



# State of the Turtle

## Raising Awareness for Turtle Conservation

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### Trouble for Turtles

The fossil record shows us that turtles, as we know them today, have been on our planet since the Triassic Period, over 220 million years ago. Although they have persisted through many tumultuous periods of Earth's history, from glaciations to continental shifts, they are now at the top of the list of species disappearing from the planet: 47.6% of turtle species are identified as "Threatened" worldwide. Their plight is part of the ongoing worldwide loss of biodiversity, with about 30% of amphibians, 25% of mammals, and 12% of birds in similar straits. Conservation action can successfully slow or reduce this trend for turtles, however. The "2011 Year of the Turtle" (see below) is an opportunity to raise awareness of the issues, and ideally, to initiate new and increase existing conservation actions that can successfully slow or reduce the problems that turtles face. Because this group can respond well to population management and conservation, it is not too late to preserve our turtle heritage.

### Our Natural Heritage of Turtles

While turtles (which include tortoises) occur in fresh water, salt water, and on land, their shells make them some of the most distinctive animals on Earth. Turtles are so unique that some scientists argue that they should be in their own Class of vertebrates, Chelonia, separate from reptiles (such as lizards and snakes) and other four-legged creatures.

The longevity of turtles has made their stature iconic in many world cultures. Turtle folklore is abundant, with turtles often depicted as wise and determined. In many ancient stories from diverse places, from America to Asia, it is believed that we live on the back of a turtle. Turtles also frequently appear in recent stories such as children's books and animated movies, often portrayed as gentle creatures helping others through their problems. Many people can recall specific instances of seeing turtles in the wild as children. It is clear that turtles are an important symbol of the connection between people and nature.

Turtles are also important ecologically. They occupy a central node in food webs. For example, in the eastern and southern United States, the Diamondback Terrapin is an essential member of salt marsh ecosystems where it feeds upon periwinkle snails which in turn feed on cord grass (*Spartina*). Terrapins are part of the balance of nature in those marshes.

Turtles also are important to people for a variety of personal uses. They are our pets and in many diverse cultures worldwide, they are sources of food. In some places, they are used for traditional medicines. Seeing a turtle in the wild, basking or on a trail, gives joy and wonder.



## A Growing Need for Attention

### Quick Turtle Facts:

- Over 40% of freshwater turtles species are threatened worldwide. That is more than any other animal group.
- North America is a turtle biodiversity hotspot, home to nearly 20% of all known turtle species.

The United States has more native turtle species than any other country; it is a turtle biodiversity hotspot. In the last 30 years, however, many turtle species have become imperiled.

Currently, 328 species of turtles are known worldwide, with 57 species in the United States and Canada. The Red List of the International Union for the Conservation of Nature (IUCN), the official list of the conservation status of the world's animals, lists 47.6% of living turtle species as Threatened. If we expand our view to 'modern' turtles (all species that are known to have occurred in the last 400 years), then 50% are extinct or threatened with extinction. This level of threat is greater than that of all other well-known species groups.

## Slow Growth Means Fast Problems

As characterized by the story of the Tortoise and the Hare, turtles are typically slow creatures. This isn't limited to their speed; they also grow slowly. It may take 10-15 years before individuals of some species can reproduce. A thriving turtle population relies on turtles surviving many years, if not decades. But if a population loses adults and begins to decline, a slow recovery can be expected. Because of these 'slow' characteristics, the primary threats to turtles are intensified.



## Primary Threats

**Habitat loss and degradation**— Many turtles have small distributions, in other words, they are found only in a few locations. This heightens their risk of losses when habitat changes occur. Habitat of freshwater turtles includes both the surface waters where they live and the surrounding land where they nest. These areas can be subject to many types of human alteration, such as wetland drainage or water diversions. When the habitat of more widespread species is lost or degraded (because of land development or other land uses), larger populations



become isolated and places to feed, mate, or nest become harder to find. Over a relatively short time, this can lead to population declines of ‘common’ species. Even large populations can be affected in short order. Habitat degradation can take many forms, and can include chemical pollution for some species. Oil spills can affect both sea and freshwater turtles. For sea turtles, city lights interfere with orientation; this is another form of habitat alteration adversely affecting these animals.

**Overexploitation of wild turtles for food, traditional medicines, and pets**—Turtles that are removed from the wild for food, used as medicines, or as pets can contribute to population declines. When a large number of individuals are removed, the remaining wild turtles cannot produce enough offspring quickly enough to recover and maintain a healthy population.

People have been using turtles as food, medicines, and pets for thousands of years—this is not new. However, a rapidly growing human population of over 6 billion people has created an unprecedented increase in these uses. An estimated 300 million turtles are consumed each year in Asia alone. The impact of overexploitation of wild turtles is a growing concern worldwide because it has exceeded the capacity for native wild turtle populations to recover. A phenomenon known as the “Asian Turtle Crisis” is a direct result of overexploitation – most native Asian turtles are nearly extinct in the wild due to overharvest.

### Primary Threats to Turtles:

- Habitat loss
- Overexploitation

Recent concerns for North American native turtles are just an extension of this Crisis. In the 2000s, it is estimated that 12-20+ million US turtles were shipped overseas per year. Although many of these came from US turtle farms, and turtles sometimes can be successfully farmed to meet commercial demands in a sustainable way, some of these turtles came from the wild.



Compounding the problem, wild turtles often are valued more than farmed turtles in some markets, and illegal or ‘black market’ trade of turtles, including rare and highly threatened species, continues to increase. There is a growing concern that commercial demand could increasingly affect North American wild turtle populations. However, commercial exploitation of wild turtles has not been well-studied, and so the number of wild turtles harvested per year is not clearly known.

## Other Threats

**Mortality from roads, agricultural machinery, fishing bycatch, and predators**—Slow-moving turtles often are victims to fast-moving cars or agricultural machinery. In addition, when they are unintentionally caught underwater in fishing nets, they may drown before they can escape or be removed. Predators also can threaten turtle populations, particularly those that prey on turtle nests and are increasing in numbers as they capitalize on the bounty created by human-disturbed landscapes (for example, raccoons).

**Invasive species and diseases**—When non-native (exotic) animal species come into contact with native turtle species, they can compete for food and other resources. Some introduced animals are predators on turtles or carry diseases affecting turtles. Non-native plants can alter habitats where turtles live by changing the availability of their food, water, nesting sites, or shelter.

**Climate change**—In combination with the above threats, a changing climate can alter many aspects of a turtle's life cycle. Altered temperature and rainfall patterns can affect where sources of food and water are found, or suitable nesting sites. Entire wetlands can be lost. If turtles move elsewhere to find these resources, they are likely to encounter other risks such as roads and other hazards that can lead to their demise.

A peculiarity of many species of turtles is that the sex of an individual hatchling is determined by the temperature of the nest. If turtle nests become too hot or too cold, then only one sex is produced. If that trend were to continue over time, reproduction would be reduced significantly. Turtle scientists now are trying to understand how global warming might interact with this odd trait of turtles. With all of the above threats, and with the unprecedented pace of change in climate features (temperatures, rainfall, extreme weather conditions), turtles may not be as resilient to changing climates today as they have been in their long history on Earth.



## Conservation Actions for Turtles

We can reduce or prevent the decline of turtles, especially with a focus on most species in North America. Three basic approaches for species conservation include:

- 1) protecting rare species and their habitats,
- 2) managing common turtle species and their habitats so that they remain common, and
- 3) managing crisis situations, such as rare species in peril or acute hazards such as oil spills.

## 2011 – Year of the Turtle

To raise awareness for the plight of turtles and tortoises, the Partners in Amphibian and Reptile Conservation (PARC) and their collaborators have designated 2011 as the Year of the Turtle. Through outreach efforts to researchers, educators, natural resource managers, and the public, the Year of the Turtle campaign aims to increase US national involvement in local-to-national turtle issues. International outreach is extending Year of the Turtle efforts to a broader range of participants worldwide. In 2011, a monthly newsletter will highlight ongoing efforts. Visit [www.yearoftheturtle.org](http://www.yearoftheturtle.org) for more information.

Important progress is being made already with our US turtle heritage. The freshwater turtle science and conservation community, in conjunction with US state and federal wildlife agencies, recently developed recommendations for managing freshwater and land turtle populations. These recommendations include better monitoring and tracking of turtle exploitation, as well as the need for more long-term population studies on wild turtles. This new guidance is intended to draw more attention to emerging US turtle concerns. In addition, a new effort is underway to better understand the current distribution of turtles. This Turtle Mapping Project begins in January 2011 (see <http://www.parcplace.org/yotmapping.htm>).

**“Behold the turtle. He makes progress when his neck is out.”**

- James Bryant Conant (1893-1978), educator and scientist

## Basking in the Future Possibilities

After more than 200-million years on Earth, many turtle populations suddenly are facing extinction. However, we must look forward and develop strategies to assist these important creatures; only decisive actions can turn this trend around. In 2011, turtle conservation groups will be raising awareness of the issues surrounding turtles, and both private citizens and governments worldwide will become engaged to develop solutions. The scope of the problem will rely on government policies as well as personal efforts at specific locations for specific species. Citizens, natural resource managers, scientists, and the pet and food industry can come together to help steer a course toward the long-term survival of our amazing turtles. Our work today, together, can keep turtles, and our connections to them, with us for generations to come.

**Authors: Deanna H. Olson<sup>1</sup> and A. Ross Kiester<sup>2</sup>**

<sup>1</sup> US Forest Service, Pacific Northwest Research Station; dedeolson@fs.fed.us  
National Co-Chair, Partners in Amphibian and Reptile Conservation

<sup>2</sup> The Turtle Conservancy, John L. Behler Chelonian Center; ross@turtleconservancy.org

*Photo credits: Page 1, clockwise from lower left: Western Pond Turtle, Garth Hodgson; Wood Turtle, J.D. Kleopfer; Eastern Box Turtle, Bog Turtle, and River Cooter, J.D. Willson. Page 2: Diamondback Terrapin, J.D. Willson; Chicken Turtle, J. Mitchell; Page 3: Spotted Turtle, J.White; Texas Map Turtle, Troy Hibbitts; Page 4: Green Sea Turtle, J.D. Willson; Gopher Tortoise, D. Stevenson*

Key Reference: Turtle Taxonomy Working Group [Rhodin, A.G.J., P.P. van Dijk, J.B. Iverson, and H. B. Shaffer]. 2010. Turtles of the World, 2010 Update: Annotated checklist of taxonomy, synonymy, distribution, and conservation status. *Chelonian Research Monographs* 5:85-164. Available at: <http://www.iucn-tftsg.org/checklist/>