2006 Wood Turtle Monitoring Report

Ottawa National Forest

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by

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PUBLIC VERSION

1. Summary

The Bessemer Ranger District, Ottawa National Forest (ONF), conducted monitoring for wood turtles, *Glyptemys insculpta*, at nesting areas in the ONF in June, 2006. The work utilized sites identified in 2004 (Casper & Buech, 2005) as suitable for monitoring studies, and continued implementing a long-term monitoring program. The wood turtle is a semi-terrestrial, riverine species, with habitat requirements that make it a very good candidate for monitoring the health and ecological integrity of large river systems. The monitoring of turtles at nesting areas - a critical habitat - assists in managing for species population viability.

2. Objectives

a) Monitor populations of adult wood turtles at selected nesting regions across the Ottawa National Forest.
b) Monitor nesting success of wood turtles at selected nesting regions across the Ottawa National Forest.

These data contribute to a data base intended (over time) to monitor the trends in the number of wood turtle females, and nesting success, at selected nesting areas in the ONF.

3. Methods

We followed recommendations in Casper & Buech (2005). Monitoring locations were selected in cooperation with ONF staff. The monitoring program developed a list of referenced nest monitoring areas (Table 1 and electronic file *master monitoring sites.xls*), based on *major stream* systems (four streams), *nesting regions* (a cluster of nesting areas along a major stream, which would be used by a discrete population of nesting turtles assuming general site fidelity), and *nesting areas* (discrete areas of nesting activity). The term *nest site* is reserved for an actual nest location.

The annual training session for monitoring participants was held on 5 June 2006 in Watersmeet. Twenty-two people participated in monitoring in 2006 (ONF staff, volunteers, and the investigators; Appendix 1), monitoring 26 *nesting areas* (Appendices 2 and 3). Incidental observations of wood turtles were also collected. Monitoring began June 5 and ended June 30, following the protocols developed in Casper & Buech (2005).

4. Results

Table 2 provides results of nesting metrics. Full data are in Appendix 2 and the agency report. One-hundred seventy-six observations of 149 wood turtles were made in 2006, including ten recaptures of ten individuals marked in prior years (Appendix 3).

5. Discussion

The pilot monitoring sessions, in 2005 and 2006, were useful in testing the practicality of the methodology for this citizen based, volunteer, program. The program is coordinated by ONF staff (and, initially, the investigators), and monitoring is performed by ONF staff and volunteer citizens. We now suggest some improvements for several of the experimental metrics tested through this program at nest areas. Counting trails, digs, and nests, especially when they overlap, is proving difficult to standardize, and these metrics should be used only for general comparisons. A few participants were obliterating sign each day, but most followed instructions to recount each day so that maximum numbers could be obtained. However, rain events and other beach disturbances obliterate many trails and digs as well, so that these metrics are problematic. Data recording requires close attention to detail and frequent reference to master documents and instructions. A few turtle codes were accidently used twice, and two participants began marking turtles upside down (belly up, head pointed away), so that correct codes had to be re-assigned. Not all participants had digital cameras for recording ventral patterns, and other supplies such as calipers and scales for measurements are still needed. Another source of difficulty was with the use of personalized locality names, so that data forms had to be carefully scrutinized to determine what sites were being surveyed. Despite these problems, much useful data were collected, and achievable metrics are identified. These include nest predation rate, and data on individual turtles captured.

6. Recommendations

6. 1. The most useful data are the mark-recapture records, with size, age, and sex data, from which population size and trend, and survivorship and encounter rates, can be modeled (over time). This modeling will require at least one additional year of survey data to achieve enough recaptures, and model accuracy will improve with time. Software such as Program MARK can account for differing intervals between monitoring events, if monitoring is not annual, or if surveys at some nesting areas are skipped in some years. We recommend that modeling be performed on a *nesting region* basis initially, but data should be periodically reviewed for movement of individuals between *nesting regions*, and closed population assumptions adjusted accordingly by pooling of site data if supported. Encounter histories for individual turtles in each *nesting region* can be derived from Appendix 3.

6. 2. Nest predation data is also an achievable metric which should prove increasingly useful over time. We recommend that the number of predated nests continue to be recorded, but that data collection be modified to record a count for each visit, rather than a cumulative or maximum count. This would require obliterating sign of predated nests to avoid recounting them on subsequent days. This could be accomplished either by removing the shell fragments (clearing the predation evidence) when first found, or by sketching nests and referring to the field sketch each day to avoid recounts. We recommend the former method for ease and clarity.

6. 3. Timing of the monitoring surveys is weather dependant, but practical considerations require advance planning. We recommend beginning surveys immediately following the Memorial

Day weekend, and continuing until nesting activity ceases. Participants should commit to visiting their survey sites on at least six days for the effort to be useful.

6. 4. Additional simplification and standardization is recommended to forms and methods as follows:

a. Training - Participants should be:

i. Provided a list of available notch codes for their exclusive use (updated annually by removing used codes).

ii. Reminded to refer to their code list regularly to avoid re-using codes.

iii. Trained on how to hold turtles for reading and assigning correct notch codes (carapace up, head away).

iv. Reminded to write the notch code number directly on the plastron with a permanent marker before photographing. This avoids photographic record confusion, and makes for easy identification of recent recaptures.

v. Reminded to use the first opportunity to grasp the rear leg for feeling for eggs.

vi. Reminded that if eggs are not felt on one side, to check the other side as well.

b. *Turtle Data* and *Site Inspection* forms - Standardize the location names. The participants should be given the standard names for their site(s). We suggest using the Location Codes in Table 1. Participants should be instructed to record these standard names on all data sheets, and be given a map with the standard names labeled.

c. *Turtle Data Form* - Add a status field where either NEW or RECAPTURE is chosen.

d. *Site Inspection Form* - We recommend replacing this form with Appendix 4. The new form includes fields for the number of predated nests, nesting activity, numbers and species of turtles observed, disturbance, and number of wood turtles captured, as well as time and climate data. Based on the results of the pilot studies, we do not recommend continuing to try to quantify the number of trails, digs, and completed nests. Rather, the new form provides a space for the observer to choose YES or NO for new nesting activity, and to describe signs of nesting activity. We believe predated nests can be reliably counted, and recommend daily counts rather than cumulative or maximum estimates for this metric. To accomplish this, the participants must either remove egg shell fragments, or sketch and track each predated nest, so that predated nests are not recounted on subsequent visits. We believe this can be most easily and reliably accomplished by removing egg shell fragments upon each site visit.

e. *Survey Instructions* - Modified instructions are provided in Appendix 5.

f. Field equipment list - Should include data sheets, calipers, digital camera, scales, file, cinch sack (to temporarily restrain turtles), black permanent marker, cloth or towel for wiping turtles clean, a few zip lock bags in case dead turtles are found, site map, turtle photo catalog. Optional - GPS unit.

7. References Cited

Casper, G.S. and R.R. Buech. 2005. A pilot wood turtle nest monitoring study in the Ottawa National Forest, Michigan. Technical report to Bessemer Ranger District, Ottawa National Forest.

8. Tables

Table 1: Monitoring Locations
Table 2: 2006 Monitoring Metrics

9. Appendices

Appendix 1: 2006 Participant List
Appendix 2: Master Monitoring Table
Appendix 3: Master Cumulative Wood Turtle Table
Appendix 4: Site Inspection Form
Appendix 5: Survey Instructions
Appendix 6: Buech Field Notes
Appendix 7: Casper Field Notes

Table 1: Monitoring Locations (full version provided in agency report and as electronic file *master monitoring sites.xls*)

Major Stream	Location Code	Turtle Codes Used
		997, 1030, 1032, 2030, 3030, 4030, 5030, 6030, 7030, 8030, 8032, 9032, 2300s
	BR 1	
	BR 2	
		5, 105, 590, 900s, 1590, 2590, 3590, 4590, 5590, 6590, 7000
	CBOR 1	
	CBOR 2	
	CBOR 3	
	CBOR 4	
		200, 800s, 2100s, 2300s, 2400s
	EBOR 1	
	EBOR 2	
	EBOR 3	
	EBOR 4	
		502, 600s, 700s, 1000s, 2000s, 2200s
	MBOR 1	
	MBOR 2	
	MBOR 3	
	MBOR 4	
	MBOR 5	
	MBOR 6	
		101, 400s, 2000s, 2330, 2400s
	SBOR 1	
	SBOR 2	
	SBOR 3	
	SBOR 4	
	SBOR 5	
		500s
	PR 1	
	PR 2	
	PR 3	
		1s, 20, 200s, 800s, 2000s, 2200s, 2300s
	SR 1	

Table 1: Monitoring Locations (full version provided in agency report and as electronic file *master monitoring sites.xls*)

Major Stream	Location Code	Turtle Codes Used
	SR 2	
	SR 3	
	SR 4	

Table 2: 2006 Monitoring metrics. All metrics are maximums, except N wood turtles and search minutes are sums for all days.

Monitoring Area	N Days Sampled	N Trails	N Digs	N Completed Nests	N Predated Nests	N wood turtles arriving	N wood turtles digging	N wood turtles completing nests	N wood turtles	Total Search Person Minutes
BR 1 & BR 2 combined	9	NA	NA	NA	NA	0	0	0	11	1842
CBOR 1	5	10	60	3	8	0	0	0	5	588
CBOR 2	9	20	58	4	11	5	0	1	7	415
CBOR 3	1	0	0	0	0	0	0	0	0	20
CBOR 4	1	2	42	0	1	0	0	0	0	20
EBOR 1	3	34	27	0	0	0	0	0	4	730
EBOR 2	9	21	109	4	6	7	1	2	33	1342
EBOR 3	8	7	32	16	1	0	0	0	8	452
EBOR 4	1	0	50	0	0	0	0	0	0	ND
MBOR 1	6	7	4	14	12	1	1	1	1	440
MBOR 2	9	2	11	0	0	0	0	0	1	+121
MBOR 3	12	11	81	2	5	0	0	0	2	+198
MBOR 4	12	10	26	0	6	0	0	0	0	+181
MBOR 6	8	0	1	0	0	0	0	0	1	270
PR 1	7	1	19	8	5	0	0	0	1	195
PR 2	8	2	7	6	5	1	0	0	4	275
SBOR 1	9	62	235	0	12	0	3	0	26	1464
SBOR 2	7	7	12	4	9	0	0	0	8	559
SBOR 3	5	2	4	0	1	0	0	0	0	335
SBOR 5	1	0	4	0	1	0	0	0	0	13
SR 1	8	12	163	3	13	0	0	0	10	540
SR 2	6	8	10	3	1	0	0	0	4	471
SR 3	8	88	351	0	77	3	0	0	13	1820
SR 4	8	10	106	4	34	0	0	0	0	628

Appendix 1: 2006 Participant List

Available in agency report

Appendix 2: Master Monitoring Table

provided as file *master monitoring table.xls*

Appendix 3: Master Cumulative Wood Turtle Table

provide as file *master wood turtle table.xls*

Appendix 4:

Ottawa National Forest Wood Turtle Survey

SITE INSPECTION FORM

Location (standard name): _____

Observer Name(s): _____ Date: _____

Start survey: Time: _____ Temp: _____ Wind[1]: _____ Cloud Cover*: _____ Last Rain ____ Days Ago

N predated nests (daily count, do not recount): snappers _____ all other turtles _____

New nesting activity since last visit? Yes or No (circle one)

Signs of turtle activity (i.e. trails, digs; distinguish new from old if possible) _____

_____

_____

_____

Signs of predators (i.e. tracks, scat) or other disturbance (i.e. human) _____

_____

_____

Notes on any turtles observed *but not captured* (species and number), other comments _____

_____

_____

_____

End of Survey: Time _____ Temp: _____ Wind[1]: _____ Cloud Cover*: _____

Totals: Total Minutes: _____ X N Searchers = _____ minutes

Notch codes of all wood turtles *captured* (fill out a data form for each) _____

_____

USE BACK OF SHEET FOR SITE SKETCHES

[1] Beaufort wind strength scale, * - record cloud cover as percent of sky

Appendix 5

OTTAWA NATIONAL FOREST

Wood Turtle Monitoring Instructions

Summary:

The wood turtle (*Glyptemys insculpta*) is a semi-terrestrial, riverine species, with habitat requirements sensitive to human interference, road development and management, forestry practices, hydroelectric power generation, and recreational pressures. The monitoring of turtles at nesting areas - a critical habitat - will assist in managing this species. Wood turtles are a Great Lakes endemic, and protected by state laws everywhere they occur. They have relatively complex habitat needs, centered on streams, and are thought to be in decline throughout their global range. This study will collect annual nesting data on wood turtles at selected nesting areas in the Ottawa National Forest (ONF), for use in monitoring the trends in the number of wood turtle females and their nesting success.

Materials Needed (some equipment will be provided):

Data sheets , site map, turtle photo catalog, large "tree" calipers, digital camera, scales, triangular file, cinch sack (to temporarily restrain turtles), black permanent marker, cloth or towel for wiping turtles clean, gallon zip lock bags (in the event dead turtles are found). Optional - GPS unit. Prepare for wading streams and walking shorelines (proper clothing, waders, bug shirt, bug spray, maps, compass, etc.).

Methods:

Monitoring consists of repeated visits to selected nesting areas immediately prior to and during the nesting season, and a post-nesting visit to assess nest predation. Monitoring sites will be assigned by ONF staff, along with a block of available notch codes. *These sites are sensitive information and volunteers are honor bound not to reveal them publicly. By participating you become a site guardian, and your regular presence should deter poachers.* Volunteers must commit to visiting a nesting area at least six times during June, with the most important period being the first two weeks.

Procedure:

Wood turtle surveys should begin immediately after the Memorial Day weekend. A training session will be organized by the supervisory ONF staff, and participants must attend and be named on ONF permits. On each visit, intensively search for wood turtles staging in nesting areas; capture, mark, and photograph them; and collect data on nesting success. Try to visit the site daily, unless weather conditions are unfavorable (cool overcast days). Depending on site accessibility and logistical constraints, more frequent visits may be fruitful once nesting begins and weather is favorable. Searches should be conducted between 9 AM and nightfall. However, to the extent practical, focus searches during the sunniest and warmest periods of the day. Warm evenings or after rains wet the soil are ideal for finding nesting wood turtles (they nest mostly between 6 PM and nightfall). Do not disturb nesting females, but wait until they are finished nesting (usually <40 minutes duration), then capture and process them. Wood turtles tend to depart the nesting area immediately after completing the nest. Generally, nesting occurs over a period of 10-14 days and peaks following a rain on warm days. Surveys may be discontinued when nesting ends, as evidenced by few or no new nests observed for five or more days. One final site visit should be made 7-10 days after nesting ends, to make a final nest predation count.

Complete a *Site Inspection Form* each time a site is visited. Begin by recording the time and weather data on the *Site Inspection Form*, then search the nesting area and fill out the rest of the form. If turtles are nesting, do not disturb them and try to remain undetected while passively observing - perform another site inspection later when

no turtles are nesting. All turtles observed should be identified to species where possible, but only measure and notch wood turtles. Actively search for turtles along shorelines and in shrubs and grasses near the stream. Any wood turtles captured should be measured, weighed, sexed, aged, palpated for eggs, examined for general health, and individually marked by shell notching and photography of plastron patterns. When finished, record survey end time and weather, then total up the time and turtles to finish the *Site Inspection Form*. Surveys should continue until nesting ends, approximately June 20-25. Nest disturbances should be kept to a minimum.

Important point:

- For monitoring predated nests (identified by dug up egg shells) remove egg shell fragments and obliterate all sign of the predated nest, so the nest is not recounted on subsequent visits.
- You will likely have snapping turtles, and possibly some painted turtles, nesting at the same beaches as wood turtles. Try to differentiate digs and nests made by each species. With practice, this can be done with moderate accuracy. We are most interested in tracking the fate of wood turtle nests.

Turtle Handling:

Complete a *Turtle Data Form* for each wood turtle captured. Attend the training session to learn how to safely handle turtles (they may bite), how to properly record length, width, weight, number of growth rings (annuli), and how to feel for eggs. *Plastron* is the bottom half of the shell, and *carapace* is the top half of the shell. Females have flat plastrons, while males have concave plastrons. Females younger than ~12 years are not sexually mature.

Important points:

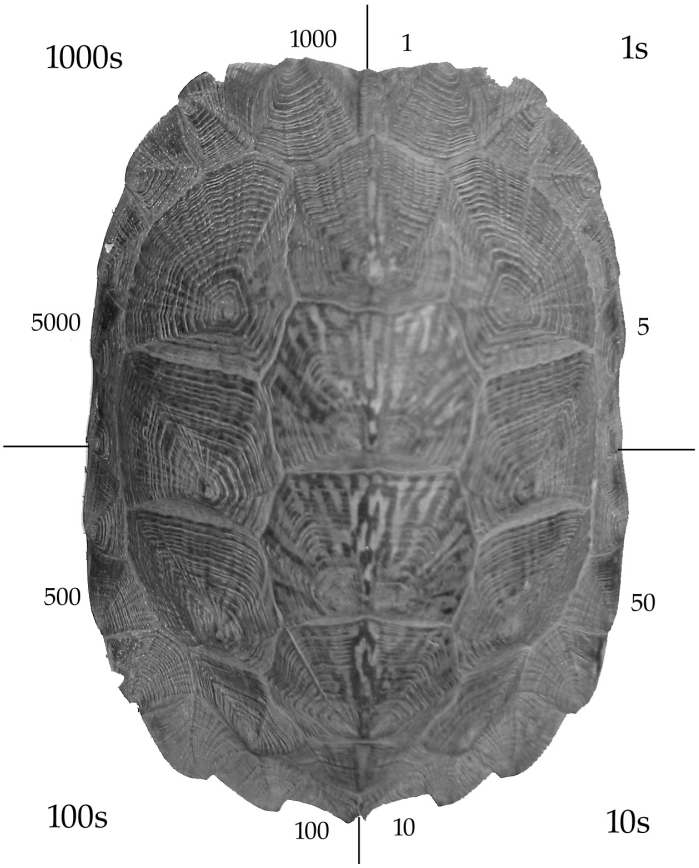
- Keep a list of your available notch codes (provided) handy to avoid re-using codes.
- Hold wood turtles correctly to read or assign correct notch codes (carapace up, head away).
- Write the notch code number directly on the plastron with a permanent marker before photographing. This avoids photo record confusion, provides redundant information on intended numeric and notch codes, and makes for easy identification of recent recaptures.
- Double check recaptures against the plastron catalog picture. The pattern should match (except for juveniles). If it doesn't, adult plastral patterns are more reliable than the notch codes (which may be chipped or scarred over) in identifying a recapture. Re-file any worn or obscured notches. If you get a recapture and are unable to check its plastral pattern against an earlier photo, or have any doubt as to its proper code number, re-photograph it.
- Use the first opportunity to grasp the rear leg for feeling for eggs. If eggs are not felt on one side, check the other side as well.

The Public:

If people are present when you arrive at a site, leave and return later so that you are not observed handling turtles. If people arrive during your survey, try to keep any turtles out of sight and discontinue your survey. If you observe persons handling turtles, you may politely remind them that the turtles are a protected species and ask that they release them. If they refuse, you may ask for some identification, and record the license plate number and make of their vehicle, and notify a Forest Service employee or DNR warden as soon as possible. Never try to take turtles away from anyone and simply walk away if an argument ensues. Generally people are well intentioned, but there are a few ill-intentioned poachers out there.

References:

Casper, G.S. and R.R. Buech. 2005. A pilot wood turtle nest monitoring study in the Ottawa National Forest, Michigan. Technical report to Bessemer Ranger District, Ottawa National Forest.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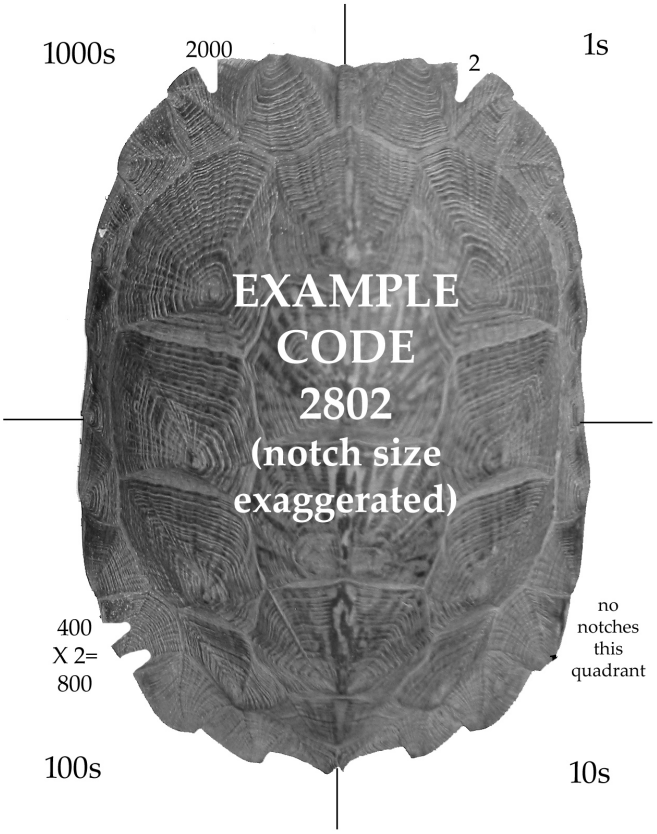
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Appendix 6: Richard Buech Field Notes

provided in agency report

Appendix 7: Gary Casper Field Notes

provided in agency report