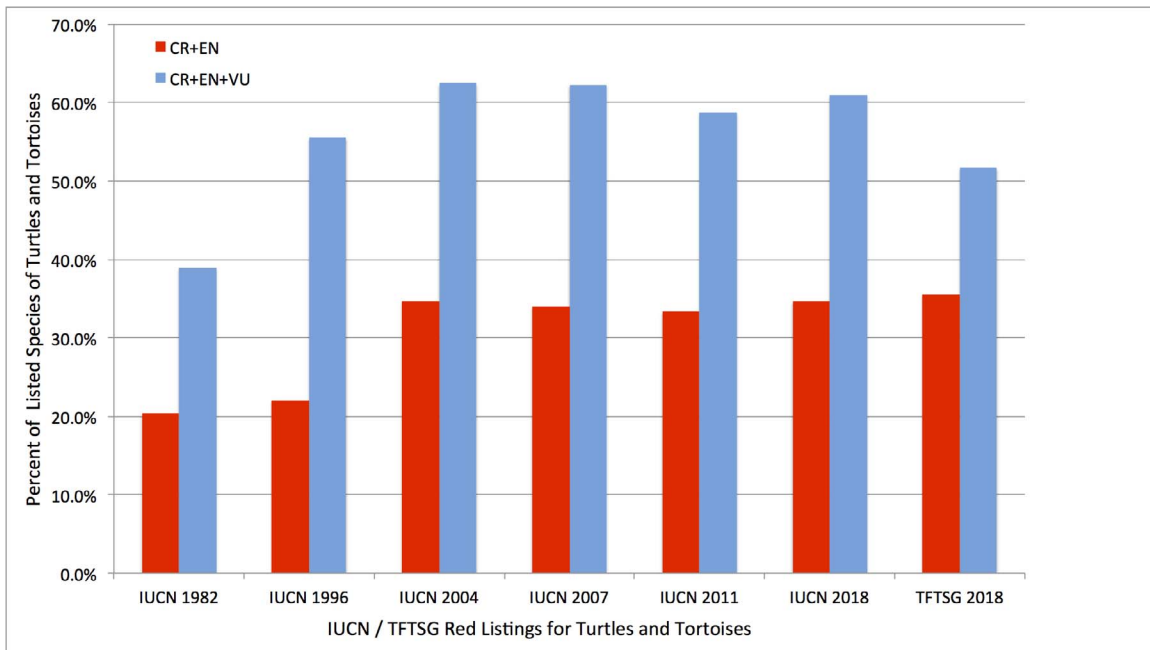
This TFTSG Red List 2018 has 187 species of turtles and tortoises (51.9%) that are Threatened, with 127

(35.3%) CR+EN, 72 (20.0%) CR, and 56.2% of 332 data-sufficient species Threatened. When analyzing these figures as percentages of only those species officially included on the IUCN Red Lists (Table 1; Fig. 1), it is apparent that the figures of 61.0% or 63.8% Threatened species as reflected on the 2018 IUCN listing are high estimates. In fact, based on our TFTSG assessments, 51.7% of all recognized turtles and tortoises, or 56.2% of all data-sufficient species, are currently assessed as Threatened and 58.3% are Threatened or already EX.

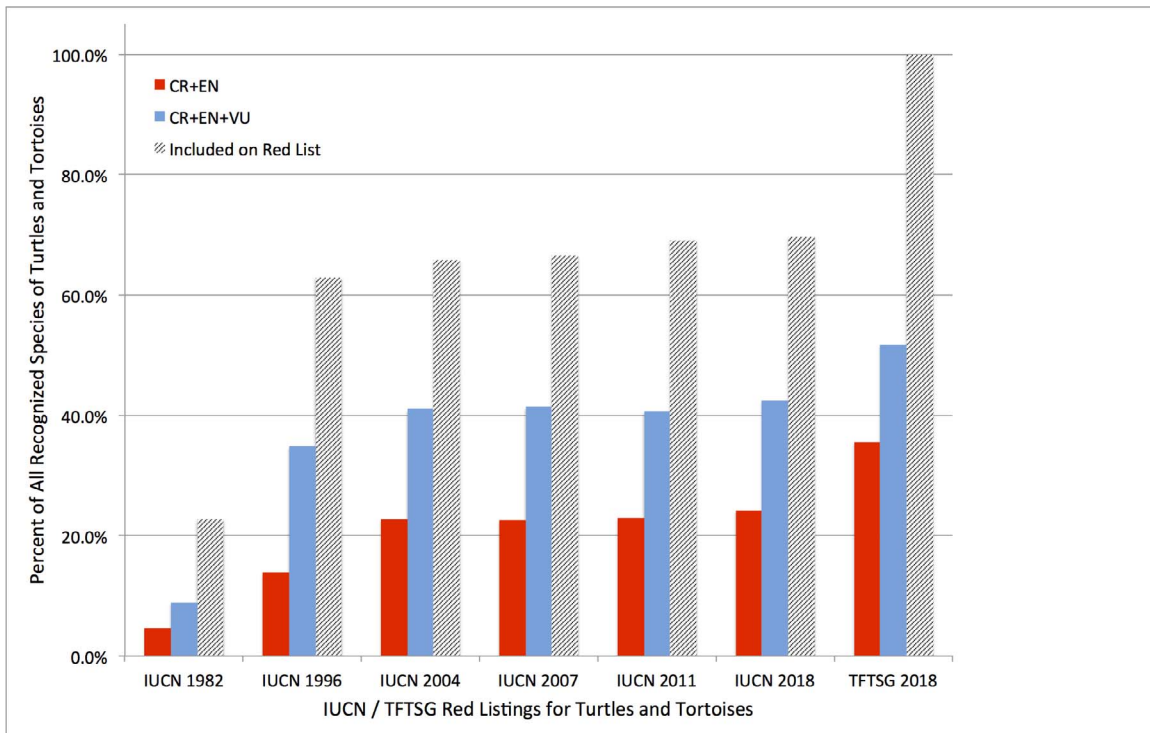
While still among the highest percentages of any of the larger vertebrate groups, these figures are not quite as high as indicated on the official IUCN Red List. The reason for these apparently lower percentages of Threatened species is that, of the species previously not included on the IUCN Red List, a lower percentage have now been provisionally assessed by the TFTSG as Threatened and many are DD or LC. However, when we calculate these figures as percentages of all turtle species recognized at the time of the assessments (Table 1; Fig. 2), they are now markedly higher than in previously published IUCN Red Lists, and we see that the percentages of both CR+EN and Threatened turtles and tortoises have actually increased over the years.

*Comparison of Taxonomic Groupings.* — We compared the percentages of Threatened and CR+EN species for selected turtle and tortoise groupings (superfamilies, families, or subfamilies) (Fig. 3). We compared all polytypic families of turtles and tortoises with 2 exceptions. One, we split the family Geoemydidae into its 2 component subfamilies because of their marked geographic separation and analyzed each separately: the Geoemydinae (Asian and Eurasian freshwater and semiterrestrial turtles) and the Rhinoclemmydinae (Neotropical freshwater and semiterrestrial turtles). Two, we included all marine turtles of the families Cheloniidae and Dermochelyidae in their inclusive superfamily Chelonioidea.

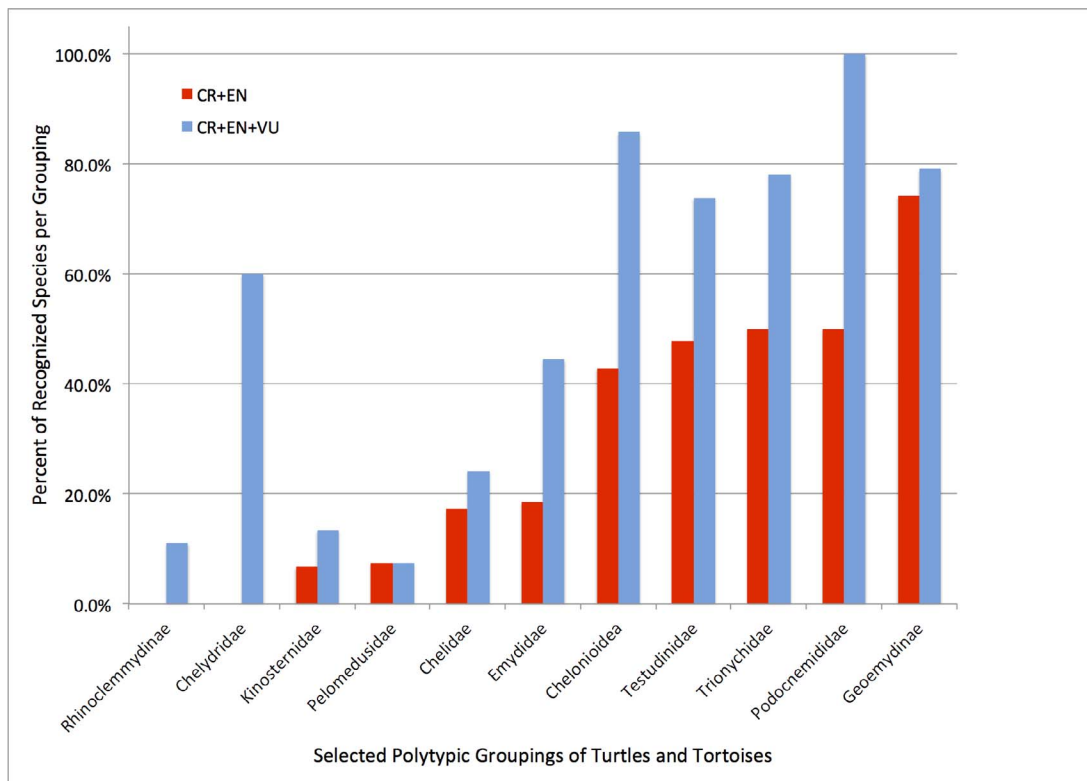
We found that, among these groupings, the subfamily Geoemydinae (62 Asian and Eurasian species) currently has the overall highest percentages of imperiled species, with 74.2% CR+EN and 79.0% Threatened. Only the much-smaller family Podocnemididae (South American and Madagascan river turtles, 8 species) has a higher proportion of Threatened species (100.0%), and the superfamily Chelonioidea (marine turtles, 7 species) also has more Threatened species (85.7%), but each of these families have lower percentages of CR+EN species than do the Geoemydinae. The subfamily Rhinoclemmydinae (9 Neotropical species) and the families Kinosternidae (Neotropical mud turtles, 30 species) and Pelomedusidae (African side-necked turtles, 27 species) have the lowest percentages of Threatened species. The 4 evolutionarily distinct and monotypic freshwater turtle families and subfamilies (Dermatemydidae, Platysternidae, Carettochelyidae, and Pseudemydurinae) are all highly imperiled with a single CR or EN species each: *Dermatemys mawii*,



**Figure 1.** Critically Endangered and Endangered (CR+EN) and Threatened (CR+EN+VU) species of turtles and tortoises as a percentage of the total number of IUCN- or TFTSG-listed species at the time, as published by IUCN Red Lists 1982–2018 and on this TFTSG Red List 2018. Data sources as in Table 1. (Color version is available online.)



**Figure 2.** Critically Endangered and Endangered (CR+EN), Threatened (CR+EN+VU), and Listed species of turtles and tortoises as percentages of the total number of recognized species at the time, as published on IUCN Red Lists 1982–2018 and on this TFTSG Red List 2018. Data sources as in Table 1. (Color version is available online.)



**Figure 3.** Composition of TFTSG Red List 2018 showing Critically Endangered and Endangered (CR+EN) and Threatened (CR+EN+VU) turtle and tortoise species per selected polytypic group (superfamily, family, or subfamily) as a percentage of the total number of recognized species in each defined group. (Color version is available online.)

*Platysternon megacephalum*, *Carettochelys insculpta*, and *Pseudemydura umbrina*. The distinct monotypic marine turtle family Dermochelyidae has a single VU species: *Dermochelys coriacea*.

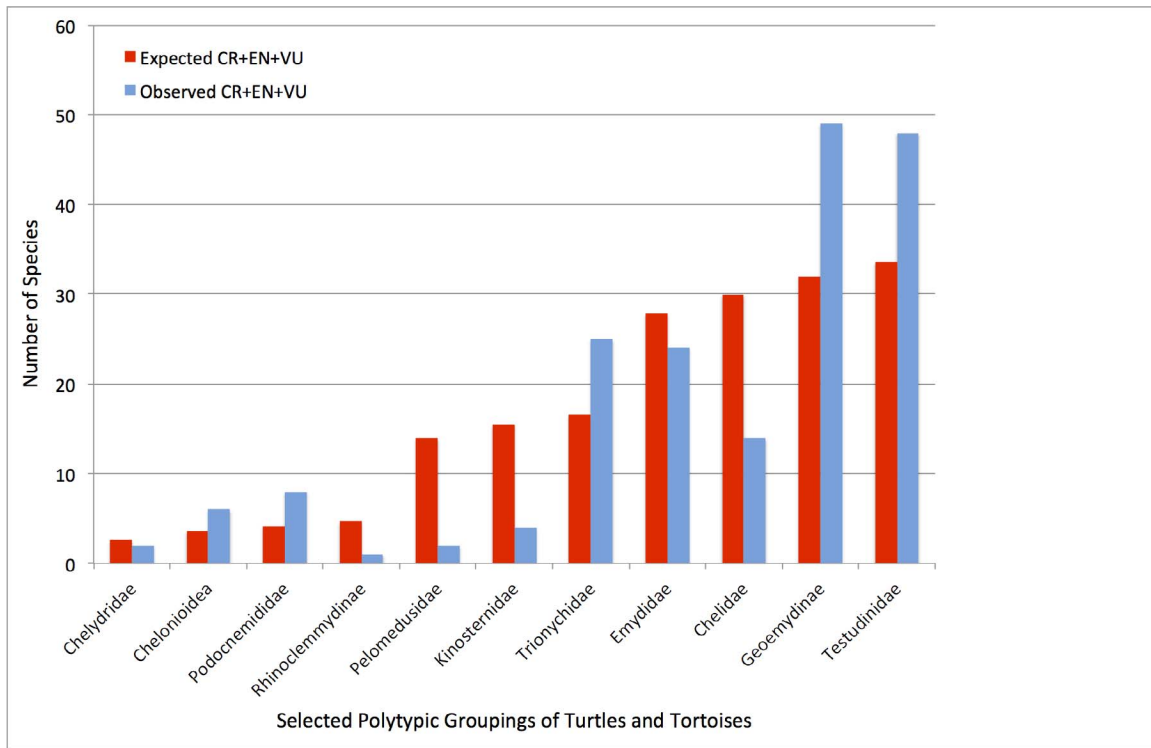
There was a highly significant positive correlation between the species richness and number of Threatened species per selected taxonomic grouping (superfamily, family, or subfamily) (Pearson's  $r = 0.895$ ,  $r^2 = 0.802$ ,  $p < 0.0001$ ). However, after accounting for the relative species richness in each grouping in calculating the expected frequencies, there was a significant difference among groups in terms of frequency of expected vs. observed Threatened species ( $\chi^2 = 25.89$ ,  $df = 13$ ,  $p < 0.01$ ), with the Testudinidae, Geoemydinae, and Trionychidae having more Threatened species than expected and Chelidae, Pelomedusidae, and Kinosternidae having fewer Threatened species than expected (Fig. 4).

If we calculate the percentage of Threatened or Extinct species, then the family Testudinidae (tortoises, 65 species), with 7 species of insular giant tortoises already having gone extinct during modern times, increases from 73.8% Threatened to 84.6% Threatened or Extinct species.

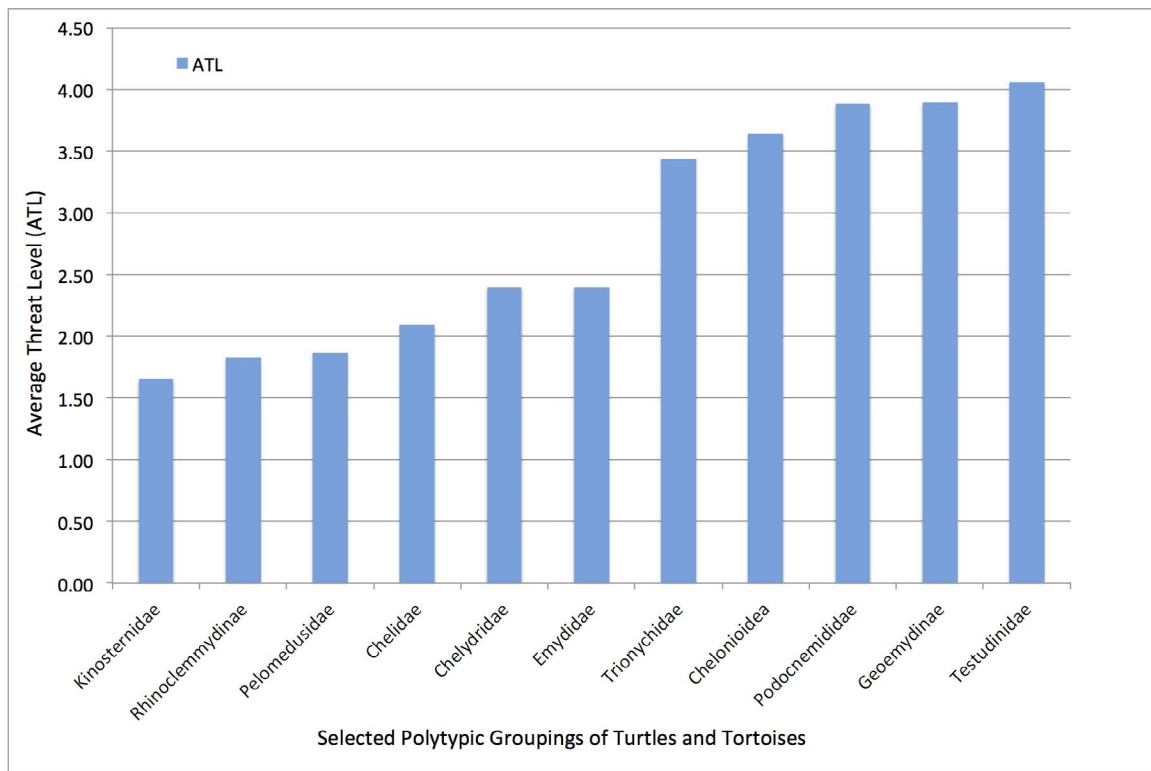
The Testudinidae, with its many large and easily collected terrestrial tortoises, has been highly exploited and consumed by humans for about as long as humanity has existed on the planet (Turtle Extinctions Working Group [TEWG] 2015). Many continental and insular

species of giant tortoises went extinct during the Quaternary (Pleistocene and Holocene) during the global spread of prehuman hominids and humans out of Africa into first Asia and Eurasia, then the Australasian archipelago and Australia, and eventually to North America, Central America, the Caribbean archipelago, and South America (TEWG 2015). When the numbers of fossil tortoises that went extinct during the Quaternary are combined with the modern (living and extinct) species of tortoises, of the more than 120 species of tortoises that have existed since the beginning of the Pleistocene nearly 60% have already gone extinct, presumably primarily through human overexploitation (TEWG 2015). The other large-bodied terrestrial turtles, the giant horned turtles of the extinct family Meiolaniidae with 7 species (also often insular), all went extinct during the Pleistocene and Holocene, apparently due at least partly to human exploitation (TEWG 2015; Hawkins et al. 2016).

We calculated ATL values for all selected taxonomic groupings of turtles and tortoises (Fig. 5). The entire Order Testudines, with 360 total species, has a calculated ATL of 2.96. We found that five (Testudinidae, Geoemydinae, Podocnemididae, Cheloniodea, and Trionychidae) currently have much-higher threat levels (ATL = 3.44–4.06) than the other families and subfamilies, with the Kinosternidae, Pelomedusidae, and Rhinoclemmydinae having the lowest ATLs (1.65–1.87).

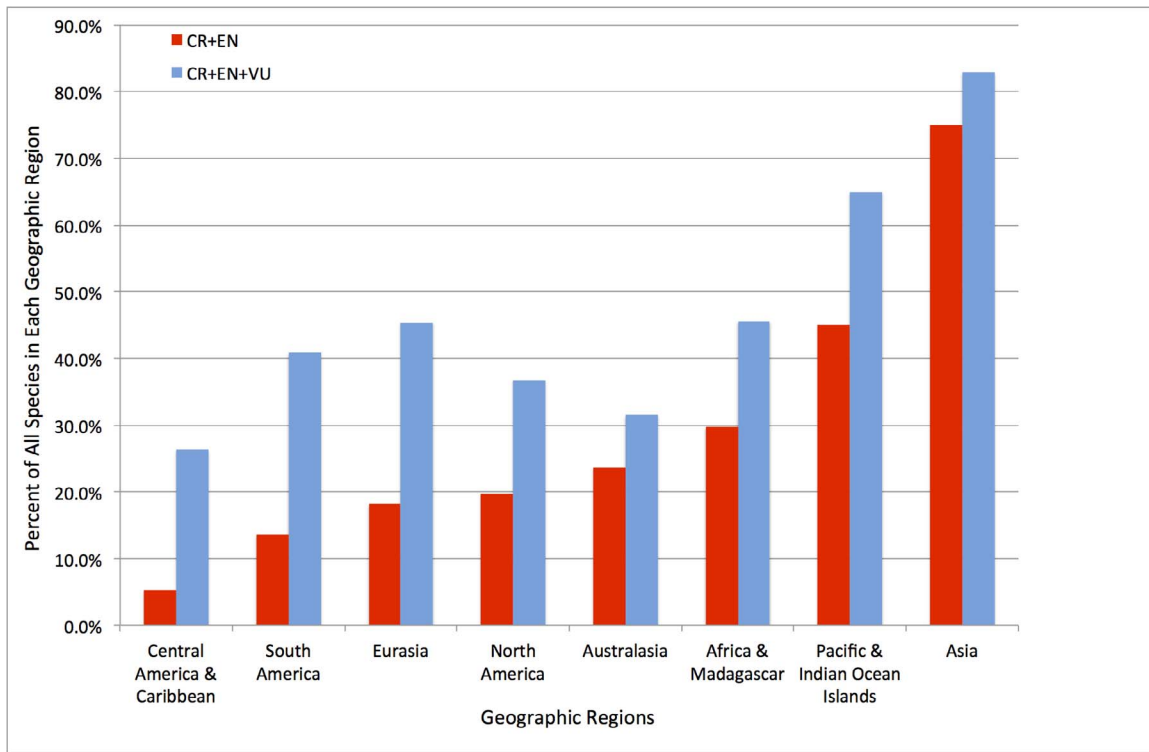


**Figure 4.** Composition of TFTSG Red List 2018 showing expected vs. observed number of Threatened (CR+EN+VU) turtle and tortoise species per selected polytypic grouping (superfamily, family, or subfamily) as related to species richness in each grouping. The observed and expected frequencies differed significantly, with species of Testudinidae, Geoemydinae, and Trionychidae at higher risk than in other groupings. (Color version is available online.)



**Figure 5.** Composition of TFTSG Red List 2018 showing calculated Average Threat Level (ATL; see text for calculation methodology) per selected polytypic group (superfamily, family, or subfamily) of turtles and tortoises. The entire order Testudines has an ATL of 2.96. (Color version is available online.)





**Figure 6.** Composition of TFTSG Red List 2018 showing Critically Endangered and Endangered (CR+EN) and Threatened (CR+EN+VU) freshwater turtle and tortoise species per geographic region as a percentage of the total number of recognized species in each region. Regional delineations defined in Appendix 1. (Color version is available online.)

*Comparison of Geographic Regions.* — When comparing the percentages of Threatened and CR+EN species of turtles and tortoises by geographic region (Fig. 6; definitions of geographic regional delineations in Appendix 1), we found that Asia (88 species) has the overall highest proportions with 75.0% CR+EN and 83.0% Threatened. Only the much-smaller regional grouping, Pacific and Indian Ocean Islands (20 giant tortoise species of which 7 are already Extinct), has a similar but lower percentage of Threatened species (65.0%). However, if we examine the percentage of Threatened or Extinct species, then the Pacific and Indian Ocean Islands group of giant tortoises increases to 100%.

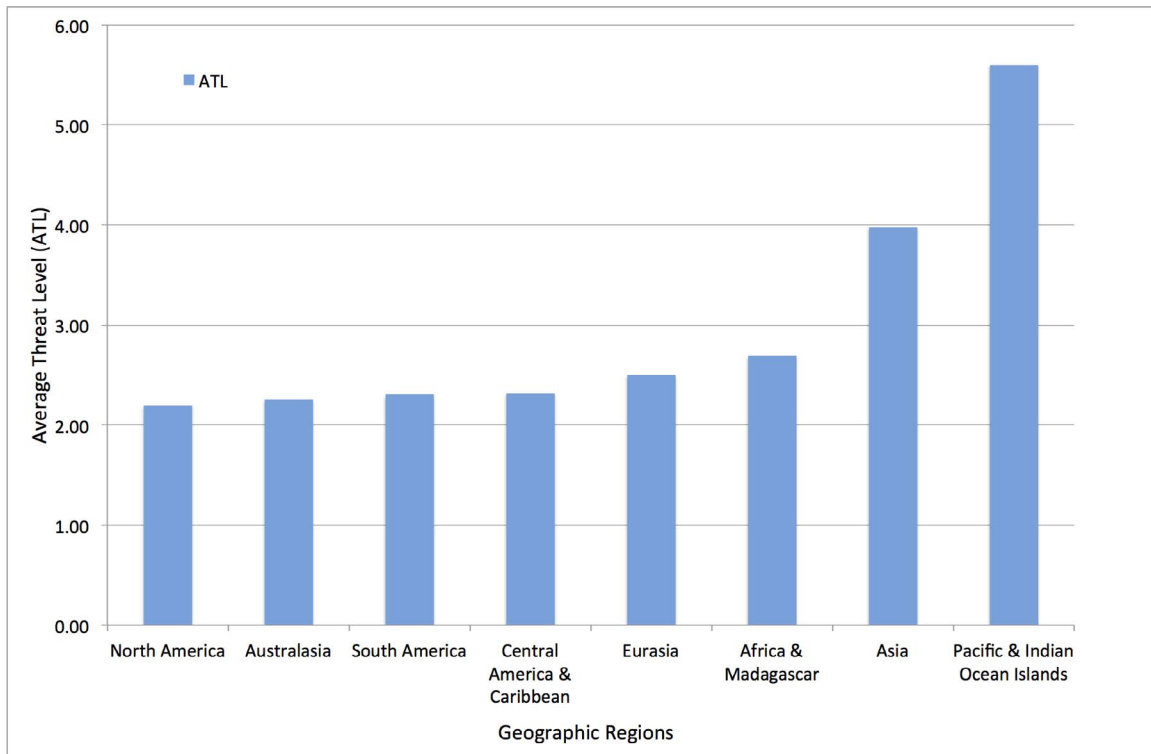
Analysis of the ATLS for these geographic regions (Fig. 7) revealed that the Pacific and Indian Ocean Islands, with their many recently EX tortoise species, have the highest ATL level (5.60). However, Asia also has a quite high ATL (3.98), with the other regions having much lower ATLS, although the Africa and Madagascar grouping has a slightly higher ATL (2.69) than the others.

There was a highly significant positive correlation between species richness and number of Threatened species per geographic region (Pearson's  $r = 0.886$ ,  $r^2 = 0.786$ ,  $p < 0.01$ ). To highlight whether the turtles of any specific geographic region are more threatened than those from other geographic regions, we considered the relative species richness in each region. We then calculated the expected numbers of imperiled species per geographic region given the total species richness of that region, and

compared the observed vs. expected frequencies of imperiled species per geographic region by a chi-square test. The result of this analysis for CR+EN species, using the total number of species per geographic region, was that the observed and expected frequencies differed significantly ( $\chi^2 = 26.32$ ,  $df = 7$ ,  $p < 0.001$ ), with only Asian species being more at risk than in the other geographic regions (Fig. 8). For Threatened species, the chi-square was not significant ( $\chi^2 = 13.15$ ,  $df = 7$ ,  $p = 0.068$ ), indicating that the geographic pattern of Threatened species was consistent with the species richness of that region.

We also calculated the expected frequency of EX, CR, or EN species by geographic region. The EX species were found only in the Pacific and Indian Ocean Islands, and this pattern was highly nonrandom ( $\chi^2 = 49$ ,  $df = 7$ ,  $p < 0.0001$ ). For CR species, there was a significant difference among geographic regions ( $\chi^2 = 18.62$ ,  $df = 7$ ,  $p < 0.01$ ), with Asia having a significantly higher-than-expected frequency of CR species and Australasia and North America having significantly lower-than-expected frequencies. All other geographic regions had expected frequencies of CR species consistent with their overall richness. For EN species, there was no significant difference among geographic regions ( $\chi^2 = 8.93$ ,  $df = 7$ ,  $p = 0.258$ ).

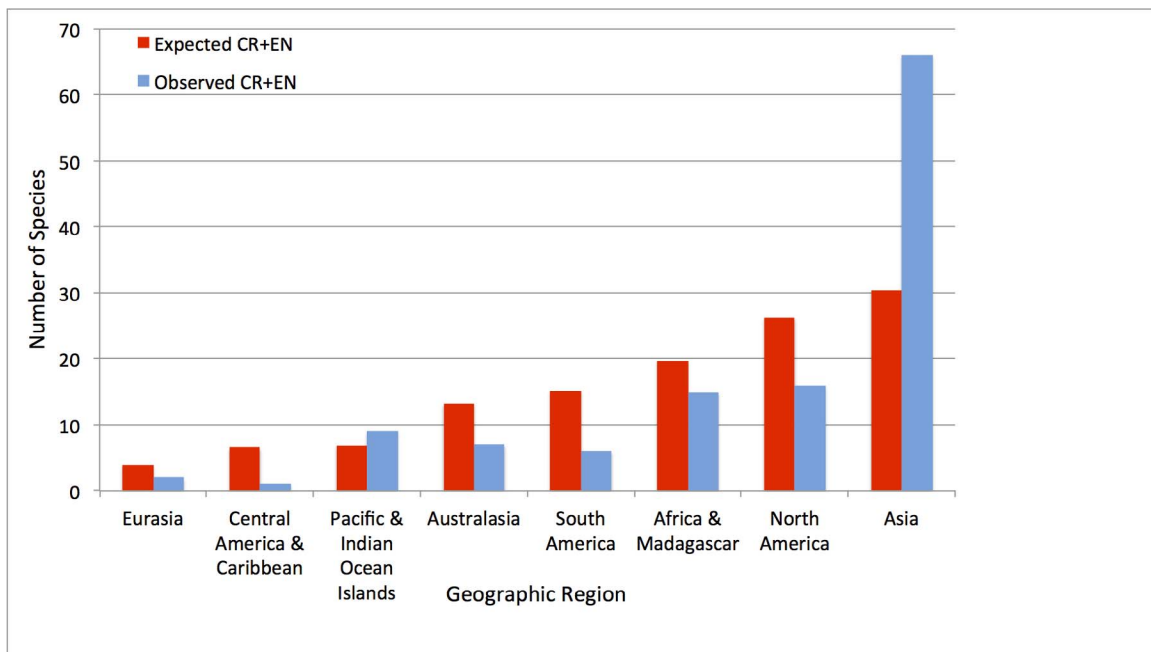
*Comparison with Other Vertebrates.* — We calculated the percentage of data-sufficient Threatened species for several other selected vertebrate groups included on the



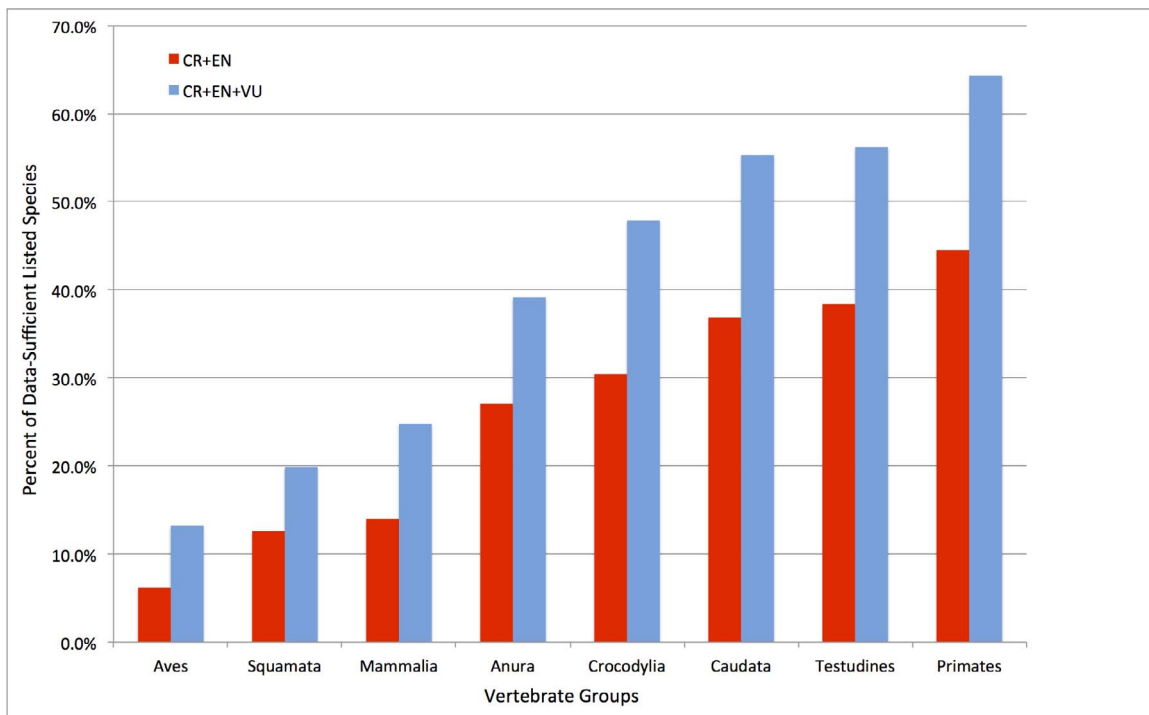
**Figure 7.** Composition of TFTSG Red List 2018 showing calculated Average Threat Level (see text for calculation methodology) per selected geographic region of turtles and tortoises. Regional delineations defined in Appendix 1. (Color version is available online.)

current IUCN Red List (version 2018.1): Squamata, Crocodylia, Amphibia, Mammalia, Aves, and Primates (Fig. 9). The percentages of Threatened species in most of these other groups were lower than for turtles and

tortoises, with only Primates (64.3%) having a higher percentage of Threatened species than the Testudines (56.2%) but with Caudata (salamanders, 55.4%) very close behind. Turtles and tortoises, with anywhere from about



**Figure 8.** Composition of TFTSG Red List 2018 showing expected vs. observed number of Critically Endangered and Endangered (CR+EN) turtle and tortoise species per selected geographic region as related to species richness in each region. The observed and expected frequencies differed significantly, with Asian species being at higher risk than in other geographic regions. Regional delineations defined in Appendix 1. (Color version is available online.)



**Figure 9.** Critically Endangered and Endangered (CR+EN) and Threatened (CR+EN+VU) species in various selected classes and orders of vertebrates as a percentage of the number of data-sufficient listed species in each group, as published by IUCN Red List 2018.1, and for Testudines as of TFTSG Red List 2018. (Color version is available online.)

51%–56% of all their modern species Threatened and nearly 60% Threatened or Extinct, are one of the most imperiled of any of the larger groups of vertebrates.

We also compared the ATLs of turtles and tortoises from our fully assessed TFTSG Red List to the ATLs of other selected vertebrate groups (Fig. 10; Tables 2 and 3) that we calculated from the current IUCN Red List. Because these other vertebrate groups have also been fully assessed, we considered the analyses to be comparable. This indicated that the ATL of Testudines is similar to that of Primates, but very slightly higher, and that the other groups are all lower.

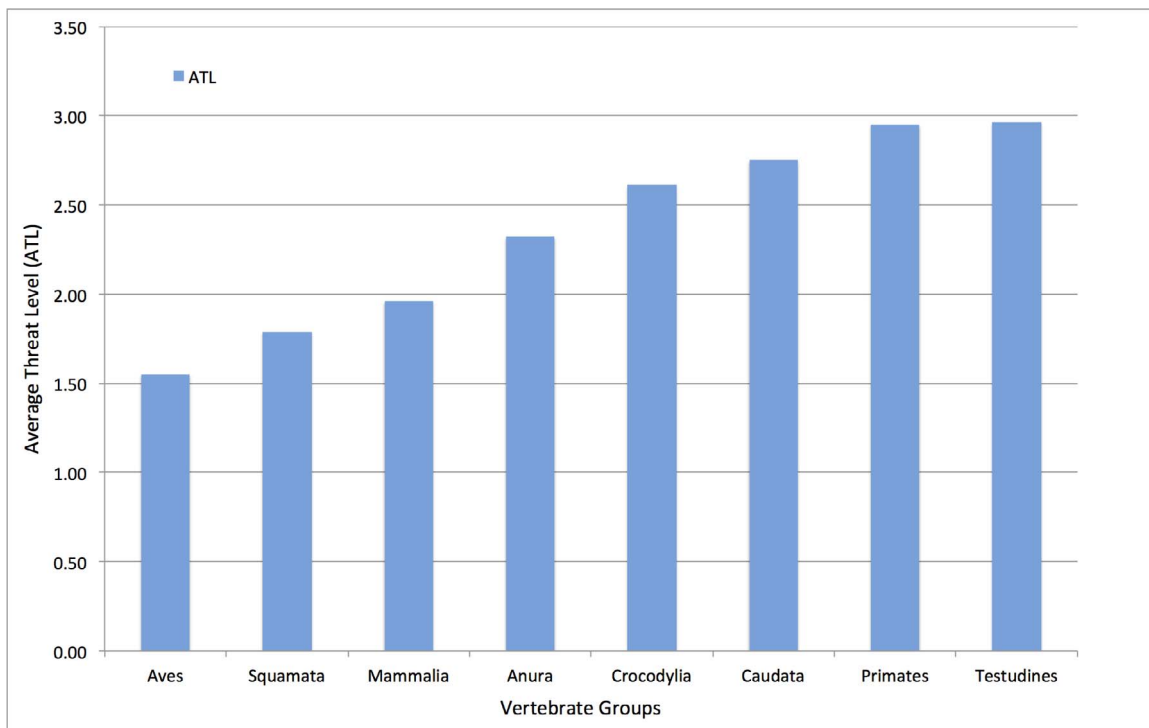
We then calculated and ranked the ATLs of all other polytypic ( $\geq 5$  species) orders of the classes Reptilia, Amphibia, Mammalia, and Aves. All other large and moderate-sized orders (44 with  $\geq 20$  species) have lower ATLs than do the Testudines (Table 2), even the 2 orders of Amphibia, although the Caudata (salamanders) come close to Primates and Testudines in their threat levels.

We also compared and ranked the ATLs of all polytypic families ( $\geq 5$  species) of Reptilia and Amphibia. The Testudinidae (tortoises) have the highest ranked ATL of all 114 families, with the top 4 ranked families and 5 of the top 10 also being Testudines (Table 3).

## DISCUSSION

Corroborating our comparisons and analyses, turtles and tortoises are among the most imperiled vertebrates on the planet, and Asia is at the epicenter of the global turtle

extinction crisis that has recently and rapidly developed as a result of the unsustainable trade that began as the Asian Turtle Crisis (Behler 1997; Altherr and Freyer 2000; van Dijk et al. 2000; Rhodin 2000, 2001, 2002; Cheung and Dudgeon 2006; Zhou and Jiang 2008; Horne et al. 2012). Huge numbers of turtles, initially of Chinese and Asian species and then spreading regionally, have been collected and traded in the East Asian meat consumption trade, and their shells and bone are also used for traditional Chinese medicines (van Dijk et al. 2000; Chen et al. 2009). Live animals of all sizes, especially of rare and/or attractive species, have been poached and illegally marketed to the high-end international pet trade, primarily in China, but also to other Asian countries (e.g., Thailand, Malaysia, Japan, and Indonesia) as well as to Europe and the United States (van Dijk et al. 2000; Cheung and Dudgeon 2006; Nijman and Shepherd 2007, 2015; Zhou and Jiang 2008; Gong et al. 2009; TFTSG 2010a, 2010b; Stengel et al. 2011; Turtle Conservation Coalition [TCC] 2011, 2018; Horne et al. 2012; Auliya et al. 2016; Luiselli et al. 2016; Morgan and Chng 2017; Sigouin et al. 2017; Sung and Fong 2018). From this focal origin in East Asia, an unsustainable turtle trade has gradually spread and expanded, first regionally and then globally, as wild turtle populations have been sequentially exploited, with many rendered commercially and ecologically extinct (van Dijk et al. 2000; Rhodin 2000, 2001, 2002; Krishnakumar et al. 2009; TFTSG 2010a, 2010b; Eisemberg et al. 2011; TCC 2011, 2018; Horne et al. 2012; Castellano et al. 2013;



**Figure 10.** Average Threat Level (ATL; see text for calculation methodology) per selected class or order of listed vertebrates as of IUCN Red List 2018.1 and TFTSG Red List 2018. See Table 2 for ranked listing of ATLs for all large polytypic orders ( $\geq 100$  species) of Reptilia, Amphibia, Mammalia, and Aves. (Color version is available online.)

**Table 2.** Top 25 ranked Average Threat Levels (ATL; see text for calculation methodology) of the largest 26 orders ( $n \geq 100$  species) of Reptilia, Amphibia, Mammalia, and Aves. The next largest 18 orders ( $n \geq 20$  species) also all have ATLs lower than Testudines. Taxonomy of orders and calculations from IUCN Red List (version 2018.1) and TFTSG Red List 2018.

| Order             | Class    | <i>n</i> | ATL  |
|-------------------|----------|----------|------|
| Testudines        | Reptilia | 360      | 2.96 |
| Primates          | Mammalia | 440      | 2.95 |
| Caudata           | Amphibia | 566      | 2.75 |
| Gruiformes        | Aves     | 192      | 2.65 |
| Diprotodontia     | Mammalia | 147      | 2.53 |
| Procellariiformes | Aves     | 142      | 2.52 |
| Cetartiodactyla   | Mammalia | 335      | 2.48 |
| Anura             | Amphibia | 5936     | 2.32 |
| Psittaciformes    | Aves     | 415      | 2.14 |
| Columbiformes     | Aves     | 367      | 1.94 |
| Carnivora         | Mammalia | 295      | 1.94 |
| Eulipotyphla      | Mammalia | 469      | 1.88 |
| Anseriformes      | Aves     | 176      | 1.82 |
| Galliformes       | Aves     | 308      | 1.81 |
| Rodentia          | Mammalia | 2285     | 1.80 |
| Squamata          | Reptilia | 6393     | 1.79 |
| Accipitriformes   | Aves     | 251      | 1.77 |
| Chiroptera        | Mammalia | 1241     | 1.74 |
| Strigiformes      | Aves     | 241      | 1.73 |
| Charadriiformes   | Aves     | 384      | 1.63 |
| Coraciiformes     | Aves     | 188      | 1.45 |
| Passeriformes     | Aves     | 6648     | 1.42 |
| Caprimulgiformes  | Aves     | 596      | 1.38 |
| Cuculiformes      | Aves     | 151      | 1.32 |
| Piciformes        | Aves     | 485      | 1.29 |

**Table 3.** Top 25 ranked Average Threat Levels (ATL; see text for calculation methodology) of 114 polytypic families ( $n \geq 5$  species) of Reptilia and Amphibia. Taxonomy of families and calculations from IUCN Red List (version 2018.1) and TFTSG Red List 2018. The turtle family Geoemydidae was treated as 2 separate subfamilies (Geoemydinae and Rhinoclemmydinae).

| Family               | Class    | Order      | <i>n</i> | ATL  |
|----------------------|----------|------------|----------|------|
| Testudinidae         | Reptilia | Testudines | 65       | 4.06 |
| Geoemydinae          | Reptilia | Testudines | 62       | 3.89 |
| Podocnemididae       | Reptilia | Testudines | 8        | 3.88 |
| Cheloniidae          | Reptilia | Testudines | 6        | 3.75 |
| Iguanidae            | Reptilia | Squamata   | 36       | 3.63 |
| Telmatobiidae        | Amphibia | Anura      | 60       | 3.59 |
| Eleutherodactylidae  | Amphibia | Anura      | 193      | 3.56 |
| Trionychidae         | Reptilia | Testudines | 32       | 3.44 |
| Ranixalidae          | Amphibia | Anura      | 10       | 3.20 |
| Calyptocephalellidae | Amphibia | Anura      | 5        | 3.20 |
| Nyctibatrachidae     | Amphibia | Anura      | 16       | 3.13 |
| Alsodidae            | Amphibia | Anura      | 27       | 3.00 |
| Crocodylidae         | Reptilia | Crocodylia | 14       | 3.00 |
| Micrixalidae         | Amphibia | Anura      | 11       | 2.95 |
| Plethodontidae       | Amphibia | Caudata    | 380      | 2.89 |
| Petropedetidae       | Amphibia | Anura      | 9        | 2.89 |
| Rhacophoridae        | Amphibia | Anura      | 328      | 2.84 |
| Conrauidae           | Amphibia | Anura      | 6        | 2.83 |
| Aromobatidae         | Amphibia | Anura      | 100      | 2.82 |
| Hynobiidae           | Amphibia | Caudata    | 50       | 2.80 |
| Brevicipitidae       | Amphibia | Anura      | 33       | 2.77 |
| Bufoidea             | Amphibia | Anura      | 546      | 2.68 |
| Craugastoridae       | Amphibia | Anura      | 704      | 2.64 |
| Xenosauridae         | Reptilia | Squamata   | 6        | 2.58 |
| Ambystomatidae       | Amphibia | Caudata    | 36       | 2.53 |



Luiselli et al. 2013; Mali et al. 2014; Colteaux and Johnson 2017).

In addition to this severe past and ongoing overexploitation and trade, global turtle and tortoise populations have also been further impacted and reduced by numerous other contributing threats. These include increasing habitat loss, fragmentation and degradation, deforestation and agricultural expansion, urbanization and road mortality, nest and hatchling depredation by subsidized predators, environmental pollution, invasive species, and global climate change causing habitat alteration (desertification and sea level rise) and potentially affecting reproductive potential (through temperature-dependent sex determination), as well as increased incidence of infectious disease (Swingland and Klemens 1989; Gibbons et al. 2000; Moll and Moll 2004; Steen and Gibbs 2004; Rizkalla and Swihart 2006; Browne and Hecnar 2007; Rhodin et al. 2008–2018; TCC 2011, 2018; Quesnelle et al. 2013; Agha et al. 2018; Bowne et al. 2018; Fagundes et al. 2018; Hamilton et al. 2018; Spencer et al. 2018; Thompson et al. 2018a, 2018b). As a result of all these impacts and the resultant decreasing populations, the important ecological roles that turtles and tortoises normally fulfill in their habitats and ecosystems have suffered dramatically (Lovich et al. 2018).

The global extent and severity of the turtle extinction crisis can be visualized through a series of maps showing the richness of species currently categorized as CR, CR+EN, or Threatened (CR+EN+VU) and of all recognized species (Fig. 11). The geographic hotspots for species assessed as CR (Fig. 11A) are in Southeastern China, Southeast Asia, and Northern India. The geographic hotspots for species assessed as CR+EN (Fig. 11B) are in Southeastern China, Southeast Asia and Indonesia, and Northern India and Pakistan. Several species in the Amazon region of South America as well as Africa are also impacted in addition to some in North America, especially in the Northeastern United States. For species assessed as Threatened (Fig. 11C), the same hotspots apply but are more pronounced and spread across larger geographic areas. Additional emerging hotspots of Threatened species include the Southeastern United States, West and Central Africa, Central and Southern India, and Southern New Guinea. For comparison, the species richness distribution for all freshwater turtles and tortoises is shown in Fig. 11D. Additionally, Iverson (1992b), Buhlmann et al. (2009), Mittermeier et al. (2015), Ennen et al. (2017), Roll et al. (2017), and TTWG (2017) have also provided similar maps and analyses of turtle distribution patterns, global turtle hotspots, and priority areas of conservation concern.

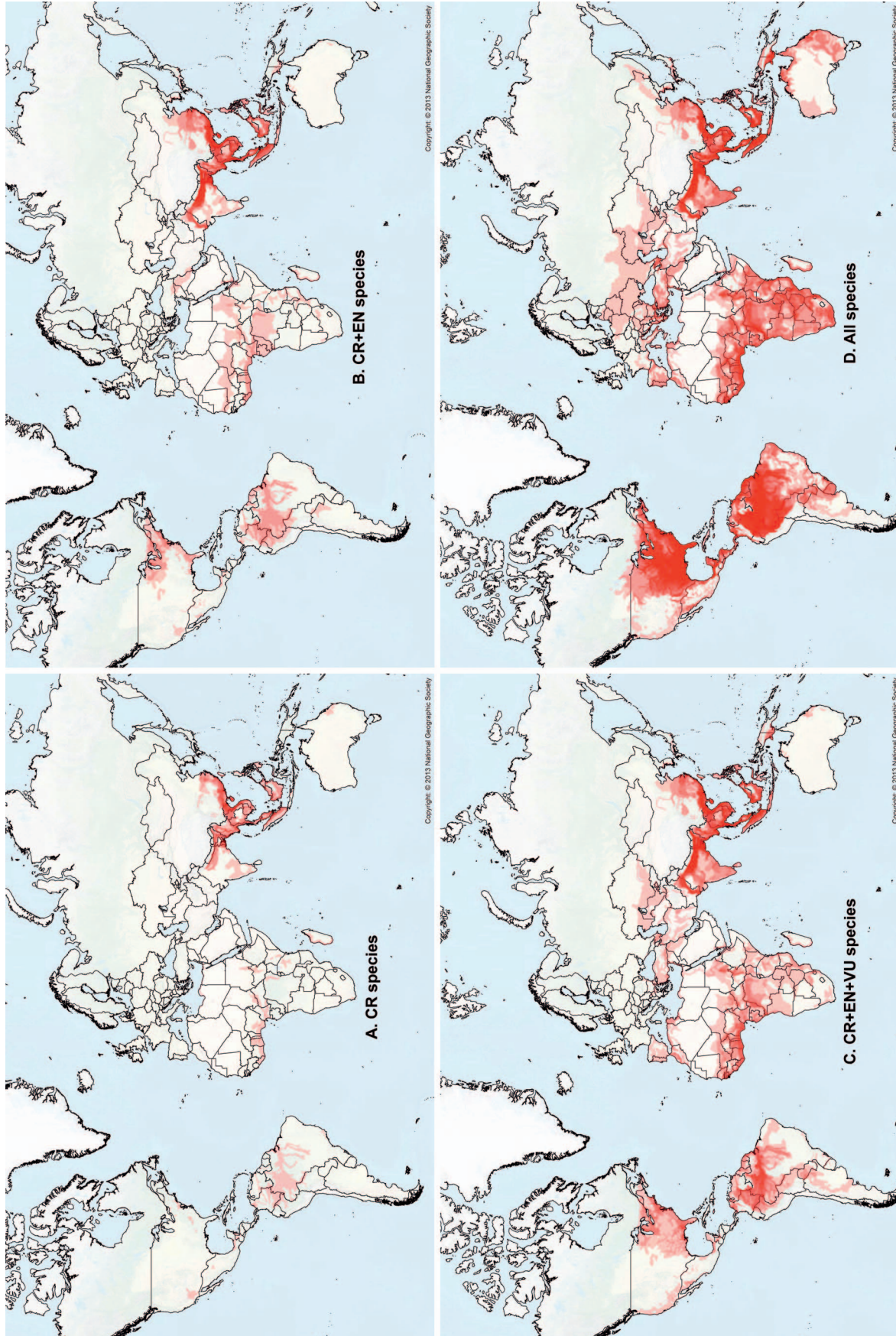
As part of the process of determining the threatened status of the world's tortoises and freshwater turtles, the TCC (2011, 2018) has compiled 2 consensus listings of the Top 25+ most endangered turtles in the world, which included the top 50–65 most imperiled species in each of those years. Continuing to evaluate further changes in turtle species status and reflecting those in Top 25+ compilations, as well as the IUCN Red List and TFTSG

Red List, will be vitally important for ongoing and future conservation efforts for these highly imperiled species. This will be important in terms of both documenting potential improved status for those species that are benefitting from conservation efforts and evaluating increasing threats and deteriorating survival prospects for other species that need heightened attention.

Responding to the increasingly imperiled status of tortoises and freshwater turtles worldwide has been the focus of the TFTSG and other organizations over the last 3 decades, with several action plans and reviews having been generated (TFTSG 1989; van Dijk et al. 2000; TCF 2002; TCC 2011; Horne et al. 2012; TCC 2018). The regular use and analysis of both the official IUCN Red List and the augmented TFTSG Red List in developing action plans, while continuing the important work of finalizing publication of these TFTSG Provisional Red List assessments, will provide the global turtle conservation community with an improved and more timely overview of the conservation status of all tortoises and freshwater turtles. Further, continuing to calculate and monitor changes in the ATLS of various taxonomic and geographic groupings of turtles and tortoises can help measure improvement or deterioration of conservation status and provide a metric for the need and/or effectiveness of conservation efforts. This will help guide emerging conservation policy and strategic action and allow for more time-sensitive implementation of critically needed conservation and research efforts for this highly imperiled group of charismatic vertebrates.

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This TFTSG Red Listing process has been accomplished with major support from the Frankel Family Foundation for many workshops over many years. Additional support for workshops has been received from the Mohamed bin Zayed Species Conservation Fund, Conservation International, Turtle Conservancy, Moore Family Foundation, George Meyer and Maria Semple, Matt Frankel, Turtle Conservation Fund, Chelonian Research Foundation, Galapagos Conservancy, US Fish and Wildlife Service, and the Andrew Sabin Family Foundation. The TFTSG is grateful for its close working relationship with other focused turtle conservation organizations in the Turtle Conservation Coalition, notably Turtle Conservancy and Turtle Survival Alliance, with both organizations making critically important global conservation impacts on turtles and tortoises. The TFTSG also works closely with the Turtle Conservation Fund to help support global turtle conservation projects and with Chelonian Research Foundation to publish scientific information on the biology and conservation of all turtles. In addition, the TFTSG is grateful to Global Wildlife Conservation, Conservation International, and Wildlife Conservation Society for their important support. Further, TFTSG works with many international (e.g., Convention on International Trade in Endangered Species of Wild



**Figure 11.** Global species richness maps for all tortoises and freshwater turtles as of TFTSG Red List 2018. Composite maps of distribution shapefiles, each species shown in red at 80% transparency and stacked, with the lightest red color = 1 species, and increasing up to the darkest red color for up to about 15–20 species. A. Species assessed as Critically Endangered (CR = 70). B. Species assessed as Critically Endangered and Endangered (CR+EN = 125). C. Species assessed as Threatened (CR+EN+VU = 186). D. All 353 currently recognized species of tortoises and freshwater turtles (adapted from Turtle Taxonomy Working Group [TTWG] 2017 and TTWG, unpubl. data, 2018).



Fauna and Flora [CITES]), national (e.g., USFWS), and sub-national (provincial or state) wildlife management and conservation agencies and regulating bodies in many countries that devote time and resources to the conservation of species under their regulatory mandate and control; this includes conducting conservation research and management and regulating the domestic and international use and trade in these species. The TFTSG is most grateful to all of them, as they play a vital role in supporting the efforts of the entire turtle conservation community to help preserve turtles and prevent their extinction. We also thank Jeffrey Seminoff and Peter Lindeman for their helpful reviews. Required disclaimer for US Government employees (coauthors Berry and Lovich): any use of trade, firm, or product names is for descriptive purposes only and does not imply endorsement by the US Government.

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**Appendix 1.** Listing of conservation status of all 360 currently recognized turtle and tortoise species (Order Testudines: tortoises, freshwater turtles, and marine turtles), including primary geographic occurrence, IUCN Red List status (and year published), TFTSG Provisional Red List status (and most recent year assessed), and current updated TFTSG Red List 2018 global status. Taxonomy as per Turtle Taxonomy Working Group (TTWG 2017 and TTWG unpubl. data, 2018). Red List categories: EX = Extinct; EW = Extinct in the Wild; CR = Critically Endangered; EN = Endangered; VU = Vulnerable; (Threatened = CR+EN+VU); NT = Near Threatened; LC = Least Concern; LR/CD = Lower Risk/Conservation Dependent (now = NT); DD = Data Deficient; NE = Not Evaluated; NL = Not Listed; (PE) = Possibly Extinct; (PEW) = Possibly Extinct in the Wild. Geographic regions: AF = Africa (excluding the Mediterranean region of northern Africa but including the southernmost tip of the Arabian Peninsula); AS = Asia (includes Pakistan through China, Korea, and Japan and through Malaysia to Indonesia but excluding Timor, Roti, and Indonesian Papua); AU = Australasia (Australia and New Guinea, including Timor, Roti, and Indonesian Papua); CA = Central America (from the Isthmus of Tehuantepec in Mexico to Panama, including San Andrés); CB = Caribbean Islands (except Trinidad and San Andrés); EA = Eurasia (includes the Mediterranean region of northern Africa through the Middle East to Afghanistan and including Russia and the former Soviet Republics of Central Asia); IO = Indian Ocean Islands (Mascarenes and Seychelles); MG = Madagascar; NA = North America (includes Mexico to the Isthmus of Tehuantepec); OC = Oceanic (marine turtles); PO = Pacific Ocean Islands (Galápagos); SA = South America (includes Trinidad but not the Galápagos). \* = TFTSG provisional assessments submitted and in press on the IUCN Red List.

| Classification                  | Common name                        | Geographic region | IUCN Red List |                | TFTSG Provisional |               | Global Status |
|---------------------------------|------------------------------------|-------------------|---------------|----------------|-------------------|---------------|---------------|
|                                 |                                    |                   | Status        | Year published | Status            | Year assessed |               |
| Cryptodira                      |                                    |                   |               |                |                   |               |               |
| Chelydridae                     |                                    |                   |               |                |                   |               |               |
| <i>Chelydra acutirostris</i>    | South American Snapping Turtle     | SA                | NE            | 2007           | NT                | 2018          | NT            |
| <i>Chelydra rossignoni</i>      | Central American Snapping Turtle   | CA                | VU            | 2012           |                   |               | VU            |
| <i>Chelydra serpentina</i>      | North American Snapping Turtle     | NA                | LC            |                |                   |               | LC            |
| <i>Macrochelys suwanniensis</i> | Suwannee Alligator Snapping Turtle | NA                | NE            |                | VU                | 2018          | VU            |
| <i>Macrochelys temminckii</i>   | Western Alligator Snapping Turtle  | NA                | VU            | 1996           | VU                | 2011          | VU            |
| Cheloniodea                     |                                    |                   |               |                |                   |               |               |
| Cheloniidae                     |                                    |                   |               |                |                   |               |               |
| Caretinae                       |                                    |                   |               |                |                   |               |               |
| <i>Caretta caretta</i>          | Loggerhead                         | OC                | VU            | 2015           |                   |               | VU            |
| <i>Eretmochelys imbricata</i>   | Hawksbill                          | OC                | CR            | 2008           |                   |               | CR            |
| <i>Lepidochelys kempii</i>      | Kemp's Ridley                      | OC                | CR            | 1996           |                   |               | CR            |
| <i>Lepidochelys olivacea</i>    | Olive Ridley                       | OC                | VU            | 2008           |                   |               | VU            |
| Cheloniinae                     |                                    |                   |               |                |                   |               |               |
| <i>Chelonia mydas</i>           | Green Turtle                       | OC                | EN            | 2004           |                   |               | EN            |
| <i>Natator depressus</i>        | Flatback                           | OC                | DD            | 1996           |                   |               | DD            |
| Dermochelyidae                  |                                    |                   |               |                |                   |               |               |
| <i>Dermochelys coriacea</i>     | Leatherback                        | OC                | VU            | 2013           |                   |               | VU            |
| Kinosternoidea                  |                                    |                   |               |                |                   |               |               |
| Dermatemydidae                  |                                    |                   |               |                |                   |               |               |
| <i>Dermatemys mawii</i>         | Central American River Turtle      | CA                | CR            | 2006           |                   |               | CR            |
| Kinosterninae                   |                                    |                   |               |                |                   |               |               |
| <i>Kinosternon abaxillare</i>   | Central Chiapas Mud Turtle         | CA                | NE            | 1996           |                   | DD            | DD            |
| <i>Kinosternon acutum</i>       | Tabasco Mud Turtle                 | CA                | NT            | 2007           |                   |               | NT            |
| <i>Kinosternon alamosae</i>     | Alamos Mud Turtle                  | NA                | DD            | 1996           |                   |               | DD            |
| <i>Kinosternon angustipons</i>  | Narrow-bridged Mud Turtle          | CA                | VU            | 2011           |                   | LC            | LC            |
| <i>Kinosternon baurii</i>       | Striped Mud Turtle                 | NA                | LC            | 2007           |                   |               | VU            |
| <i>Kinosternon chimalhuaca</i>  | Jalisco Mud Turtle                 | NA                | LC            | 2007           |                   |               | LC            |
| <i>Kinosternon creaseri</i>     | Creaser's Mud Turtle               | CA                | LC            | 2007           |                   |               | LC            |
| <i>Kinosternon dunnii</i>       | Dunn's Mud Turtle                  | SA                | VU            | 1996           |                   | VU            | VU            |
| <i>Kinosternon durangoense</i>  | Durango Mud Turtle                 | NA                | DD            | 2007           |                   | LC            | LC            |
| <i>Kinosternon flavescens</i>   | Yellow Mud Turtle                  | NA                | DD            | 2011           |                   |               | DD            |
| <i>Kinosternon herrerai</i>     | Herrera's Mud Turtle               | NA                | NT            | 2007           |                   |               | NT            |

## Appendix 1. Continued.

| Classification                             | Common name                     | Geographic region | IUCN Red List |                | TFTSG Provisional |               | Global Status |
|--|---------------------------------|-------------------|---------------|----------------|-------------------|---------------|---------------|
|  |                                 |                   | Status        | Year published | Status            | Year assessed |               |
| <i>Kinosternon hirtipes</i>                | Rough-footed Mud Turtle         | NA                | LC            | 2007           |                   |               | LC            |
| <i>Kinosternon integrum</i>                | Mexican Mud Turtle              | NA                | LC            | 2007           |                   |               | LC            |
| <i>Kinosternon leucostomum</i>             | White-lipped Mud Turtle         | CA                | NE            |                |                   | LC            | 2011          |
| <i>Kinosternon oxacae</i>                  | Oaxaca Mud Turtle               | NA                | DD            | 2007           |                   | LC            | 2018          |
| <i>Kinosternon scorioides</i>              | Scorpion Mud Turtle             | SA                | NE            |                |                   | LC            | 2011          |
| <i>Kinosternon sonoriense</i>              | Sonora Mud Turtle               | NA                | NT            | 2011           |                   |               | NT            |
| <i>Kinosternon steindachneri</i>           | Florida Mud Turtle              | NA                | NE            |                |                   | LC            | 2011          |
| <i>Kinosternon stejnegeri</i> <sup>a</sup> | Arizona Mud Turtle              | NA                | LC            | 2007           |                   |               | LC            |
| <i>Kinosternon subrubrum</i>               | Eastern Mud Turtle              | NA                | LC            | 2011           |                   |               | LC            |
| <i>Kinosternon vogti</i>                   | Vallarta Mud Turtle             | NA                | NE            |                |                   | CR            | 2018          |
| <i>Sternotherus carinatus</i>              | Razor-backed Musk Turtle        | NA                | LC            | 2011           |                   |               | CR            |
| <i>Sternotherus depressus</i>              | Flattened Musk Turtle           | NA                | CR            | 2011           |                   |               | CR            |
| <i>Sternotherus intermedius</i>            | Intermediate Musk Turtle        | NA                | NE            |                |                   | LC            | 2018          |
| <i>Sternotherus minor</i>                  | Loggerhead Musk Turtle          | NA                | LC            | 2011           |                   |               | LC            |
| <i>Sternotherus odoratus</i>               | Common Musk Turtle              | NA                | LC            | 2011           |                   |               | LC            |
| <i>Sternotherus peltifer</i>               | Stripe-necked Musk Turtle       | NA                | NE            |                |                   | LC            | 2011          |
| Sturotypinae                               |                                 |                   |               |                |                   |               |               |
| <i>Claudius angustatus</i>                 | Narrow-bridged Musk Turtle      | CA                | NT            | 1996           |                   |               | NT            |
| <i>Sturotypus salvini</i>                  | Pacific Coast Giant Musk Turtle | CA                | NT            | 1996           |                   |               | NT            |
| <i>Sturotypus triporcatus</i>              | Northern Giant Musk Turtle      | CA                | NT            | 1996           |                   |               | NT            |
| Testudinoidea                              |                                 |                   |               |                |                   |               |               |
| Emydoidea                                  |                                 |                   |               |                |                   |               |               |
| Deirochelyinae                             |                                 |                   |               |                |                   |               |               |
| <i>Chrysemys dorsalis</i>                  | Southern Painted Turtle         | NA                | NE            |                |                   | LC            | 2011          |
| <i>Chrysemys picta</i>                     | Painted Turtle                  | NA                | LC            |                |                   |               | LC            |
| <i>Deirochelys reticularia</i>             | Chicken Turtle                  | NA                | NE            | 2011           |                   |               | LC            |
| <i>Graptemys barbouri</i>                  | Barbour's Map Turtle            | NA                | VU            | 2011           |                   | NT            | VU            |
| <i>Graptemys caglei</i>                    | Cagle's Map Turtle              | NA                | EN            | 2011           |                   |               | EN            |
| <i>Graptemys ernsti</i>                    | Escambia Map Turtle             | NA                | NT            | 2011           |                   |               | NT            |
| <i>Graptemys flavimaculata</i>             | Yellow-blotched Map Turtle      | NA                | VU            | 2011           |                   |               | VU            |
| <i>Graptemys geographica</i>               | Northern Map Turtle             | NA                | LC            | 2011           |                   |               | LC            |
| <i>Graptemys gibbonsi</i>                  | Pascagoula Map Turtle           | NA                | EN            | 2011           |                   |               | EN            |
| <i>Graptemys nigrinoda</i>                 | Black-knobbed Map Turtle        | NA                | LC            | 2011           |                   |               | LC            |
| <i>Graptemys oculifera</i>                 | Ringed Map Turtle               | NA                | VU            | 2011           |                   |               | VU            |
| <i>Graptemys ouachitensis</i>              | Ouachita Map Turtle             | NA                | LC            | 2011           |                   |               | LC            |
| <i>Graptemys pearlensis</i>                | Pearl River Map Turtle          | NA                | EN            | 2011           |                   |               | EN            |
| <i>Graptemys pseudogeographica</i>         | False Map Turtle                | NA                | LC            | 2011           |                   |               | LC            |
| <i>Graptemys pulchra</i>                   | Alabama Map Turtle              | NA                | LC            | 2011           |                   |               | LC            |
| <i>Graptemys sabinensis</i>                | Sabine Map Turtle               | NA                | NT            | 2011           |                   |               | NT            |
| <i>Graptemys versa</i>                     | Texas Map Turtle                | NA                | NE            |                |                   | LC            | 2011          |
| <i>Malaclemys terrapin</i>                 | Diamondback Terrapin            | NA                | LC            | 2011           |                   |               | LC            |
| <i>Pseudemys alabamensis</i>               | Alabama Red-bellied Cooter      | NA                | NT            | 2011           |                   | VU            | 2018          |
| <i>Pseudemys concinna</i>                  | River Cooter                    | NA                | EN            | 1996           |                   | EN            | 2011          |
| <i>Pseudemys floridana</i>                 | Coastal Plain Cooter            | NA                | LC            | 2011           |                   |               | LC            |
| <i>Pseudemys forzungi</i>                  | Rio Grande Cooter               | NA                | LC            | 2011           |                   |               | LC            |

| Classification                   | Common name                  | Geographic region | IUCN Red List |                | TFTSG Provisional |               | Global Status |
|----------------------------------|------------------------------|-------------------|---------------|----------------|-------------------|---------------|---------------|
|                                  |                              |                   | Status        | Year published | Status            | Year assessed |               |
|                                  |                              |                   |               |                |                   |               |               |
| <i>Pseudemys nelsoni</i>         | Florida Red-bellied Cooter   | NA                | LC            | 2011           |                   |               | LC            |
| <i>Pseudemys peninsularis</i>    | Peninsula Cooter             | NA                | LC            | 2011           |                   |               | LC            |
| <i>Pseudemys rubriventris</i>    | Northern Red-bellied Cooter  | NA                | NT            | 2011           |                   |               | NT            |
| <i>Pseudemys texana</i>          | Texas Cooter                 | NA                | LC            | 2011           |                   |               | LC            |
| <i>Trachemys adiutrix</i>        | Maranhao Slider              | SA                | EN            | 1996           | NT                | 2011          | NT            |
| <i>Trachemys callirostris</i>    | Colombian Slider             | SA                | NE            |                | VU                | 2011          | VU            |
| <i>Trachemys decorata</i>        | Hispaniolan Slider           | CB                | VU            | 1996           |                   |               | VU            |
| <i>Trachemys decussata</i>       | Cuban Slider                 | CB                | NE            |                | LC                | 1996          | LC            |
| <i>Trachemys dorbigni</i>        | D'Orbigny's Slider           | SA                | NE            |                | LC                | 2011          | LC            |
| <i>Trachemys gaigeae</i>         | Big Bend Slider              | NA                | VU            | 2011           |                   |               | VU            |
| <i>Trachemys grayi</i>           | Western Meso-American Slider | CA                | NE            |                | DD                | 2018          | DD            |
| <i>Trachemys medemi</i>          | Atrato Slider                | SA                | NE            |                | VU                | 2017          | VU            |
| <i>Trachemys nebulosa</i>        | Baja California Slider       | NA                | NE            |                | DD                | 2018          | DD            |
| <i>Trachemys ornata</i>          | Ornate Slider                | NA                | VU            | 2007           |                   |               | VU            |
| <i>Trachemys scripta</i>         | Pond Slider                  | NA                | LC            | 2011           |                   |               | LC            |
| <i>Trachemys stejnegeri</i>      | Central Antillean Slider     | CB                | NT            | 1996           | NT                | 2011          | NT            |
| <i>Trachemys taylora</i>         | Cuatro Cienegas Slider       | NA                | EN            | 2007           |                   |               | EN            |
| <i>Trachemys terrapen</i>        | Jamaican Slider              | CB                | VU            | 1996           |                   |               | VU            |
| <i>Trachemys venusta</i>         | Eastern Meso-American Slider | CA                | NE            |                | DD                | 2018          | DD            |
| <i>Trachemys yaquia</i>          | Yaqui Slider                 | NA                | VU            | 2007           |                   |               | VU            |
| Emydoidea                        |                              |                   |               |                |                   |               |               |
| <i>Actinemys marmorata</i>       | Northern Pacific Pond Turtle | NA                | VU            | 1996           |                   |               | VU            |
| <i>Actinemys pallida</i>         | Southern Pacific Pond Turtle | NA                | VU            | 1996           |                   |               | VU            |
| <i>Clemmys guttata</i>           | Spotted Turtle               | NA                | EN            | 2011           |                   |               | EN            |
| <i>Emydoidea blandingii</i>      | Blanding's Turtle            | NA                | EN            | 2011           |                   |               | EN            |
| <i>Emys orbicularis</i>          | European Pond Turtle         | EA                | NT            | 1996           |                   |               | NT            |
| <i>Emys trinacris</i>            | Sicilian Pond Turtle         | EA                | DD            | 2009           |                   |               | DD            |
| <i>Glyptemys insculpta</i>       | Wood Turtle                  | NA                | EN            | 2011           |                   |               | EN            |
| <i>Glyptemys mhlenbergii</i>     | Bog Turtle                   | NA                | CR            | 2011           |                   |               | CR            |
| <i>Terrapene carolina</i>        | Common Box Turtle            | NA                | VU            | 2011           |                   |               | VU            |
| <i>Terrapene coahuila</i>        | Coahuilan Box Turtle         | NA                | EN            | 2007           |                   |               | EN            |
| <i>Terrapene nelsoni</i>         | Spotted Box Turtle           | NA                | DD            | 1996           |                   |               | DD            |
| <i>Terrapene ornata</i>          | Ornate Box Turtle            | NA                | NT            | 2011           |                   |               | NT            |
| Platysternidae                   |                              |                   |               |                |                   |               |               |
| <i>Platysternon megacephalum</i> | Big-headed Turtle            | AS                | EN            | 2000           |                   |               | CR            |
| Geoemydidae                      |                              |                   |               |                |                   |               |               |
| Geoemydinae                      |                              |                   |               |                |                   |               |               |
| <i>Batagur affinis</i>           | Southern River Terrapin      | AS                | CR            | 2016           |                   |               | CR            |
| <i>Batagur baska</i>             | Northern River Terrapin      | AS                | CR            | 2000           |                   |               | CR            |
| <i>Batagur borneoensis</i>       | Painted Terrapin             | AS                | CR            | 2000           |                   |               | CR            |
| <i>Batagur dhongoka</i>          | Three-striped Roofed Turtle  | AS                | EN            | 2000           |                   |               | CR            |
| <i>Batagur kachuga</i>           | Red-crowned Roofed Turtle    | AS                | CR            | 2000           |                   |               | CR            |
| <i>Batagur trivittata</i>        | Burmese Roofed Turtle        | AS                | EN            | 2000           |                   |               | CR            |
| <i>Cuora amboinensis</i>         | Southeast Asian Box Turtle   | AS                | VU            | 2000           |                   |               | EN            |
| <i>Cuora aurocapitata</i>        | Yellow-headed Box Turtle     | AS                | CR            | 2000           |                   |               | CR            |
| <i>Cuora bourreti</i>            | Bourret's Box Turtle         | AS                | CR            | 2016           |                   |               | CR            |

Appendix 1. Continued.



## Appendix 1. Continued.

| Classification                  | Common name                         | Geographic region | IUCN Red List |                | TFTSG Provisional |               | Global Status |
|---------------------------------|-------------------------------------|-------------------|---------------|----------------|-------------------|---------------|---------------|
|                                 |                                     |                   | Status        | Year published | Status            | Year assessed |               |
| <i>Cuora cyclomata</i>          | Vietnamese Three-striped Box Turtle | AS                | CR            | 2000           | CR                | 2016          | CR            |
| <i>Cuora flavomarginata</i>     | Yellow-margined Box Turtle          | AS                | EN            | 2000           | CR                | 2011          | CR            |
| <i>Cuora galbinifrons</i>       | Indochinese Box Turtle              | AS                | CR            | 2016           |                   |               | CR            |
| <i>Cuora mccordi</i>            | McCord's Box Turtle                 | AS                | CR            | 2000           | CR                | 2011          | CR            |
| <i>Cuora mouhotii</i>           | Keeled Box Turtle                   | AS                | EN            | 2000           | CR                | 2011          | CR            |
| <i>Cuora pani</i>               | Pan's Box Turtle                    | AS                | CR            | 2000           | CR                | 2011          | CR            |
| <i>Cuora picturata</i>          | Southern Vietnam Box Turtle         | AS                | CR            | 2016           | CR                | 2018          | CR            |
| <i>Cuora trifasciata</i>        | Chinese Three-striped Box Turtle    | AS                | CR            | 2000           | CR                | 2011          | CR            |
| <i>Cuora yunnanensis</i>        | Yunnan Box Turtle                   | AS                | CR            | 2010           |                   |               | CR            |
| <i>Cuora zhoui</i>              | Zhou's Box Turtle                   | AS                | CR            | 2000           | CR                | 2011          | CR            |
| <i>Cyclenys atripons</i>        | Western Black-bridged Leaf Turtle   | AS                | NE            |                | EN                | 2018          | EN            |
| <i>Cyclenys dentata</i>         | Asian Leaf Turtle                   | AS                | NT            | 2000           | NT                | 2018          | NT            |
| <i>Cyclenys enigmatica</i>      | Enigmatic Leaf Turtle               | AS                | NE            |                | DD                | 2018          | DD            |
| <i>Cyclenys fusca</i>           | Myanmar Brown Leaf Turtle           | AS                | NE            |                | LC                | 2018          | LC            |
| <i>Cyclenys gemeli</i>          | Assam Leaf Turtle                   | AS                | NE            |                | NT                | 2018          | NT            |
| <i>Cyclenys oldhamii</i>        | Southeast Asian Leaf Turtle         | AS                | NE            |                | EN                | 2018          | EN            |
| <i>Cyclenys pulchristriata</i>  | Eastern Black-bridged Leaf Turtle   | AS                | NE            |                | EN                | 2018          | EN            |
| <i>Geoclemys hamiltonii</i>     | Spotted Pond Turtle                 | AS                | VU            | 2000           | EN                | 2018          | EN            |
| <i>Geoemyda japonica</i>        | Ryukyu Black-breasted Leaf Turtle   | AS                | EN            | 2000           | EN                |               | EN            |
| <i>Geoemyda spengleri</i>       | Black-breasted Leaf Turtle          | AS                | EN            | 2000           | EN                | 2011          | EN            |
| <i>Hardella thurjii</i>         | Crowned River Turtle                | AS                | VU            | 2000           | EN                | 2018          | EN            |
| <i>Heosemys annandalii</i>      | Yellow-headed Temple Turtle         | AS                | EN            | 2000           | CR                | 2018          | CR            |
| <i>Heosemys depressa</i>        | Arakan Forest Turtle                | AS                | CR            | 2000           | EN                | 2011          | EN            |
| <i>Heosemys grandis</i>         | Giant Asian Pond Turtle             | AS                | VU            | 2000           | EN                | 2011          | EN            |
| <i>Heosemys spinosa</i>         | Spiny Turtle                        | AS                | EN            | 2000           | EN                | 2011          | EN            |
| <i>Leucocephalon yuwonoi</i>    | Sulawesi Forest Turtle              | AS                | CR            | 2000           | CR                | 2011          | CR            |
| <i>Malayemys khoratensis</i>    | Khorat Snail-eating Turtle          | AS                | NE            |                | LC                | 2018          | LC            |
| <i>Malayemys macrocephala</i>   | Malayan Snail-eating Turtle         | AS                | NE            |                | LC                | 2018          | LC            |
| <i>Malayemys subtrijuga</i>     | Mekong Snail-eating Turtle          | AS                | VU            | 2000           | NT                | 2018          | NT            |
| <i>Mauremys annamensis</i>      | Vietnamese Pond Turtle              | AS                | CR            | 2000           | CR                | 2018          | CR            |
| <i>Mauremys caspica</i>         | Caspian Turtle                      | EA                | NE            |                | LC                | 2011          | LC            |
| <i>Mauremys japonica</i>        | Japanese Pond Turtle                | AS                | NT            | 2000           |                   |               | NT            |
| <i>Mauremys leprosa</i>         | Mediterranean Pond Turtle           | EA                | NE            |                | VU                | 2011          | VU            |
| <i>Mauremys mutica</i>          | Yellow Pond Turtle                  | AS                | EN            | 2000           | CR                | 2011          | CR            |
| <i>Mauremys nigricans</i>       | Chinese Red-necked Turtle           | AS                | EN            | 2000           | CR                | 2011          | CR            |
| <i>Mauremys reevesii</i>        | Reeves' Turtle                      | AS                | EN            | 2011           |                   |               | EN            |
| <i>Mauremys rivulata</i>        | Western Caspian Turtle              | EA                | NE            |                | LC                | 2011          | LC            |
| <i>Mauremys sinensis</i>        | Chinese Stripe-necked Turtle        | AS                | EN            | 2000           | EN                | 2011          | EN            |
| <i>Melanochelys tricarinata</i> | Tricarinata Hill Turtle             | AS                | VU            | 2000           | CR                | 2018          | CR            |
| <i>Melanochelys trijuga</i>     | Indian Black Turtle                 | AS                | NT            | 2000           | LC                | 2018          | LC            |
| <i>Morenia ocellata</i>         | Burmese Eyed Turtle                 | AS                | VU            | 2000           | EN                | 2018          | EN            |
| <i>Morenia petersi</i>          | Indian Eyed Turtle                  | AS                | VU            | 2000           | EN                | 2018          | EN            |
| <i>Notochelys platynota</i>     | Malayan Flat-shelled Turtle         | AS                | VU            | 2000           | VU                | 2018          | VU            |
| <i>Oritia borneensis</i>        | Malaysian Giant Turtle              | AS                | EN            | 2000           | CR                | 2018          | CR            |
| <i>Pangshura smithii</i>        | Brown Roofed Turtle                 | AS                | NT            | 2000           | NT                | 2018          | NT            |

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| Classification                             | Common name                       | Geographic region | IUCN Red List |                | TFTSG Provisional |               | Global Status |
|--|-----------------------------------|-------------------|---------------|----------------|-------------------|---------------|---------------|
|  |                                   |                   | Status        | Year published | Status            | Year assessed |               |
| <i>Pangshura sylhetensis</i>               | Assam Roofed Turtle               | AS                | EN            | 2000           | EN                | 2018          | EN            |
| <i>Pangshura tecta</i>                     | Indian Roofed Turtle              | AS                | LC            | 2000           | VU                | 2018          | VU            |
| <i>Pangshura tenioria</i>                  | Indian Tent Turtle                | AS                | LC            | 2000           | LC                | 2018          | LC            |
| <i>Sacalia bealei</i>                      | Beale's Eyed Turtle               | AS                | EN            | 2000           | CR                | 2011          | CR            |
| <i>Sacalia quadriocellata</i>              | Four-eyed Turtle                  | AS                | EN            | 2000           | EN                | 2011          | EN            |
| <i>Siebenrockiella crassicolis</i>         | Black Marsh Turtle                | AS                | VU            | 2000           | EN                | 2011          | EN            |
| <i>Siebenrockiella leytenis</i>            | Palawan Forest Turtle             | AS                | CR            | 2000           | CR                | 2018          | CR            |
| <i>Vijayachelys silvatica</i>              | Cochin Forest Cane Turtle         | AS                | EN            | 2000           | EN                | 2018          | EN            |
| Rhinoclemmydinae                           |                                   |                   |               |                |                   |               |               |
| <i>Rhinoclemmys annulata</i>               | Brown Wood Turtle                 | CA                | NT            | 1996           | DD                | 2018          | DD            |
| <i>Rhinoclemmys areolata</i>               | Furrowed Wood Turtle              | CA                | NT            | 2007           | NT                |               | NT            |
| <i>Rhinoclemmys diademata</i>              | Maracaibo Wood Turtle             | SA                | NE            |                | VU                | 2011          | VU            |
| <i>Rhinoclemmys funerea</i>                | Black Wood Turtle                 | CA                | NT            | 1996           |                   |               | NT            |
| <i>Rhinoclemmys melanosterna</i>           | Colombian Wood Turtle             | SA                | NE            |                | LC                | 2011          | LC            |
| <i>Rhinoclemmys nasuta</i>                 | Large-nosed Wood Turtle           | SA                | NT            | 1996           | NT                | 2010          | NT            |
| <i>Rhinoclemmys pulcherrima</i>            | Painted Wood Turtle               | NA                | NE            |                | LC                | 1996          | LC            |
| <i>Rhinoclemmys punctularia</i>            | Spot-legged Turtle                | SA                | NE            |                | LC                | 2011          | LC            |
| <i>Rhinoclemmys rubida</i>                 | Mexican Spotted Wood Turtle       | NA                | NT            | 2007           |                   |               | NT            |
| Testudinidae                               |                                   |                   |               |                |                   |               |               |
| <i>Albarrachelys gigantea</i> <sup>b</sup> | Aldabra Giant Tortoise            | IO                | VU            | 1996           |                   |               | VU            |
| <i>Asrochelys radiata</i>                  | Radiated Tortoise                 | MG                | CR            | 2008           |                   |               | CR            |
| <i>Asrochelys yniphora</i>                 | Ploughshare Tortoise              | MG                | CR            | 2008           |                   |               | CR            |
| <i>Centrochelys sulcata</i>                | African Spurred Tortoise          | AF                | VU            | 1996           |                   | 2013          | EN            |
| <i>Chelonoidis carbonarius</i>             | Red-footed Tortoise               | SA                | NE            |                | VU                | 2011          | VU            |
| <i>Chelonoidis chilensis</i>               | Chaco Tortoise                    | SA                | VU            | 1996           | VU                | 2011          | VU            |
| <i>Chelonoidis denticulatus</i>            | Yellow-footed Tortoise            | SA                | VU            | 1996           |                   |               | NT            |
| <i>Chelonoidis abingdonii</i>              | Pinta Giant Tortoise              | PO                | EX            | 2016           |                   |               | EX            |
| <i>Chelonoidis chathamensis</i>            | Volcán Wolf Giant Tortoise        | PO                | VU            | 2017           |                   |               | VU            |
| <i>Chelonoidis darwini</i>                 | San Cristóbal Giant Tortoise      | PO                | EN            | 2017           |                   |               | EN            |
| <i>Chelonoidis donfaustoi</i>              | Santiago Giant Tortoise           | PO                | CR            | 2016           |                   |               | CR            |
| <i>Chelonoidis duncanensis</i>             | Eastern Santa Cruz Giant Tortoise | PO                | CR            | 2017           |                   |               | CR            |
| <i>Chelonoidis guntheri</i> *              | Pinzón Giant Tortoise             | PO                | VU            | 2017           |                   |               | VU            |
| <i>Chelonoidis hoodensis</i>               | Sierra Negra Giant Tortoise       | PO                | EN            | 1996           |                   | 2017          | CR            |
| <i>Chelonoidis microphyes</i> *            | Española Giant Tortoise           | PO                | CR            | 2017           |                   |               | CR            |
| <i>Chelonoidis niger</i>                   | Volcán Darwin Giant Tortoise      | PO                | VU            | 1996           |                   |               | VU            |
| <i>Chelonoidis plantasticus</i>            | Floreana Giant Tortoise           | PO                | EX            | 2017           |                   |               | EX            |
| <i>Chelonoidis porteri</i>                 | Femadina Giant Tortoise           | PO                | CR(PE)        | 2017           |                   |               | CR(PE)        |
| <i>Chelonoidis vandenburghi</i> *          | Western Santa Cruz Giant Tortoise | PO                | CR            | 2017           |                   |               | CR            |
| <i>Chelonoidis vicina</i> *                | Volcán Alcedo Giant Tortoise      | PO                | VU            | 1996           |                   |               | VU            |
| <i>Chersina angulata</i> *                 | Cerro Azul Giant Tortoise         | PO                | EN            | 1996           |                   |               | EN            |
| <i>Chersobius boulengeri</i> *             | Angulate Tortoise                 | AF                | LC            | 2017           |                   |               | LC            |
| <i>Chersobius signatus</i> *               | Karoo Dwarf Tortoise              | AF                | NT            | 2017           |                   |               | EN            |
| <i>Chersobius solus</i>                    | Speckled Tortoise                 | AF                | VU            | 2017           |                   |               | EN            |
| <i>Cylindraspis indica</i>                 | Nama Tortoise                     | AF                | VU            | 1996           |                   |               | EN            |
|  | Reunion Giant Tortoise            | IO                | EX            | 1996           |                   |               | EX            |

## Appendix 1. Continued.

| Classification                          | Common name                           | Geographic region | IUCN Red List |                | TFTSG Provisional |               | Global Status |
|---|---------------------------------------|-------------------|---------------|----------------|-------------------|---------------|---------------|
|   |                                       |                   | Status        | Year published | Status            | Year assessed |               |
| <i>Cylindraspis inepta</i>              | Mauritius Giant Domed Tortoise        | IO                | EX            | 1996           |                   |               | EX            |
| <i>Cylindraspis peltales</i>            | Rodrigues Domed Tortoise              | IO                | EX            | 1996           |                   |               | EX            |
| <i>Cylindraspis triserrata</i>          | Mauritius Giant Flat-shelled Tortoise | IO                | EX            | 1996           |                   |               | EX            |
| <i>Cylindraspis vosmaeri</i>            | Rodrigues Giant Saddleback Tortoise   | IO                | EX            | 1996           |                   |               | EX            |
| <i>Geochelone elegans</i>               | Indian Star Tortoise                  | AS                | VU            | 2016           | VU                | 2018          | VU            |
| <i>Geochelone platynota</i>             | Burmese Star Tortoise                 | AS                | CR            | 2000           | CR                | 2018          | CR            |
| <i>Gopherus agassizii</i>               | Mojave Desert Tortoise                | NA                | VU            | 1996           | CR                | 2011          | CR            |
| <i>Gopherus berlandieri</i>             | Texas Tortoise                        | NA                | NE            |                | NT                | 2011          | NT            |
| <i>Gopherus evgoodei</i> *              | Goode's Thoms scrub Tortoise          | NA                | NE            |                | VU                | 2018          | VU            |
| <i>Gopherus flavomarginatus</i> *       | Bolson Tortoise                       | NA                | VU            | 2007           | CR                | 2017          | CR            |
| <i>Gopherus moroikawai</i>              | Sonoran Desert Tortoise               | NA                | NE            |                | VU                | 2011          | VU            |
| <i>Gopherus polyphemus</i>              | Gopher Tortoise                       | NA                | VU            | 1996           | EN                | 2011          | EN            |
| <i>Homopus areolatus</i> *              | Parrot-beaked Tortoise                | AF                | LC            | 2017           | LC                | 2017          | LC            |
| <i>Homopus femoralis</i> *              | Greater Dwarf Tortoise                | AF                | LC            | 2017           | LC                | 2017          | LC            |
| <i>Indotestudo elongata</i>             | Elongated Tortoise                    | AS                | EN            | 2000           | CR                | 2018          | CR            |
| <i>Indotestudo forstenii</i>            | Forsten's Tortoise                    | AS                | EN            | 2000           | EN                | 2018          | EN            |
| <i>Indotestudo travancorica</i>         | Travancore Tortoise                   | AS                | VU            | 2000           | EN                | 2011          | EN            |
| <i>Kinixys belliana</i>                 | Bell's Hinge-back Tortoise            | AF                | NE            |                | VU                | 2013          | VU            |
| <i>Kinixys erosa</i>                    | Forest Hinge-back Tortoise            | AF                | DD            | 1996           | EN                | 2013          | EN            |
| <i>Kinixys homeana</i>                  | Home's Hinge-back Tortoise            | AF                | VU            | 2006           | CR                | 2013          | CR            |
| <i>Kinixys lobatiana</i> *              | Lobatse Hinge-back Tortoise           | AF                | LC            | 2017           | VU                | 2017          | VU            |
| <i>Kinixys natalensis</i> *             | Natal Hinge-back Tortoise             | AF                | NT            | 1996           | VU                | 2017          | VU            |
| <i>Kinixys nogueyi</i>                  | Western Hinge-back Tortoise           | AF                | NE            |                | VU                | 2013          | VU            |
| <i>Kinixys spekii</i>                   | Speke's Hinge-back Tortoise           | AF                | NE            |                | VU                | 2013          | VU            |
| <i>Kinixys zombensis</i>                | Southeastern Hinge-back Tortoise      | AF                | NE            |                | VU                | 2013          | VU            |
| <i>Malacochersus tornieri</i> *         | Pancake Tortoise                      | AF                | VU            | 1996           | CR                | 2013          | CR            |
| <i>Manouria emys</i>                    | Asian Giant Tortoise                  | AS                | EN            | 2000           | CR                | 2018          | CR            |
| <i>Manouria impressa</i>                | Impressed Tortoise                    | AS                | VU            | 2000           | EN                | 2011          | EN            |
| <i>Psammobates geometricus</i> *        | Geometric Tortoise                    | AF                | CR            | 2015           | CR                | 2017          | CR            |
| <i>Psammobates oculifer</i>             | Serrated Tent Tortoise                | AF                | NE            |                | LC                | 2013          | LC            |
| <i>Psammobates tentorius</i> *          | Tent Tortoise                         | AF                | LC            | 2017           | NT                | 2017          | NT            |
| <i>Pyxis arachnoides</i>                | Spider Tortoise                       | MG                | CR            | 2008           | CR                |               | CR            |
| <i>Pyxis planicauda</i>                 | Flat-tailed Tortoise                  | MG                | CR            | 2008           | CR                |               | CR            |
| <i>Stigmocheilus pardalis</i>           | Leopard Tortoise                      | AF                | LC            | 2015           | LC                |               | LC            |
| <i>Testudo (Testudo) graeca</i>         | Spur-thighed Tortoise                 | EA                | VU            | 1996           | VU                |               | VU            |
| <i>Testudo (Testudo) kleinmanni</i>     | Egyptian Tortoise                     | EA                | CR            | 2003           | CR                |               | CR            |
| <i>Testudo (Testudo) marginata</i>      | Marginated Tortoise                   | EA                | LC            | 2004           | LC                |               | LC            |
| <i>Testudo (Agrionemys) horsfieldii</i> | Central Asian Tortoise                | EA                | VU            | 1996           | VU                |               | VU            |
| <i>Testudo (Chersine) hermanni</i>      | Hermann's Tortoise                    | EA                | NT            | 2004           | NT                |               | NT            |
| Trionychidae                            |                                       |                   |               |                |                   |               |               |
| Carettochelyidae                        |                                       |                   |               |                |                   |               |               |
| <i>Carettochelys insculpta</i> *        | Pig-Nosed Turtle                      | AU                | VU            | 2000           | EN                | 2017          | EN            |
| Trionychidae                            |                                       |                   |               |                |                   |               |               |
| Cyclanorbinae                           |                                       |                   |               |                |                   |               |               |
| <i>Cyclanorbis elegans</i>              | Nubian Flapshell Turtle               | AF                | CR            | 2016           | CR                |               | CR            |

## Appendix 1. Continued.

| Classification                       | Common name                            | Geographic region | IUCN Red List |                | TFTSG Provisional |               | Global Status |
|--------------------------------------|--|-------------------|---------------|----------------|-------------------|---------------|---------------|
|                                      |  |                   | Status        | Year published | Status            | Year assessed |               |
| <i>Cyclanorbis senegalensis</i>      | Senegal Flapshell Turtle               | AF                | VU            | 2016           |                   |               | VU            |
| <i>Cycloderma aubryi</i>             | Aubry's Flapshell Turtle               | AF                | VU            | 2017           |                   |               | VU            |
| <i>Cycloderma frenatum</i>           | Zambezi Flapshell Turtle               | AF                | EN            | 2016           |                   |               | EN            |
| <i>Lissemys ceylonensis</i>          | Sri Lankan Flapshell Turtle            | AS                | NE            |                |                   | VU            | VU            |
| <i>Lissemys punctata</i>             | Indian Flapshell Turtle                | AS                | LC            | 2000           |                   | VU            | VU            |
| <i>Lissemys scutata</i>              | Burmese Flapshell Turtle               | AS                | DD            | 2000           |                   | LC            | LC            |
| Trionychinae                         |  |                   |               |                |                   |               |               |
| <i>Amyda cartilaginea</i>            | Malayan Softshell Turtle               | AS                | VU            | 2000           |                   | VU            | VU            |
| <i>Amyda ornata</i>                  | Southeast Asian Softshell Turtle       | AS                | VU            | 2000           |                   | VU            | VU            |
| <i>Apalone ferox</i>                 | Florida Softshell Turtle               | NA                | LC            | 2010           |                   |               | LC            |
| <i>Apalone mutica</i>                | Smooth Softshell Turtle                | NA                | LC            | 2010           |                   |               | LC            |
| <i>Apalone spinifera</i>             | Spiny Softshell Turtle                 | NA                | LC            | 2010           |                   |               | LC            |
| <i>Chitra chitra</i>                 | Asian Narrow-headed Softshell Turtle   | AS                | CR            | 2000           |                   | CR            | CR            |
| <i>Chitra indica</i>                 | Indian Narrow-headed Softshell Turtle  | AS                | EN            | 2000           |                   | EN            | EN            |
| <i>Chitra vandijki</i>               | Burmese Narrow-headed Softshell Turtle | AS                | NE            | 2000           |                   | CR            | CR            |
| <i>Dogania subplana</i>              | Malayan Softshell Turtle               | AS                | LC            | 2000           |                   | LC            | LC            |
| <i>Nilssonina formosa</i>            | Burmese Peacock Softshell Turtle       | AS                | EN            | 2000           |                   | CR            | CR            |
| <i>Nilssonina gangetica</i>          | Indian Softshell Turtle                | AS                | VU            | 2000           |                   | EN            | EN            |
| <i>Nilssonina hurum</i>              | Indian Peacock Softshell Turtle        | AS                | VU            | 2000           |                   | EN            | EN            |
| <i>Nilssonina leithii</i>            | Leith's Softshell Turtle               | AS                | VU            | 2000           |                   | CR            | CR            |
| <i>Nilssonina nigricans</i>          | Black Softshell Turtle                 | AS                | EW            | 2002           |                   | CR            | CR            |
| <i>Palea steindachneri</i>           | Wattle-necked Softshell Turtle         | AS                | EN            | 2000           |                   | EN            | EN            |
| <i>Pelochelys bibroni</i>            | New Guinea Giant Softshell Turtle      | AU                | VU            | 2000           |                   | VU            | VU            |
| <i>Pelochelys cantorii</i>           | Asian Giant Softshell Turtle           | AS                | EN            | 2000           |                   | CR            | CR            |
| <i>Pelochelys signifera</i> *        | Northern New Guinea Softshell Turtle   | AU                | NE            | 2000           |                   | VU            | VU            |
| <i>Pelodiscus asenaria</i>           | Hunan Softshell Turtle                 | AS                | NE            | 2000           |                   | DD            | DD            |
| <i>Pelodiscus parviformis</i>        | Northern Chinese Softshell Turtle      | AS                | NE            | 2000           |                   | DD            | DD            |
| <i>Pelodiscus maackii</i>            | Vietnamese Softshell Turtle            | AS                | NE            | 2000           |                   | CR            | CR            |
| <i>Pelodiscus sinensis</i>           | Chinese Softshell Turtle               | AS                | VU            | 2000           |                   | EN            | EN            |
| <i>Rafetus euphraticus</i>           | Euphrates Softshell Turtle             | EA                | EN            | 2017           |                   | EN            | EN            |
| <i>Rafetus swinhoei</i>              | Red River Giant Softshell Turtle       | AS                | CR            | 2000           |                   | CR            | CR            |
| <i>Trionyx triunguis</i>             | African Softshell Turtle               | AF                | VU            | 2017           |                   |               | VU            |
| Pleurodira                           |  |                   |               |                |                   |               |               |
| Chelidae                             |  |                   |               |                |                   |               |               |
| Cheloniae                            |  |                   |               |                |                   |               |               |
| <i>Acanthochelys macrocephala</i> *  | Pantanal Swamp Turtle                  | SA                | NT            | 1996           |                   | NT            | NT            |
| <i>Acanthochelys pallidipectoris</i> | Chaco Side-necked Turtle               | SA                | EN            | 2016           |                   |               | EN            |
| <i>Acanthochelys radiolata</i>       | Brazilian Radiolated Swamp Turtle      | SA                | NT            | 1996           |                   | LC            | LC            |
| <i>Acanthochelys spixii</i>          | Black Spiny-necked Turtle              | SA                | NT            | 1996           |                   | NT            | NT            |
| <i>Chelus fimbriata</i>              | Matamata Turtle                        | SA                | NE            | 1996           |                   | LC            | LC            |
| <i>Mesoclemmys dahli</i>             | Dahl's Toad-headed Turtle              | SA                | CR            | 1996           |                   | CR            | CR            |
| <i>Mesoclemmys gibba</i>             | Gibba Turtle                           | SA                | NE            |                |                   | LC            | LC            |
| <i>Mesoclemmys heliostemma</i>       | Yellow-crowned Toad-headed Turtle      | SA                | NE            |                |                   | DD            | DD            |
| <i>Mesoclemmys hoguei</i>            | Hoge's Side-necked Turtle              | SA                | CR            | 2016           |                   | DD            | DD            |
| <i>Mesoclemmys nasuta</i>            | Guyanese Toad-headed Turtle            | SA                | NE            |                |                   | DD            | DD            |



## Appendix 1. Continued.

| Classification  | Common name                        | Geographic region | IUCN Red List |                | TFTSG Provisional |               | Global Status |
|---|------------------------------------|-------------------|---------------|----------------|-------------------|---------------|---------------|
|   |                                    |                   | Status        | Year published | Status            | Year assessed |               |
| <i>Mesoclemmys perplexa</i>                                 | Cerrado Side-necked Turtle         | SA                | NE            |                | LC                | 2018          | LC            |
| <i>Mesoclemmys raniceps</i>                                 | Amazon Toad-headed Turtle          | SA                | NE            |                | LC                | 2018          | LC            |
| <i>Mesoclemmys tuberculata</i>                              | Tuberculate Toad-headed Turtle     | SA                | NE            |                | LC                | 2018          | LC            |
| <i>Mesoclemmys vanderhaegei</i>                             | Vanderhaege's Toad-headed Turtle   | SA                | NT            | 1996           | NT                | 2018          | NT            |
| <i>Mesoclemmys zuliae</i>                                   | Zulia Toad-headed Turtle           | SA                | VU            | 1996           | VU                | 2011          | VU            |
| <i>Phrynops Geoffroanus</i>                                 | Geoffroy's Side-necked Turtle      | SA                | NE            |                | LC                | 2011          | LC            |
| <i>Phrynops hilarii</i>                                     | Saint-Hilaire's Side-necked Turtle | SA                | NE            |                | LC                | 2011          | LC            |
| <i>Phrynops tuberosus</i>                                   | Guianan Shield Side-necked Turtle  | SA                | NE            |                | LC                | 2011          | LC            |
| <i>Phrynops williamsi</i> *                                 | Williams' Side-necked Turtle       | SA                | NE            |                | VU                | 2018          | VU            |
| <i>Platemys platycephala</i>                                | Twist-necked Turtle                | SA                | NE            |                | LC                | 2011          | LC            |
| <i>Rhinemys rufipes</i>                                     | Red Side-necked Turtle             | SA                | NT            | 1996           | LC                | 2011          | LC            |
| <i>Hydromedusinae</i>                                       |                                    |                   |               |                |                   |               |               |
| <i>Hydromedusa maximiliani</i>                              | Brazilian Snake-necked Turtle      | SA                | VU            | 1996           | NT                | 2011          | NT            |
| <i>Hydromedusa tectifera</i>                                | South American Snake-necked Turtle | SA                | NE            |                | LC                | 2011          | LC            |
| <i>Cheloniinae</i>  |                                    |                   |               |                |                   |               |               |
| <i>Chelodina (Chelodina) canni</i>                          | Canni's Snake-necked Turtle        | AU                | NE            |                | NT                | 2009          | NT            |
| <i>Chelodina (Chelodina) gunaleni</i>                       | Gunalen's Snake-necked Turtle      | AU                | NE            |                | DD                | 2009          | DD            |
| <i>Chelodina (Chelodina) longicollis</i>                    | Eastern Snake-necked Turtle        | AU                | NE            |                | LC                | 2009          | LC            |
| <i>Chelodina (Chelodina) mccordi</i> *                      | Roti Snake-necked Turtle           | AU                | CR            | 2000           | CR                | 2018          | CR            |
| <i>Chelodina (Chelodina) novaeguineae</i>                   | New Guinea Snake-necked Turtle     | AU                | NE            |                | LC                | 2009          | LC            |
| <i>Chelodina (Chelodina) pritchardi</i>                     | Pritchard's Snake-necked Turtle    | AU                | EN            | 2000           | EN                | 2009          | EN            |
| <i>Chelodina (Chelodina) reimanni</i>                       | Reimann's Snake-necked Turtle      | AU                | NT            | 2000           | DD                | 2009          | DD            |
| <i>Chelodina (Chelodina) steindachneri</i>                  | Steindachner's Snake-necked Turtle | AU                | NE            |                | LC                | 2009          | LC            |
| <i>Chelodina (Macrochelodina) burrungandjii</i>             | Arnhem Snake-necked Turtle         | AU                | NE            |                | LC                | 2009          | LC            |
| <i>Chelodina (Macrochelodina) expansa</i>                   | Broad-shelled Snake-necked Turtle  | AU                | NE            |                | NT                | 2009          | NT            |
| <i>Chelodina (Macrochelodina) kuchlingi</i> <sup>c</sup>    | Kuchling's Snake-necked Turtle     | AU                | NE            |                | DD                | 2018          | DD            |
| <i>Chelodina (Macrochelodina) oblonga</i>                   | Northern Snake-necked Turtle       | AU                | NE            |                | LC                | 2018          | LC            |
| <i>Chelodina (Macrochelodina) parkeri</i>                   | Parker's Snake-necked Turtle       | AU                | VU            | 2000           | NT                | 2018          | NT            |
| <i>Chelodina (Macrochelodina) walloyarrina</i> <sup>c</sup> | Kimberley Snake-necked Turtle      | AU                | NE            |                | LC                | 2018          | LC            |
| <i>Chelodina (Macrochelodina) colliei</i>                   | Southwestern Snake-necked Turtle   | AU                | NT            | 1996           | NT                | 2009          | NT            |
| <i>Eelseya (Eelseya) branderhorsti</i>                      | White-bellied Snapping Turtle      | AU                | VU            | 2000           | VU                | 2009          | VU            |
| <i>Eelseya (Eelseya) dentata</i>                            | Northern Snapping Turtle           | AU                | NE            |                | LC                | 2009          | LC            |
| <i>Eelseya (Eelseya) flaviventralis</i>                     | Yellow-bellied Snapping Turtle     | AU                | NE            |                | LC                | 2018          | LC            |
| <i>Eelseya (Hanwarachelys) novaeguineae</i>                 | Western New Guinea Stream Turtle   | AU                | LC            | 2000           | LC                | 2015          | LC            |
| <i>Eelseya (Hanwarachelys) rhodini</i>                      | Southern New Guinea Stream Turtle  | AU                | NE            |                | LC                | 2015          | LC            |
| <i>Eelseya (Hanwarachelys) schultzei</i>                    | Northern New Guinea Stream Turtle  | AU                | NE            |                | LC                | 2015          | LC            |
| <i>Eelseya (Pelcomastes) albagula</i>                       | White-throated Snapping Turtle     | AU                | NE            |                | EN                | 2018          | EN            |
| <i>Eelseya (Pelcomastes) irwini</i>                         | Irwin's Snapping Turtle            | AU                | NE            |                | NT                | 2018          | NT            |
| <i>Eelseya (Pelcomastes) lavarackorum</i>                   | Riverleigh Snapping Turtle         | AU                | NE            |                | DD                | 2018          | DD            |
| <i>Elusor macrurus</i>                                      | Mary River Turtle                  | AU                | EN            | 1996           | CR                | 2018          | CR            |
| <i>Emydura macquarii</i>                                    | Eastern Short-necked Turtle        | AU                | NE            |                | LC                | 2009          | LC            |
| <i>Emydura subglobosa</i>                                   | Red-bellied Short-necked Turtle    | AU                | LC            | 2000           | LC                | 2009          | LC            |
| <i>Emydura tanybaraga</i>                                   | Northern Yellow-faced Turtle       | AU                | NE            |                | LC                | 2018          | LC            |
| <i>Emydura victoratae</i>                                   | Northern Red-faced Turtle          | AU                | NE            |                | LC                | 2009          | LC            |
| <i>Myuchelys bellii</i>                                     | Bell's Sawshelled Turtle           | AU                | EN            | 1996           | VU                | 2018          | VU            |

## Appendix 1. Continued.

| Classification                       | Common name                       | Geographic region | IUCN Red List |                | TFTSG Provisional |               | Global Status |
|--------------------------------------|-----------------------------------|-------------------|---------------|----------------|-------------------|---------------|---------------|
|                                      |                                   |                   | Status        | Year published | Status            | Year assessed |               |
| <i>Myuchelys georgesi</i>            | Bellenger River Sawshelled Turtle | AU                | DD            | 1996           | CR                | 2015          | CR            |
| <i>Myuchelys latisternum</i>         | Sawshelled Turtle                 | AU                | NE            |                | LC                | 2011          | LC            |
| <i>Myuchelys purvizi</i>             | Manning River Sawshelled Turtle   | AU                | DD            | 1996           | NT                | 2011          | NT            |
| <i>Rheodytes leukops</i>             | Fitzroy River Turtle              | AU                | VU            | 1996           | EN                | 2018          | EN            |
| <i>Pseudemydura</i>                  |                                   |                   |               |                |                   |               |               |
| <i>Pseudemydura umbrina</i>          | Western Swamp Turtle              | AU                | CR            | 1996           | CR                | 2011          | CR            |
| Pelomedusidae                        |                                   |                   |               |                |                   |               |               |
| <i>Pelomedusa barbata</i>            | Arabian Helmeted Turtle           | AF                | NE            |                | EN                | 2016          | EN            |
| <i>Pelomedusa galeata*</i>           | South African Helmeted Turtle     | AF                | NE            |                | LC                | 2017          | LC            |
| <i>Pelomedusa gehafte</i>            | Eritrean Helmeted Turtle          | AF                | NE            |                | DD                | 2018          | DD            |
| <i>Pelomedusa kobe</i>               | Tanzanian Helmeted Turtle         | AF                | NE            |                | DD                | 2018          | DD            |
| <i>Pelomedusa neumanni</i>           | Neumann's Helmeted Turtle         | AF                | NE            |                | DD                | 2018          | DD            |
| <i>Pelomedusa olivacea</i>           | Sahelian Helmeted Turtle          | AF                | NE            |                | DD                | 2018          | DD            |
| <i>Pelomedusa schweinfurthi</i>      | Schweinfurth's Helmeted Turtle    | AF                | NE            |                | DD                | 2018          | DD            |
| <i>Pelomedusa somalica</i>           | Somalian Helmeted Turtle          | AF                | NE            |                | DD                | 2018          | DD            |
| <i>Pelomedusa subrufa</i>            | Helmeted Turtle                   | AF                | NE            |                | DD                | 2018          | DD            |
| <i>Pelomedusa variabilis</i>         | West African Helmeted Turtle      | AF                | NE            |                | DD                | 2018          | DD            |
| <i>Pelusios adansoni</i>             | Adanson's Mud Turtle              | AF                | NE            |                | LC                | 2013          | LC            |
| <i>Pelusios bechuanicus</i>          | Okavango Mud Turtle               | AF                | NE            |                | LC                | 2013          | LC            |
| <i>Pelusios broadleyi</i>            | Turkana Mud Turtle                | AF                | VU            | 1996           | EN                | 2013          | EN            |
| <i>Pelusios carinatus</i>            | African Keel Mud Turtle           | AF                | NE            |                | LC                | 2013          | LC            |
| <i>Pelusios castaneus</i>            | African Mud Turtle                | AF                | NE            |                | LC                | 2013          | LC            |
| <i>Pelusios castanoides</i>          | Yellow-bellied Mud Turtle         | AF                | NE            |                | LC                | 2013          | LC            |
| <i>Pelusios chapini</i>              | Central African Mud Turtle        | AF                | NE            |                | LC                | 2013          | LC            |
| <i>Pelusios cupulatta</i>            | Ivory Coast Mud Turtle            | AF                | NE            |                | LC                | 2013          | LC            |
| <i>Pelusios gabonensis</i>           | African Forest Turtle             | AF                | NE            |                | LC                | 2013          | LC            |
| <i>Pelusios marani</i>               | Gabon Mud Turtle                  | AF                | NE            |                | DD                | 2018          | DD            |
| <i>Pelusios nanus</i>                | African Dwarf Mud Turtle          | AF                | NE            |                | DD                | 2018          | DD            |
| <i>Pelusios niger</i>                | West African Black Mud Turtle     | AF                | NE            |                | NT                | 2018          | NT            |
| <i>Pelusios rhodesianus</i>          | Variable Mud Turtle               | AF                | NE            |                | LC                | 2013          | LC            |
| <i>Pelusios sinuatus</i>             | Serrated Hinged Terrapin          | AF                | NE            |                | LC                | 2013          | LC            |
| <i>Pelusios subniger</i>             | East African Black Mud Turtle     | AF                | NE            |                | LC                | 2013          | LC            |
| <i>Pelusios upembae</i>              | Upemba Mud Turtle                 | AF                | DD            | 1996           | DD                | 2018          | DD            |
| <i>Pelusios williamsi</i>            | Williams' Mud Turtle              | AF                | NE            |                | LC                | 2013          | LC            |
| Podocnemididae                       |                                   |                   |               |                |                   |               |               |
| <i>Erymnochelys madagascariensis</i> | Madagascan Big-headed Turtle      | MG                | CR            | 2008           | CR                |               | CR            |
| <i>Peltocephalus dumerilianus</i>    | Big-headed Sideneck Turtle        | SA                | VU            | 1996           | VU                | 2011          | VU            |
| <i>Podocnemis erythrocephala</i>     | Red-headed Amazon River Turtle    | SA                | VU            | 1996           | VU                | 2011          | VU            |
| <i>Podocnemis expansa</i>            | Giant South American River Turtle | SA                | LR/CD         | 1996           | CR                | 2011          | CR            |
| <i>Podocnemis lewyana</i>            | Magdalena River Turtle            | SA                | CR            | 2016           | CR                |               | CR            |
| <i>Podocnemis sextuberculata</i>     | Six-tubercled Amazon River Turtle | SA                | VU            | 1996           | VU                | 2011          | VU            |
| <i>Podocnemis unifilis</i>           | Yellow-spotted River Turtle       | SA                | VU            | 1996           | EN                | 2011          | EN            |
| <i>Podocnemis vogli</i>              | Savanna Sideneck Turtle           | SA                | NE            |                | VU                | 2011          | VU            |

<sup>a</sup> Listed as *Kinosternon arizonense* by IUCN (see TTWG 2017, Annotation 17:13).<sup>b</sup> Listed as *Geochelone gigantea* by IUCN.<sup>c</sup> *Chelodina (Macrochelodina) kuchlingi* and *C. (M.) walloyarrina* are not presently accepted as valid species by the Taxonomic Committee of the Australian Society of Herpetologists, but TTWG (2017, Annotation 17:94) has accepted them provisionally.

**Appendix 2.** Listing of conservation status of 21 currently recognized subspecies of turtles and tortoises (Order Testudines) and 3 synonymized taxa still listed by IUCN, including geographic occurrence, IUCN Red List status (year published), TFTSG Provisional Red List status (year assessed), and current updated TFTSG Red List 2018 global status. Geographic regions and Red List categories as in Appendix 1. \* = TFTSG provisional assessments currently in press on the IUCN Red List.

| Classification  | Common name                          | Geographic region | IUCN Red List |                | TFTSG provisional |               | Global status |
|---|--------------------------------------|-------------------|---------------|----------------|-------------------|---------------|---------------|
|   |                                      |                   | Status        | Year published | Status            | Year assessed |               |
| Cryptodira  |                                      |                   |               |                |                   |               |               |
| Kinosternoidea  |                                      |                   |               |                |                   |               |               |
| Kinosternidae   |                                      |                   |               |                |                   |               |               |
| Kinosterninae   |                                      |                   |               |                |                   |               |               |
| <i>Kinosternon hirtipes hirtipes</i>                                | Valley of Mexico Mud Turtle          | NA                |               |                | CR                | 2018          | CR            |
| <i>Kinosternon hirtipes chapalaense</i>                             | Lake Chapala Mud Turtle              | NA                |               |                | CR                | 2018          | CR            |
| <i>Kinosternon hirtipes magdalaense</i>                             | San Juanico Mud Turtle               | NA                |               |                | CR                | 2018          | CR            |
| <i>Kinosternon hirtipes megacephalum</i>                            | Viesca Mud Turtle                    | NA                | EX            | 2007           | EX                | 2018          | EX            |
| <i>Kinosternon hirtipes murrayi</i>                                 | Mexican Plateau Mud Turtle           | NA                |               |                | LC                | 2018          | LC            |
| <i>Kinosternon hirtipes tarascense</i>                              | Pátzcuaro Mud Turtle                 | NA                |               |                | CR                | 2018          | CR            |
| <i>Kinosternon scorpoides albogulare</i>                            | White-throated Mud Turtle            | CA                |               |                | LC                | 2011          | LC            |
| <i>Kinosternon sonoriense longifemorale</i>                         | Sonoyta Mud Turtle                   | NA                | CR            | 2017           | LC                |               | CR            |
| Testudinoidea   |                                      |                   |               |                |                   |               |               |
| Emydidae  |                                      |                   |               |                |                   |               |               |
| Emydinae  |                                      |                   |               |                |                   |               |               |
| <i>Terrapene carolina mexicana</i>                                  | Mexican Box Turtle                   | NA                | LC            | 2011           | LC                |               | LC            |
| <i>Terrapene carolina yucatanana</i>                                | Yucatan Box Turtle                   | CA                | VU            | 2011           | VU                |               | VU            |
| Testudinidae  |                                      |                   |               |                |                   |               |               |
| <i>Psammobates tentorius tentorius*</i>                             | Southern Tent Tortoise               | AF                |               |                | LC                | 2017          | LC            |
| <i>Psammobates tentorius trimenti*</i>                              | Western Tent Tortoise                | AF                |               |                | EN                | 2017          | EN            |
| <i>Psammobates tentorius verroxii*</i>                              | Northern Tent Tortoise               | AF                |               |                | LC                | 2017          | LC            |
| <i>Testudo (Testudo) graeca nikolskii<sup>a,b</sup></i>             | Krasnodar Spur-thighed Tortoise      | EA                | CR            | 1996           | CR                |               | CR            |
| <i>Testudo (Chersine) hermanni hermanni</i>                         | Western Hermann's Tortoise           | EA                | EN            | 1996           | EN                |               | EN            |
| Trionychoidea   |                                      |                   |               |                |                   |               |               |
| Trionychidae  |                                      |                   |               |                |                   |               |               |
| <i>Apalone spinifera atra</i>                                       | Black Spiny Softshell Turtle         | NA                | CR            | 2016           | CR                |               | CR            |
| Pleurodira  |                                      |                   |               |                |                   |               |               |
| Chelidae  |                                      |                   |               |                |                   |               |               |
| Cheloniinae   |                                      |                   |               |                |                   |               |               |
| <i>Chelodina (Chelodina) mccordi mccordi*</i>                       | Western Roti Snake-necked Turtle     | AU                |               |                | CR(PEW)           | 2018          | CR(PEW)       |
| <i>Chelodina (Chelodina) mccordi roosei*</i>                        | Eastern Roti Snake-necked Turtle     | AU                |               |                | CR(PEW)           | 2018          | CR(PEW)       |
| <i>Chelodina (Chelodina) mccordi timorensis*</i>                    | Timor-Leste Snake-necked Turtle      | AU                |               |                | CR                | 2018          | CR            |
| <i>Chelodina (Macrochelodina) oblonga siebenrocki<sup>b,c</sup></i> | Siebenrock's Snake-necked Turtle     | AU                | NT            | 2000           | NT                |               | NT            |
| <i>Emydura macquarii signata<sup>b,d</sup></i>                      | Brisbane River Turtle                | AU                | LC            | 1996           | LC                |               | LC            |
| Pelomedusidae   |                                      |                   |               |                |                   |               |               |
| <i>Pelusios castaneus seychellensis<sup>e</sup></i>                 | Seychelles Mud Turtle                | IO                | EX            | 2003           | EX                |               | EX            |
| <i>Pelusios castanoides intergularis</i>                            | Seychelles Yellow-bellied Mud Turtle | IO                | CR            | 2003           | CR                |               | CR            |
| <i>Pelusios subniger parietalis</i>                                 | Seychelles Black Mud Turtle          | IO                | CR            | 2003           | CR                |               | CR            |

<sup>a</sup> Currently considered a synonym of *Testudo (Testudo) graeca ibera*, not a separate subspecies (see Turtle Taxonomy Working Group [TTWG] 2017, Annotation 14:35).

<sup>b</sup> Not currently recognized by TTWG (2017) as separate distinct subspecies; therefore without recognized separate conservation status.

<sup>c</sup> Listed by IUCN as *Chelodina rugosa siebenrocki*; currently considered a synonym of *Chelodina (Macrochelodina) oblonga*, not a separate subspecies (see TTWG 2017, Annotation 07:91).

<sup>d</sup> Currently considered a synonym of *Emydura macquarii macquarii*, not a separate subspecies (see TTWG 2017, Annotation 10:42).

<sup>e</sup> Listed as *Pelusios seychellensis* by IUCN, but currently considered a questionable subspecies (see TTWG 2017, Annotation 17:103).