

Turtle Nest Surveys, 2008

Sandhill Wildlife Area



Gravid Female Turtle Mark-Recapture Population Survey

Annual Report, 2008

DNR, Sandhill Outdoor Skills Center

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Background: Painted (*Chrysemys picta*) (PT), snapping (*Chelydra serpentina*) (ST) and Blanding's (*Emydoidea blandingii*) (BT) turtles inhabit the 9,150 acre Sandhill Wildlife Area (SWA), in southwest Wood County, Wisconsin. SWA is composed of gentle undulating sandy ridges of oak (*Quercus spp.*) and aspen (*Populus spp.*) uplands, and sedge marshlands. Water in area flowages straddle 2 watersheds and are maintained via a series of ditches that transect the area, moving water into 2 drainages systems: the East Fork of the Black River (Mississippi River), and the Yellow River (Wisconsin River). The 3 turtle species occur primarily in marsh and flowage habitats scattered across the facility.

Turtle consist of a BT radio telemetry and mark-recapture program begun in 1991. Systematic hoop-netting, mark and recapture work was conducted between 1995 – 98 and in 2002 to determine relative abundance levels of all 3 species.

Drought conditions apparently caused an exodus and/or excessive mortality of all species occupying the southeastern portion of SWA in 1996. Hoop-netting efforts in 1997, 1998, and 2002 were unproductive (OSC Unpubl. rept.1999, Dassow 2002). These findings suggested a decline was occurring among turtle populations on SWA. In an effort to determine the relative stability of turtles, we decided to concentrate our efforts in encountering gravid females nesting during the month of June. We hypothesized that year-to-year trends in numbers of gravid females in all three species would provide an index to long-term population trends. The marking program would also provide us with a base-line of yearly survival rates among the most valuable members of turtle populations: adult breeding females. The annual nesting surveys were piloted in June 2001, and commenced in June 2002.

Objectives:

- (1) determine year-to-year trends in numbers of gravid females to assess relative population stability for all 3 species,
- (2) provide information on annual survival rates among adult female turtles.

Methods

Surveys are run along roads, dikes and trails by vehicle between 1800-2100 hours on evenings in June. Surveys are not run each consecutive day in June, but as often as staff time constraints allow. Crews drive slowly, searching roadsides for turtles. Turtle behavior is assigned one of 3 categories: (A) milling around, (B) nest digging, or (C) egg-laying. Turtles are approached to determine whether they were previously marked (=recapture).

Turtles engaged in behaviors A and B are picked up and weighed, measured, and palpated to assess whether gravid. Crews attempt to determine whether egg-laying turtles have been previously marked, record their ID number if found, but do not otherwise disturb them. PTs and BTs are uniquely marked by filing notches in numerically assigned marginal scutes while ST are notched and tagged by affixing a numbered, Style 890 wing tag (National Band & Tag Co.) in a hind marginal scute. Upon completion of processing, turtles are released where captured. Other data recorded include location and time for each turtle encountered.

Results

Effort: Search efforts were similar over the 7-year period, averaging a total of 26 hours accumulated over an average of 11 days (Table 1). This year exceeded all previous years in terms of effort for both hours and days surveyed.

Table 1. Daily and hourly effort, by year of nesting turtle surveys, 2002-2008.

Year	Dates	Days	Hours
2002	8-24 June	11	19.5
2003	10-18 June	9	20.5
2004	11-21 June	7	16.5
2005	1-16 June	10	26.5
2006	31 May – 16 June	13	37.0
2007	31 May – 18 June	10	25.5
2008	2-24 June	16	38
AVE		10.9	26.2

Weather conditions varied over the 7-year period in which June surveys were conducted. This year evening temperatures averaged 74.2 °F, percent cloud cover averaged 37.6, and 4 days of precipitation was recorded. This year's surveys were the second coolest (behind 2004), second

least cloudiest, and tied with 2007 with the most days of precipitation in the 7 years in which surveys were run.

Table 2. Weather conditions during evening nesting turtle surveys, June 2002-2008.

Year	Weather Conditions		
	Temp	Clouds	Days Precip
2002	75.4	59.1	2
2003	75	70.8	1
2004	73.3	50	3
2005	79.1	52.8	6
2006	78.7	26.9	1
2007	74.3	32.5	4
2008	74.2	37.6	4
AVE	75.7	47.1	3

Encounters: Over the 16-day period from 2-24 June we encountered 96 female turtles (8 ST/ 28 PT/ 60 BT) on our evening surveys. Eliminating repeats, these encounters included 8 ST's, 27 PT's and 41 BT's.

Turtle encounters averaged 2.8 turtles/ hour surveyed in 2008, and has ranged from a low of 1.8 turtles /hour (2007) to a high of 3.7 turtles/hour (2002) (Table 3). Regressions of encounter rates run against percent cloud cover, temperature, days with precipitation, number of days run per season and total hours per season show little if any correlation.

Table 3. Encounter rates, 2002 through 2008.

Year	Days	Hours	TotTurt	Turt/Hr
2002	11	19.5	19.5	3.7
2003	9	20.5	20.5	3.0
2004	7	16.5	16.5	2.4
2005	10	26.5	26.5	2.2
2006	13	37	37.0	2.0
2007	10	25.5	25.5	1.8
2008	16	38	95.0	2.8

Peak Nesting: Seasonally, turtles have been observed gravid and/or engaged in nesting behavior between 23 May (ST) and mid July (PT). Dates for peak numbers vary by species, and by year

(Table 4). In 2008, numbers peaked for ST's on June 9 and BT's peaked on J14. ST's peak an average of 5.4 days (range -12 days) prior to BT's. PT's are too variable to determine peaks.

Table 4. Dates of peak numbers of nesting ST's and BT's.

Year	ST	BT	Days Apart
2002	J10	J11	1
2003	J12	J12	0
2004		J17	
2005	J9	J11	2
2006	J1	J8/13	7
2007	M31	J11	12
2008	J9	J14	5

Species Trends Accounts:

Painted Turtles. We encountered 33 PT's between June 2-24; of these 27 were encountered during evening surveys while 6 were encountered fortuitously while conducting other work during normal daily work hours. Of these 18 percent (6/33) were gravid. We have marked in excess of 275 PTs since hoop-netting activities commenced in 1995. Over the years we have been inconsistent in recovering and marking all PTs encountered while conducting routine activities within SWA. Therefore we are unable to assess population trends. However, 18.5 percent (5/27) of PT's encountered on evening surveys, and 16.7 percent (1/6) fortuitously encountered during the day were recaptures of previously marked individuals.

Table 5. Significant Painted Turtle Recapture Encounters, 2008.

Turt ID	Original Capture				Recapture					Yrs Elapsed?
	Date	Year	Wt (Kg)	Length	Date	Year	Weight	Length	Km Moved	
42	23- Jun	1995	385.5	142	13- Jun	2008			0.3	13
49	12- Jul	1995	18.2	48	20- Jun	2008	640.8	172	1	13
360	14- Jun	2003	505	157	14- Jun	2008	487.8	155	3.1	5
391	04- Jun	2005	514.3	168	13- Jun	2008	496.3	168	0.3	3
402	01- Jun	2006	411.4	150	13- Jun	2008	486.5	150	0.3	2
									1	7.2

Table 5 yields information on PT recaptures of significance. PT49 was marked as a juvenile in 1995 and recaptured this year 1 km from its original location and was the heaviest of the 5 recaptured PTs encountered this season. One PT (360) was located 3.1 km from its original

location 5 years earlier. Two of this year's recaptured PTs (42 and 49) were marked 13 years ago (1995).

Snapping Turtles. In 2006 we became aware that we were likely missing STs nesting in dawn hours. During the 2008 evening surveys we encountered 8 female STs. SWA staff encountered 3 additional adult females between 1000-1600 h. Surveys run on 3 mornings between 0530-0800 h (June 14, 15, 21) yielded an additional 3 STs. Combining data from the 2007 and 2008 field seasons, we encountered 8 STs between 0530-1000h, 3 between 1000-1600 h, and 14 between 1800-2100 h. Beginning with this annual report we are combining all collection data (evening, daytime, and morning) to assess ST trends.

The 2008 ST nesting season ran from 2-18 June, peaking on June 9 (Table 4). This is in sharp contrast to 2007 when the season ran from 23 May to 4 June.

A total of 12 female STs were encountered in June 2008. Fifty-eight percent (7/12) were gravid or had just completed egg-laying when encountered. Eight of 12 (67 percent) were new STs.

Years elapsed since original capture ranged from 1 – 12 years (Table 6).

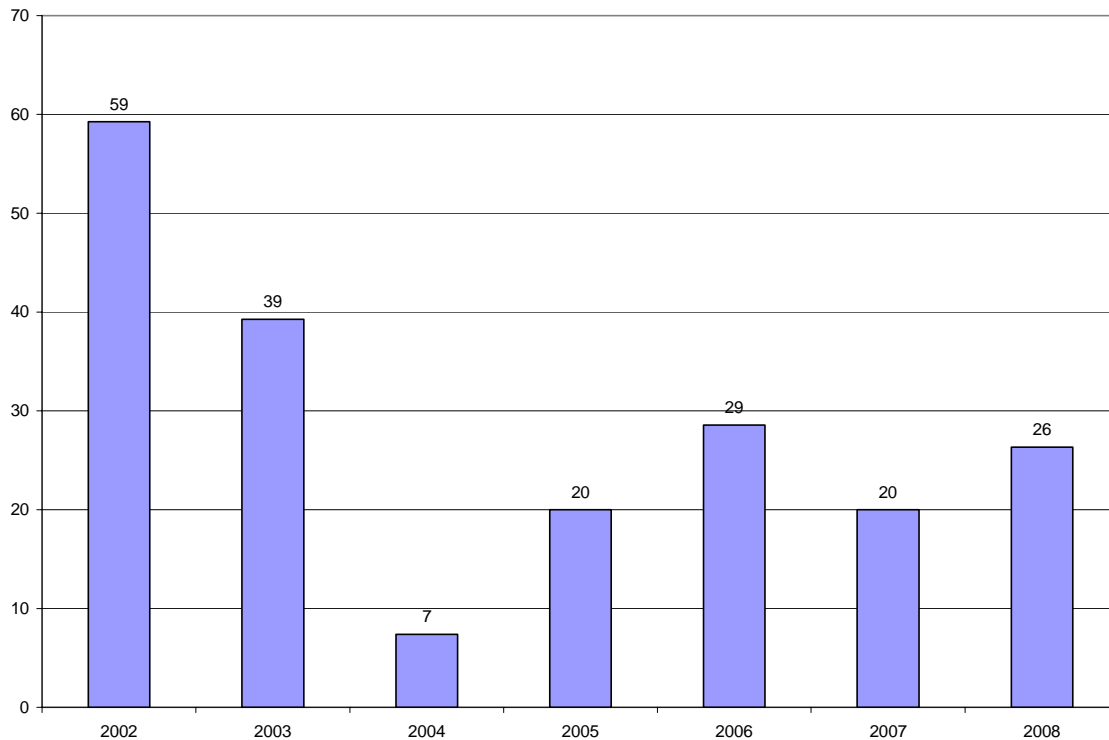
Table 6. Significant Snapping Turtle recapture encounters, 2008.

Turt ID	Date	Original Capture				Recapture				Km Moved	Yrs Elapsed?	
		Year	Wt (Kg)	Length	Gravid?	Date	Year	Weight	Length			Gravid?
28	18-Jul	1996	5.5	267		12-Jun	2008	5.4	286	N	0.7	12
52	12-Jun	2003	8.9	324		09-Jun	2008				0	5
69	07-Jun	2006	5.9	281	Y	10-Jun	2008	5.4	280	Y	0.6	2
80	31-May	2007	10.2	345	Y?	12-Jun	2008				2.1	1

We have consistently encountered 5-9 gravid adult females yearly since 2002. Previously we estimated that the ST nesting population in SWA consists of approximately 25-30 females nesting annually. Between 2002 and 2007, 34 adult STs were marked, and only 4 (12 percent) have been recaptured between 2003 and 2008. Our adult female snapping turtle population is *at least* 25-30, but since we are unsure what proportion of them actually breed and lay eggs annually, and we have very poor recapture rates to date, we are unable to estimate the size of the breeding population with any certainty.

Blanding's Turtles. We encountered a record 38 BT females this year, of which 10 (26 percent) were new. The percent of newly encountered females has remained between 20-30 percent annually after the first several years of evening surveys commenced in 2002 (Figure 3).

Figure 3. Percent of newly encountered female Blanding's turtles, 2002-2008.



Ages of newly marked female turtles ranged from 18-25 (ave=19.2) and between 20 and 39 years with a mean age of 25.7 years for females marked prior to 2008. The “eldest” gravid female this year was #154. She was located in the same area on 3 of 4 consecutive evenings. Sometime after her original capture she suffered ablations of her left front and right hind limbs. The eldest female turtle encountered this June is 39 year-old female #127 originally captured in 2001 and recaptured previously in 2006. She moved considerably between re-encounters (Table 7.) The straight-line distance between her reencounters corroborate the premise put forth by Schuler and Thiel (Submitted) that Blanding's turtle “life ranges” are substantially larger than home ranges in the literature based on 1 or 2 years of telemetry study.

Table 7. Encounter history of female Blanding's turtle no. 127.

Year	Date	Time	Gravid?	Location	Distance f/ Previous?
2001	6-13	1917	Unk	Trumpeter Tr. near Hunter Cut-off	
2006	6-3	1815	Y	Top of 2-way	1.4 km
2008	6-17	1515	Unk	Hunter Cut-off Sand Pit	1.9 km

Forty-nine percent (36/73) of female BTs marked prior to 2002 were encountered on nesting surveys between 2002 and 2008. Fifty-one percent of female BTs (37/73) marked between 2002 and 2007 were recaptured in a subsequent year (2003-2008.)

With this, our sixth year of assessing BT capture/recapture trends, we are able to estimate *minimal* survival rates of marked female BTs. Using 3-year recapture encounter data from females marked in 2001, 2002 2003, 2004 and 2005, we were able to determine how many females were *alive* the year following capture. A minimum annual survival rate of 73 percent was calculated (49/67) for gravid, adult females in our population. With each passing year, this rate is increasing so the actual rate must be higher.

In last year's annual report we calculated an encounter probability where $P_E = 0.69$ (Thiel 2007). A mean of 29 BT females encountered yearly (Figure 4), yields approximately 42 gravid BT's per year ($29 \div 0.69$). This supports our hypothesis of 25-40 BTs nesting annually inside SWA and it suggests that we are encountering a high percentage of them ($38/42=90$ percent). However, because we still encounter unmarked adult females each year (this year, 10), we still do not know the size of the breeding-aged female population because many of these females do not reproduce with any regularity. At least 65 individual BT females have been observed either gravid or egg laying within SWA during evening nesting surveys since 2001.

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Figure 4. Number of Unique female Blanding's turtles encountered yearly, 2002-2008.

