Stripe-necked Terrapin (*Mauremys caspica*)
Ecological Risk Screening Summary

U.S. Fish and Wildlife Service, January 2022
Revised, April 2022
Web Version, 6/16/2023

Organism Type: Reptile
Overall Risk Assessment Category: Uncertain

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1 Native Range and Status in the United States

Native Range

From Ayaz et al. (2006):

"*Mauremys caspica* is known from eastern and southeastern Anatolia [Turkey] and from the middle Anatolian Plateau, […]"

From Vamberger et al. (2013):

"The stripe-necked terrapin *Mauremys caspica* (Gmelin 1774) is a medium-sized fresh water turtle that is widespread throughout the Middle East. […] and is distributed from Central Anatolia [Turkey] east-and southeastwards across Syria and the Caucasus Region to Iraq and

Iran; isolated relict populations are known from Bahrain and adjacent Saudi Arabia (Anderson 1979; Fritz and Havaš 2007; Fritz and Wischuf 1997; Gasperetti et al.1993)."

Status in the United States

According to McKercher (2022), a specimen of *Mauremys caspica* was collected in Massachusetts in 1987.

From McKercher (2022):

"Just one specimen was collected, so the species is not considered established (Cardoza et al., 1993)."

Mauremys caspica is listed in Group II of the New Mexico Director's Species Importation List (NMDFG 2010). *Mauremys caspica* is also found on Hawaii's Conditional Animal List (HDOA 2019). *Mauremys caspica* is listed as a Prohibited Species in Oregon as part of the *Mauremys* genus (ODFW 2022). It is listed as a Prohibited level 3 species in Washington (WDFW 2022).

Mauremys caspica is in trade within the United States.

From The Turtle Source (2022):

"Thanks to a few skillful US breeders, limited numbers of captive born Caspian Pond Turtles are available to keepers - who will enjoy this very versatile and active species."

Means of Introductions in the United States

From McKercher (2022):

"The means of introduction is unknown; it is presumed to be an escaped or release [sic] pet."

Remarks

There has been inconsistent taxonomic treatment for this species over time. *Mauremys caspica* and the related *M. rivulata* were originally thought to be two separate species. They were then considered to be two subspecies of *M. caspica*: *M. caspica caspica* and *M. caspica rivulata*. Currently, they are considered two separate species (see Ayaz et al. 2006 and references therein) and that is the treatment this screening follows. Every effort has been made to only include information pertaining to *M. caspica* as the species is currently defined, and any remaining uncertainty is noted in the relevant sections.

From Ayaz et al. (2006):

"Boulenger (1926) reported the sympatric occurrence of *M. caspica* and *M. rivulata* in the vicinity of Ankara. Bird (1936) stated that the adults of 2 forms could easily be distinguished. Referring to the sympatric occurrence near Ankara recorded by Boulenger (1926), Bird (1936) elevated both forms to full species rank. Bodenheimer (1944) accepted that both taxa are full species and claimed to have seen *M. rivulata* and *M. caspica* in the same locality in central

Turkey, namely Eymir Lake near Ankara. With the exception of the specimens mentioned by Boulenger (1926), Bodenheimer (1944) is the sole other author who reported that he has seen specimens of both taxa from the same locality. Later, most authors treated *caspica* and *rivulata* as subspecies of *M. caspica* (e.g., Mertens 1946; Loveridge and Williams 1957; Wermuth and Mertens 1961, 1977)."

"Fritz and Wischuf (1997) demonstrated that *caspica* and *rivulata* inhabit parapatric ranges. In the contact zone of both, no intergradation was recorded and only at 2 localities have a few hybrids been recorded. Therefore, Fritz and Wischuf (1997) raised *caspica* and *rivulata* to full specific rank again."

"Eiselt and Spitzenberger (1967) and Fritz and Freytag (1993) gave the Euphrates and the Ceyhan rivers as the definite border between the ranges of *rivulata* and *caspica*."

2 Biology and Ecology

Taxonomic Hierarchy and Taxonomic Standing

According to WoRMS (2021), *Mauremys caspica* (Gmelin, 1774) is the accepted name for this species.

From CABI (2022):

Domain: Eukaryota
Kingdom: Metazoa
Phylum: Chordata
Subphylum: Vertebrata
Class: Reptilia
Order: Testudines
Family: Emydidae
Genus: *Mauremys*
Species: *Mauremys caspica*

Size, Weight, and Age Range

From Ayaz et al. (2006):

"[…] whereas in *M. caspica* males are larger [than females] […] Fritz and Wischuf (1997) measured the largest *caspica* of both sexes as 250mm SCL [straight carapace length]. We found an average SCL of 169.9 and 177.2 mm for *caspica* and [*Mauremys*] *rivulata*, respectively, […]"

Environment

From Ayaz et al. (2006):

"The ecological properties of the habitats also showed great variation [between *M. caspica* and *M. rivulata*], especially in terms of water salinity (S = 0.2 ppt for *caspica*, [...]) and conductivity (μS = 470 $\mu S^{25°}$ for *caspica*, […]). The pH was measured as 7.62 in the water of *caspica*; […]"

Climate

From Ayaz et al. (2006):

"Fritz and Wischuf (1995) scanned all the existing sources on *M. caspica* […] and *M. caspica caspica* [is confined to] a continental steppe climate"

Distribution Outside the United States

Native

From Ayaz et al. (2006):

"*Mauremys caspica* is known from eastern and southeastern Anatolia [Turkey] and from the middle Anatolian Plateau, […]"

From Vamberger et al. (2013):

"The stripe-necked terrapin *Mauremys caspica* (Gmelin 1774) is a medium-sized fresh water turtle that is widespread throughout the Middle East. […] and is distributed from Central Anatolia [Turkey] east-and southeastwards across Syria and the Caucasus Region to Iraq and Iran; isolated relict populations are known from Bahrain and adjacent Saudi Arabia (Anderson 1979; Fritz and Havaš 2007; Fritz and Wischuf 1997; Gasperetti et al.1993)."

Introduced

Mauremys caspica has been introduced to Germany (Global Register of Introduced and Invasive Species-Germany in GBIF Secretariat 2022).

From ITIS (2022):

"Introduced: Latvia"

No information regarding the current statuses of the introductions in Germany or Latvia was found.

Means of Introduction Outside the United States

There was no information found on a means of introduction outside of the United States for *Mauremys caspica.*

Short Description

From Ayaz et al. (2006):

"Fritz and Wischuf (1997) showed in their study that considerable diagnostic differences exist between *caspica* and *rivulata*: 1) the carapace in *caspica* has a double ocellus (like an ''8'') on each costal scute, […]; 2) in younger individuals, the plastron bears isolated dark spots on a yellow background in *caspica*, […]; 3) in *caspica* the bridge is yellow with dark scute seams,

[…]; 4) the submarginals in *caspica*, if not entirely yellow, consistently bear 2 small dots, […]; 5) in *caspica* the dorsal head is unpatterned, […]; 6) the snout is distinctly striped in *caspica*, […]; 7) in *caspica* yellow stripes run from the eye through the temporal region to the neck, […]; 8) the stripes on the forelegs are wide in *caspica* […]; and 9) in *caspica* the thighs bear several vertical yellow stripes […]

Biology

From Ayaz et al. (2006):

"The natural vegetation consists of the following species for *caspica: Populus nigra, Poa perennis, Salix alba, Alnus orientalis, Ficus carica, Phragmites communis, Ulmus minor, Mentha spicata*, and *Rubus caesius."*

From Yadollahvand and Kami (2014):

"In this study, 118 specimens [of *Mauremys caspica*] were collected from 23 stations (Figure 1[in source material]) including lakes, rivers, ponds, pools and fish farms […]"

"Habitat of this species is often covered by canebrake and bed is marshy and muddy."

Human Uses

Mauremys caspica is currently in the pet trade (e.g., ReptilesNCritters 2022; The Turtle Source 2022).

From Highfield (2002):

"The eggs of *M. caspica* and *M. leprosa* are also used in Arabic medicinal lore as treatments for a range of conditions from upset stomachs to poor sight."

Diseases

No records of OIE-reportable diseases (OIE 2022) were found for *Mauremys caspica.*

From Ozcan and Sarieyyupoglu (2009):

"In conclusion, *Salmonella* isolated from alive fresh water turtle [*Mauremys caspica*] in Kockale Region was evaluated that it is threat for human health and fish living in this water."

According to Poelen et al. (2014) *Falcaustra armenica* is a parasite of *Mauremys caspica.*

Uetz (2021), reports *Mauremys caspica* as a host for the endoparasites *Telorchis assula* and *T.s solivagus*.

From Yadollahvand and Kami (2014):

"Also, the turtle leech, *Placobdella costata* of the family Glossiphoniidae was identified from 3 specimens [of *Mauremys caspica*]."

Threat to Humans

From Ozcan and Sarieyyupoglu (2009):

"In conclusion, *Salmonella* isolated from alive fresh water turtle [*Mauremys caspica*] in Kockale Region was evaluated that it is threat for human health and fish living in this water."

3 Impacts of Introductions

There are no known established nonnative populations of *Mauremys caspica*, and therefore there is no information on impacts of introduction.

Mauremys caspica is regulated in Hawaii, New Mexico, Oregon, and Washington (NMDFG 2010; HDOA 2019; ODFW 2022; WDFW 2022).

4 History of Invasiveness

The History of Invasiveness for *Mauremys caspica* is classified as No Known Nonnative Population. Mentions of nonnative introductions of *Mauremys caspica* to Germany and Latvia were found but there was no further information available. *Mauremys caspica* is in trade but the duration and volume of trade was not found.

5 Global Distribution

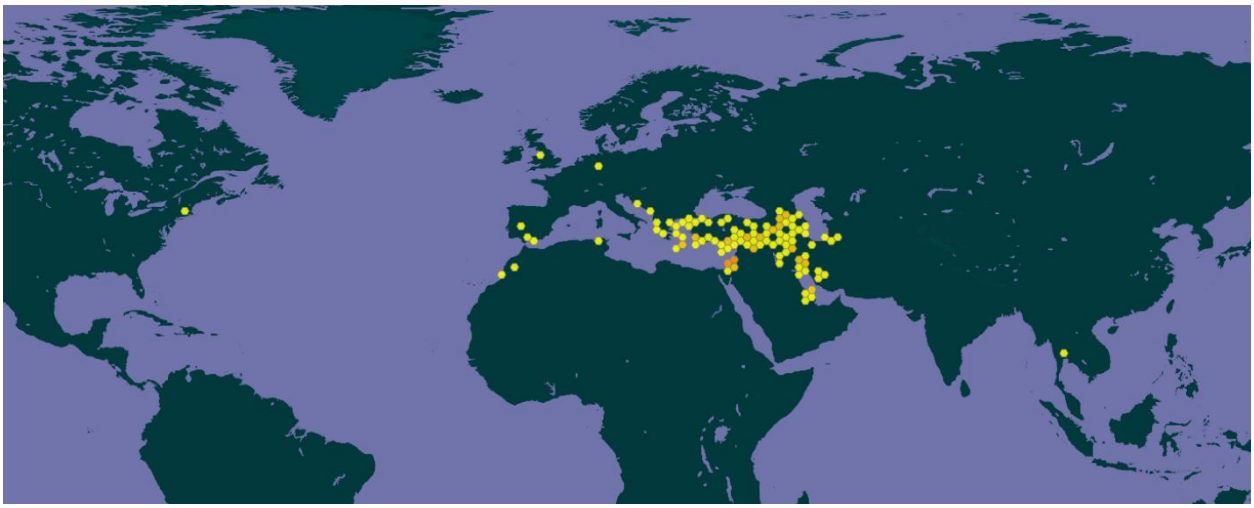

Figure 1. Known global distribution of *Mauremys caspica*. Observations are reported from Eastern Mediterranean and Middle East, Thailand, Croatia, Montenegro, Tunisia, Morocco, Spain, Germany, England, and the United States. Map from GBIF Secretariat (2022). The observation in the United States does not represent an established population and was not used to select source points for the climate match. Source points in Europe, Africa, Southeast Asia, and along the Mediterranean Coast of the Middle East were not used to select source points as the literature indicates these are most likely observations of *M. rivulata* reported during the time the species were considered synonymous (see Remarks).

Ayaz et al. (2006) provides a map showing the different distributions of *M. caspica* and *M. rivulata* in Turkey. This map was used to determine which source points in Turkey were valid for *M. caspica* and should be used in the climate match. Additional range clarifying maps are found in Vamberger et al. (2013).

6 Distribution Within the United States

Figure 2. Location of the known collection of *Mauremys caspica* in the United States. Map from McKercher (2022). A single specimen was collected in Massachusetts. This observation is not representative of an established population and was not used to select source points in the climate match.

7 Climate Matching

Summary of Climate Matching Analysis

The climate match for *Mauremys caspica* to the contiguous United States was mostly medium to high. Areas of high match were mainly found in the northern Great Lakes, in a few large patches in the Central Plains and through much of the Rocky Mountains and California. Areas of low match were found along the Pacific Coast from the Olympic Peninsula south to the Oregon-California border. Areas of low match were also found in the Cascade Mountains and the northern Sierra Nevada Mountains. The southeast had a generally low match. Everywhere else had a medium match. The overall Climate 6 score (Sanders et al. 2021; 16 variables; Euclidean distance) was 0.789, High (scores greater or equal to 0.103 are classified as high). Most States had a High individual Climate 6 score. Louisiana, Mississippi, New Jersey, and North Carolina had Medium individual scores and Delaware and Florida had Low individual scores.

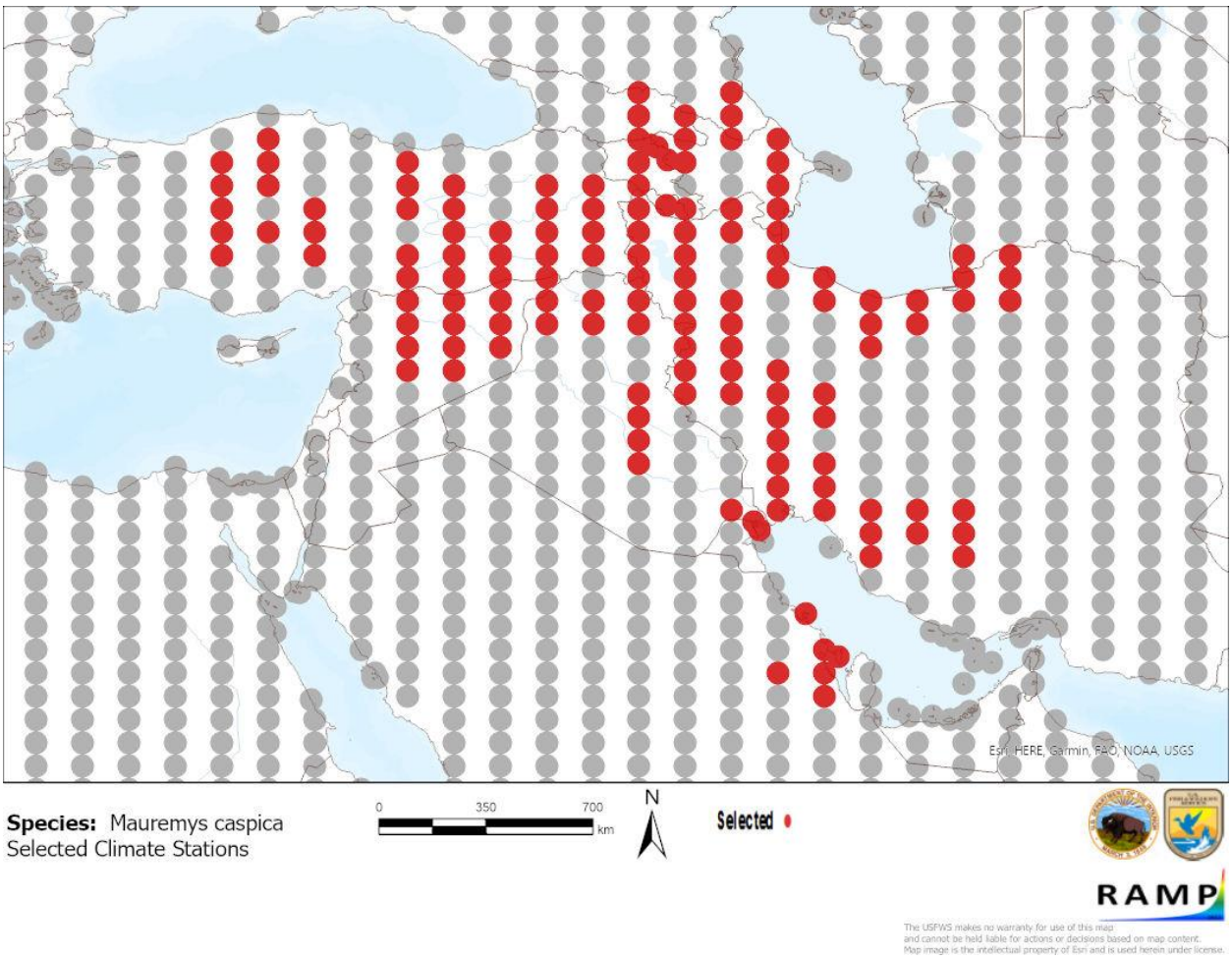

Figure 3. RAMP (Sanders et al. 2021) source map showing weather stations the Middle East, and Eastern Mediterranean areas selected as source locations (red; Georgia, Armenia, Azerbaijan, Bahrain, Iran, Iraq, Kuwait, Russia, Saudi Arabia, Syria, Turkey,) and non-source locations (gray) for *Mauremys caspica* climate matching. Source locations from GBIF Secretariat (2022). Selected source locations are within 100 km of one or more species occurrences, and do not necessarily represent the locations of occurrences themselves.

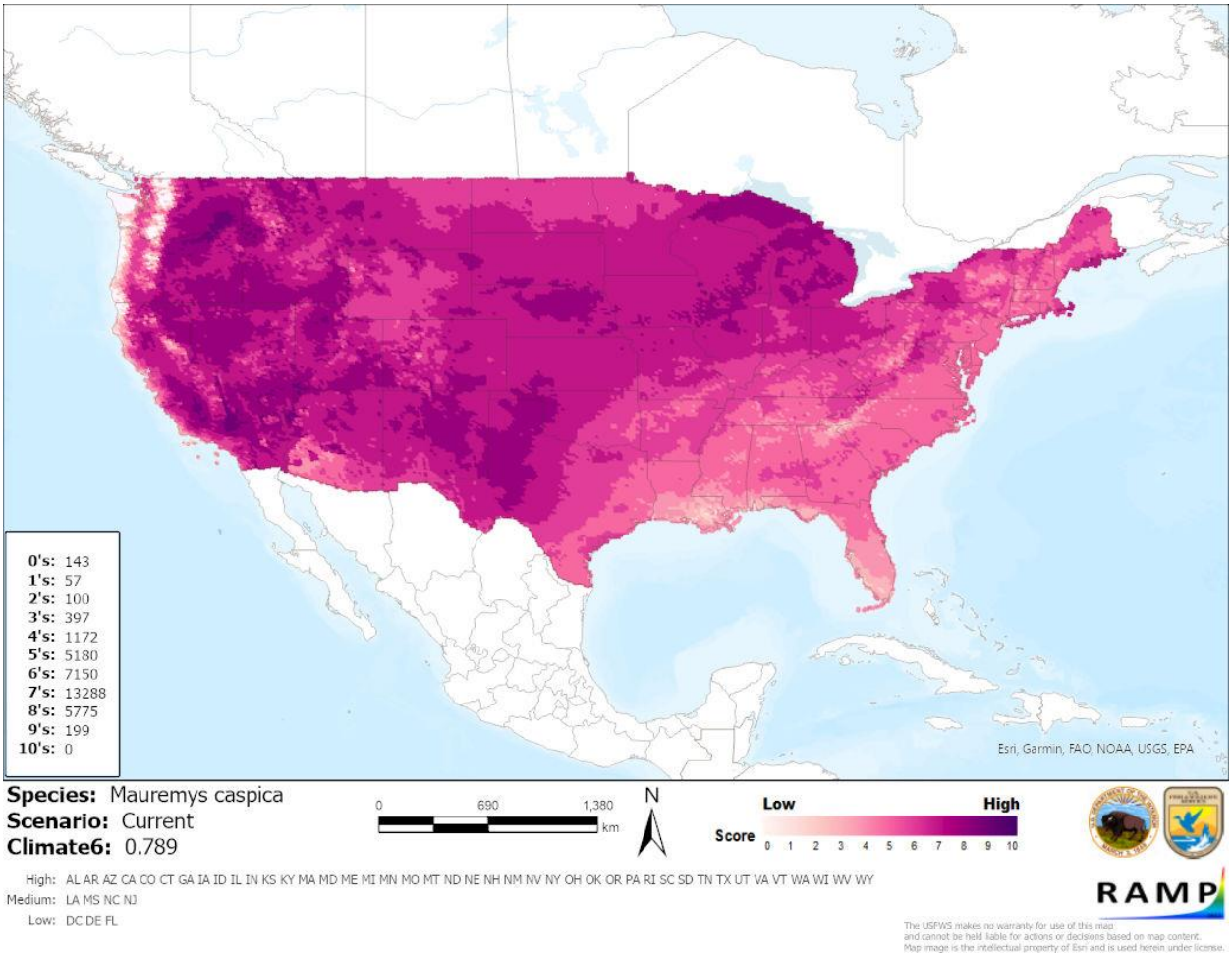

Figure 4. Map of RAMP (Sanders et al. 2021) climate matches for *Mauremys caspica* in the contiguous United States based on source locations reported by GBIF Secretariat (2022). Counts of climate match scores are tabulated on the left. 0/Pale Pink = Lowest match, 10/Dark Purple = Highest match.

The High, Medium, and Low Climate match Categories are based on the following table:

Climate 6: (Count of target points with climate scores 6-10)/ (Count of all target points)	Overall Climate Match Category
0.000≤X≤0.005	Low
0.005<X<0.103	Medium
≥0.103	High

8 Certainty of Assessment

The Certainty of Assessment is Low. Some information is available regarding the species biology and ecology. There is reasonably complete information regarding the species distribution. Records of introduction were found but there was no information on establishment or impacts. No detailed trade information was available. The species has a history of being

taxonomically combined with a closely related species, adding some uncertainty about what information is relevant to *M. caspica* as currently defined.

9 Risk Assessment

Summary of Risk to the Contiguous United States

Striped-necked terrapin (*Mauremys caspica*) is a freshwater turtle with a native range from central Turkey to Iran and Bahrain. It has been present in the pet trade. The duration and volume of trade is not determined. *M. caspica* is regulated at the species or genus level in Oregon, Washington, Hawaii, and New Mexico. This species has records of introduction to Germany and Latvia as well as the United States (Massachusetts). The introduction to the United States did not result in an established population. No information was found regarding the status of the introductions in Germany and Latvia. The History of Invasiveness is classified as No Known Nonnative Populations. This species is a known carrier for *Salmonella* which poses a risk to human health. The Overall Climate Match with the contiguous United States is High. Areas of high match were mainly found in the West with some large patches in the Central Plains and northern Great Lakes. The Certainty of Assessment is Low mainly due to the lack of information regarding history of invasiveness and the complicated taxonomic history with *M. rivulata*. The Overall Risk Assessment Category for *Mauremys caspica* is Uncertain.

Assessment Elements

- **History of Invasiveness (Sec. 4): No Known Nonnative Population**
- **Overall Climate Match Category (Sec. 7): High**
- **Certainty of Assessment (Sec. 8): Low**
- **Remarks, Important additional information: *Mauremys caspica* can carry *Salmonella* bacteria.**
- **Overall Risk Assessment Category: Uncertain**

10 Literature Cited

Note: The following references were accessed for this ERSS. References cited within quoted text but not accessed are included below in Section 11.

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11 Literature Cited in Quoted Material

Note: The following references are cited within quoted text within this ERSS, but were not accessed for its preparation. They are included here to provide the reader with more information.

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