



Sent via electronic and certified mail

March 20, 2026

Will Meeks
Regional Director
Midwest Region
5600 American Blvd.
West Suite 990
Bloomington, MN55437-1458
will_meeks@fws.gov

Sharon Marino
Acting Regional Director
Northeast Region
300 Westgate Center Dr
Hadley, MA 01035
sharon_marino@fws.gov

Gina Shultz
Acting Assistant Director
Ecological Services
US Fish and Wildlife Service
5275 Leesburg Pike
Falls Church, VA, 22041

Brian Nesvik,
Director
U.S. Fish and Wildlife Service
MS: BPHC
5275 Leesburg Pike
Falls Church, VA 22041-3803

Re: Endangered Species Act listing of the Wood Turtle (*Glyptemys insculpta*)

The Center for Biological Diversity submits the following information to support the Endangered Species Act (“ESA” or “the Act”) listing of the wood turtle (*Glyptemys insculpta*) and designation of critical habitat, concurrent with the species being listed, pursuant to 16 U.S.C. § 1533(a)(3)(A) and 50 C.F.R. § 424.12.

In its September 18, 2015, 90-day petition finding, the U.S. Fish and Wildlife Service found that the listing petition for the wood turtle presented substantial scientific or commercial information, indicating that listing the species as endangered or threatened may be warranted based on the

five listing factors under section 4(a)(1) of the Act.¹ The U.S. Fish and Wildlife Service also stated that it would review the species status by 2023 to make a listing determination.²

Wood turtles are currently experiencing unprecedented threats due to habitat loss and fragmentation, agricultural machinery, invasive plants in nesting habitat, road-crossing mortality, degraded water quality, disease, heavy predation, climate change and illegal collection for the black market pet trade.³ This species occurs in small, increasingly disjunct subpopulations, many of which are separated from each other by distances greater than the species can be expected to disperse.⁴ Optimal habitat and suitable habitat are expected to decline by 62-86% and 29-52% by 2070, respectively.⁵

The species has also experienced severe population decline for decades throughout its range due to a very low rate of nests hatching and a low rate of juveniles surviving to adulthood, which takes 14-18 years.⁶ Due to these threats and others, wood turtles (*Glyptemys insculpta*) qualify as endangered or threatened under the Endangered Species Act.

The Center for Biological Diversity (“Center”) is a nonprofit, public interest environmental organization dedicated to the protection of imperiled species and the habitat and climate they need to survive through science, policy, law, and creative media. The Center is supported by more than 1.8 million members and supporters throughout the country. The Center submits this information on its own behalf and on behalf of its members and staff with an interest in protecting the wood turtle and its habitat.

Please contact feel free to contact me at 415-419-4210 or tzuardo@biologicaldiversity.org if you have any questions or need clarification on any of the information provided.

Sincerely,

Tara Zuardo
Senior Advocate
Center for Biological Diversity
415.419.4210
tzuardo@biologicaldiversity.org

¹ 80 Fed Reg. 56, 431.

² U.S. Fish and Wildlife Service. (2026, March 15). *Wood Turtle* <https://www.fws.gov/species/wood-turtle-glyptemys-insculpta>.

³ *Id.* See also NatureServe. 2026.

https://explorer.natureserve.org/Taxon/ELEMENT_GLOBAL.2.100280/Glyptemys_insculpta (accessed March 15, 2026).

⁴ *Id.*

⁵ Mothes, Caitlin C., et. al., *Habitat suitability models for the imperiled wood turtle (Glyptemys insculpta) raise concerns for the species' persistence under future climate chang.* Global Ecology and Conservation 24 (2020) e01247.

⁶ NatureServe. 2026. https://explorer.natureserve.org/Taxon/ELEMENT_GLOBAL.2.100280/Glyptemys_insculpta (accessed March 15, 2026).

Executive Summary



U.S. Fish & Wildlife Service

The wood turtle is one of America's rarest and most imperiled turtles. Over the last 150 years, wood turtles (*Glyptemys insculpta*) have likely lost more than half of their suitable habitat.

The wood turtle's range includes part of eastern Canada and northeastern United States, with populations often small and isolated. Wood turtles occur in Connecticut, Iowa, Maine, Maryland, Massachusetts, Michigan, Minnesota, New Hampshire, New Jersey, New York, Pennsylvania, Vermont, Virginia, West Virginia and Wisconsin.⁷

The wood turtle was given protection in 1992 By CITES, the Convention on International Trade in Endangered Species (Appendix II). They have been listed as Threatened in New Jersey since 1979 and are ranked as Vulnerable in most states where they occur.

A compilation of available evidence shows that the species has undergone drastic distribution-wide declines by as much as 50% or more in the last 100 years.⁸ The wood turtle's total known population is still unknown, but clearly well below historical levels.

⁷ U.S. Fish and Wildlife Service. (2026, March 15). *Wood Turtle* <https://www.fws.gov/species/wood-turtle-glyptemys-insculpta>.

⁸ Brown, Donald J. and Lapin, Carly N. (2022). Wood Turtle (*Glyptemys insculpta*). https://www.fs.usda.gov/nrs/pubs/jrnl/2022/nrs_2022_brown-d_003.pdf.

One of the primary threats to wood turtles is low nest hatching success and low juvenile survival rates.⁹ Nesting success generally is very low, with egg predators taking a heavy toll. One report conservatively estimated egg and hatchling mortality at 98%.¹⁰ The species is also very slow to mature, and maturity is reached around 14-18 years of age.¹¹ As aging adults die out, those individuals are not being replaced by a younger generation. This causes slow, and difficult to detect, declines. Judging by the widespread reports of declining populations, only a small proportion of occurrences likely have good or excellent long-term viability.¹² For example, a population along a 37.5-km stretch of river in Michigan is one of the only populations documented to have good viability.¹³

The wood turtle is threatened by all five of the Section 4(a)(1) factors: habitat destruction, overutilization, disease and predation, inadequacy of existing regulatory mechanisms, and natural and manmade factors affecting its continued existence.

Wood turtles have strong site fidelity, often returning to restricted nesting and overwintering areas for decades. Although they require both aquatic and terrestrial habitats, they are also more terrestrial than other freshwater turtles, making them especially vulnerable to roadkill and land use practices.¹⁴ As a result, agricultural expansion, urban development, and road construction have directly eliminated or degraded suitable wood turtle habitats, while clear-cutting near riparian areas removes crucial cover and alters stream conditions. Disc mowing has been shown to cause direct mortality to enough individuals to cause extirpation of populations in agricultural settings over time.¹⁵ Intense land use, such as high-use canoe put-ins and campgrounds, generally results in absence of turtles along such stretches of stream.

In addition to agricultural activity and exposure to agricultural equipment (particularly mowing and tilling), increased exposure to traffic on paved and unpaved roads also destroys habitat and leads to direct take of the turtles.

Illegal collection has been responsible for dramatic population declines in the past and continues to be a threat, despite some protections that are in place. Their size and attractive appearance make them a prized species in many black markets. Poaching continues to wipe out populations across their range.

Threats affecting this species have not been adequately addressed and it is unknown how many occurrences are adequately managed and protected.¹⁶ Wood turtles have been designated as Threatened by the Committee on the Status of Endangered Wildlife in Canada (COSEWIC). They are also listed as a Species of Greatest Conservation Need in the Wildlife Action Plans of

⁹ NatureServe. 2026. https://explorer.natureserve.org/Taxon/ELEMENT_GLOBAL.2.100280/Glyptemys_insculpta (accessed March 15, 2026).

¹⁰ *Id.*

¹¹ *Id.*

¹² *Id.*

¹³ *Id.*

¹⁴ *Id.*

¹⁵ *Id.*

¹⁶ *Id.*

all 13 northeastern U.S. states and the District of Columbia.¹⁷ Although wood turtles were listed on Appendix II of CITES in 1992, illegal collection has been responsible for dramatic population declines in the past and continues to be a threat, despite protections.¹⁸ Protective legislation at state and provincial levels in the United States and Canada appears to have done little to curb collection of this species and increased effectiveness in deterring illegal collection is needed.

Heavy predation by natural predators and expanding populations of subsidized predators poses a significant threat to wood turtles. Climate change from the effect of rising temperatures is also projected to decrease optimal habitat and suitable habitat for this species by 62–86% and 29-52% by 2070, respectively.¹⁹ Pollution is also a serious threat to wood turtles.

Wood turtles are in danger of extinction across the entirety of their range and warrant immediate listing as an endangered species.

Introduction



Chesapeake Bay Program

¹⁷ U.S. Fish and Wildlife Service. (2026, March 15). *Wood Turtle* <https://www.fws.gov/species/wood-turtle-glyptemys-insculpta>.

¹⁸ NatureServe. 2026. https://explorer.natureserve.org/Taxon/ELEMENT_GLOBAL.2.100280/Glyptemys_insculpta (accessed March 15, 2026).

¹⁹ *Id.*

The wood turtle (*Glyptemys insculpta*) is one of the most endangered turtles in North America.²⁰ With a sculpted, pyramidal brown carapace, a yellowish plastron with dark markings, and bright orange to red coloring on its neck, chin, and legs, this turtle has been targeted by poachers and others for the pet trade for decades. Wood turtles have likely lost more than half of their suitable habitat over the last century and a half due to urbanization and agriculture, and remaining sites face new threats from development, roads, fragmentation, poaching, and predation. Populations have experienced a 50 percent decline in less than ten years.²¹

In its September 18, 2015, 90-day petition finding, the U.S. Fish and Wildlife Service found that the listing petition for the wood turtle presented substantial scientific or commercial information, indicating that listing the species as endangered or threatened may be warranted based on the five listing factors under section 4(a)(1) of the Act.²² The U.S. Fish and Wildlife Service also stated that it would review the species status by 2023 to make a listing determination.²³

Wood Turtle populations throughout the range of the species have been negatively influenced by habitat fragmentation and habitat loss.²⁴ Additional threats include poaching, predation, roads, pollution, and climate change. Loss of subpopulations and sites, extremely low juvenile survival rates, and little to no recruitment have resulted in dwindling, aging turtle populations struggling for survival.

Existing protections have done little to slow this decline. Despite efforts by federal and state agencies, the wood turtle's numbers have dropped by at least 50 percent in the past decade. Although there are no accurate estimates as to total population size, it is roughly estimated that approximately 10,000 individuals may remain.²⁵

All five factors identified in Section 4 of the Endangered Species Act are contributing to the wood turtle's crash: habitat destruction, overutilization, disease and predation, inadequacy of existing regulations, and natural and manmade factors.²⁶

Protecting wood turtles and their habitat would protect other endangered species, including fish, amphibians, mammals, and birds.

²⁰ Willey Lisbeth L., et. al., (2022). Distribution models combined with standardized surveys reveal widespread habitat loss in a threatened turtle species (pg. 2).

²¹ Willey, Lisbeth L., et. al., (2021). *Demography and Reproduction*; from *Biology and Conservation of the Wood Turtle* / Michael T. Jones ; Lisabeth L. Willey, editors. Available at [fs.usda.gov/nrs/pubs/jrnl/2021/nrs_2021_willey_002.pdf](https://www.fs.usda.gov/nrs/pubs/jrnl/2021/nrs_2021_willey_002.pdf).

²² 80 Fed Reg. 56, 431.

²³ U.S. Fish and Wildlife Service. (2026, March 15). *Wood Turtle*. <https://www.fws.gov/species/wood-turtle-glyptemys-insculpta>.

²⁴ Willey, Lisbeth L., et. al., (2021). *Biology and Conservation of the Wood Turtle* / Michael T. Jones ; Lisabeth L. Willey, editors. page 3.

²⁵ NatureServe. 2026. https://explorer.natureserve.org/Taxon/ELEMENT_GLOBAL.2.100280/Glyptemys_insculpta (accessed March 15, 2026).

²⁶ ESA Section 4 (16 U.S.C. § 1533(a)(1)).

NatureServe has assessed the wood turtle as Imperiled (G2) across its entire range: subpopulations in Iowa are Critically Imperiled (S1).²⁷ IUCN lists the wood turtle as Endangered and in decline.²⁸

Due to declining population trends and growing threats, the wood turtle will ultimately go extinct in the wild unless it is protected as an endangered species.

Current Distribution

Wood turtles occupy a highly discontinuous and fragmented range in the eastern United States, primarily in wetlands, streams, and forests. Within this range, they occur in small, increasingly distinct subpopulations, many of which are separated from each other by distances greater than the species can be expected to disperse.²⁹

Wood turtles have strong site fidelity, often returning to specific nesting and overwintering areas for decades.³⁰ Individuals spend the winter underwater in free-flowing streams, but spend the warmer months of April–October in terrestrial habitats near their overwintering streams. Their varied aquatic and terrestrial habitat requirements often necessitate movements across anthropogenically altered landscapes, where they sustain elevated rates of mortality caused by machinery. Like many chelonian species worldwide, these threats - coupled with their delayed sexual maturity - render them vulnerable to population decline and local extirpation.³¹

Today, the species ranges from northern Virginia west to eastern Minnesota, and north to southern Ontario, Quebec, New Brunswick, and Nova Scotia, Canada. Their range is broken up by the Great Lakes, where they occur most densely east of the Great Lakes in the northeastern United States and southeastern Canada. A second group also exists in the Lower Peninsula of Michigan. The western population is sparser, and made up of northeastern Iowa, eastern Minnesota, Wisconsin, and the Upper Peninsula of Michigan.³²

Recent studies indicate that wood turtles have experienced severe habitat alteration throughout the northeastern United States, with 58% of potentially suitable stream habitat likely impaired due to land-use in the surrounding area. Furthermore, historical occurrences (>35 years ago) without recent corroboration have significantly higher impairment scores (i.e., less forest and more urbanization, similar to sites yielding zero wood turtles over three surveys) than recent occurrences, suggesting that many of these populations have likely been substantially reduced or extirpated due to habitat loss (specifically land-use change).³³ Population declines or extirpations have been documented in disparate areas from Ontario and Quebec to New England, Minnesota,

²⁷ NatureServe. 2026. https://explorer.natureserve.org/Taxon/ELEMENT_GLOBAL.2.100280/Glyptemys_insculpta (accessed March 15, 2026).

²⁸ IUCN Red List. (2026). Wood Turtle, *Glyptemys insculpta*. <https://www.iucnredlist.org/species/4965/97416259>.

²⁹ NatureServe. 2026. https://explorer.natureserve.org/Taxon/ELEMENT_GLOBAL.2.100280/Glyptemys_insculpta (accessed March 15, 2026).

³⁰ *Id.*

³¹ *Id.*

³² *Id.*

³³ *Id.* at 11.

and Virginia.³⁴ It is predicted that 29-52 percent of the species range may become climatically unsuitable by 2070.³⁵

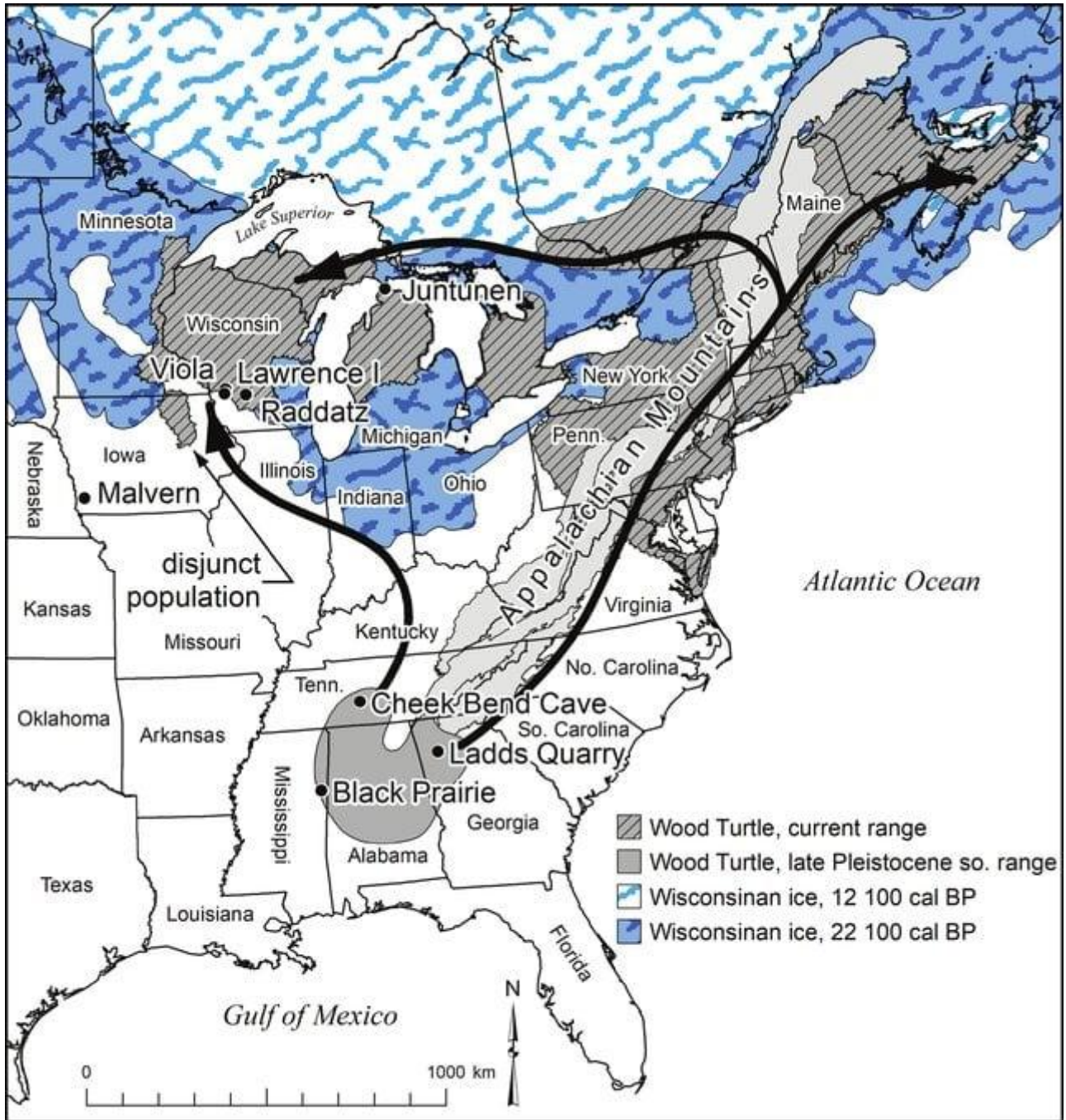


Figure 1. Current range of Wood Turtle (*Glyptemys insculpta*) in the contiguous United States and Canada

³⁴ Willey, Lisbeth L., et al. (2021). *Distribution models combined with standardized surveys reveal widespread habitat loss in a threatened turtle species*. *Science Direct* (pg. 1).

³⁵ *Id.* at 2.

Population Status

While total adult population size is unknown, a compilation of available evidence shows that the wood turtle has undergone drastic distribution wide declines by as much as 50% or more in the last 100 years. This species has been declining in abundance for decades throughout its range. Though the overall range has not contracted, occurrences have become patchier due to habitat loss and increasing dispersal barriers.

The species occurs in small, increasingly disjunct subpopulations, many of which are separated from each other by distances greater than the species can be expected to disperse. Wood turtles have strong site fidelity, often returning to specific nesting and overwintering areas for decades. The combination of late maturity, reduced reproductive success, and long-lived adults, results in a population structure skewed heavily toward adults. These characteristics combine to delay the detection of population declines, and to reduce the ability of small, declining populations to recover.

Judging by the widespread reports of declining populations, only a small proportion of occurrences likely have good or excellent long-term viability. A population along a 37.5-km stretch of river in Michigan is one of the only populations documented to have good viability.³⁶ The combined conclusion of recent studies is that the population is declining because of adult mortality associated with hay mowing and other agricultural activities.³⁷ Based on occurrence records and recent surveys, Jones et al. (2015) estimated 58% of suitable habitat in the northeastern U.S. has been impaired as a result of land use conversion.³⁸

Massachusetts: Wood turtles are found in the central and western regions, with populations typically numbering less than 100 adults. Urbanized areas in the eastern part of the state have severely impaired populations.³⁹

New York: Wood turtles are thought to occur statewide, except on Long Island. They are most common in the Hudson River Valley, with concentrations in the north and south Taconics and Hudson Highlands.⁴⁰

New Hampshire: Wood turtles are listed as a species of special concern in the state, with many states across the species range reporting declines and population structures with a disproportionate number of adults.⁴¹

³⁶ NatureServe. 2026. https://explorer.natureserve.org/Taxon/ELEMENT_GLOBAL.2.100280/Glyptemys_insculpta (accessed March 15, 2026).

³⁷ Willey, Lisbeth L., et. al., (2021). *Demography and Reproduction*; from *Biology and Conservation of the Wood Turtle* / Michael T. Jones ; Lisabeth L. Willey, editors. Available at [fs.usda.gov/nrs/pubs/jrnl/2021/nrs_2021_willey_002.pdf](https://extapps.fs.usda.gov/nrs/pubs/jrnl/2021/nrs_2021_willey_002.pdf).

³⁸ *Id.*

³⁹ Commonwealth of Massachusetts. (2026). *Wood Turtle*. <https://www.mass.gov/info-details/wood-turtle>.

⁴⁰ New York Department of Environmental Conservation. (2025, Jan. 9). Wood Turtle Species Status Assessment. <https://extapps.dec.ny.gov/fs/programs/dfw/SWAP2025/Reptiles/Wood%20turtle.pdf>.

⁴¹ New Hampshire Wildlife Action Plan, Appendix A, Reptiles. (2015). [reptile-woodturtle.pdf](#).

Wisconsin: Standardized population surveys conducted across 8 HUC-8 watersheds from 2019 to 2023 detected 250 unique individuals consisting of 107 adult females, 77 adult males, and 66 juveniles.⁴²

Connecticut: The wood turtle population in Connecticut is currently facing significant challenges due to habitat loss and fragmentation from urban development. Although they once ranged widely across the state, they are now considered a species of special concern and are protected under the Connecticut Endangered Species Act. While conservation efforts are ongoing, including habitat restoration and monitoring to ensure the sustainability of their populations, the population is at risk due to threats such as habitat loss, agricultural machinery, and illegal collection for the pet trade.⁴³

Iowa: The wood turtle is an endangered species in Iowa, characterized by high levels of adult and egg predation and low juvenile recruitment. The population is isolated and faces significant challenges, including habitat destruction and low survivorship rates. Studies indicate that the Iowa population exhibits low levels of adult survivorship and high levels of nest destruction, with 7.3% of juveniles surviving to adulthood.⁴⁴

Maine: The wood turtle population in Maine is currently considered a “Special Concern” species due to declining populations and habitat loss. Recent studies estimate a total population size of 73 individuals, with annual survival rates ranging from 80.5% to 97.5%. The wood turtle is found statewide, but its wild populations are decreasing, and it is listed as one of Maine’s rarest turtles.⁴⁵

Maryland: The population of wood turtles in Maryland is currently considered vulnerable, and they are classified as imperiled at the state level. They are at risk due to habitat destruction, fragmentation, and poaching.⁴⁶

Michigan: The population of wood turtles in Michigan has been experiencing a decline over the past 30 years due to habitat destruction and degradation. Wood Turtles in the Lower Peninsula of Michigan exist as two populations, referred to as a North population and a South population. Both populations show evidence of decline. Given the increase in rate of urbanization in Michigan and evidence of overall decline in wood turtle populations, experts expect to see evidence of demographic decline in future populations there. However, they also deduced that the slow loss of genetic diversity presents a unique conservation opportunity to improve

⁴² Badje, Andrew F., et. al., *Baseline Abundances and Population Demographics at Wood Turtle (*Glyptemys insculpta*) Monitoring Sites in Wisconsin*. (2024). *Biology and Conservation of Emydine Turtles*, Northeastern Naturalist. 31 (Special Issue 12): G28-G46. pnw_2024_badje001.pdf.

⁴³ Connecticut Department of Energy & Environmental Protection. Wood Turtle, *Glyptemys insculpta*. (2026). <https://portal.ct.gov/deep/wildlife/fact-sheets/wood-turtle>.

⁴⁴ Lapin et. al., *A Regional Analysis of *Glyptemys insculpta* (Wood Turtle) Survival in the Upper Midwest of the USA*. (2019). *Herpetological Conservation and Biology* 14(3):668-679.

⁴⁵ Chatfield, Matthew. *Population and Movement Ecology of Wood turtles (*Glyptemys insculpta*) on Maine’s Working Lands*. (2023). Wildlife Conservation Initiative Annual Report. ME_Wood_Turtle_Report_2023.pdf

⁴⁶ Maryland Department of Natural Resources. *Natural Heritage Program Spotlight, Winter Work: Wood Turtles*. (2026, Feb. 9). <https://news.maryland.gov/dnr/2026/02/09/natural-heritage-program-spotlight-winter-work-wood-turtles/>.

populations demographically without the added cost and considerations necessary in the conservation of genetically depauperate populations.⁴⁷

Minnesota: The population of wood turtles in Minnesota is currently threatened and classified as a state-listed threatened species. Monitoring efforts in place since 1998 indicate a substantial decrease in population numbers from 247 to 112 in the northeast over the past few years.⁴⁸

New Jersey: The population of wood turtles in New Jersey is currently considered declining due to habitat loss and degradation. Historically, wood turtles were common across northern and central New Jersey, but their populations have significantly decreased since the 1970s due to factors such as habitat loss and vehicle mortality. They are currently listed as a threatened species.⁴⁹

Pennsylvania: The population of wood turtles in Pennsylvania is currently considered to be declining. Regular assessments conducted by the Pennsylvania Fish and Boat Commission reveal that the turtles are a Species of Greatest Conservation Need in the state. Habitat loss, overcollection, and other environmental factors have led to a decrease in their numbers.⁵⁰

Vermont: The population there is currently facing several threats, including invasive species and flooding, which have significantly impacted their nesting sites and survival rates.⁵¹

Virginia: The population of wood turtles in Virginia is currently facing significant challenges due to habitat loss and degradation from urbanization. The species has declined dramatically in northern Virginia, with only a few isolated populations remaining.⁵²

West Virginia: The population of wood turtles in West Virginia has been monitored since 2020, with a total of 162 individuals captured across five long-term monitoring sites. The estimated adult abundances varied from 72 to 147. No juveniles were captured in these efforts, raising concerns about the long-term viability of the population.⁵³

⁴⁷ Willoughby, Janna et. al., *Population Decline in a Long-Lived Species: The Wood Turtle in Michigan*. (2013). *Herpetologica*, 69(2), 2013, 186–198.

⁴⁸ Cochrane, Madaline et. al., *Status of a wood turtle (Glyptemys Insculpta) population in northeastern Minnesota*. (2018). *Herpetological Conservation and Biology*. 13 (1): 273–282.

⁴⁹ NJ Department of Environmental Protection. Wood Turtle, *Glyptemys insculpta*. <https://www.nj.gov/dep/fgw/ensp/pdf/end-thrtened/woodtrtl.pdf>.

⁵⁰ Commonwealth of Pennsylvania. *Wood Turtle Conservation*. (2026). <https://www.pa.gov/agencies/fishandboat/conservation/species-management/reptiles-and-amphibians/turtles/wood-turtle-conservation>.

⁵¹ Vermont Fish & Wildlife Department. *Wood Turtle*. (2026). <https://www.vtfishandwildlife.com/learn-more/vermont-critters/reptiles/wood-turtle>.

⁵² Virginia DWR. *Wood Turtle*. (2026). <https://dwr.virginia.gov/wildlife/information/wood-turtle/>.

⁵³ Fonda, Michelle et. al., *Baseline Wood Turtle (Glyptemys insculpta) Population Demography and Abundance Estimates at Long-term Monitoring Sites in West Virginia*. (2024). *Northeastern Naturalist*, Volume 31, Special Issue 12: G110–G116.

Threats



Virginia Department of Wildlife Resources

Present or threatened habitat destruction, curtailment, or modification of habitat or range

This species is highly threatened by habitat loss, strikes by vehicles, development, and agricultural equipment.⁵⁴ Wood turtles have likely lost more than half of their suitable habitat over the last century due to factors such as urbanization and agriculture.⁵⁵ Habitat loss is a major factor for the past and present decline of the wood turtle across its entire range.

Wood turtles rely on wetlands as part of their diverse habitat requirements; specifically, riparian wetlands. Today, wetland ecosystems are disappearing three times faster than forests and are one of the world's most endangered ecosystems.⁵⁶ The draining and ditching of wetlands, the conversion of wetlands for agriculture, logging, industrial and commercial development, succession, lack of wetlands management, and interstate and road construction are a main driver of wood turtle habitat loss. These activities have also severely fragmented remaining habitat and created physical barriers to movement and migration, further isolating wood turtles from other

⁵⁴ NatureServe. 2026. https://explorer.natureserve.org/Taxon/ELEMENT_GLOBAL.2.100280/Glyptemys_insculpta (accessed March 15, 2026).

⁵⁵ U.S. Fish and Wildlife Service. (2026, March 15). *Wood Turtle*. <https://www.fws.gov/species/wood-turtle-glyptemys-insculpta>.

⁵⁶ Elbein, Saul. 2021. *Wetlands point to extinction problems beyond climate change*. The Hill. December 11. thehill.com/policy/equilibrium-sustainability/585382-wetlands-point-to-extinction-problems-beyond-climate-change (paragraph 6).

sites and preventing the gene flow necessary to sustain the species. Urbanized areas lacking aquatic or wetland habitat creates serious separation barriers for the turtles.⁵⁷ Riparian wetlands have been particularly harmed, physically and chemically, by dams, channelization, siltation, pollution, etc.

Recovery of the species to historical levels is daunting, because much habitat has been permanently lost to development. Development may include residential, commercial, or industrial land use conversion, but it almost always includes an increase in impermeable surfaces. More impermeable surfaces result in increased stormwater runoff and erosion bringing additional nutrients and pollutants into turtle habitat. Development also lowers the water table due to the sinking of wells and when roads and other structures act as barriers to the normal flow of surface waters. Development also leads to increased traffic and road mortality, surface water pollution, and accelerated succession by invasive plants. Untimely mowing or burning and the use of pesticides on adjacent agricultural fields also degrades turtle habitat.

Large-scale agriculture has been a major source of mortality and habitat loss. Disc mowing has been shown to cause direct mortality to enough individuals to cause extirpation of populations in agricultural settings over time.⁵⁸ Tractor tires are also a significant source of mortality.⁵⁹

Direct mortality from road vehicles is a serious threat to wood turtles, especially for adults.⁶⁰ Wood turtles are particularly vulnerable to vehicle collisions and road mortality due to their delayed sexual maturity and slow reproductive rate. Road mortality also skews turtle populations toward males. Sexually mature females completing nesting migrations are likely much more susceptible to road-induced mortality than males.⁶¹ Researchers have found more male turtles than females in wetlands surrounded by high-density roads.⁶² For most small populations of turtles, the loss of a single female per year results in a negative growth rate.⁶³ Beyond direct mortality, roads result in habitat fragmentation, decreased dispersal between sites, reduced abundance, and loss of genetic diversity.⁶⁴ Road mortality also reduces a wood turtle's ability to disperse, which reduces gene flow and can drive a population to extinction. Moreover, since human roads often run parallel to rivers and streams, roads may take an especially large toll on wood turtles.

⁵⁷ NatureServe. 2026. https://explorer.natureserve.org/Taxon/ELEMENT_GLOBAL.2.100280/Glyptemys_insculpta (accessed March 15, 2026).

⁵⁸ *Id.*

⁵⁹ *Id.*

⁶⁰ *Id.*

⁶¹ Steen, David and James Gibbs. 2004. Effects of Roads on the Structure of Freshwater Turtle Populations. *Conservation Biology*. 18: 4.

Tamplin et. al (2025). Home Range Size and Habitat Usage of Hatchling and Juvenile Wood Turtles (*Glyptemys insculpta*) in Iowa. *Diversity* 2025, 17(10), 733 (4).

⁶² *Id.*

⁶³ Gibbs, J.P., and W.G. Shriver. 2002. Estimating the effects of road mortality on turtle populations. *Conservation Biology* 16:1647-1652.

⁶⁴ Marsh, D.M. and J.A.G. Jaeger. 2015. Direct effects of roads on small animal populations. In "Roads and Ecological Infrastructure: Concepts and Applications for Small Animals." K.M. Andrews, P. Nanjappa, and S.P.D. Riley (eds.). Johns Hopkins University Press. 42-5 (42).

Overutilization

This species is highly threatened by illegal collection, where direct mortality or removal from the wild is a serious ongoing threat.⁶⁵ Illegal collection has been responsible for dramatic population declines in the past and continues to be a moderate threat, despite protections.⁶⁶ Wood turtles are highly sought after by collectors, leading to poaching and illegal trade. This activity not only undermines conservation efforts but also disrupts the natural reproduction cycles of the turtles, which are vital for maintaining their populations.⁶⁷

Poaching rare turtles, such as the wood turtle, is a multimillion dollar industry. The illegal collection is driven by high demand from both domestic and international markets, making wild turtle populations highly vulnerable to decline. The potential market value for poached wood turtles from Virginia between 2021 and 2023 was estimated to be around \$35,000 in the U.S., or \$155,000 overseas.⁶⁸ Wood turtles can be found online and in pet shops.⁶⁹ The rarer the turtle, the more valuable they become on the black market. A 2018 meta-analysis of the impact of turtle trade concluded that turtles are the most imperiled vertebrates globally.⁷⁰ North American species including the wood turtle are especially prized and popular.

The Collaborative to Combat the Illegal Trade in Turtles (CCITT)⁷¹ is a key program aimed at deterring the illegal collection of wood turtles. Formed in 2018, it focuses on understanding, preventing, and eliminating the illegal collection and trade of North America's native turtles. The program is composed of wildlife law enforcement, biologists, legal experts, social scientists, communication experts, and other professionals. Associated working groups focus on coordinating state regulations and providing outreach and resources to combat the crisis, however, illegal collection of wood turtles remains a significant threat to their populations.⁷²

Rare turtles represent the fourth largest source of wildlife sold on the black market. While once sought as a delicacy or as a source for medicines, turtles are now mainly bought as unusual pets. Demand for rare turtles in Asia has skyrocketed, especially in the last five to ten years.

⁶⁵ NatureServe. 2026. https://explorer.natureserve.org/Taxon/ELEMENT_GLOBAL.2.100280/Glyptemys_insculpta (accessed March 15, 2026).

⁶⁶ *Id.*

⁶⁷ Meck, Jessica. *The Spotted, Blanding's, and Wood Turtle Conservation Symposium*. (2019). pg. 6-8.

⁶⁸ Roth, Maggie. (2024, March 20). Virginia's Turtles are in Peril due to Poaching. *Northern Virginia Magazine*. <https://northernvirginiamag.com/news/2024/03/20/virginias-turtles-are-in-peril-due-to-poaching/>.

⁶⁹ 2026. *The Turtle Source*. <https://theturtlesource.com/north-american-wood-turtle/>.

⁷⁰ Rhodin, A., C. Stanford, P. van Dijk, and C. Eisemberg. 2018 Global Conservation Status of turtles and Tortoises (Order Testudines). *Chelonian Conservation and Biology*: 17(2):135-161 (155).

⁷¹ Partners in Amphibian and Reptile Conservation. (2026). *Collaborative to Combat the Illegal Trade in Turtles*. <https://parcplace.org/species/collaborative-to-combat-the-illegal-trade-in-turtles/>.

⁷² *Id.*

Disease and predation

Wood turtles are highly threatened by predation. All age classes appear to be threatened by predation by natural predators throughout the range.⁷³ It is suspected that the rate of predation has increased due to predators surviving well in close association with humans. High rates of predation also suppress nest success.⁷⁴ Raccoons, skunks, foxes, crows, birds of prey, otters, and large-mouthed bass pose significant threats to wood turtles, especially during their vulnerable life stages. Wood turtles primarily defend themselves by retracting their head, tail, and limbs into their hard shell. They can also release a foul-smelling musk to deter potential threats.

Wood turtles have suffered unusually high predation rates of nests, especially in the past decade. Increased development near turtle wetlands habitat has attracted more meso mammal predators, including raccoons, skunks, foxes, and opossum. These human-commensal predators consume both wood turtles and their eggs. Predation by mesopredators such as raccoons appears to increase with higher human density. As development encroaches further upon wood turtle habitat, domesticated and feral dogs and cats may also prey on and/or disturb wood turtles and their nests.

Increased nest predation may also help explain the lack of young and juvenile wood turtles across nearly all sites. Low nest success and juvenile survival may be the most critical factor in the persistence of the species. Predation impairs reproductive recruitment and skews the population age structure towards older individuals.

Wood turtles, like other aquatic turtles, are also susceptible to both viral and bacterial infections. These include respiratory diseases, shell infections, and other health issues. Bacteria from the genera *Aeromonas* and *Pseudomonas* can cause severe infections in turtles. These bacteria are known to cause pneumonia and are commonly associated with infections in various aquatic environments. Infections and diseases can inhibit population growth, especially in conjunction with other threat factors.⁷⁵ Environmental contaminants, including pesticides and heavy metals that act as endocrine disruptors, cause acute and chronic harm to wood turtles.⁷⁶ Increased stress from habitat degradation increases susceptibility to infections.

Inadequacy of existing regulatory mechanisms

Existing federal, state, and local regulatory mechanisms are inadequate to protect against the threats to the wood turtle, which include habitat destruction, overutilization, disease, predation, invasive species, and climate change. Despite dedicated efforts by federal and state agencies, existing mechanisms have not stemmed the increasing loss of wood turtles and their habitat across the entire range.

⁷³ NatureServe. 2026. https://explorer.natureserve.org/Taxon/ELEMENT_GLOBAL.2.100280/Glyptemys_insculpta (accessed March 15, 2026).

⁷⁴ *Id.*

⁷⁵ Mullin, Damien I. *Predation and disease limit population recovery following 15 years of head starting an endangered freshwater turtle*. *Biological Conservation* 245 (2020) 108496.

⁷⁶ Hunter, Christina, et. al., *Reversing global causes of juvenile recruitment loss as a means to recover endangered freshwater turtles*. *Biol. Rev.* (2025), pp. 000-000.

Illegal collection and commercial exploitation for the live animal trade have been responsible for dramatic population declines in the past and continue to be a moderate threat, despite protections.⁷⁷ In 1992, the wood turtle was listed in Appendix II of the CITES treaty, requiring permits for export of the species. The summary prepared for its listing indicated protective legislation at state and provincial levels in the United States and Canada appeared to have done little to curb collection of this species.⁷⁸ Unfortunately, despite its listing as an Appendix II species, wood turtles have been increasingly harvested by illegal collectors. Enforcement of CITES has been lacking, and poaching of wood turtles remains a significant threat to the species' long-term survival.

While some states list wood turtles as threatened or as a species of conservation need, and this can sometimes involve prohibiting direct take and/or developing a Conservation Plan for the species, unfortunately, there are no legally actionable state-level mechanisms or enforcement measures to adequately protect populations or their habitat, and few states have adequate monitoring plans. As a result, these populations continue to decline severely. State mechanisms are currently inadequate to protect the wood turtle.

Other Natural and manmade factors affecting its continued existence

Wood turtles are highly threatened by low hatching success, invasive species, pollution and climate change. Increased mortality of freshwater turtles due to changing climate conditions, possibly due to increased predation because of a lack of refugia in drought years, is a key issue facing turtle-recovery efforts.⁷⁹ Climate change, particularly from the effect of rising temperatures, is projected to decrease optimal habitat and suitable habitat for this species by 62–86% and 29-52% by 2070, respectively.⁸⁰ This means that wood turtles are exposed to higher temperatures and have fewer naturally available wetlands across their range.

One of the primary threats to wood turtles is low nest hatching success and low juvenile survival rates.⁸¹ As aging adults die out, those individuals are not being replaced by a younger generation.⁸² This causes slow, and difficult to detect, declines. Suspected mechanisms suppressing nest success also include flooding, soil erosion, and, at one site in New Jersey, lead contamination.⁸³

Other biological factors make the wood turtle exceptionally vulnerable to local extirpation and range-wide declines, including delayed sexual maturity, low fecundity, low juvenile recruitment rate, and low vagility. The species requires persistence and longevity of adults to maintain stable

⁷⁷ NatureServe. 2026. https://explorer.natureserve.org/Taxon/ELEMENT_GLOBAL.2.100280/Glyptemys_insculpta (accessed March 15, 2026).

⁷⁸ *Id.*

⁷⁹ Kamm, Matthew D., et. al., *Increased Mortality in Wood Turtles (Glyptemys insculpta) during Drought Years*. (2024). *Northeastern Naturalist*, 31(sp12):G47-G56 (2024).

⁸⁰ NatureServe. 2026. https://explorer.natureserve.org/Taxon/ELEMENT_GLOBAL.2.100280/Glyptemys_insculpta (accessed March 15, 2026).

⁸¹ *Id.*

⁸² *Id.*

⁸³ *Id.*

populations, as the survivorship of eggs and hatchlings can be low, and recruitment of juveniles can be infrequent and often episodic.⁸⁴

Movement and migration has become increasingly difficult and dangerous as wetlands habitat and corridors are destroyed for wood turtles. They exhibit small home ranges, particularly in juvenile stages. Hatchlings in particular have significantly smaller home ranges, with mean home range sizes of 11.4 hectares.⁸⁵ Females also have smaller home ranges than males averaging 9.5 hectares compared to 13.3 hectares for males.⁸⁶

Invasive plants are also threatening wood turtles in some areas. Japanese knotweed (*Polygonum cuspidatum*), in particular, overruns sand and gravel bars, forcing females to travel greater distances to find a suitable place to lay eggs.⁸⁷ Habitat destruction and fragmentation, development, road construction, and climate change are likely to exacerbate the impact of invasive plants on wood turtles and their habitat. Development and soil disturbance often lead to the introduction of invasive species that also threaten their habitat, creating barriers to movement and making it difficult for them to find suitable nesting and foraging areas. The presence of these plants can also lead to increased competition for resources, which then further threatens their survival.⁸⁸

Request for Critical Habitat

We encourage the U.S. Fish and Wildlife Service to designate critical habitat for the wood turtle concurrent with its listing. Critical habitat as defined by Section 3 of the ESA is: (i) the specific areas within the geographical area occupied by a species, at the time it is listed in accordance with the provisions of section 1533 of this title, on which are found those physical or biological features (I) essential to the conservation of the species and (II) which may require special management considerations or protection; and (ii) the specific areas outside the geographical area occupied by the species at the time it is listed in accordance with the provisions of section 1533 of this title, upon a determination by the Secretary that such areas are essential for the conservation of the species (16 U.S.C. § 1532(5)).

Congress recognized that the protection of habitat is essential to the recovery and/or survival of listed species, stating that: “classifying a species as endangered or threatened is only the first step in ensuring its survival. Of equal or more importance is the determination of the habitat necessary for that species’ continued existence... If the protection of endangered and threatened

⁸⁴ Bullmann, Kurt. A., et. al (2024). *Survival and Age at Maturity in Head-Started Wood Turtles (Glyptemys insculpta) with Implications for Population Recovery*. Northeastern Naturalist, 31(sp12):G138-G155 (2024).

⁸⁵ Regents of the University of Michigan. (2025). *Glyptemys insculpta* (North American) Wood Turtle. https://animaldiversity.org/accounts/Glyptemys_insculpta/.

⁸⁶ Tamplin, Jeffrey, et. al., *Home Range Size and Habitat Usage of Hatchling and Juvenile Wood Turtles (Glyptemys insculpta) in Iowa*. *Diversity* 2025, 17(10), 733.

⁸⁷ The Orianne Society. (2008-2025). *Wood Turtle*. <https://www.oriannesociety.org/priority-species/wood-turtle/?v=f69b47f43ce4>.

⁸⁸ U.S. Fish and Wildlife Service. (2026, March 15). *Wood Turtle* <https://www.fws.gov/species/wood-turtle-glyptemys-insculpta>; see also Klemens, Michael W., et. al., *Wood Turtle (Glyptemys insculpta) Occurrences and Conservation Needs*, American Museum of Natural History, <https://www.salisburyct.us/wp-content/uploads/2024/07/WOOD-TURTLE-CONSERVATION-IN-SALISBURY-CT.pdf>.

species depends in large measure on the preservation of the species' habitat, then the ultimate effectiveness of the Endangered Species Act will depend on the designation of critical habitat.”⁸⁹

The wood turtle urgently needs critical habitat protection to be issued concurrently with its endangered species designation. The population will not survive without protection of its remaining wetlands, buffers, upland habitat, and migration corridors. Critical habitat is essential to protecting the wood turtle from further harm and population decline. Wood turtle critical habitat consists of wetlands, surrounding buffer habitat, upland habitat, and migratory corridors between sites, which are essential to the turtle's long-term genetic health and survival.

The U.S. Fish and Wildlife Service has discretion with the scale at which it publishes critical habitat information. Published critical habitat designation should be publicly presented range wide or at the county level. All site-specific data should be kept confidential. Because wood turtles' critical habitat includes upland forests and migratory corridors, FWS can protect the wood turtle's complete critical habitat without revealing specific locations.

Because one of the chief threats to the wood turtle is overutilization, the petition does not include the exact locations of populations or individuals. Instead, the petition cites publicly available information regarding the location of wood turtles and identifies the threats that jeopardize its survival. We understand and expect that location information about the wood turtle will be protected from disclosure in the event of a Freedom of Information Act request and in any future rulemakings regarding the species.

Conclusion

In 1995, the U.S. Fish and Wildlife Service cited the following reason not to grant the wood turtle protection under the Endangered Species Act: inadequacy of existing data to support the contention that the wood turtle has undergone range wide decline or that the threats identified in the petition are affecting wood turtle populations across all or a significant portion of its range to the extent that the species is likely to become an endangered species in the foreseeable future.⁹⁰ In the past 31 years, substantial surveys across the wood turtle's range have shown that the population is in steep decline. Conservation efforts at the state level have not offset the loss of sites across its entire range. The wood turtle is crashing, and the few remaining viable populations are under threat.

Information on threats to wood turtles has also increased substantially in the past 31 years. These new studies have identified the key factors driving their decline. These are the same five factors listed under Section 4(a)(1) of the Endangered Species Act: habitat destruction, overutilization, disease and predation, inadequacy of existing regulatory mechanisms, and natural and manmade factors affecting its continued existence.

Specifically, wood turtle habitat is being drained, developed, and destroyed at an alarming rate. Roads and development are resulting in direct wood turtle mortality and increasing habitat

⁸⁹ H. Rep. No. 94-887 at 3 (1976).

⁹⁰ USFWS 1995. 27954.

fragmentation and isolation. Stormwater runoff from impervious surfaces floods more wetlands with pollution. Poachers continue to illegally harvest wood turtles. Anthropogenic mesopredators such as raccoons accompany encroaching human development and prey upon wood turtles, and diseases remain a serious threat to wood turtles' long-term health. Despite sustained efforts by state agencies and volunteers, wood turtle populations continue to crash in every state. Unsustainably low juvenile recruitment magnifies the dangers to wood turtles' survival. Climate change and invasive species are fundamentally altering the hydrology and smothering the essential vegetation of the wood turtles' remaining habitat.

The wood turtle urgently needs the full protection of the Endangered Species Act as a federally endangered species.

References Cited

- Badje, Andrew F., et. al., *Baseline Abundances and Population Demographics at Wood Turtle (*Glyptemys insculpta*) Monitoring Sites in Wisconsin*. (2024). *Biology and Conservation of Emydine Turtles*, *Northeastern Naturalist*. 31 (Special Issue 12): G28-G46.
pnw_2024_badje001.pdf.
- Brown, Donald J. and Lapin, Carly N. (2022). Wood Turtle (*Glyptemys insculpta*).
https://www.fs.usda.gov/nrs/pubs/jrnl/2022/nrs_2022_brown-d_003.pdf.
- Bulhmann et. al (2024). Survival and Age at Maturity in Head-Started Wood Turtles (*Glyptemys insculpta*) with Implications for Population Recovery. *Northeastern Naturalist*, 31(sp12):G138-G155 (2024).
- Chatfield, Matthew. *Population and Movement Ecology of Wood turtles (*Glyptemys insculpta*) on Maine's Working Lands*. (2023). Wildlife Conservation Initiative Annual Report.
ME_Wood_Turtle_Report_2023.pdf
- Commonwealth of Massachusetts. (2026). *Wood Turtle*. <https://www.mass.gov/info-details/wood-turtle>.
- Connecticut Department of Energy & Environmental Protection. Wood Turtle, *Glyptemys insculpta*. (2026). <https://portal.ct.gov/deep/wildlife/fact-sheets/wood-turtle>.
- Elbein, Saul. 2021. *Wetlands point to extinction problems beyond climate change*. The Hill. December 11. thehill.com/policy/equilibrium-sustainability/585382-wetlands-point-to-extinction-problems-beyond-climate-change (paragraph 6).
- Ford, J. (2017). Dirty Turtles: Examining the Effects of Persistent Pollutants on Embryonic Turtle Development. *McGill Science Undergraduate Research Journal*, 12(1), 29–32.
<https://doi.org/10.26443/msurj.v12i1.41>.
- Gibbs, J.P., and W.G. Shriver. 2002. Estimating the effects of road mortality on turtle populations. *Conservation Biology* 16:1647-1652.
- Hunter, Christina, et. al., *Reversing global causes of juvenile recruitment loss as a means to recover endangered freshwater turtles*. *Biol. Rev.* (2025), pp. 000-000.
- IUCN Red List. (2026). Wood Turtle, *Glyptemys insculpta*.
<https://www.iucnredlist.org/species/4965/97416259>.
- Kamm, Matthew D., et. al (2024). Increased Mortality in Wood Turtles (*Glyptemys insculpta*) during Drought Years. *Northeastern Naturalist*, 31(sp12):G47-G56 (2024).

Klemens, Michael W., et. al., Wood Turtle (*Glyptemys insculpta*) Occurrences and Conservation Needs, American Museum of Natural History, <https://www.salisburyct.us/wp-content/uploads/2024/07/WOOD-TURTLE-CONSERVATION-IN-SALISBURY-CT.pdf>.

Lapin et. al., *A Regional Analysis of Glyptemys insculpta* (Wood Turtle) Survival in the Upper Midwest of the USA. (2019). *Herpetological Conservation and Biology* 14(3):668-679.

Marsh, D.M. and J.A.G. Jaeger. 2015. Direct effects of roads on small animal populations. In “Roads and Ecological Infrastructure: Concepts and Applications for Small Animals.” K.M. Andrews, P. Nanjappa, and S.P.D. Riley (eds.). Johns Hopkins University Press. 42-5 (42). Maryland Department of Natural Resources. *Natural Heritage Program Spotlight, Winter Work: Wood Turtles*. (2026, Feb. 9). <https://news.maryland.gov/dnr/2026/02/09/natural-heritage-program-spotlight-winter-work-wood-turtles/>.

Meck, Jessica. *The Spotted, Blanding’s, and Wood Turtle Conservation Symposium*. (2019). pg. 6-8.

Mothes, Caitlin C., et. al., *Habitat suitability models for the imperiled wood turtle (Glyptemys insculpta) raise concerns for the species’ persistence under future climate change*. *Global Ecology and Conservation* 24 (2020) e01247.

Mullin, Damien I. *Predation and disease limit population recovery following 15 years of head starting an endangered freshwater turtle*. *Biological Conservation* 245 (2020) 108496.

NatureServe. 2026.

https://explorer.natureserve.org/Taxon/ELEMENT_GLOBAL.2.100280/Glyptemys_insculpta (accessed March 15, 2026).

New Hampshire Wildlife Action Plan, Appendix A, Reptiles. (2015). [reptile-woodturtle.pdf](#).

New York Department of Environmental Conservation. (2025, Jan. 9). Wood Turtle Species Status Assessment.

<https://extapps.dec.ny.gov/fs/programs/dfw/SWAP2025/Reptiles/Wood%20turtle.pdf>.

The Orianna Society. (2008-2025). *Wood Turtle*. <https://www.oriannesociety.org/priority-species/wood-turtle/?v=f69b47f43ce4>.

Partners in Amphibian and Reptile Conservation. (2026). *Collaborative to Combat the Illegal Trade in Turtles*. <https://parcplace.org/species/collaborative-to-combat-the-illegal-trade-in-turtles/>.

Regents of the University of Michigan. (2025). *Glyptemys insculpta* (North American) Wood Turtle). https://animaldiversity.org/accounts/Glyptemys_insculpta/.

Rhodin, A., C. Stanford, P. van Dijk, and C. Eisemberg. 2018 Global Conservation Status of turtles and Tortoises (Order Testudines). *Chelonian Conservation and Biology*: 17(2):135-161 (155).

Roth, Maggie. (2024, March 20). Virginia's Turtles are in Peril due to Poaching. *Northern Virginia Magazine*. <https://northernvirginiamag.com/news/2024/03/20/virginias-turtles-are-in-peril-due-to-poaching/>.

Steen, David and James Gibbs. 2004. Effects of Roads on the Structure of Freshwater Turtle Populations. *Conservation Biology*. 18: 4.

Tamplin et. al (2025). Home Range Size and Habitat Usage of Hatchling and Juvenile Wood Turtles (*Glyptemys insculpta*) in Iowa. *Diversity* 2025, 17(10), 733.

2026. *The Turtle Source*. <https://theturtlesource.com/north-american-wood-turtle/>.

U.S. Fish and Wildlife Service. (2026, March 15). *Wood Turtle*. <https://www.fws.gov/species/wood-turtle-glyptemys-insculpta>.

Willey Lisbeth L., et. al., *Distribution models combined with standardized surveys reveal widespread habitat loss in a threatened turtle species*. Science Direct. (2022).

Willey, Lisbeth L., et. al., (2021). *Demography and Reproduction*; from Biology and Conservation of the Wood Turtle / Michael T. Jones ; Lisabeth L. Willey, editors. Available at fs.usda.gov/nrs/pubs/jrnl/2021/nrs_2021_willey_002.pdf.

Willey, Lisbeth L., et. al., (2021). Biology and Conservation of the Wood Turtle / Michael T. Jones ; Lisabeth L. Willey, editors. page 3.