
SAFEGUARDING THE EUROPEAN POND TURTLE: CONSERVATION STRATEGIES IN TÜRKIYE

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Abstract. The European Pond Turtle (*Emys orbicularis*) has experienced a significant population decline across its range due to habitat loss, climate change, and human activities. This review examines the factors contributing to its decline, such as habitat degradation from agricultural practices, climate shifts, and population fragmentation, which limits gene flow and increases the risk of local extinctions. Conservation efforts, including habitat restoration, legal protections under the Natura 2000 framework, and population management techniques, have been implemented with varying success. In Türkiye, a subspecies, *Emys orbicularis eiselti*, faces critical endangerment, with fewer than 100 mature individuals remaining. Conservation strategies must prioritize habitat connectivity and address both aquatic and terrestrial habitat needs. A multifaceted, adaptive approach that incorporates continued research and landscape management is essential for the long-term survival of the species.

The European Pond turtle has faced a substantial decline across its range, primarily due to habitat loss, climate change, and human activities. Conservation efforts are critical for ensuring the survival of this species, which is classified as vulnerable in several regions of Europe. This synthesis will explore the factors contributing to the turtle's decline, assess the effectiveness of various conservation strategies, and emphasize the importance of habitat management.

The decline of the European pond turtle can be attributed to several interrelated factors. Habitat degradation, particularly from agricultural intensification, has resulted in the loss of essential wetland habitats (Serrano et al., 2019; Fay, 2023). Additionally, the species' historical range has contracted significantly since the Holocene, with populations in Central Europe becoming fragmented and isolated (Sommer et al., 2009; Mitre et al., 2014). This fragmentation exacerbates the species' challenges by limiting gene flow and increasing vulnerability to local extinctions (Ficetola et al., 2004). Climate change also plays a role, as shifts in temperature and precipitation patterns affect the availability of aquatic habitats (Mitre et al., 2014).

Conservation strategies for the European pond turtle have included habitat restoration, legal protection, and population management techniques. For example, the creation of ecological networks and habitat restoration efforts have shown promise in supporting turtle populations (Lukošiūtė et al., 2021; Pereira et al., 2011). Legal protections, such as those under the Natura 2000 framework, have been implemented across Europe to safeguard remaining populations (Ružauskas et al., 2016). However, some methods, such as headstarting—where juvenile turtles are raised in captivity and released—have faced criticism for their limited contribution to population recovery (Mitrus, 2008). This suggests that while some conservation strategies are beneficial, others may need reevaluation to enhance their effectiveness.

In Türkiye, conservation activities and preliminary studies date back to the 2010s. Ayaz et al. (2013) identified the primary threats to Anatolian populations and proposed various conservation projects. Authors monitored many populations and estimated some demographic parameters. Recent efforts have focused on a lesser-known subspecies of the European pond turtle, *Emys orbicularis eiselti*. Today, the range of this subspecies within the Amik-Maraş Rift Valley has shrunk by approximately 98%, from an original area of 11,612 km² to just 206 km² (Ayaz et al., 2021). It is estimated that fewer than 100 mature individuals of Eiselt's pond turtle remain in the wild, with habitat loss and degradation being the most significant threats to this subspecies.

The importance of maintaining landscape connectivity cannot be overstated. Studies have shown that the movement of turtles between temporary ponds is crucial for survival, as it allows them to exploit varying resources throughout the seasons (Pereira et al., 2011). Conservation planning must, therefore, prioritize the preservation and restoration of connectivity between habitats to facilitate the natural dispersal and migration of turtle populations (Ficetola et al., 2004; Liuzzo et al., 2023). Additionally, understanding the specific habitat requirements of the European pond turtle, including both aquatic and terrestrial environments, is essential for effective management (Ficetola et al., 2004).

In conclusion, the conservation of the European pond turtle requires a multifaceted approach that addresses habitat loss, promotes connectivity, and evaluates the effectiveness of various management strategies. Beyond efforts to protect the species, conserving natural ecosystems and promoting awareness activities will play a crucial role in ensuring its survival. Continued research and adaptive management practices will be essential to secure the long-term survival of this species across its historical range.

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