

# The Wood Turtle in Wisconsin

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# Wood Turtle in Wisconsin

- State-listed Threatened Species
- Species of Greatest Conservation Need



Carly Lapin, WDNR



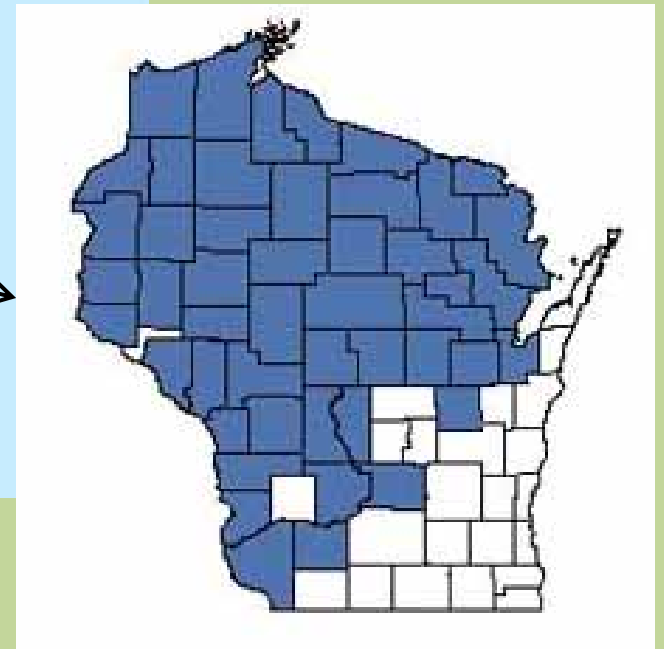
Carly Lapin, WDNR

# Species Description

- Medium-sized (5-9.5 inches long)
- Carapace dark gray to brown, with yellow striations on scutes
- Plastron yellow with large black blotches on rear outside corner of each scute
- Skin dark brown with yellow or orange markings

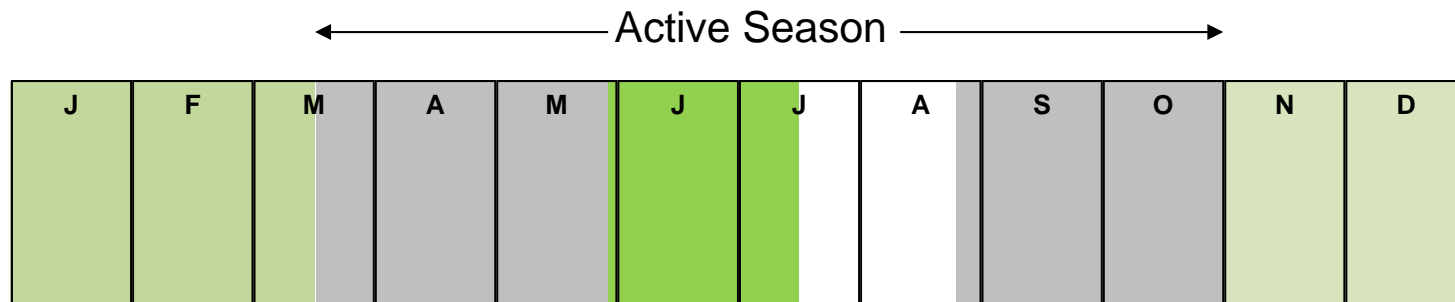


# Distribution and Abundance



Counties with documented locations of wood turtle in Wisconsin. Source: Natural Heritage Inventory Database, January 2017.

# Phenology



<b>Phenology</b>	Overwintering	Mating and Pre-nesting	Nesting	Post-nesting	Mating	Overwintering
<b>Location</b>	Underwater	Near/In water	Primarily terrestrial	Terrestrial	Near/In water	Underwater

# Overwintering (Brumation)

- Overwinter underwater
  - Moderate to fast-flowing rivers or streams
  - Locations with high oxygen content that do not freeze
  - Near structures: logs, boulders, cutbanks
- Have been found hibernating in communal groups

# Aquatic Habitat

- Moderate to fast-flowing rivers in forested riparian corridors
  - Clear water, hard bottom



Andrew Badje, WDNR

# Aquatic Habitat



Ryan Magana, WDNR



# Reproduction

- Mate primarily in fall in the water
- Nesting season May 20 – July 5; peak is mid- to late- June
- Nest in areas with exposed, sandy soil
- One clutch per year or less
  - Average WI clutch size: 11 eggs
  - Eggs incubate for 75-90 days before hatching



# Nesting Habitat



Ryan Magana, WDNR



Carly Lapin, WDNR

Recently completed wood turtle nest

# Nesting Habitat



# Terrestrial Habitat

- Near rivers and streams in spring and fall
  - Alder stands and swales on riverbanks
- Mostly terrestrial in summer
  - Select for edge habitat
  - Edges of wooded riparian corridors near open water
  - Wooded upland adjacent to open meadows and wetlands
  - Forest openings
- Very mobile
  - Have been documented up to 1 mile from water in WI



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# Terrestrial Habitat



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# Threats

Wood turtle populations have declined significantly across the species' range

1. Habitat loss
2. Adult removal
3. Low recruitment (production of hatchlings)



A.B. Sheldon

# Habitat Loss

- Fragmentation and development
- Reduction in fires that create nesting habitat
- Climate change and high water events



Carly Lapin, WDNR

# Low Recruitment

- Low hatchling production
  - Flooding events
  - Nest predation
    - Increased human populations
    - Nesting on roadsides



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First year wood turtle



Raccoon patrolling a nest site



Michele Woodford, WDNR

Predated nest



# Upper Midwest Riverine Turtle Habitat Improvement

- Competitive State Wildlife Grant
  - Wisconsin, Michigan, Minnesota, Iowa
- Objectives
  1. Improve turtle nesting success with nest site management
  2. Reduce adult turtle mortality
  3. Improve turtle habitat in river and stream corridors
  4. Assess effectiveness of conservation actions

2014-2015, 2016

# Surveys and Telemetry



# Surveys and Telemetry



Michele Woodford, WDNR



Carly Lapin, WDNR



Andrew Badje, WDNR



Carly Lapin, WDNR

# Surveys and Telemetry, Results

- Processed and Marked (2014-present)
  - 51 male, 80 female, 18 juvenile = 149 turtles
- Telemetry (2014-15)
  - 6 male, 26 female = 32 turtles
- GPS Bugs (2014-15)
  - 8 turtles in 2014
  - 4 turtles in 2015
- Over 3,000 wood turtle locations collected (2014-15)



# Nest Site Creation/Restoration



# Nest Site Creation/Restoration



Michele Woodford, WDNR

# Nest Site Creation/Restoration, Results

- Study Area 1: 37 sites identified, 9 restored (0.79 ha)
- Study Area 2: 29 sites identified, 1 restored (0.02 ha)
- 5 of the 10 restored sites were used by wood turtles



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Damian Vraniak

# Nest Protection and Monitoring



Michele Woodford, WDNR



Carly Lapin, WDNR



# Nest Protection and Monitoring



Erik Wild



Michele Woodford, WDNR



Carly Lapin, WDNR

# Nest Protection and Monitoring



# Nest Protection/Monitoring, Results

- Nests documented (2014-16) = 83
- Nests protected (2014-16) = 46
- Nests predated (2014-16) = 29
  - 12/46 protected nests were predated (24%; up from 17%)
  - 17/37 unprotected nests were predated (46%; down from 52%)



# Nest Protection/Monitoring, Results

- Hatching Success
  - 2014: 1 of 19 nests hatched = 5.3%; 11 hatchlings
  - 2015: 30 of 50 nests hatched = 60%; 239 hatchlings
  - 2016: 6 of 14 nests hatched (2 unknown) = 43%; 37 hatchlings



# Road Mortality Reduction, Results



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# Road Mortality Reduction, Results

- ½ Plastic Culvert
  - 1 location
  - \$6.76/foot



Jim Woodford, WDNR



Jim Woodford, WDNR

- Filter Fence
  - 3 locations
  - \$2.50/foot

# Going Forward

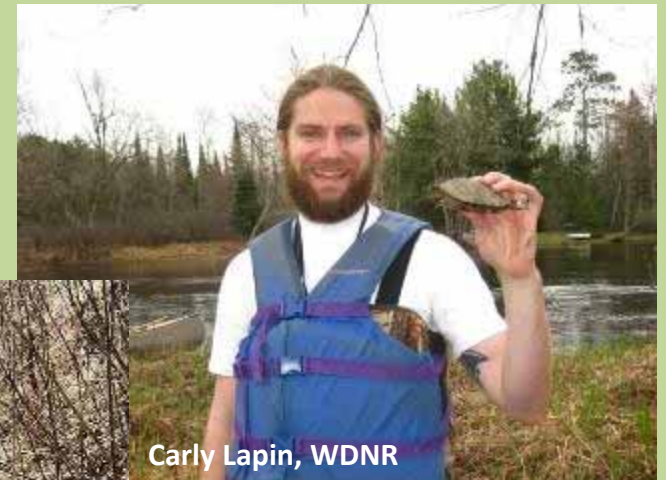
- Continue effective conservation strategies
- Assess long-term effectiveness
- Better understanding of Wood Turtle populations in WI and Midwest



Carly Lapin, WDNR



Josh Stephens



Carly Lapin, WDNR

# Phase 2 Project

- Spring 2017 – fall 2018
- Maintain road barriers and nest sites from Phase 1
- Wood turtle surveys and population estimates
- Create 1 to 3 nest sites per new river
- Nest surveys, protection, and monitoring



Mark Hoffman, MJS



Donald Brown



# How Effective are These Conservation Actions?



- Short-term
  - Turtles using new nest sites; sites don't flood
  - Compare hatchling rates of protected and unprotected nests
  - Turtles being stopped by roadside barriers
- Long-term
  - Surveys to document
    - Increased numbers of juveniles
    - Population estimates, survivorship, sex ratios
  - Increase in number of turtles using new nest sites



# Additional Research Questions

- Predator deterrence strategies
- Wood turtle habitat selection and suitability
- Developing a statewide long-term monitoring protocol that is more accurate
- Additional regional collaboration



# Acknowledgements

- Staff and volunteers: Andrew Badje, Neal Baudhuin, Donald Brown, Alex Coombs, Terry Cummings, Joel Flory, Kathy Kafura, Eric Kroening, Dan and Kate Lapin, Justin Newman, Rori Paloski, Curt Rollman, Josh Stephens, Damian Vraniak, Eric Wild, Michele and Sierra Woodford
- Private landowners: Dr. Jim Imp and Dr. Damian Vraniak



# Questions?



Drew Feldkirchner, WDNR



[dnr.wi.gov](http://dnr.wi.gov) → “wood turtle”

# Surveys and Telemetry, Results

- Population Estimates (mark-recapture 2014-2015)
  - Study Area 1: 5 and  $105 \pm 32$
  - Study Area 2: 4 and  $44 \pm 24$
- Survival Probability (Kaplan-Meier)
  - 2014: 0.844 ( $SE = 0.046$ )
  - 2015: 0.762 ( $SE = 0.094$ )
  - Entire period: 0.734 ( $SE = 0.046$ )

