CHELONIAN COMMUNITY COMPOSITION OF LOCKPORT PRAIRIE NORTH, WILL COUNTY, ILLINOIS WITH AN EMPHASIS ON THE THREATENED BLANDING'S TURTLE, *EMYS BLANDINGII*

Final Report to

Wildlife Preservtion Fund - Large Projects
Illinois Department of Natural Resources
Office of Resource Conservation/Operations
One Natural Resources Way
Springfield, IL 62702-1271

Submitted in fulfillment of requirements of
Illinois Wildlife Preservation Fund Contract #RC05L32W
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9 SEPTEMBER 2005

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INTRODUCTION

Community ecology began as a descriptive science and has since evolved a broad theoretical framework on such topics as niche and trophic theory (Morin, 1999). For simplicity, most contemporary research focuses on assemblages, a subset of a community where the organisms are similar taxonomically or ecologically. Ecologists have long realized that within ecosystems, organisms interact with each other and the abiotic environment to form these distinct groups (Schluter and Ricklefs, 1993). Biotic interactions such as competition, predation, commensalism, and trophic cascade determine the structure of assemblages (Morin, 1999). Within a particular ecosystem, the number of species present (richness) in any given assemblage is usually expressed as function of the area, amount and heterogeneity of the habitat, degree of isolation, or trapping effort (Lawton *et al.*, 1993; Schluter and Ricklefs, 1993). For many taxa and habitats, it is often difficult to have an *a priori* knowledge of richness. For turtles, a series of global richness maps have been produced (Iverson, 1992) that can serve as an initial predictor of species richness. When the assemblage has been effectively sampled (*ie.* no additional species added with subsequent effort), within-assemblage relationships in relative abundance, density, and biomass can be analyzed without bias.

Organisms that occur at higher abundances often comprise a significant portion of the biomass within a particular ecosystem. Resources and nutrient flow are limited thus biomass decreases as trophic levels increase. Because turtles are relatively long-lived, comprise a large amount of the total biomass in a community, and have low biomass productivity (Congdon *et al.*, 1986; Iverson, 1982), turtles may restrict nutrient flow and lock nutrients into biomass longer than most organisms. Thus, their role in the ecosystem is important. Contrary to most vertebrates, many of the factors affecting the structure of turtle assemblages remain poorly understood (Bury, 1979). Several studies have found the structure of freshwater turtle assemblages changes across habitat, resource, and seasonal gradients (DonnerWright *et al.*, 1999; Moll, 1990; Vandewalle and Christiansen, 1996). From a temporal aspect, studies have documented turtle assemblages that have exhibited no change in structure (Congdon and Gibbons, 1996), marked shifts in relative abundance (Meylan et al., 1992), and partial species turnover (Stone *et al.*, 1993). These studies have occurred on managed reserves (Congdon and Gibbons, 1996), in constructed wetlands (Stone *et al.,* 1993), and in areas with heavy human impact (Meylan *et al.*, 1992).

Urbanization and industrial expansion in northeastern Illinois has resulted in a dramatic loss of natural wetland communities. Remaining wetlands have become more isolated within this mosaic of urbanization. This fragmentation often reduces the health and viability of wetland communities by limiting such natural functions as gene flow and nutrient cycling. To preserve natural wetland communities, many county nature preserves in northeastern Illinois have made wetland restoration, creation, and protection paramount among their long-term goals. Once wetlands are protected, they require consistent monitoring to determine their health and assess their long-term viability and functioning as a self-sustaining ecosystem. For example, if a community is composed primarily of generalist species capable of sustaining local populations even in degraded wetlands, and lacking in representation of specialists, the wetland may not be functioning properly. To determine wetland health, most biologists study the population characteristics of certain indicator species. These species are generally susceptible to environmental perturbations or have the capacity to exist in even degraded habitats. Because of their importance in the function of ecosystems, turtle species have the capacity to delineate wetland health. An assessment of the entire turtle community can delimit wetland health especially when examining the composition of generalists and specialists.

Lockport Prairie Nature Preserve is 249 acres (not including recent addition of bluff areas) located in Lockport Township, Will County, Illinois. The preserve is known for the occurrence of atypical, shallow-soil dolomite prairie and wetland communities. Subtle variation in topography, soil depth and hydrological regimes interact to form a complex mosaic of dolomite prairie, sedge meadow, marsh and fen communities (De Mauro 1986). These dolomite prairie communities also harbor rare plant species: federally endangered leafy prairie clover (*Petalostemum foliosum*) and stiff sandwort (*Arenaria patula*; De Mauro 1986; CDF 2003). Regionally, rare grasses such as tufted hair grass (*Deschampsia caespitosa*) occurs in wet dolomite prairie, while the satin hair grass (*Muhlenbergia cuspidata*) occurs in dry dolomite prairie (De Mauro 1986). There are also rare animal species, including Hine's emerald dragonfly (*Somatachlora hineana*), spotted turtle (*Clemmys guttata*) and Blanding's turtle (*Emys blandingii*).

LPNP provides habitat to two turtle species currently listed as endangered or threatened by the Illinois Endangered Species Protection Board; the State endangered spotted turtle (*Clemmys guttata*) and State Threatened Blanding's turtle (*Emys blandingii).* Other turtle species occur at the preserve including painted turtle (*Chrysemys picta*), common snapping turtle (*Chelydra serpentina*), red-eared slider (*Trachemys scripta*), common musk turtle (*Sternotherus odoratus*), and spiny softshell (*Apalone spinifera*), many of these occurring mostly in the open-water marsh ponds in LPNP north. The close proximity to the Des Plaines River may also allow map turtles (*Graptemys*) to intermittently occupy the ponds. LPNP is extremely important in terms of the heritage of turtle fauna in Illinois because it is one of two localities where both *Clemmys guttata* and coexist.

Past turtle research at LPNP has focused on the spotted turtle (*Clemmys guttata*) that is mostly concentrated in the south region of the preserve (Capler and Moll 1988; Mauger, 1987, 1990, 1991, 2000, 2001, 2004, 2005; Mauger et al. 2002; Mauger & Stillwaugh 1991; Wilson 1994, 2002). A highly localized and habitat specific spotted turtle population at LPNP was first verified in 1987). The baseline spotted turtle survey conducted by Capler and Moll (1988) was the first to attempt to quantify overall turtle community structure, while a spotting scope survey by Redmer (1989) provided additional observations of turtle species associated with the large ponds and Des Plaines River. However, further efforts to assess the composite turtle community structure of the larger ponds in LPNP north was not undertaken until 2001(Wilson, 2004).

Despite the wealth of knowledge concerning *C. guttata* in LPNP south, still little is known about their occurrence and use of habitat in LPNP north. Further, a comprehensive picture of the structural dynamics and resources that comprise the entire turtle community at a particular site is crucial to identify the limits of spatial dispersion and abundance of populations of rare turtle species. Thus, this study seeks to fill this void and build a composite picture of the structure and dynamics of the turtle community at LPNP north.

OBJECTIVES

1) Quantify the richness, diversity, relative abundance, and biomass of the chelonian community at Lockport Prairie North.
2) Determine population parameters of size structure, sex ratio, population size, morphological variation, and growth rates for as many members of the Lockport turtle community as possible.
3) Examine dietary composition and overlap of community members
4) Delineate the suitability and identify potential limiting factors of the ponds in LPNP as habitat for *Clemmys guttata* and *Emys blandingii*.

MATERIALS AND METHODS

TRAP TYPES, PLACEMENT, AND BAIT ROTATION

We initiated trapping on 29 June 2004 and continued through 1 August 2004. The predominant trapping method was baited hoop traps (Legler, 1960) with double throats. These traps were approximately 3 ft long and 1.5 ft in diameter. We used three sizes of fyke nets. Large fyke nets measured 12 ft long with 50ft wings and leads, and a 3ft diameter front hoop. Small fyke nets measured 6 ft long with 12ft wings and leads, and a 1 ft diameter front hoop. Mini fyke nets measured 3 ft long, had 8ft wings, and a 6 inch diameter front hoop. To augment capture effort we also employed a wire cage D-net and 12 minnow traps in the east pond. Minnow traps were deployed to capture turtles of smaller size classes.

We focused our effort toward the east pond, west marsh and the middle pond habitat units. Because we were limited in number of traps and because most of the wetland habitat was too shallow, our trap deployment in the North ORV Trail Pools and Bulrush Pond Units was minimal. We apportioned traps approximately based on the relative size of core wetland pools, with priority of large fyke arrays afforded to the East and Middle ponds, the two largest open-water areas. Traps were moved to new locations whenever pulled for repair or when yielded no captures after approximately one week of sampling. We maintained at least 12 hoop traps and two large fyke nets in the east pond, 6 hoop traps and a small fyke in the middle pond, and 5 traps in the west marsh pond.

Because the east pond was so large, we had to successively move traps along the western, northern, and eastern shorelines so that we trapped the entire shoreline at a spacing of 6 – 8 m. Hoop traps in the east pond yielding no turtle captures after approximately one week were redeployed to new untrapped areas of the East Pond or moved to another wetland unit. Because the middle pond was substantially smaller, it was not necessary to rotate traps to achieve 6 – 8 m spacing. Finally, traps were placed in the west marsh wherever, water depths and runways or openings in dense cattail growth would. We deployed them so that the north and south portions of the marsh had an equal number of traps (i.e. 4 – 5). The two large fyke nets were placed in the east pond; one at the east and west ends and the small fyke net was deployed in the middle pond facing south to close off the north channel to turtle movements. Finally, the mini fyke net was placed in the bulrush pond for a brief period to test its effectiveness.

All hoop, minnow, and D-net traps were placed such that no more than two thirds of the trap was submerged by water. Fyke nets were totally submerged in most cases but we placed two plastic milk jugs in the rear chamber to prevent accidentally drowning turtles. All traps were placed parallel to the shoreline or in the case of fyke nets, wings were run up to the shoreline where possible, in an attempt to funnel turtles moving in the water into the traps. We used sardines in water, sardines in oil, clams in clam juice, tuna in water, and 9lives tuna and shrimp as baits, which were changed at periods ranging from 2 – 4 days. Fyke nets were not baited. Traps were checked once, and at times, twice per day. We supplemented trapping with hand captures during routine trap checks. Upon initial placement of traps, we recorded GPS coordinates (UTM; NAD83).

DATA ACQUISITION

Every turtle captured within a given species was given a unique shell notch (Cagle, 1939). For *Chelydra* and *Sternotherus* only the posterior marginal scutes were notched. For each turtle we measured the following morhpological variables to the nearest mm using metric tree calipers: carapace length (CL), carapace width (CW), plastron length (PL), and shell height (SH). We also measured the left pectoral scute (LPECT) and each scute ring on LPECT (from the pectoral-abdominal seam to the end of the ring on pectoral scute) to the nearest 0.01 mm using metric vernier calipers. We also measured maximum anterior plastral lobe width (APW) and maximum posterior lobe width (PPW) with digital calipers to the nearest 0.01 mm, front and rear angle of the carapace at the midline (FA and RA respectively) and side angle of the carapace between the 2^{nd} and 3^{rd} vertebral scutes (SA) with a goniometer to the nearest degree, and curved carapace length (CCL) and curved carapace width (CCW) between the 2^{nd} and 3^{rd} vertebral scute with a flexible tape to the nearest mm. We weighed all turtles less than 5 kg to the nearest gram using OHAUS electronic scales and turtles larger than 5 kg were measured to the nearest 100g on a Pesola pull spring scale (typically large *Chelydra serpentina*).

We palpated the inguinal pockets of all females to determine their reproductive condition. We partitioned individuals of each species into three sex categories; males, females, and unknown. Males were identified by having the combination of elongated fore-claws and cloacal vent extension beyond the posterior carapace margin. Females were identified by the lack of male secondary sexual characteristics while exceeding the plastral length of the smallest male. A subset of turtles (and all *E. blandingii*) was held overnight in buckets with tepid water to collect feces. Fecal samples were then preserved in 70% EtOH and their contents identified later in the lab.

We took blood samples from the cervical sinus from the majority of turtles for future DNA analysis. We took no more than 0.1 cc per 100 grams of turtle mass. Additionally, shell notches from all *E. blandingii* were preserved in 100 EtOH. All samples will be stored at the INHS in a -80°C freezer.

DATA ANALYSIS

Population Size, Density, and Biomass. – We estimated population size for all species with a sufficient enough recapture rate using the Schumacher-Eschmeyer regression method. For species without sufficient recaptures, we based population size on the abundance of the species in the community. We calculated relative abundance of each turtle species by the following relational formula:

$$PS_2 = (RA_2PS_1)/RA_1$$

Where PS_2 is the population size of the species in question, RA_2 is the relative abundance of the species in question, PS_1 is the best population size estimate of a second species, and RA_1 is the relative abundance of that second species in the community (Dreslik *et al.* in press). This relationship assumes that sampling was adequate and that the species are captured in proportion to their actual population size. Density was calculated by dividing the estimated population size by the wetland area sampled in hectares. Biomass was calculated by taking the mean body weight multiplied by the population size and divided by the wetland area studied.

Population Structure. – We partitioned all turtles of a given species into 10 mm size classes by sex/stage for graphical representation and also partitioned them into relative age classes when age could be determined. We calculated both, adult sex ratios and juvenile to adult ratios for all species with sufficient representation. We determined if ratios deviated from equality using Chi-square tests.

Morphometry. – To examine morphometric variation we regressed all variables versus PL. We linearized all variables using natural logarithms then conducted a MANOVA for all species with sufficient data to determine sexual dimorphism with respect to size. To determine sexual dimorphism with respect to shape, we first had to remove variability associated with size. We accomplished this by using the residuals of the regression relationships for all variables versus PL. Next, a PCA for all species to was conducted to determine if variable reduction was required. If the KMO score was greater than 0.500 we used the extracted PC scores as the variables. Finally, with size removed as a factor and the variables sufficiently reduced to prevent colliniearity, we then used a MANOVA on the retained PC scores.

Growth. – We used scute rings to age turtles and a modification of Sexton's method (Sexton, 1959) to align scute rings when age zero was not present. The modification followed as such, 99.5% confidence intervals were calculated for each ring from the set of turtles with age zero present. We then took the set of turtles that lacked ring 0 but had measurements for ring 1 that fell within the 99.5% C.I. of the full ring set and added them to the full ring set. We then recalculated 99.5% C.I. and repeated this process until all turtles with rings could be aligned. We chose the von Bertalanffy known age growth model because it is robust for describing the growth pattern of numerous turtle species. We then used nonlinear regression to fit PLs by freely estimating all parameters. Finally, we tested the parameters of the model between sexes using a t-test (Zar, 1996).

Dietary Composition. – All fecal samples were sorted and examined under a microscope. Items were scored as belonging to algae, seeds vascular plant material, detritus, Crustacea, Mollusca, Arachnida, Insecta, Hirudina, Bryozoa, Pisces, and unidentifiable matter and dietary items were identified to the lowest taxonomic unit where possible. We then calculated the percent occurrence of a dietary item with respect to the number of fecal samples present and the relative abundance of the dietary items with respect to the number of categories present. We determined if dietary categories were consumed out of equality using Chi-square tests.

Community Parameters. – We calculated relative abundance as the proportion a turtle species was given the entire sample of turtles. Using the relative abundance we calculated the Shannon diversity index and eveness for the turtle community based on the relative abundance of each species. We compared the LPNP turtle community to other turtle communities from Illinois and other marsh type communities using Horn's simplification of the Morisita index of similarity (Horn, 1966). We calculated the dietary niche also using the Shannon index and eveness. Finally, dietary overlap between the *C. picta, E. blandingii,* and *S. odoratus* was examined using Horn's simplification of the Morisita index of similarity (Horn, 1966).

RESULTS

TRAPPING

We trapped the north unit of LPNP for approximately 26,500 trap hours yielding 550 total captures at a rate of one turtle per 47.6 trap hours (Figure 1; Table 1). The East Pond was the most intensively trapped with approximately 13,600 trap hours and we made 479 total captures there at a rate of one turtle every 28.5 hrs (Figure 1; Table 1). Trapping effort was second most intensive in the Middle Pond with approximately 8,300 hrs and 56 total captures at a rate of one turtle every 149.5 hrs (Figure 1; Table 1). We trapped the West Marsh for approximately 3,800 hours and made 14 total captures there at a rate of 1 turtle every 272.4 hrs (Figure 1; Table 1). Trapping effort at the Bulrush Pond and North ORV trail pools was approximately 677 hrs and we made one turtle capture in the North ORV trail pools (Figure 1; Table 1).

Overall, we captured male turtles of all species at a rate of one per 98.5 hrs, female turtles at a rate of one per 118.8 hrs, and juvenile turtles at a rate of one per 456.9 hrs (Table 2). The most frequently captured turtle was *C. picta* at an overall rate of one per 79.8 hrs with one male, female, and juvenile, respectively, per 148.9, 217.2, and 828.1 hrs (Table 2). We captured *C. serpentina* at a rate of one per 208.7 hrs with one male, female, and juvenile, respectively, per 473.2, 509.6, and 1,394.7 hrs (Table 2). We captured *S. odoratus* at a rate of one per 519.6 hrs withne male, female, and juvenile, respectively, per 1,261.8, 913.7, and 26,498.7 hrs (Table 2). We captured *E. blandingii* at a rate of one per 828.1 hrs with one male, female, and juvenile, respectively, per 2,944.3, 1,558.7, and 4,416.5 hrs (Table 2). We captured *T. scripta* at a rate of one per 3,785.5 hrs and one male and female respectively, per 5,299.7 and 13,249.4 hrs (Table 2). We captured only one *A. spinifera* female in the East Pond and made an incidental capture of a *C. guttata* crossing Division Street.

Fyke nets consistently captured more turtles per day compared to hoop traps (Figure 2). All captures of turtles were higher within the first week of study from 29 June 200 to 6 July 2004 (Figure 2). The number of total captures decreased thereafter throughout the remainder of the study but appeared to stabilize between 10 – 15 captures per day (Figure 1). Fyke nets showed the most appreciable decline in capture rates; whereas hoop traps captures fluctuated around 10 turtles per day (Figure 2). The majority of the captures in fyke nets were *C. picta* and *C. serpentina* and both species were initially captured in large number (Figure 3). However, only captures of *C. picta* appeared to affect the decreasing trend in capture rates of fyke nets (Figure 3). Captures of *C. serpentina* and *S. odoratus* in fyke nets appeared rather stable around 8 and 4 captures per day respectively (Figure 3). Captures of other species were sporadic in fyke nets (Figure 3). Captures of *C. picta* in hoop traps followed two definite pulses during the study peaking at 11 and 10 individuals per day, but declined steadily to around 2 captures per day after 18 July 2004 (Figure 4). Captures of *S. odoratus* were also pulsed with multiple peaks at a maximum of seven individuals per day (Figure 4). There was no regular pattern of capture for other species; however, the majority of *E. blandingii* captures were made in hoop traps (Figure 4).

CHRYSEMYS PICTA

Population Size, Density, and Biomass. – We made 332 captures of *C. picta* from the East Pond, Middle Pond, and West Marsh (293 initial captures and 43 recaptures). Thus, the population estimate for these three wetlands is 935 *C. picta* (95% C.I. - 793,1139). The density of *C. picta* in these three wetlands is estimated at 301 turtles /ha with a biomass of 75.9kg/ha. Because we had the greatest recapture rate for *C. picta*, we used it to calculate the population sizes of the remaining species.

Population Structure. – The majority of *C. picta* captured fell between two modes, one centered on 90 mm PL and one centered on 120 mm PL (Figure 5). We captured 142 males and 118 females for a M:F sex ratio of 1.2:1. The sex ratio was not significantly different from equality (Chi-square = 2.22, df = 1, $p = 0.14$). Overall we captured 182 adults, 75 immature, 34 juveniles, and one hatchling for an adult: immature ratio of 1.65:1. This ratio was significantly skewed toward adult turtles (Chi-square = 43.4, df = 1, $p < 0.001$).

Morphometry and Sexual Size Dimorphism. – Mean sizes for adult females were greater than those than for adult males (Table 3). Sexable immature turtles began to show similar patterns as the adults, with females being larger than males (Table 3). Juveniles ranged in size from 52.8 – 75 mm PL and 33.9 – 78 g in mass (Table 3). We captured one hatchling during the study that was 33.8 mm PL and weighed 12.3 g (Table 3).

All morphometric regressions were significant (Table 4). For the PLxCL relationships, both females and males exhibited isometry (Table 4, Figure 6). For the PLxCW relationships, females and males shared the exact rate of change (Table 4, Figure 6). For the PLxSH relationships, females increased in height relative to PL at a faster rate than males, but the rate was nearly isometric for both sexes (Table 4, Figure 6). For the PLxMass relationships, both sexes increased at a rate of approximately 1/3 isometric, but females increased in mass at a faster rate than males (Table 4, Figure 6). For the CLxCW relationships, both sexes increase at near isometry but females increased in width at a greater rate than males (Table 4, Figure 6). For the CLxSH relationships, both sexes increased at a nearly isometric rate, but females increased at a greater rate than males (Table 4, Figure 11). For the CLxMass relationships, results are similar to those of PLxMass (Table 4, Figure 6). For the CWxSH relationships, females increased at a rate greater than isometry and at a rate more than double that of males (Table 4, Figure 6). For the CWxMass relationships, both sexes increased at a nearly identical rate, approximately 1/3 isometric (Table 4, Figure 6). For the SHxMass relationships, both sexes increased at a rate approximately 1/3 isometric, but females increased at a faster rate than males (Table 4, Figure 6).

The multivariate model for all natural log transformed variables between sexes was significant (Wilk's lambda = 0.52, $F_{12,245} = 18.73, p < 0.001$). All variables measured were significantly different between the sexes with females being larger than males (Table 5). For most measurements, females were larger than males by approximately 12 – 15% (Table 5). After using the residuals from the linear regression versus PL, the KMO score for PCA was 0.56 suggesting that some variable reduction was warranted. Seven principle components greater than 0.90 were retained that totaled 77.1% of the variation in the residuals (Table 6). Of the PC's retained, *C. picta* was only sexually dimorphic in shape with respect to PCs 1, 2, 3, and 6 differed between sexes (Table 7). Thus sexual dimorphism in *C. picta* is reflective in size and some shape parameters.

Growth Rates. – We were only able to analyze growth for *C. picta* and were able to age 68 females and 71 males by using both, individuals with complete sets of rings and individuals that were aligned. Males are estimated to attain an *A* of 103 mm PL (95% C.I. – 91.8, 114.3), have a *k* of 0.4851 yr^{-1} (95% C.I. – 0.2078, 0.7630), and have a *b* of 0.619% (95% C. I. – 0.498, 0.741). Females are estimated to attain an *A* of 146 mm PL (95% C.I. – 102.7, 189.7), have a *k* of 0.2228 yr^{-1} (95% C.I. – 0.1934, 0.2078), and have a *b* of 0.704% (95% C. I. – 0.609, 0.799). Females grew to larger sizes ($A - t_{0.05,131} = 49.7, p > 0.001$; Figure 7) and had more post hatching growth remaining ($b - t_{0.05,131} = 29.0, p > 0.001$; Figure 7) compared to males, whereas males grew at a faster rate than females ($k - t_{0.05,131} = 38.9, p > 0.001$; Figure 7).

Dietary Composition. – Algae was found in every fecal sample of *C. picta* we took (Tables 8, 9; Figure 8). Overall, algae accounted for 19% of the diet and were predominantly *Cladophora*, but some individuals consumed *Oedogonium, Chara,* and other unidentifiable algal material (Tables 8, 9; Figure 8). Seeds were present in 16.0% of the samples and comprised 3% of the total diet (Tables 8, 9; Figure 8). Vascular plants accounted for 18% of the diet and were represented in 92% of the samples (Tables 8, 9; Figure 8). Insects were the second most abundant dietary item being represented in 72% of the samples and accounted for 14% of the total diet (Tables 8, 9; Figure 8). The majority of insects that were consumed were larval Odonates, but Tricopterans, Coleopterans, Hemipterans, Dipterans, and Ephemeropterans were also consumed at lesser frequencies (Table 8). Molluscs, predominately of the gastropod families Physidae, Planorbidae, and Lymnaeidae, were represented in 28% of the samples and were rughly 5% of the total diet (Tables 8, 9; Figure 8). Although Hirudina were present in the 64% of the samples, we removed them from further analysis because of the difficulty in determining if the leeches were consumed by or removed from the turtle (Table 8). Fish were present in 20% of the samples and comprised 4% of the total diet (Tables 8, 9; Figure 8). Finally, Bryozoans were present in only one sample and represented 1% of the total diet (Tables 8, 9; Figure 8).

There was significantly more algae (Chi-square = 16.3, df = 7, $p < 0.001$), insects (Chi-square = 3.86, df = 7, $p = 0.049$), and vascular plant material (Chi-square = 11.9, df = 7, $p < 0.001$) consumed than expected. Also, *C. picta* consumed fewer crustaceans (Chi-square = 11.4, df = 7, $p < 0.001$) and seeds (Chi-square = 4.78, df = 7, $p = 0.029$) than expected. However, detritus

(Chi-square = 0.50, df = 7, p = 0.481), molluscs (Chi-square = 1.68, df = 7, p = 0.195), and fish (Chi-square = 3.57, df = 7, p = 0.059) were all consumed in expected proportions.

CHELYDRA SERPENTINA

Population Size, Density, and Biomass. – We made 127 captures of *C. serpentina* from the East Pond, Middle Pond, and West Marsh (98 initial captures and 31 recaptures). Thus, the population estimate for these three wetlands is 180 *C. serpentina* (95% C.I. - 133, 280). The density of *C. serpentina* in these three wetlands is estimated at 58 turtles /ha with a biomass of 185.3 kg/ha. Because the population estimate for *C. serpentina* was also possible using the Schumacher-Eschemyer formula, we retained it rather than calculating it based on relative abundance.

Population Structure. – The majority of *C. serpentina* fell around one mode centered at 180 mm PL (Figure 9). We captured 41 males and 42 females for a M:F sex ratio of 0.98:1. The sex ratio was not significantly different from equality (Chi-square = 0.01, df = 1, p = 0.91). Overall, we captured 42 adult, 41 immature, and 16 juvenile turtles for an adult: immature ratio of 0.73:1. This ratio was not significantly different from equality (Chi-square = 2.60, df = 1, p = 0.11).

Morphometry and Sexual Size Dimorphism. – Mean sizes for adult males were greater than those than for adult females (Table 10). Sexable immature turtles did not show the same pattern as the adults and were of similar sizes (Table 10). Juveniles range in size from 47.0 – 128.0 mm PL and 53 – 1122 g in mass (Table 10). We captured one hatchling during the study that was 26.5 mm PL and weighed 14.4 g (Table 10).

All morphometric regressions were significant (Table 11). For the PLxCL relationships, females increased at a greater rate than males and both were close to isometry (Table 11; Figure 10). For the PLxCW relationships, males widened at a faster rate than females and both slopes were close to isometry (Table 11; Figure 10). For the PLxSH relationships, both sexes increased at a rate 2/3 isometric (Table 11; Figure 10). For the PLxMass relationships, both sexes increased at a rate of approximately 1/3 isometric, but males increased in mass at a faster rate than females (Table 11; Figure 10). For the CLxCW relationships both sexes increased near isometry, but males widened at a greater rate than females (Table 11; Figure 10). For the CLxSH relationships, both sexes increased at a rate 2/3 isometric (Table 11; Figure 10). For the CLxMass relationships, results are similar to those of PLxMass (Table 11; Figure 10). For the CWxSH relationships, females increased at a rate greater rate than males (Table 11; Figure 10). For the CWxMass relationships, both sexes increased at nearly identical rates, approximately 1/3 isometric (Table 11; Figure 10). For the SHxMass relationships, both sexes increased at a rate approximately 1/4 isometric, but females increased at a faster rate than males (Table 11; Figure 10).

The multivariate model for all natural log transformed variables between sexes was significant (Wilk's lambda = 0.79, $F_{5,63}$ = 3.36, p = 0.009). All variables measured were significantly different between the sexes with females being larger than males (Table 12). For most measurements, males were larger than females by approximately 10% (Table 12). After using the residuals from the linear regression versus PL, the KMO score for PCA was 0.84 suggesting that variable reduction was warranted. One principle component was retained that explained 80.7% of the total variance. Factor loadings of the residuals are PLxCL – 0.90, PLxCW – 0.92, PLxSH – 0.84, and PLxMass – 0.93. Sexual dimorphism in *C. serpentina* is restricted to size not shape (F = 0.03, df = 67, $p = 0.09$).

STERNOTHERUS ODORATUS

Population Size, Density, and Biomass. – We made 51 captures of *S. odoratus* from the East Pond (51 initial captures and 3 recaptures). Because there were too few recaptures to obtain a reliable population estimate, we estimated their population size based on their relative abundance. Thus, the population estimate was 168 *S. odoratus* with a density of 58 turtles /ha and a biomass of 10.1 kg/ha.

Population Structure. – The majority of *S. odoratus* fell around one mode centered at 80 mm PL (Figure 11). We captured 16 males and 34 females for a M:F sex ratio of 0.47:1. The sex ratio was significantly biased toward females (Chi-square = 6.48, df = 1, $p = 0.01$). Overall, we captured 42 adult, 8 immature, and one juvenile turtles for an adult: immature ratio of 4.7:1. This ratio was significantly biased toward adult turtles (Chi-square = 22.7, df = 1, $p < 0.001$).

Morphometry and Sexual Size Dimorphism. – Mean sizes for adult females were greater than those than for adult males (Table 13). However, we only captured 16 adult males and only one juvenile so further comparisons cannot be made (Table 13).

All morphometric regressions were significant (Table 14). For the PLxCL relationships, both sexes increased in isometry (Table 14; Figure 12). For the PLxCW relationships, males widened at a faster rate than females and both slopes were nearly isometric (Table 14; Figure 12). For the PLxSH relationships, males increased at a greater rate than females (Table 14; Figure 12). For the PLxMass relationships, both sexes increased at a rate of approximately 1/3 isometric (Table 14; Figure 12). For the CLxCW relationships, males widened at a faster rate than females (Table 14; Figure 12). For the CLxSH relationships, both sexes increased at an isometric rate (Table 14; Figure 12). For the CLxMass relationships, results are similar to those of PLxMass (Table 14; Figure 12). For the CWxSH relationships, males widened at a faster rate than females, but both sexes increased near isometric (Table 14; Figure 12). For the CWxMass relationships, both sexes increased approximately 1/3 isometry (Table 14; Figure 12). For the SHxMass relationships, both sexes increased at a rate approximately 1/3 isometric, but females increased at a faster rate than males (Table 14; Figure 12).

The multivariate model for all natural log transformed variables between sexes was significant (Wilk's lambda = 0.306, $F_{12,37} = 6.98$, $p < 0.001$). Only PL. CW. SH, Mass APW, PPW, DL, and SA differed between the sexes (Table 15). For those measurements, females were approximately 10% larger than males (Table 15). After using the residuals from the linear regression versus PL, the KMO score for PCA was 0.68 suggesting that variable reduction was warranted. Five principle components were retained, which in sum, explained 78.1% of the total variance (Table 16). Factor one explained the variation in shape of the carapace by being associated with CL, CW, SH, DL, and CCL as well as mass (Table 16). Factor two reflects the variation in plastral shape and was associated with APW and PPW (Table 16). Factor three associated with SA; whereas factor four explained FA (Table 16). Finally factor five explained the second most amount of variation in DL (Table 16). Sexual dimorphism in shape was present in *S. odoratus* (Wilk's lambda = 0.67, $F_{5,44} = 4.29$, $p = 0.003$). Only factor one, which was associated with carapacial shape, differed between males and females (Table 17).

Dietary Composition. – Algae were found in every sample of *S. odoratus* (Tables 8,9; Figure 13). Overall algae accounted for 18% of the diet and were predominantly *Cladophora* and *Oedogonium* but some individuals consumed *Chara,* and other unidentifiable algal material (Tables 8,9; Figure 13). Seeds were present in 26.7% of the samples and comprised 4% of the total diet (Tables 8,9; Figure 13). Vascular plants accounted for 12% of the diet and were represented in 77.8% of the samples (Tables 8,9; Figure 13). Insects were represented in 55.6% of the samples and accounted for 10% of the total diet (Tables 8,9; Figure 13). The majority of insects that were consumed were larval Odonates (Table 8). Molluscs, predominately of the gastropod families Physidae, Planorbidae, and Lymnaeidae, were represented in 73.3% of the samples comprised 13% of the total diet (Tables 8,9; Figure 13). Fish were present in 51.1% of the samples and comprised 9% of the total diet (Tables 8,9; Figure 13). Finally, Bryozoans were present in 20% of the samples and represented 4% of the total diet (Tables 8,9; Figure 13).

There was significantly more algae (Chi-square = 17.2, df = 7, $p < 0.001$) and vascular plant material (Chi-square = 4.5, df = 7, $p = 0.034$) consumed than expected. Also, *S. odoratus* consumed fewer crustaceans (Chi-square = 17.2, df = 7, $p < 0.001$) and seeds (Chi-square = 6.38, df = 7, $p = 0.012$) than expected. However detritus (Chi-square = 1.23, df = 7, $p = 0.267$), insects (Chi-square = 0.01, df = 7, $p = 0.920$), molluscs (Chi-square = 2.94, df = 7, $p = 0.086$), and fish (Chi-square = 0.09, df = 7, $p = 0.762$) were all consumed in expected proportions.

EMYS BLANDINGII

Population Size, Density, and Biomass. – We made 35 captures of *E. blandingii* from the East Pond, Middle Pond, and West Marsh (21 initial captures and 14 recaptures). One capture was a hand capture made from the North ORV trail pools on 22 June 2004 during a site visit. Because there were too few recaptures to obtain a reliable population estimate, we estimated their population size based on their relative abundance. Thus, the population estimate was 69 *E. blandingii* with a density of 22 turtles /ha and a biomass of 20.6 kg/ha.

Population Structure. – The majority of *E. blandingii* fell around two modes, one centered at 120 mm PL and one centered around 190 mm PL (Figure 14). We captured 13 females and 5 males for a M:F sex ratio of 0.38:1. The sex ratio was not significantly different from equality (Chi-square = 3.56, df = 1, $p = 0.06$). Overall we captured 16 adult, 3 immature, and 2 juvenile turtles for an adult: immature ratio of 3.2:1. This ratio was significantly biased toward adult turtles (Chi-square = 8.23, df = 1, $p = 0.004$).

Morphometry and Sexual Size Dimorphism. – Adult males and females were of similar sizes and the ranges broadly overlapped (Table 18). However, we captured very few individuals so a detailed analysis of morphology and sexual size dimorphism could not be completed.

Dietary Composition. – Algae were found in 84.2% of the *E. blandingii* samples (Tables 8,9; Figure 15). Overall, algae accounted for 14% of the diet and were predominantly *Cladophora* and *Oedogonium* but some individuals consumed *Chara,* and other unidentifiable algal material (Tables 8,9; Figure 15). Seeds were present in 15.8% of the samples and comprised 3% of the total diet (Tables 8,9; Figure 15). Vascular plants accounted for 15% of the diet and were represented in 94.7% of the samples (Tables 8,9; Figure 15). Insects were represented in 78.9% of the samples and accounted for 13% of the total diet (Tables 8,9; Figure 15). The majority of insects that were consumed were larval Odonates; however Tricopterans, Coleopterans, Hemipterans, Dipterans, and Ephemeropterans were also consumed at lesser frequencies (Tables 8). Molluscs, predominately of the gastropod families Physidae, Planorbidae, and Lymnaeidae, were represented in 57.9% of the samples and were 9% of the total diet (Tables 8,9; Figure 15). Fish were present in 36.8% of the samples and comprised 6% of the total diet (Tables 8,9; Figure 15).

There was significantly more individuals having vascular plant material (Chi-square = 5.86, df = 7, $p = 0.034$) in their feces than expected. Also, *E. blandingii* consumed fewer crustaceans (Chi-square = 5.13, df = 7, $p = 0.024$) and seeds (Chi-square = 5.13, df = 7, $p = 0.024$) than expected. However algae (Chi-square = 3.23, df = 7, $p = 0.072$), detritus (Chi-square = 0.15, df = 7, $p = 0.696$), insects (Chi-square = 2.20, df = 7, $p = 0.138$), molluscs (Chi-square = 0.05, df = 7, $p = 0.815$), and fish (Chi-square = 1.03, df = 7, $p = 0.310$) were all consumed in expected proportions.

TRACHEMYS SCRIPTA

During this study we captured six individual *T. scripta*. Because there were too few recaptures to obtain a reliable population estimate, we estimated their population size based on their relative abundance. Thus, the population estimate would be 20 *T. scripta* with a density of 6 turtles /ha and a biomass of 3.8 kg/ha. Two were females, an adult and immature. The adult female measured 194 mm PL, 206 mm CL, 156 mm CW, 84 mm SH, and weighed 1,212 g. The immature female measured 103 mm PL, 112 mm CL, 94 mm CW, 41 mm SH, and weighed 219g. We captured four adult males which averaged in size of 145.3 mm PL (118 -167), 159.5 mm CL (129 – 183), 123 mm CW (101 – 136), 58 mm SH (48 – 65), and weighed 528.8 g (298 – 774). All captures were made in the east pond.

APALONE SPINIFERA

On 11 July 2004 we captured a large female *A. spinifera* in the east pond in the fyke net assembly in the eastern cove. Because there were too few recaptures to obtain a reliable population estimate, we estimated their population size based on their relative abundance. Thus, the population estimate would be 3 *A. spinifera* with a density of 1 turtle/ha and a biomass of 4.2 kg/ha. This large female measured 348 mm CL, 279 mm CW, 87 mm SH, and 258 mm PL, and weighed 4000g. The turtle was notched at the 1:00 position and we attached a red spaghetti tag to the rear of the carapace. We released the turtle the same day into the large pond.

CLEMMYS GUTTATA

On 14 July 2004 we captured an immature female *C. guttata* heading south across Division Street away from the East Pond. The female measured 88 mm CL, 71 mm CW, 37 mm SH, 80mm PL, and weighed 107 grams. Seven rings were present on the left pectoral scute when including the areola. The rings measured 4.72, 8.74, 10.26, 11.18, 12.76, 14.33, and 15.20 mm respectively. The turtle was notched 02L-09L-10R by D. Mauger and we attached a small thread package in attempt to get some baseline movement. The outfitted turtle was released into the south unit the next day. However, when we checked the thread trail on 16 July 2004, it had broken at a short distance from its release point.

COMMUNITY PARAMETERS

Species Richness, Diversity, and Eveness. – Overall we captured seven species, *Apalone spinifera, Chelydra serpentina, Chrysemys picta, Clemmys guttata, Emys blandingii, Sternotherus odoratus,* and *Trachemys scripta.* The two most dominant turtles in the community were *C. picta* and *C. serpentina; whereas, S. odoratus* and *E. blandingii* occurred at roughly ten percent of the pond community (Figure 16). Finally, the rarest species in the pond community were *T. scripta, C. guttata,* and *A. spinifera* (Figure 16). When we considered all captures, species diversity is 1.11 and eveness is 0.569. Although the community has numerous species, it is dominated by one species (*C. picta*). The results are similar if we only use the number of individuals we captured (Diversity = 1.08, Eveness = 0.557). The rareifaction curve shows that the community becomes adequately sampled with only 200 turtle captures (Figure 17).

Community Similarity. – The relative abundance of turtles in the Lockport Prairie ponds shows the greatest similarity with another marsh community in Michigan ($C_h = 0.493$) but also shares some surprising similarity with southern Illinois lakes and ponds ($C_h = 0.266$), Mississippi River ($C_h = 0.329$), and Illinois River ($C_h = 0.298$) communities. The abundance structure was however dissimilar from Wabash River ($C_h = 0.074$) and Missouri River communities (Ch = 0.048). Similarity with both marsh communities and some riverine communities is not surprising because the ponds are located on the floodplain next to the main channel of the Des Plaines River.

We further compared the density structure of LPNP ponds with other community studies that provided density and biomass estimates. There was moderate similarity between the density structure of LPNP ponds and three communities sampled on the E.S. George Reserve, Michigan. The greatest similarity was between LPNP and the George and Burt ponds ($C_h = 0.323$) followed by the Southwest Reserve ($C_h = 0.297$), and the West Marsh ($C_h = 0.159$). However, there was greater similarity in the biomass structure between LPNP ponds and George and Burt ponds ($C_h = 0.493$) followed by the Southwest Reserve ($C_h = 0.493$), and the West Marsh ($C_h = 0.499$). Finally, when compared to another riverine-lacustrine ecotonal community in Illinois (Round Pond, Gallatin County), there was marked dismilarity in the density structure ($C_h = 0.016$) but more similarity in the biomass structure ($C_h = 0.284$).

Dietary Niche. – All three species had very diverse and even diets. The diet of *S. odoratus* was the most diverse and even (H = 2.17, J' = 0.940) followed by *E. blandingii* (H = 2.16, J' =

0.944), then *C. picta* (H = 2.04, J' = 0.884). When analyzed by major prey category, all three species broadly overlapped in their dietary preferences (*C. picta* - *S. odoratus* C_h = 0.938; *C. picta* - *E. blandingii* C_h = 0.973; *S. odoratus* - *E. blandingii* C_h = 0.971). Thus, there appears to be no major dietary partitioning among the three species across our dietary classification.

DISCUSSION

TRAPPING

Because no one capture method can effectively sample all sizes, sexes, and species of turtles (Ream and Ream, 1966), we opted to use a combination of hoop traps and fyke nets. Active methods such as the baited hoop traps have long proved useful in readily capturing large numbers of turtles (Legler, 1960) but the sizes and species strongly depend upon the bait type used, the age of the bait, and the microhabitat location of the trap (Graham, 1979). In an attempt to catch smaller turtles we tried using minnow traps in shallow water habitat, however, we captured no turtles with these traps suggesting that juvenile turtles by this time may have grown to large for the opening or possibly were lacking in the area(s) the traps were used. We concentrated our minnow trapping in the shallow water in the large *Chara* beds in the middle of the ponds. What is needed is sampling with these smaller traps throughout the shallower waters and potentially earlier in the active season if growth rates are the concern. Finally, for passive methods of capture we used fyke nets (Vogt, 1980). These nets, when placed appropriately can catch large numbers of turtles (Dreslik, 1997 (1998)), Dreslik *et al. in press*). For example, the large fyke net that intercepted movements in the east pond to the eastern cove accounted for over 70% of the captures.

Trapping efficiency steadily decreased over the duration of the session. This result could be due to two factors; avoidance of turtles to the traps and trapping locations or a shift in the activity levels of the turtles. Neither conclusion is mutually exclusive. It is possible that the constant trapping we employed deterred captured turtles from actively moving in these habitats and hindered our recapture rate. However, we know of no study or method for partitioning such a source of error. We can only suggest to minimize such error that there should be a cessation period between such trapping sessions to allow turtles to return to their normal activity for nets that impede movement (fyke nets) and the rotation of baited traps. Secondly, what we may have observed was a natural quiescence in the activity levels of turtles with warmer weather. Our trapping session ended when summer temperatures were increasing. Foraging activity decreases in *C. picta* during warmer periods (Bury, 1979).

Although trapping was intense in the middle and east pond's, more effort needs to be exerted in the west marsh complex and some of the smaller isolated wetlands within the N-ORV Trails Unit, including the bulrush pond. Although these wetlands are ephemeral they still may constitute an important habitat for all species by serving as refugia during overland movements. These areas may also provide habitat for hatchlings and young juveniles.

CHRYSEMYS PICTA

Population Size, Density, and Biomass. – Our findings of a density and biomass of 301 turtls/ha and 75.9 kg/ha, respectively, are consistent with other published literature on the population sizes of the species. Where studied, *C. picta* occurs at high densities. In pond-marsh habitats, *C. picta* can attain large densities such as in Pennsylvania at 590 turtles/ha (Ernst, 1971) and Michigan at 410 turtles/ha and 838 turtles/ha (Sexton, 1959; Frazer et al., 1991). In other habitats such as oxbow lakes, *C. picta* have been reported at densities ranging from 160 – 333 turtle/ha (McAuliffe, 1978). Thus when present in a turtle community, *C. picta* usually dominates. Although *C. picta* are small turtles in comparison to *Chelydra, Emys, Pseudemys, Trachemys,* and *Apalone*, they represent a significant portion of the ecosystem's biomass because they occur at large densities. Biomasses ranging from 106.4 kg/ha to 7.2 kg/ha have been reported for marsh habitats (Iverson, 1982b; Congdon et al., 1986); whereas, biomasses of 28.3 kg/ha and 23.5 kg/ha haven reported for ponds (Mitchell, 1988; Zweifel, 1989).

Population Structure. – The two modes appear close to the reported sizes of sexual maturity for each sex. Male painted turtles have been reported to become sexually mature at sizes ranging from 70 – 95 mm PL; whereas females mature at 97 – 128 mm PL (Ernst et al., 1994a). Although the two modes do not exclusively include adult males and females respectively, adult turtles of these sexes comprise a large portion of the size classes at the modes. Ageing turtles based on size is extremely difficult because age classes broadly overlap with size. Finally, although we have captured numerous turtles under 90 mm PL, there is still lack of smaller turtles below 70 mm PL. Again, this may be indicative of the natural population where turtles at these size classes grow rapidly and thus spend little time at that size or it may represent a bias in our sampling regime.

We found that the sex ratios were in equality. Although several studies have found that sex ratios are not skewed, there are some short-term fluctuations (Ernst et al., 1994b). For example, if females were on nesting forays during the trapping session and were unavailable for capture or during the mating season when males may become more active in search of mates. Nevertheless, few studies report an actual bias in sex ratios (Ernst, 1972; Gibbons and Lovich, 1990). This is not to say biases in natural populations do not occur. In most cases, skewed sex ratios can be directly tied to biases in the sampling regime. In extreme situations, road mortality may be a source of biased sex ratios. In a study of turtle populations in Florida, sex ratios were biased toward males in a lake adjacent to a highway (Aresco, 2005). The demography of these turtle populations were severely altered because females making nesting forays were often killed by automobiles (Aresco, 2005).

In many populations of freshwater turtles, adult to juvenile ratios are severely skewed toward adults. Although the juvenile-adult ratio of 1:1.7 is skewed toward adults, we did capture a large number of smaller turtles with our sampling. Our result is similar to other populations of *C. picta*. For example, populations studied in Illinois, Michigan, Pennsylvania, and Virginia had juvenile to adult ratios ranging from 1:1.0 – 1.6 (Cagle, 1942; Gibbons, 1968b; Ernst, 1971; Mitchell, 1988; Zak, 2003). In *C. picta* populations the ratio of juveniles to adults runs the gamut from biased toward juveniles to greatly biased toward adults. There are populations in Illinois, Michigan, and New York biased toward juveniles at 1:0.5 – 0.8 (Wilbur, 1975; Zweifel, 1989); whereas other populations in Michigan, New York, Quebec, Saskatchewan, and Wisconsin are heavily biased toward adults at 1:3.0 – 9.4 (Ream and Ream, 1966; Bider and Hoek, 1971; McKenzie and Bayless, 1975; MacCulloch and Secoy, 1983). Finally, there are populations that appear to be equally represented by juveniles and adults in two Illinois populations (Cagle, 1954) which had ratios of 1:0.7-1.0. It is plausible for a population to be skewed toward adults because of high mortality pressures on juveniles (Bury, 1979). In many cases, skewed ratios are attributable to biases inherent in the sampling regime precluding the capture of smaller individuals (Ream and Ream, 1966). More trap effort earlier in the season with smaller traps in shallower habitats in addition with hand searches should provide better answers as to the abundance of juveniles.

Morphometry and Sexual Size Dimorphism. – Females of many freshwater emydid species are larger than males and this trend is exaggerated in species of *Graptemys* (Ernst et al., 1994b). This is also true of *C. picta* (Gibbons and Lovich, 1990), although the magnitude of the difference between the sexes is not as great. In *C. picta* females are generally 1.1 to 1.5 times larger than males (Gibbons and Lovich, 1990). All size variables we examined were dimorphic females generally being 12 – 15% larger than males.

Most allometric comparisons isometrically increased for both sexes. The exceptions are the relationships between length to height and width to height. This suggests that relative to males, females increased carapace height which consequentially increases their internal shell volume. Thus, morphologically, it is apparent that males become more fusiform in shape whereas females become more domed. Also, females gained mass relative to size at a more rapid rate than males. Variation in shell morphology also varies across populations. In Nebraska, a population possessed individuals that were distinctly wider compared to other populations (Rowe, 1997).

We also found some degree of shape dimorphism between the sexes. The angular measurements of the carapace revealed that females had higher arched carapaces whereas males were compositely flatter. This result is similar to those found for *Clemmys muhenbergi* and *Rhinoclemmys diademata* (Ernst and Barbour, 1972; Pritchard and Trebbau, 1984). Also in females, the rear shell was wider and more arched, the curvature of the carapace was greater, and the front of the shell was more arched when compared to males. For turtles that swim mid-column it would be adaptive to reduce resistance during locomotion, hence a fusiform body form (Mosimann, 1958). Considering copulatory success, a relatively shorter plastron may be adaptive in that it allows greater mobility of the tail and hence better placement of the penes during sexual apposition. Evidence from our data and others (Mosimann, 1958; Jolicoeur and Mosimann, 1960; Moll and Legler, 1971; Witzell, 1980; Meek, 1982; Long, 1984; Rowe, 1997) enables us to examine three-dimensionality in the growth of the chelonian shell. Since Mosimann (1958) and Long (1984) found strong correlations and relationships between volume and other size variables, the use of volume may aid in further explaining ecological and life history aspects.

Our results show males become more fusiform than females, whereas females become more domed. This suggests that some selective pressure on a reduction in fusiformity is focusing on females. Do females show an increase in egg number or egg size with an increase in maternal shell volume? Previous studies showed that egg size in turtles may be constrained by the pelvic canal aperture (Tucker et al., 1978; Congdon and Gibbons, 1987; Long and Rose, 1989) or the carapace-xiphiplastral aperture (Rose and Judd, 1991). Because clutch size has been known to correlate highly with turtle weight (Iverson, 1992a) and weight to volume ratio (Mosimann, 1958) a clutch size constraint may exist with maternal shell volume (Jackson, 1988).

Considering the strong correlations between volume and female body mass and body mass and clutch size (Mosimann, 1958; Iverson, 1992a), a more feasible alternative may be to analyze the relationship between maternal shell volume and clutch size. Although researchers routinely analyze the relationship between clutch size and one morphological variable (Moll and Legler, 1971; Iverson, 1978; Iverson, 1991; Gibbons et al., 1982; Congdon and Sels, 1991; Iverson and Smith, 1993; Jackson and Walker, 1997), future efforts should focus on examining the effects of several, or one composite measurement (volume). Only a direct examination of the relationship between volume and clutch size will resolve the validity of a volumetric constraint and provide inference as to why females become more domed than males.

Growth Rates. – Growth in most ectothermic vertebrates is strongly related to the availability of resources, the duration of suitable climatic conditions, and reproductive condition (Andrews, 1982). Rapid growth has been documented for many *C. picta* populations where body size typically doubled through the first two-four growing seasons depending upon the population (Ernst et al., 1994). Both sexes grow at similar rates up to about age four where males begin to level off as they are potentially attaining sexual maturity. In females, growth is slower through ages 4 – 10 whereas males have already attained near asymptotic size by age 6. It is during this time when males may first allocate energy to reproduction reducing the energy budget for growth. Contrastingly, females may still invest in growth for several more years until maturity is attained.

Our results are similar, in that, *C. picta* would double their size by age 2. When we compare our data to that derived for the western subspecies, asymptotic sizes we estimated for males and females are considerably smaller than two populations in Idaho. Males at these populations had asymptotic sizes of 165.2 and 167.6 mm PL and females 193.7 and 194.1 (Lindeman, 1997). Consequentially, because *C. picta* at LPNP are attaining a smaller size, their growth rates are more accelerated compared to the Idaho populations. Males in these two Idaho populations had growth rate averaging 0.218 and 0.141 yr^{-1} (Lindeman, 1997), whereas male at LPNP grew at a rate of 0.485 yr^{-1}. Similarly for females, growth rates averaged 0.209 and 0.158 between populations (Lindeman, 1997), whereas females at LPNP grew at a rate of 0.223 yr^{-1}. Thus, the growth rates of males at LPNP are more accelerated compared to the Idaho population, whereas females grew at similar rates.

Overall, females grow to larger sizes at a slower rate compared to males. There are two explanations for this trend. First, growth is comparatively stretched out over a longer time, resulting in a depression in the growth rate compared to males. Second, females are carrying clutches; a larger body size is required compared to males to maximize fecundity. For ectotherms, larger body sizes require more energy to produce the same amount of growth when compared to smaller body sizes (Andrews, 1982). Thus, the depression in growth rate does not necessarily mean a shift in resource allocation from growth to reproduction but could mean an increased energy demand for growth.

Dietary Composition. – Interestingly, the diet of *C. picta* has not been well studied across its range. The general trend is a strong omnivorous propensity with plant material typically comprising a great portion of the diet. Filamentous algae, seeds, and vascular plants comprised 40% of the total diet and *C. picta* at LPNP consumed more plant matter than expected (except for seeds). Similar results have been found in Pennsylvania where plant material occurred in 100% of *C. picta* examined (Ernst and Barbour, 1972) and in two populations from Canada, plant matter was found in 5 and 25% of the stomachs, respectively (MacCulloch and Secoy, 1983). Finally, eight of the nine samples collected by Capler and Moll (1988) at LPNP had vascular plant material.

Although not solely herbivorous, *C. picta* has been reported to consume large amounts of insects and mollusks. Insects were consumed more frequently than expected at LPNP; however, mollusks were consumed in expected proportions. In the two Canadian populations, insects and mollusks were found in 10% and 70% of the stomach for a river population and ~40% and ~30% of the stomachs for a creek population. A previous study a LPNP found all individuals sampled had insects and none contained mollusks (Capler and Moll, 1988).

Fish were not consumed in large quantities and crustaceans were consumed less than expected. Fish represented a small portion of the diet at LPNP and in the Pennsylvania and Canadian populations (Ernst and Barbour, 1972; MacCulloch and Secoy, 1983). Crayfish were not found in any fecal samples examined but have been reported to occur in Pennsylvania (Ernst and Barbour, 1972) and were a dominant food source in the Canadian River population (MacCulloch and Secoy, 1983). However, from previous dietary work at LPNP also yielded no fish in the individuals sampled (Capler and Moll, 1988).

However, because our study did occur over such a short window there is the potential that there are seasonal differences in prey items. For example, *C. picta* may switch to prey on more insects when larvae are developing and emerging, and even become more herbivorous in the late summer when algae bloom. Other studies have found dietary shifting in *Trachemys scripta* for example (Clark and Gibbons, 1969; Hart, 1983; Moll and Legler, 1971; Dreslik, 1999). Further, because our sample size is limited, we lack the power to discern if there are ontogentic and sexual differences in prey items. For example, female *T. scripta* consumed large amount of mollusks to increase calcium stores prior to egg deposition (Moll and Legler, 1971) or to potentially replenish calcium after egg production (Dreslik, 1999). Thus, additional studying of the diet of *C. picta* in the areas of seasonal and ontogenetic variation and in relationship to the amount of prey consumed versus what is available is warranted.

CHELYDRA SERPENTINA

Population Size, Density, and Biomass. – Large densities and biomasses of *C. serpentina*, such as what we observed for LPNP at 58 turtles/ha and 185.3 kg/ha, respectively, are not uncommon in the literature, especially for smaller wetlands and marshes. Small wetlands in Nebraska, Tennessee, and West Virginia have been reported as having densities of 50.7, 59, and 60.5 turtles/ha (Froese and Burghardt, 1974; Major, 1975; Iverson et al., 2000) and biomasses for the Nebraska and Tennessee studies were 254 and 181.3 kg/ha respectively (Iverson, 1982a; Iverson et al., 2000). Two smaller wetlands studied in Canada had densities of 71.4 and 60.4 turtles/ha and biomasses of 365.7 and 30.3 kg/ha (Galbraith et al., 1988). However, this may not solely be the case as smaller marshes and ponds studied in Michigan had densities and biomasses ranging from 6.8 – 13.3 turtles/ha and 15.9 – 33.9 kg/ha and those in South Carolina ranged from 7.3 – 8.0 turtles/ha and 20.6 -21.6 kg/ha (Congdon et al., 1986). Larger wetlands such as lakes do tend to have lower densities of *C. serpentina.* Two approximately 30 ha lakes in southern Illinois and Canada had low densities and biomass of 5.0 turtles/ha and 19.0 kg/ha and 2.0 turtles/ha and 13.54 kg/ha, respectively (Galbraith et al., 1988)Dreslik *et al. in press*). The decline in densities in larger systems may reflect either a limited amount of suitable habitat and/or the effects of turtle harvesting.

Population Structure. – The modes for adult male and female *C. serpentina* fall at about 180 mm PL and are larger than lengths reported for sexual maturity in the literature. In Canada, Iowa, and Tennessee, males are reported to mature between 140 – 150 mm PL (Mosimann and Bider, 1960; White and Murphy, 1973; Christiansen and Burken, 1979). Comparatively, females have been reported to develop eggs at sizes ranging from 123 – 150 mm PL (Mosimann and Bider, 1960; White and Murphy, 1973; Christiansen and Burken, 1979; Congdon et al., 1987). Although the LPNP adult population consists of larger individuals, we lack concurrent growth data to infer if these are larger and older individuals or if *C. serpentina* at LPNP grow faster to larger sizes. Again, because there is such broad overlap between size classes, ageing through size frequency histogram is impossible. The lack of representation in size classes between 30 – 70 mm PL may reflect some sampling bias, may just be that these turtles do grow rapidly through those size classes, or may represent a difference in habitat preference. At present we only have limited information to support or refute these possibilities. However, during spring searches for *C. guttata,* smaller size classes of all turtles are captured suggesting the potential of an ontogenetic habitat shift (D. Mauger *pers. com.*).

Our sex ratio was in equality. Typically the sex ratios of *C. serpentina* populations are in equality although there are some populations which deviate slightly. Studies in Canada, Tennessee, and West Virginia have produced even sex ratios (Mosimann and Bider, 1960; Froese and Burghardt, 1975; Hogg, 1975; Major, 1975). Two populations studied in Canada exhibit skewed sex ratios, one skewed toward males (1.96:1) and one skewed toward females (1:0.7). However only 71 and 43 snapping turtles were included in those calculations (Galbraith et al., 1988). Thus, the skewed sex ratios could have easily been an artifact of incomplete sampling.

The fact that we were able to capture a large number of immature and juvenile turtles suggests our sampling regime was adequate for *C. serpentina.* The *C. serpentina* at population in LPNP is skewed toward immature individuals suggesting one or two trends. First, we would expect a bias toward juveniles in a population that is harvested for meat, whereby larger adults are being removed. This is most likely not the case because there is no angling allowed at LPNP and it is a dedicated reserve. Further, if harvest was taking place without angling it would impact nesting females the greatest as they would be the most exposed to harvesting. An additional source of female mortality could come from mortality on Rt. 53 when females are searching for nests. Over the years of study at LPNP D. Mauger has observed numerous *C. serpentina* and *C. picta* killed. Because we did not observe a male biased sex ratio this is also likely not the case. The pattern of a larger number of juveniles more likely represents the natural recruitment of a population. Because mortality pressures are highest on smaller size classes (Congdon and Gibbons, 1990) and *C. serpentina* have high reproductive output (Ernst et al., 1994b), we would expect a larger representation of recruiting classes.

Morphometry and Sexual Size Dimorphism. – Male *C. serpentina* are generally 1.05 – 1.15 times larger than females (Gibbons and Lovich, 1990). All size variables we examined were dimorphic with males at LPNP being generally 10% larger than females. Populations from Canada, Iowa, South Carolina, South Dakota, and Tennessee also showed similar of larger males for various shell measurements (Mosimann and Bider, 1960; Hammer, 1969; Froese and Burghardt, 1975; Christiansen and Burken, 1979; Gibbons and Lovich, 1990). Explanations of larger male sizes in *C. serpentina* range from an increased ability to copulate with larger females (Gibbons and Lovich, 1990) to the requirement to maintain territories (Obbard and Brooks, 1981; Galbraith et al., 1987).

Most allometric comparisons were isometric increases and the same for both sexes. However males did widen at a faster rate than females and female CL increased at a greater rate relative to PL compared to males. This suggests that females become relatively more elongate whereas males become relatively more rounded. A more circular carapace has been reported for males of at least one other turtle species, *Podocnemis expansa* (Pritchard and Trebbau, 1984). It is unknown if the more circular shape in males is adaptive for copulation but it could conceivably aid in balancing. Elongation in females could potentially result in larger reproductive tracts and hence increased fecundity. Any differences in the relative rates for carapacial measurements in females may translate directly to increased internal volume.

Although we found that sexual dimorphism in *C. serpentina* was restricted to size not shape, we only took four measurements of the shell. It is possible that the vaulting of the shell as expressed in angular measurements may well differ. Because *C. serpentina* is a primarily benthic species (Ernst et al., 1994) the potential increase in resistance to movement by deviating from a streamlined morphotype cannot be invoked.

STERNOTHERUS ODORATUS

Population Size, Density, and Biomass. – Although the densities and biomasses at 58 turtles/ha and 10.1 kg/ha, respectively, for *S. odoratus* may appear high, they fall mid range compared to many other studies. The only similar estimate reported was from a lake in Indiana where densities were 79.5 turtles/ha and biomass 8.4 kg/ha (Wade and Gifford, 1985). The largest densities have been reported with populations in Alabama, Florida, Oklahoma, and Virginia at 148.5, 700, 150, and 194 turtles/ha respectively (Mahmoud, 1969; Iverson, 1982a; Mitchell, 1988; Dodd, 1989). These populations also supported large biomasses even though this is a relatively small turtle. Contrastingly, small ponds in South Carolina and Pennsylvania supported densities ranging from 7.5 – 24.0 turtle/ha at biomasses ranging from 1.2 – 1.4 kg/ha]Congdon 1986](Ernst, 1986). Further, a large floodplain lake in southern Illinois had densities at 2.7 turtles/ha and biomasses of 0.4 kg/ha (Dreslik et al. *in press*). Thus there is wide variability in densities of *S. odoratus* populations; however, it appears shallower, smaller wetlands such as those at LPNP host the largest densities.

Population Structure. – The mode for females fell near what is typically reported for sexual maturity. Studies have found that female *S. odoratus* mature at minimum sizes between 61 - 80 mm PL (Ernst et al., 1994b). Females from a Virginia population matured at minimum sizes of 120 mm PL (Mitchell, 1988), whereas in a population from Alabama, females matured around 70 mm CL (McPherson and Marion, 1981). The variation in sexual maturity has been linked to latitudinal variation such that, more northern populations mature at larger sizes compared to southern ones (Tinkle, 1961). Our sample of males and immature individuals is too small to determine where a mode is represented and warrants further investigation.

Of the turtles studied, populations of *S. odoratus* appear to exhibit the widest variation in sex ratios with some populations favoring either sex. We found the LPNP population to be significantly skewed toward females at a ratio of 1:2.1. Most reports for *S. odoratus* found the sex ratio was skewed toward females (Risley, 1933; Tinkle, 1961; Dodd, 1989); however there are reports of populations where the ratio is slightly male biased (Ernst, 1986). Some populations such as those studied in Oklahoma and Virginia have equal sex ratios (Mahmoud, 1969; Mitchell, 1988). Because we did not capture a large number of *S. odoratus* compared to *C. picta* and *C. serpentina*, the skewed sex ratio may be an artifact of small sample size or improper sampling. Thus, additional data and surveying are required before the result can be justified.

We only captured a small number of juveniles during the study. Our finding that 17% of the population was comprised by juveniles is similar to the 16.3 % reported for a population in Alabama (Dodd, 1989). The number of juveniles found in Pennsylvania was much greater and they comprised 30% of the population (Ernst, 1986). Although our finding may seem low, *S. odoratus* typically lays clutches between 2 to 3 eggs (Ernst et al., 1994b). Thus, smaller reproductive output translates to a smaller recruiting class.

Morphometry and Sexual Size Dimorphism. – There is little previous evidence for sexual size dimorphism in *S. odoratus* (Gibbons and Lovich, 1990). Similar to our findings, sexes had similar CLs for populations in Oklahoma and South Carolina (Mahmoud, 1969; Gibbons and Lovich, 1990). However, PL, CW, SH, Mass, APW, PPW, DL, and SA differed between the sexes such that females were approximately 10% larger than males. Dimorphism in the carapacial measurements will afford housing larger clutches.

Most allometric comparisons were isometric increases and the same for both sexes. Our allometric results shoed males did widen and increase in shell height relative to other size measurements at a faster rate than females. Male and female *S. odoratus* from Michigan increased in width faster than height (Mosimann, 1958). Additionally, there was only a slight difference detected between the sexes for length to width and length to height relationships (Mosimann, 1958). Further, there was shape dimorphism present in the carapacial morphology between males and females. The shape dimorphism suggested that males were developing relatively more elongate and oval shaped carapaces. Mosimann (1958) found similar results in and postulated that although *S. odoratus* is benthic, because water is a dense medium relatively long body shapes are more streamline.

Dietary Composition. – Omnivory has been widely reported for *S. odoratus* range-wide (see Ernst *et al.*, 1994 for review). Algae were a dominant portion of the diet of *S. odoratus*. Turtles from Lake Springfield, Missouri also consumed a large proportion of algae (predominantly *Oedogonium*) and the consumption of algae did not differ across seasons (Ford and Moll, 2004). Similarly, plant material is often consumed in high abundances (Mahmoud, 1968; Ford and Moll, 2004). Our results show that both algae and vascular plant material were consumed at greater frequencies than expected.

Insects are an important part of the diet of *S. odoratus* throughout its range (Mahmoud, 1968; Ford and Moll, 2004). However, insects were found from a relatively smaller proportion of the individuals at LPNP (55.6%) compared to 98.3% in Oklahoma (Mahmoud, 1968) and 85.8% in Missouri (Ford and Moll, 2004). At LPNP, the majority of insects that were consumed were larval odonates; whereas in Missouri, odonates, coleopterans and tricopterans were the most abundant insects in the diet (Ford and Moll, 2004). Insects were consumed at roughly the same proportion across the active season in the Missouri population (Ford and Moll, 2004).

Interestingly, crustaceans were not consumed as much as reported from other populations. Crustacean consumption was highest from the Oklahoma population at 61.1% (Mahmoud, 1968) followed by the Missouri population at 57.7% (Ford and Moll, 2004). At LPNP crustaceans were consumed at a lower proportion than expected and were found in only 8.9% of the samples. Consumption of crustaceans showed seasonal variability in Missouri and ranged from being found in none of the females in September to 100% of the individuals in August (Ford and Moll, 2004). Thus, additional sampling across the season is required to determine if a similar pattern occurs at LPNP so our results should be considered preliminary.

Mollusks were found in 73.3% of the samples at LPNP and were a major component of their diet. Similar results were found for the Oklahoma and Missouri populations (Mahmoud, 1968; Ford and Moll, 2004). However, mollusks also varied seasonally in the diet in Missouri with consumption peaking in August and September (Ford and Moll, 2004). This was because the littoral zone of Lake Springfield contracts during the summer, increasing mollusks densities (Ford and Moll, 2004).

Mahmoud (1968) concluded that *S. odoratus* was euryphagous, eating whatever foods were in abundance. This supposition appears to be supported for the Lake Springfield population as the proportion of dietary items consumed varied across the active season (Ford and Moll, 2004). Further work should examine diets to determine if seasonal, sexual, and ontogenetic shifts in prey occur at LPNP.

EMYS BLANDINGII

Population Size, Density, and Biomass. – The density and biomass of *E. blandingii* at LPNP of 22 turtles/ha and 20.6 kg/ha, respectively, is the third highest reported in the literature. Populations in Missouri and Wisconsin were much higher at densities of 55 turtles/ha and 27.5 turtles per hectare respectively (Kofron and Schreiber, 1985; Ross and Anderson, 1990). Our densities are higher than those reported for Maine (5.9 turtle/ha), Massachusetts (6.3 turtles/ha), Michigan (8.8 – 15.8 turtles/hectare), and Minnesota (3 – 6 turtles/ha) (Gibbons, 1968a; Graham and Doyle, 1977; Congdon et al., 1986; Joyal et al., 2000; Pappas et al., 2000). However, further work is required because we were unable to obtain a reliable closed population estimate and had to resort to obtaining a population estimate based on relative abundance. Additionally, this estimate is based on the area of water sampled and *E. blandingii* will routinely foray overland, thus broader sampling is required for this species.

Population Structure. – Our sample sizes of the population structure of *E. blandingii* are too small to warrant discussion and provide conclusions; however, a second year will at least double the encounters will provide a stronger data source. What is required is at least another season of sampling. In this second season of sampling, trapping should be expanded to include as many of the wetlands within LPNP boundaries as possible. Trapping should also be augmented with hand captures and visual searches in the spring to target turtles emerging from hibernation. However, there is a rich history of *E. blandingii* sampling from previous turtle research at LPNP and potentially the inclusion of historic data with the data we provide will garner a clearer picture of the population structure of *E. blandingii* at LPNP.

Dietary Composition. – For such a well studied species, there are relatively few reports of the diet of *E. blandingii*. We found that algae were a dominant dietary item in *E. blandingii* and was present in over 84% of the samples. Surprisingly, the two detailed studies of *E. blandingii* do not report algae as a major dietary item or if even in the diet at all (Lagler, 1943; Kofron and Schreiber, 1985). Further, *E. blandingii* for LPNP consumed more vascular plant material than elsewhere reported and more than expected. In Michigan, percentages were not provided (Lagler, 1943) but roughly 50% of the individuals analyzed in Missouri consumed plant matter (Kofron and Schreiber, 1985). Additionally, three of the four samples taken by Capler and Moll (1988) had vascular plants.

Crustaceans, insects, and fish have been reported as the principle dietary items for the species (Ernst et al., 1994b). In Michigan, roughly 50% of the food volume was crustaceans, 25% insects, and roughly 20% fish (Lagler, 1943). Similarly in Missouri crustaceans were found in 73% of the turtles, insects in 13%, and fish in 33% (Kofron and Schreiber, 1985). Fewer crustaceans were consumed than expected and only found in 15% of the individuals. Contrastingly, from four samples taken from LPNP crustaceans were present in 50% (Capler and Moll, 1988). Although we did find high overlap, we must note that crustacean consumption by *E. blandingii* was highest compared to *C. picta* and *S. odoratus* thus with increased sampling over a longer period, we may find some specialization in crustacean consumption. The proportion of insects represented in the diet is similar to the Michigan and Missouri studies and insects were a major dietary component represented in 78.9% of the samples. At LPNP *E. blandingii* appeared to consume insects from all orders such as larval Odonates, Tricopterans, Coleopterans, Hemipterans, Dipterans, and Ephemeropterans. Capler and Moll (1988) reported arthropods in three of the four samples taken. Our finding of fish consumption is similar to the previous studies as fish were present in 36.8% of the samples. Neither the Michigan nor Missouri study reported mollusks as a major dietary category; however at LPNP, mollusks were represented in 57.9% of the samples and comprised 9% of the total diet. Only one sample previously taken from LPNP had fish (Capler and Moll, 1988).

Although the previous studies that *E. blandingii* is chiefly carnivorous, our findings suggest it is omnivorous at LPNP and also a generalist. However, our samples were restricted in duration and a more detailed analysis of diet would benefit from more sampling across the active season and across size classes.

COMMUNITY PARAMETERS

Species Richness, Diversity, and Eveness. – Several studies have documented species richness in reptiles is primarily associated with environmental gradients such as annual rainfall (Schall and Pianka, 1977; Schall and Pianka, 1978; Owen, 1989; Iverson, 1992b). The two centers for turtle species richness appear to be the lower Ganges-Brahmaputra and lower Mobile river basins with 17 and 16 species respectively (Iverson, 1992b; Iverson, 1992c; Vogt and Benitez, 1997). Within the upper Midwest, the Mississippi River was the most species rich (Dreslik and Phillips *in press*). Other communities in Illinois range between 3 – 10 turtle species (Dreslik, 1996). Thus, LPNP is a very rich turtle community especially when considering it is bordered by urbanization. The rich turtle community is most likely because LPNP is located on the floodplain of the Des Plaines River. Within river floodplains, habitats grade from riverine to ecotonal to lacustrine and the juxtaposition and proximity of these habitats may relate to increased diversity of freshwater species. Similar trends have been found along the Missouri River (Bodie et al., 2000) and within the upper Midwest (Dreslik and Philips *in press*). The floodplains increase habitat heterogeneity so both lentic and lotic adapted species occur.

The lotic-lentic transition is well represented by the turtle species we captured. At LPNP we would be expected to potentially capture up to nine freshwater turtle species (Iverson, 1992c): *A. spinifera, C. picta, C. serpentina, C. guttata, Graptemys geographica, G. pseudogeographica, E. blandingii, S. odoratus,* and *T. scripta.* Of the seven species we captured, *C. serpentina, C. picta, C. guttata, E. blandingii, S. odoratus,* and *T. scripta* are primarily lentic, although *C. serpentina, C. picta,* and *T. scripta* will occupy riverine habitats (Ernst et al., 1994a). Surprisingly, we only captured one of the three lotic species, *A. spinifera.* It is possible that *Graptemys sp.* could be captured after additional effort. Dreslik *et al.* (*in press*) noted it took over 3,000 trap hours to capture all nine species in a southern Illinois turtle community but we have surpassed that effort at LPNP. On numerous trips to the Division Street bridge, the only turtles we observed basking were *A. spinifera.* However, some trapping should occur in the Des Plaines River to verify the existence of a nearby *Graptemys* population.

The interaction between *C. picta* and *T. scripta* as dominant members in the community is exemplified at LPNP. At LPNP the dominant turtle species was *C. picta* and *T. scripta* was fifth; whereas for a southern Illinois floodplain lake, *T. scripta* was dominant and *C. picta* was eighth (Dreslik *et al., in press*). Typically in Illinois where both species co-occur, *T. scripta* dominates the community (E. O. Moll *pers com.*). This association may represent a latitudinal gradient that can be explained by numerous proximate and ultimate factors other than competition, ranging from habitat productivity to clinal variation in reproductive traits (Dreslik and Phllips, *in press*). More likely, it may be adaptations *C. picta* has to colder climates similar to *C. serpentina* (Bobyn and Brooks, 1994).

Most interesting is that LPNP supports one of the only two communities in Illinois where *C. guttata* and *E. blandingii* co-occur. Both species are currently listed in Illinois exemplifying their rarity statewide. The focus of research has always been on *C. guttata*; however, *E. blandingii* were captured at LPNP as early as 1988 (Capler and Moll, 1988). Both species inhabit similar wetlands but adult *E. blandingii* tolerates deeper water habitats more than adult *C. guttata* (Ernst et al., 1994). Although *E. Blandingii* have been reported in numerous captures surveys (Mauger, 2005), they have never been a focal study species, but in recent years all that are captured while conducting spotted turtle census work have been marked and measured.

Community Similarity. – The structure of the LPNP turtle assemblage was somewhat dissimilar from even those reported for other marsh communities (Congdon and Gibbons, 1996). We would have expected more similarity between the LPNP and the E. S. George Reserve, Michigan community because of the similarity in habitat composition. However, LPNP represents a distinct ecotonal community because of similarity to other lentic and lotic assemblages. The similarity with marsh, pond, and riverine communities is not surprising because of the diversity of wetlands and habitat types present in the preserve.

When we examined the density and biomass structure of LPNP and compared it to other communities we found that there was moderate similarity with three communities sampled on the E.S. George Reserve, Michigan (Congdon et al., 1986). When we compared LPNP to another riverine-lacustrine ecotonal community in Illinois, we found there was marked dissimilarity in the density and biomass structure. This is directly related to the species present. In the southern Illinois community riverine species represented roughly half of the community (Dreslik *et al*, *in press*). Thus, the structural dynamics of the LPNP are relatively unique compared to the published literature.

Dietary Niche. – The diets of *C. picta, E. blandingii,* and *S odoratus* were diverse and even, but broadly overlapped. Thus, there appears to be no major dietary partitioning among the three species across our dietary classification. This is surprising given the variation in diets and the existing literature base reporting dietary partitioning in turtles. For example, Moll (1990) found some dietary separation between *T. scripta, Kinosternon leucostomum, K. scorpioides,* and *Staurotypus triporcatus*. Although the first three species' diets strongly overlapped, there was more divergence in the diet as the season progressed (Moll, 1990). Finally, *S. triporcatus* exhibited the most distinct diet and even consumed small turtles (Moll, 1990). In three closely related species of *Graptemys,* some dietary partitioning has been observed (Vogt, 1981) but overlapped considerably less than those diets observed for *C. picta, E. blandingii,* and *S. odoratus* at LPNP.

Our data on resource partitioning along the dietary axis should be considered preliminary. We sampled only three of the seven species. Further, our sampling is on a limited number of individuals over a five week period. There may be distinct dietary differences between the sexes, age classes, and even the seasons that allow all these species to coexist. Also, we have no information on the abundance of resources at LPNP. There is also the possibility that the ponds and marshes at LPNP are so productive, that there would be little segregation along the dietary axis.

RECCOMENDATIONS AND FUTURE DIRECTIONS

MONITORING THE ECOLOGY OF *E. BLANDINGII*

Previous surveys at LPNP have always produced a dozen on more *E. blandingii* captures per year representing all stages. With the addition of our survey, we have documented that the population may be fairly large and potentially as large as that of the *C. guttata* population. The most interesting aspect is that there is evidence of successful recruitment of *E. blandingii* at LPNP. Studies from other natural areas in DuPage County have found that juvenile recruitment in *E. blandginii* populations is low (Rubin, 2000). However, in our five weeks of trapping we captured three unsexable juvenile and three immature females. Comparatively from the natural areas in DuPage County, only three juveniles and two hatchlings were captured over a five year period despite intensive trapping (Rubin, 2000). Thus, focusing on the ecology and life history of *E. blandingii* in a relatively healthy population can provide strong management recommendations that can be widely applied for this declining species in the Chicago area.

What should follow is a more in depth mark/recapture study with trapping expanded to include wetlands in the entire reserve as well as focused spring hand searches for individuals. Once individuals are located they should be outfitted with radio-transmitters and monitored. We suggest a minimum of five individuals of each sex dispersed over the entire preserve. This will allow the creation of a habitat use model that can be used to assess the suitability of other natural areas in the region. Also, some effort should be placed on the spatial ecology and habitat requirements of juveniles. If successful, a habitat use model can be developed and shared with other management agencies in the region so they can assess the quality of their natural areas with respect to juvenile *E. blandingii.* This can be accomplished by monitoring several adult and immature individuals for a few activity seasons. A telemetry study will also afford insight into female reproductive effort, nesting ecology, and juvenile recruitment rates. Once nesting habitat is located, appropriate management recommendations can be made to maintain the habitat and allow us to gauge the natural predation of nests.

EXAMINE THE SPATIAL REQUIREMENTS OF *C. GUTTATA* NORTH OF DIVISION STREET

Great effort has been placed on the wetlands south of Division Street (Wilson, 1994, 2004) where the population of *C. guttata* is the largest. However, over recent surveys *C. guttata* have been located in wetlands north of Division Street and the individual we found crossing suggests that some individuals utilize habitats on the north part of the preserve. To accomplish this, we would recommend tracking a smaller number (2-3) additional *C. guttata* from the north subunit to add to the existing data gathered from the south unit. Because the habitat structure of the north subunit of LPNP contains a different mosaic of habitats, it is important to assess the spatial utilization of these turtles. Doing so will provide a more robust understanding of the spatial requirements of *C. guttata* across the entire preserve and not just the south region.

Continuation of the mark/recapture study

Although we have gathered a firm understanding of some of the aspects of the turtle community at LPNP there are still several areas that another session of intensive trapping will provide answers for. First, additional captures of some of the rarer species will increase the precision of some of our estimates of population sizes, densities, and biomass. Further, with the large number of individuals marked, open population estimators can be used to determine important demographic characteristics such as survivorship. Finally, we can use more reliable methods of growth based on mark/recapture data which may also be expanded to include estimates of growth and maturity for the other species. Thus, obtaining more detailed demographic data will eventually play a role in determining population viability for all the species in the community and may also highlight certain demographic traits that could benefit from management strategies.

In the second year, trapping should be expanded to include more wetlands in the south as well as the sampling wetlands in the north. Because of the large number of turtles marked in the first session, trapping in different wetlands may provide a rough understanding of movements within the preserve and help clarify the spatial dispersion of the populations of all turtle species across the entire preserve. It may also help to further explain why the *C. guttata* population appears to be so concentrated in limited sections of LPNP South.

Examine diets across the active season

We have provided a basic understanding of the diet of three of the species within the community; however we lack the ability to determine if there are seasonal or ontogenetic shifts and if there are sexual differences. Further, we only have an estimate of what was consumed. To identify dietary shifts or sexual differences we also need to determine how productive the wetlands are and estimate prey abundances across the active season of the turtle species. This can be accomplished by expanding the sampling across the active season for as many species as possible. Sampling should also be done in conjunction with the appropriate limnological methods to determine prey abundances, such as estimating algal biomass with Hester-Dendy multiple samplers.

Examine the spatial requirements of each species

Determining the spatial requirements for each species will be valuable for the conservation of turtles and their habitats. Because this is a rich community with a high abundance of turtles in a limited amount of habitat, it is important to further assess how these species partition habitat resources. For example, from previous years of research it has been observed *C. guttata* may avoid the use of deeper wetlands often associated with high abundances of *C. serpentina* (D. Mauger pers com.).

The intensity in competition for resources in small patches of habitat similar to LPNP may be high among species. Additionally, agriculture, sewage pollution, and construction of locks and dams along the Illinois River have caused population declines of specialist species such as the *E. blandingii*, *Kinosternon flavescens*, and *A. mutica*; whereas generalist species such as *T. scripta*, *A. spinifera*, and *C. serpentina* thrive (Moll and Moll, 2000). At LPNP similar anthropogenic alterations have altered the Des Plaines Valley since pre-settlement. Groundwater hydrology from pumping by local municipal wells in the uplands to the west-side of Rte 53 has caused severe alteration in groundwater discharge to the preserve. The change in groundwater discharge input to the preserve has serious implications for sustaining *C. guttata* and *E. blandingii* habitats as well as Hine's emerald dragonfly breeding sites. Thus, generalist turtle species may be more tolerant to degraded habitats and could out-compete specialist species for limited resources.

Also, because of the high abundances of turtles, radio-telemetry may be necessary to determine where nesting grounds occur. This information will be valuable because nest site selection patterns have only been recorded for a small number of freshwater turtles (Burke et al., 2000). If the species show differences in the habitat they prefer, this delineation is important for management if the goal is to preserve the entire turtle community. This aspect can be accomplished by tracking a minimum of 5 individuals of each sex for each species in the community and summarized by including the existing knowledge of the spatial biology of *C. guttata*.

Additional habitat use findings will contribute to current data to reveal if the turtle populations at LPNP are stable and self-sustaining, or if necessary actions are needed to prevent further declines or improve habitat. Although turtles and their critical habitats are protected within LPNP, they may still be threatened by nearby roadways, predation, flooding, ecological succession and change in site hydrology. Many freshwater turtle species such as *C. picta, C. Serpentina, E. Blandingii,* and *S. odoratus* require upland habitat for nesting (Ernst et al., 1994). For example, Blanding's turtles may travel distances > 1km during nesting forays (Congdon et al., 1983). Kills on roadways can be a significant cause of mortality among migrating turtles (Mitchell and Klemens, 2000). This may be the case at LPNP, which is surrounded by a network of roads and railroad tracks. Numerous turtles have been found DOR on Rt. 53 over the turtle studies at LPNP and are mainly *C. serpentina* and *C. picta* (D. Mauger, *pers. com.*).

Predation of turtle eggs also may be threatening species at LPNP, where potential egg predators such as raccoons, mink, skunks, foxes, and coyotes are known to occur (Wilson 1994, 2002). Increases in predators have been correlated with decreases in nesting success (Congdon et al., 1993). Additionally, protected river areas are still at risk to degradation from upstream pollution and siltation (Moll and Moll, 2000). The Des Plaines River, which borders the east side of the preserve, may flood periodically and possibly damage vital areas of the preserve necessary for turtle feeding and nesting. Inundation can destroy turtle eggs as well. For example, submerged smooth softshell eggs can suffer significant mortality after 2 days and complete mortality after 4 days (Plummer, 1976).

CONCLUSIONS

Nature preserves are critical components in the conservation of fauna and flora. However, even the best nature preserves can suffer the effects of fragmentation and insularization (Shafer, 1990). The effects are the elimination of potential sources of immigrants, reduction in immigration between habitat patches because the landscape between habitat patches is converted, and restriction of vital resources outside of the protected boundary (Wilcox, 1980; Wilcox and

Murphy, 1985). Thus, nature preserves are intended to serve as self sustaining ecosystems that are sources for population and protection for rare biota (Shafer, 1990). In reality, most nature preserves are not large enough to be self-sustaining and thus must require a great amount of management. Therefore it is imperative that sound ecological knowledge of rare species in nature preserves guide management.

LPNP has one of the richest and diverse turtle communities described for Illinois. Lentic and lotic and common and rare species utilize the preserve. From the concept of management, we should shift from autecological approaches and broaden the scope of research to include how the different species utilize the site and interact to form such a diverse community. To accomplish this we need to gather life history and ecological data for each species to assess what role each species takes within the turtle community. Once we have a better understanding of how each species utilizes and partitions the resources available at LPNP, we can then guide management strategies toward conserving the entire functioning community. Also, a comprehensive understanding of the turtle community as a whole should help determine why the rare species appear to have lower population sizes and restricted patterns of population dispersion within the preserve.

To date we have been monitoring 25 *E. blandingii* (14 females, 5 males, and 6 juveniles) since April of 2005 via radio-telemetry. Currently, we have 18 with active radio-transmitters and are locating the turtles on a daily basis. Thus the major findings will be included in supplementary report in the winter along with the spring-summer capture data of all turtles. The supplementary report will include home range size, movements, habitat use, nesting activity, and phenology of the three classes. In general we have found that *E. blandingii* will make large forays to use the Des Plaines River during the drought, thus exiting the preserve boundaries. Whether this phenomenon occurs in years with normal rainfall requires further investigation. Radio-telemetry will continue through 2006 to gauge such responses. Finally, we have also initiated radio-telemetry on three *C. guttata* captured from the north part of the preserve and five *S. odoratus*. In the 2006 field season we will maintain our level of radio-telemetry on *E. blandingii*, add seven more *C. gutttata*, and five males and five females of *C. serpentina, C. picta,* and *S. odoratus*. This final report will be submitted in the Spring of 2007 and be all inclusive.

ACKNOWLEDGEMENTS

Funding for this project was provided through the Forest Preserve district of Will County, and the Illinois Department of Natural Resources Wildlife Preservation Fund. We thank D. Mauger for donating his time to help us in the field, providing his enthusiasm toward the project, helping us with any logistical problems, and for his constant drive to gain crucial information to conserve turtles. We also thank T. Anton and A. Readel for all their help in the fieldwork of this project. We are very thankful to the Forest Preserve District of Will County for providing us the opportunity to conduct the study. Permits from the Illinois Nature Preserves Commission, Illinois Department of Natural Resources, and the Forest Preserve District of Will County we granted to MJD and CAP for the project. All research was conducted in accordance under the approved IACUC protocol # with the University of Illinois and all permits were granted to CAP by the Illinois Department of Natural Resources.

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Table 1: Trapping effort for turtles at Lockport Prairie Nature Preserve, Will County, Illinois, from 29 June 2004 to 1 August 2004 grouped by major wetland surveyed. Table included the total hours of trap effort per site, the total number of turtle captures per hour, the total number of turtle captures broken down by species and sex/stage class, and the grand totals for the study.

				A. spinifera			*C. serpentina*			*C. picta*			*E. blandingii*			*S. odoratus*			*T. scripta*		
	HRS Set Juv.	**Total**	**T/H**	♂♂	♀♀	**Juv.**	♂♂	♀♀	**Juv.**	♂♂	♀♀	**Juv.**	♂♂	♀♀	**Juv.**	♂♂	♀♀	**Juv.**	♂♂	♀♀	
East Pond	13636.1	479	0.035	0	1	0	53	51	16	155	110	23	4	7	1	21	29	1	5	2	0
Middle Pond	8371.9	56	0.007	0	0	0	3	1	2	22	11	5	4	6	2	0	0	0	0	0	0
Bullrush Pond	377.1	0	0.000	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
North ORV Trail	300.3	1	0.003	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0
West Marsh	3813.2	14	0.004	0	0	0	0	0	1	1	1	4	1	3	3	0	0	0	0	0	0
Grand Totals	**26498.7**	**550**	**0.021**	**0**	**1**	**0**	**56**	**52**	**19**	**178**	**122**	**32**	**9**	**17**	**6**	**21**	**29**	**1**	**5**	**2**	**0**

Table 2: Composite breakdown of capture effort in the number of trap hours per turtle grouped by species and by sex/stage for trapping effort at Lockport Prairie Nature Preserve, Will County, Illinois from 29 June 1004 to 1 August 2004.

Species	**Total**	**Hours/Turtle**	♂♂	♀♀	**Juv.**
C. picta	332	79.8	148.9	217.2	828.1
C. serpentina	127	208.7	473.2	509.6	1,394.7
S. odoratus	51	519.6	1,261.8	913.7	26,498.7
E. blandingii	32	828.1	2,944.3	1,558.7	4,416.5
T. scripta	7	3,785.5	5,299.7	13,249.4	--------
A. spinifera	1	26,498.7	--------	26,498.7	--------
Total	**550**	48.2	98.5	118.8	456.9

Table 3: Summary of morphometric variables (mean, standard error, range, and sample size) for all individual partitioned by stage and sex *Chrysemys picta* captured at Lockport Prairie Nature Preserve Will County, Illinois from 29 June 2004 – 1 August 2004. The measurements of PL (Plastral Length), CL (Carapace Length), CW (Carapace Width), and SH (Shell Height) are in mm. Mass is in grams.

Chrysemys picta **- Morphometric Variables**

Females		**PL**	**CL**	**CW**	**SH**	**Mass**
Adult	Mean	136.2	145.2	108.9	54.9	435.5
	Std. Error	1.4	1.7	1.3	0.8	24.3
	Range	120 - 168	122 - 216	94 - 173	42 - 98	242 - 2000
	n	74	74	74	74	74
Immature	Mean	97.5	104.3	82.0	39.8	167.4
	Std. Error	1.7	1.8	1.0	0.7	7.4
	Range	76 - 118	80 - 134	69 - 97	31 - 59	83 - 283
	n	64	64	64	64	64
Males						
Adult	Mean	114.6	124.7	94.1	43.5	247.9
	Std. Error	1.3	1.5	0.9	1.1	7.7
	Range	95 - 140	100 - 156	78 - 115	35 - 146	130 - 411
	n	103	103	103	103	103
Immature	Mean	87.9	95.4	76.8	34.4	117.5
	Std. Error	0.8	0.9	0.8	0.3	4.1
	Range	76 - 93	82 - 105	68 - 94	31 - 38	12 - 160
	n	39	39	39	39	39
Unsexable						
Juvenile	Mean	68.1	74.3	63.6	29.7	62.7
	Std. Error	1.8	1.9	1.2	0.8	4.1
	Range	52.8 - 75	58.65 - 81	53 - 67	23.5 - 33	33.9 - 78
	n	11	11	11	11	11
Hatchling	Mean	33.8	38.3	38.5	17.1	12.3
	n	1	1	1	1	1

Table 4: Regression relationship between pairings of morphological variables by sex for *Chrysemys picta* captured at Lockport Prairie Nature Preserve Will County, Illinois from 29 June 2004 – 1 August 2004.

	R^2	*p*	Slope	Intercept
Females (136)				
PLxCL	0.98	<0.001	0.98±0.01	0.15±0.06
PLxCW	0.94	<0.001	0.81±0.02	0.70±0.08
PLxSH	0.90	<0.001	0.93±0.03	-0.58±0.13
CLxCW	0.96	<0.001	0.83±0.01	0.58±0.07
CLxSH	0.91	<0.001	0.95±0.03	-0.72±0.12
CWxSH	0.91	<0.001	1.13±0.03	-1.28±0.13
PLxMass	0.96	<0.001	0.35±0.01	2.82±0.03
CLxMass	0.98	<0.001	0.35±0.00	2.89±0.02
CWxMass	0.97	<0.001	0.29±0.00	2.94±0.02
SH x Mass	0.95	<0.001	0.34±0.01	1.97±0.04
Males (140)				
PLxCL	0.98	<0.001	1.03±0.01	-0.08±0.06
PLxCW	0.93	<0.001	0.81±0.02	0.73±0.09
PLxSH	0.61	<0.001	0.86±0.06	-0.30±0.27
CLxCW	0.94	<0.001	0.77±0.02	0.81±0.08
CLxSH	0.61	<0.001	0.82±0.06	-0.18±0.26
CWxSH	0.62	<0.001	0.58±0.07	-0.92±0.31
PLxMass	0.82	<0.001	0.29±0.01	3.14±0.06
CLxMass	0.83	<0.001	0.30±0.01	3.15±0.06
CWxMass	0.79	<0.001	0.24±0.01	3.24±0.06
SH x Mass	0.54	<0.001	0.25±0.02	2.34±0.11

Table 5: MANOVA results for sexual size dimorphism in plastral length (PL), carapace length (CL), carapace width (CW), shell height (SH), mass, anterior plastral width (APW), posterior plastral width (PPW), curved carapace length (CCL), dome length (DL), front angle (FA), side angle (SA), and rear angle (RA) for *Chrysemys picta* captured at Lockport Prairie Nature Preserve Will County, Illinois from 29 June 2004 – 1 August 2004.

Measure	**F**	***p***	**Females**	**Males**	**Effect Size**	**Prop.**
PL	48.96	<0.001	123.7	107.3	16.4	0.13
CL	33.73	<0.001	131.7	116.0	15.8	0.12
CW	12.29	<0.001	99.9	88.7	11.2	0.11
SH	88.23	<0.001	49.9	41.0	9.0	0.18
Mass	55.90	<0.001	342.6	212.1	130.6	0.38
APW	28.30	<0.001	69.2	57.6	12.7	0.18
PPW	59.47	<0.001	66.1	57.6	8.5	0.13
CCL	39.68	<0.001	143.3	126.0	17.3	0.12
DL	24.33	<0.001	62.2	53.8	8.5	0.14
FA	7.32	0.007	21.2	19.3	1.9	0.09
SA	112.07	<0.001	64.1	56.0	8.1	0.13
RA	23.63	<0.001	48.1	44.9	3.2	0.07

Table 6: Results of the principle component analysis (PCA) for *Chrysemys picta* captured at Lockport Prairie Nature Preserve Will County, Illinois from 29 June 2004 – 1 August 2004. The upper panel represents the percent of variance explained by each component and the eigenvalues; whereas the lower panel shows the factor loadings of the residuals of each character when PL is controlled for.

Component	EigenValues	% Variance	Cumul. %
1	1.91	17.37	17.37
2	1.43	13.01	30.38
3	1.14	10.38	40.76
4	1.09	9.91	50.68
5	1.02	9.27	59.95
6	0.95	8.67	68.62
7	0.93	8.46	77.08
8	0.79	7.22	84.31
9	0.67	6.10	90.41
10	0.59	5.39	95.80
11	0.46	4.20	100.00

	Component						
	1	2	3	4	5	6	7
lnPlxLnCL	0.00	0.25	0.62	0.04	-0.06	-0.25	0.65
lnPLxlnCW	0.06	0.02	-0.12	0.79	0.38	-0.12	0.06
lnPLxLnSH	0.51	0.13	-0.30	0.01	0.15	-0.32	0.33
lnPLxlnMass	0.55	0.55	-0.06	-0.10	-0.11	-0.16	-0.16
lnPLxlnAPW	0.03	0.08	-0.18	0.44	-0.64	0.50	0.28
lnPLxlnPPW	0.45	0.63	-0.11	0.09	-0.13	0.02	-0.27
lnPLxlnDL	0.09	0.22	-0.32	-0.27	0.53	0.55	0.37
lnPLxlnFA	0.53	-0.51	-0.15	0.21	0.05	-0.14	0.01
lnPLxlnSA	0.51	-0.30	-0.13	-0.35	-0.29	-0.04	0.23
lnPLxlnRA	0.63	-0.49	0.23	0.02	0.03	0.21	-0.08
lnPLxlnCCL	0.43	0.11	0.63	0.08	0.21	0.36	-0.18

Table 7: MANOVA results of shape factors retained from the PCA for *Chrysemys picta* captured at Lockport Prairie Nature Preserve Will County, Illinois from 29 June 2004 – 1 August 2004.

Component	**F**	***p***	**Females**	**Males**	**Effect Size**
Factor 1	10.13	0.002	-0.21	0.18	0.39
Factor 2	43.23	<0.001	0.41	-0.35	0.76
Factor 3	19.72	<0.001	0.29	-0.24	0.54
Factor 4	0.54	0.46	0.05	-0.04	0.09
Factor 5	0.55	0.46	-0.05	0.04	0.09
Factor 6	9.23	0.003	0.20	-0.17	0.37
Factor 7	0.43	0.52	0.04	-0.03	0.08

Table 8: Table of the number of observations, percent occurrence in samples, and relative frequency of dietary items identified from fecal samples of *Chrysemys picta*, *Sternotherus odoratus,* and *Emys blandingii* captured at Lockport Prairie Nature Preserve Will County, Illinois from 29 June 2004 – 1 August 2004. (Sample size of turtles is in parentheses next to the scientific name.

	***C. picta* (25)**			***S. odoratus* (45)**			***E. blandingii* (19)**		
Diet Category	**Obs.**	**%Ocur.**	**RF**	**Obs.**	**%Ocur.**	**RF**	**Obs.**	**%Ocur.**	**RF**
Algae	**25**	**100.0%**	**0.20**	**45**	**100.0%**	**0.18**	**16**	**84.2%**	**0.14**
Cladophora	24	96.0%	0.03	39	86.7%	0.50	10	52.6%	0.77
Oedogonium	5	20.0%	0.01	24	53.3%	0.47	7	36.8%	0.78
Chara	4	16.0%	0.00	4	8.9%	0.06	2	10.5%	0.08
Unknown Algae	2	8.0%	0.00	11	24.4%	0.14	4	21.1%	0.14
Seeds	4	16.0%	0.03	12	26.7%	0.05	3	15.8%	0.03
Plant Material	23	92.0%	0.48	35	77.8%	0.14	18	94.7%	0.15
Poaceae	17	68.0%	0.13	18	40.0%	0.37	7	36.8%	0.23
Lemna	12	48.0%	0.10	8	17.8%	0.03	13	68.4%	0.41
Myriophyllum	10	40.0%	0.08	8	17.8%	0.03	4	21.1%	0.18
Othe Plant Mater	9	36.0%	0.07	15	33.3%	0.06	6	31.6%	0.21
Detritus	**9**	**36.0%**	**0.07**	**19**	**42.2%**	**0.08**	**9**	**47.4%**	**0.08**
Crustacea	**0**	**0.0%**	**0.00**	**4**	**8.9%**	**0.02**	**3**	**15.8%**	**0.03**
Mollusca	**7**	**28.0%**	**0.06**	**33**	**73.3%**	**0.13**	**11**	**57.9%**	**0.09**
Bivalvia	0	0.0%	0.00	0	0.0%	0.00	0	0.0%	0.00
Sphaeridae	0	0.0%	0.00	0	0.0%	0.00	0	0.0%	0.00
Corbiculidae	0	0.0%	0.00	0	0.0%	0.00	0	0.0%	0.00
Unionidae	0	0.0%	0.00	0	0.0%	0.00	0	0.0%	0.00
Bivalvia Frag.	0	0.0%	0.00	0	0.0%	0.00	0	0.0%	0.00
Gastropoda	7	28.0%	1.00	33	73.3%	1.00	11	57.9%	1.00
Physidae	5	20.0%	0.56	6	13.3%	0.13	3	15.8%	0.16
Planorbidae	2	8.0%	0.29	7	15.6%	0.17	1	5.3%	0.06
Lymnaeidae	1	4.0%	0.04	4	8.9%	0.07	5	26.3%	0.17
Grastropoda Frag.	6	24.0%	0.20	31	68.9%	0.42	10	52.6%	0.26
Arachnida	**0**	**0.0%**	**0.00**	**0**	**0.0%**	**0.00**	**0**	**0.0%**	**0.00**
Insecta	**18**	**72.0%**	**0.14**	**25**	**55.6%**	**0.10**	**15**	**78.9%**	**0.13**
Odonata	12	48.0%	0.33	18	40.0%	0.69	14	73.7%	0.56
Tricoptera	5	20.0%	0.13	3	6.7%	0.06	4	21.1%	0.14
Coleoptera	2	8.0%	0.06	0	0.0%	0.00	1	5.3%	0.04
Hemiptera	4	16.0%	0.12	0	0.0%	0.00	1	5.3%	0.03
Diptera	3	12.0%	0.10	0	0.0%	0.00	3	15.8%	0.06
Ephemeroptera	1	4.0%	0.03	0	0.0%	0.00	0	0.0%	0.00
Hymenoptera	0	0.0%	0.00	0	0.0%	0.00	0	0.0%	0.00
Lepidoptera	0	0.0%	0.00	0	0.0%	0.00	0	0.0%	0.00
Orthoptera	0	0.0%	0.00	0	0.0%	0.00	0	0.0%	0.00
Unkown Insect	9	36.0%	0.17	5	11.1%	0.04	2	10.5%	0.04
Hirudina	**16**	**64.0%**	**0.13**	**42**	**93.3%**	**0.17**	**17**	**89.5%**	**0.14**
Bryozoa	**1**	**4.0%**	**0.01**	**9**	**20.0%**	**0.04**	**0**	**0.0%**	**0.00**
Pisces	**5**	**20.0%**	**0.04**	**23**	**51.1%**	**0.09**	**7**	**36.8%**	**0.06**
Unidentifiable	**23**	**92.0%**	**0.18**	**43**	**95.6%**	**0.17**	**19**	**100.0%**	**0.16**

Table 9: Summary table of the major dietary categories of observations, percent occurrence in samples, and relative frequency of dietary items identified from fecal samples of *Chrysemys picta*, *Sternotherus odoratus,* and *Emys blandingii* captured at Lockport Prairie Nature Preserve Will County, Illinois from 29 June 2004 – 1 August 2004. (Sample size of turtles is in parentheses next to the scientific name.

	***C. picta* (25)**			***S. odoratus* (45)**			***E. blandingii* (19)**		
Diet Category	**Obs.**	**%Ocur.**	**Freq.**	**Obs.**	**%Ocur.**	**Freq.**	**Obs.**	**%Ocur.**	**Freq.**
Algae	25	100.0%	0.19	45	100.0%	0.16	16	84.2%	0.14
Crustacea	0	0.0%	0.00	4	8.9%	0.01	3	15.8%	0.03
Detritus	9	36.0%	0.07	19	42.2%	0.07	9	47.4%	0.08
Hirudina	16	64.0%	0.12	42	93.3%	0.15	17	89.5%	0.14
Insecta	18	72.0%	0.14	25	55.6%	0.09	15	78.9%	0.13
Mollusca	7	28.0%	0.05	33	73.3%	0.12	11	57.9%	0.09
Pisces	5	20.0%	0.04	23	51.1%	0.08	7	36.8%	0.06
Seeds	4	16.0%	0.03	12	26.7%	0.04	3	15.8%	0.03
Unidentifiable	23	92.0%	0.18	43	95.6%	0.15	19	100.0%	0.16
Vascular Plants	23	92.0%	0.18	35	77.8%	0.12	18	94.7%	0.15

Table 10: Summary of morphometric variables (mean, standard error, range, and sample size) for all individual partitioned by stage and sex *Chelydra serpentina* captured at Lockport Prairie Nature Preserve Will County, Illinois from 29 June 2004 – 1 August 2004. The measurements of PL (Plastral Length), CL (Carapace Length), CW (Carapace Width), and SH (Shell Height) are in mm. Mass is in grams.

Females		**PL**	**CL**	**CW**	**SH**	**Mass**
Adult	Mean	179.0	243.9	197.4	108.2	3093.8
	Std. Error	2.8	4.2	3.5	3.0	160.3
	Range	154 - 216	198 - 293	166 - 243	88 - 196	1847 - 4375
	n	36	36	36	36	25
Immature	Mean	139.4	201.0	164.9	91.7	1959.8
	Std. Error	2.6	9.1	7.4	2.8	355.6
	Range	128 - 149	169 - 257	140 - 208	79 - 110	1087 - 3750
	n	10	10	10	10	8
Males						
Adult	Mean	193.9	268.1	265.5	115.4	4584.9
	Std. Error	3.5	5.2	40.7	3.0	264.7
	Range	157 - 238	213 - 335	169 - 1714	90 - 199	2250 - 8000
	n	37	37	37	37	34
Immature	Mean	129.8	198.5	160.5	89.3	1899.5
	Std. Error	7.4	12.8	9.6	4.6	293.6
	Range	113 - 145	168 - 230	138 - 183	76 - 96	1092 - 2500
	n	4	4	4	4	4
Unsexable						
Juvenile	Mean	94.6	128.4	106.3	60.0	558.1
	Std. Error	8.7	11.6	9.5	5.3	105.2
	Range	47 - 128	62 - 175	53 - 145	31 - 83	53 - 1122
	n	10	10	10	10	10
Hatchling	Mean	26.5	36.7	37.5	18.9	14.4
	n	1	1	1	1	1

Table 11: Regression relationship between pairings of morphological variables by sex for *Chelydra serpentina* captured at Lockport Prairie Nature Preserve Will County, Illinois from 29 June 2004 – 1 August 2004.

	R^2	***p***	**Slope**	**Intercept**
Females (44)				
PLxCL	0.73	<0.001	0.88±0.08	0.97±0.41
PLxCW	0.70	<0.001	0.84±0.08	0.93±0.42
PLxSH	0.34	<0.001	0.64±0.13	1.35±0.69
CLxCW	0.91	<0.001	0.94±0.04	0.14±0.24
CLxSH	0.37	<0.001	0.65±0.13	1.11±0.70
CWxSH	0.39	<0.001	0.69±0.13	1.04±0.67
PLxMass	0.56	<0.001	0.24±0.04	3.22±0.30
CLxMass	0.90	<0.001	0.32±0.02	2.93±0.15
CWxMass	0.88	<0.001	0.30±0.02	2.85±0.16
SHxMass	0.32	<0.001	0.23±0.06	2.83±0.47
Males (39)				
PLxCL	0.71	<0.001	0.77±0.08	1.53±0.41
PLxCW	0.73	<0.001	0.94±0.09	0.46±0.47
PLxSH	0.47	<0.001	0.65±0.11	1.31±0.58
CLxCW	0.83	<0.001	1.10±0.08	-0.73±0.44
CLxSH	0.44	<0.001	0.69±0.13	0.87±0.70
CWxSH	0.44	<0.001	0.58±0.10	1.62±0.56
PLxMass	0.80	<0.001	0.33±0.03	2.46±0.23
CLxMass	0.84	<0.001	0.31±0.02	2.97±0.19
CWxMass	0.84	<0.001	0.37±0.03	2.27±0.22
SHxMass	0.46	<0.001	0.25±0.04	2.64±0.37

Table 12: MANOVA results for sexual size dimorphism in plastral length (PL), carapace length (CL), carapace width (CW), shell height (SH), mass, anterior plastral width (APW), posterior plastral width (PPW), curved carapace length (CCL), dome length (DL), front angle (FA), side angle (SA), and rear angle (RA) for *Chelydra serpentina* captured at Lockport Prairie Nature Preserve Will County, Illinois from 29 June 2004 – 1 August 2004.

Measure	**F**	***p***	**Females**	**Males**	**Effect Size**	**Prop.**
PL	8.2	0.006	170.8	187.6	16.8	0.09
CL	11.6	<0.001	235.7	261.3	25.6	0.10
CW	13.2	<0.001	190.6	215.3	24.7	0.11
SH	7.3	0.009	103.0	110.6	7.6	0.07
Mass	13.9	<0.001	2912.1	4302.2	1390.1	0.32

Table 13: Summary of morphometric variables (mean, standard error, range, and sample size) for all individual partitioned by stage and sex *Sternotherus odoratus* captured at Lockport Prairie Nature Preserve Will County, Illinois from 29 June 2004 – 1 August 2004. The measurements of PL (Plastral Length), CL (Carapace Length), CW (Carapace Width), and SH (Shell Height) are in mm. Mass is in grams.

Females		**PL**	**CL**	**CW**	**SH**	**Mass**
Adult	Mean	87.7	110.7	78.8	46.4	216.9
	Std. Error	0.9	1.2	0.9	0.5	7.6
	Range	79 - 96	96 - 123	70 - 86	42 - 50	141 - 285
	Maximum	96.0	123.0	86.0	50.0	285.0
	n	27	27	27	27	27
Immature	Mean	73.3	90.4	69.6	40.0	129.6
	Std. Error	1.9	1.6	0.9	0.9	8.4
	Range	67 - 79	83 - 95	66 - 72	38 - 44	101 - 164
	Maximum	79.0	95.0	72.0	44.0	164.0
	n	7	7	7	7	7
Males						
Adult	Mean	75.3	101.8	70.8	40.9	169.3
	Std. Error	2.7	3.5	2.2	1.4	18.0
	Range	63 - 104	84 - 134	59 - 90	35 - 54	103 - 327
	Maximum	104.0	134.0	90.0	54.0	327.0
	n	16	16	16	16	16
Unsexable						
Juvenile	Mean	57.0	75.0	56.0	35.0	73.0
	n	1	1	1	1	1

Table 14: Regression relationship between pairings of morphological variables by sex for *Sternotherus odoratus* captured at Lockport Prairie Nature Preserve Will County, Illinois from 29 June 2004 – 1 August 2004.

	R^2	*p*	Slope	Intercept
Females (32)				
PLxCL	0.88	<0.001	1.01±0.07	0.16±0.30
PLxCW	0.80	<0.001	0.72±0.06	1.16±0.28
PLxSH	0.74	<0.001	0.74±0.08	0.52±0.35
CLxCW	0.83	<0.001	0.68±0.05	1.18±0.25
CLxSH	0.78	<0.001	0.70±0.07	0.53±0.31
CWxSH	0.76	<0.001	0.94±0.09	-0.28±0.40
PLxMass	0.85	<0.001	0.31±0.02	2.82±0.12
CLxMass	0.86	<0.001	0.33±0.02	2.91±0.12
CWxMass	0.86	<0.001	0.25±0.02	3.04±0.09
SHxMass	0.80	<0.001	0.26±0.02	2.45±0.12
Males (14)				
PLxCL	0.96	<0.001	0.94±0.05	0.58±0.21
PLxCW	0.95	<0.001	0.84±0.05	0.61±0.22
PLxSH	0.96	<0.001	0.95±0.05	-0.39±0.23
CLxCW	0.94	<0.001	0.88±0.06	0.17±0.26
CLxSH	0.94	<0.001	0.99±0.07	-0.86±0.31
CWxSH	0.97	<0.001	1.10±0.05	-1.00±0.21
PLxMass	0.92	<0.001	0.34±0.03	2.59±0.14
CLxMass	0.90	<0.001	0.32±0.03	2.99±0.14
CWxMass	0.96	<0.001	0.30±0.02	2.72±0.08
SHxMass	0.96	<0.001	0.34±0.02	1.99±0.09

Table 15: MANOVA results for sexual size dimorphism in plastral length (PL), carapace length (CL), carapace width (CW), shell height (SH), mass, anterior plastral width (APW), posterior plastral width (PPW), curved carapace length (CCL), dome length (DL), front angle (FA), side angle (SA), and rear angle (RA) for *Emys blandingii* captured at Lockport Prairie Nature Preserve Will County, Illinois from 29 June 2004 – 1 August 2004.

Measure	**F**	***p***	**Females**	**Males**	**Effect Size**	**Prop.**
PL	14.1	<0.001	84.7	75.3	9.5	0.11
CL	2.1	0.15	106.5	101.8	4.7	0.04
CW	10.0	0.003	76.9	70.8	6.1	0.08
SH	11.4	<0.001	45.1	40.9	4.2	0.09
Mass	4.4	0.04	198.9	169.3	29.7	0.15
APW	6.3	0.02	40.4	35.8	4.7	0.12
PPW	14.8	<0.001	36.0	31.5	4.4	0.12
DL	4.9	0.03	58.9	54.3	4.6	0.08
FA	0.03	0.96	31.7	32.4	0.7	0.02
SA	4.91	0.03	84.3	77.8	6.5	0.08
RA	1.6	0.21	68.8	72.7	3.9	0.06
CCL	1.3	0.26	124.5	119.9	4.5	0.04

Table 16: Results of the principle component analysis (PCA) for *Sternotherus odoratus* captured at Lockport Prairie Nature Preserve Will County, Illinois from 29 June 2004 – 1 August 2004. The upper panel represents the percent of variance explained by each component and the eigenvalues; whereas the lower panel shows the factor loadings of the residuals of each character when PL is controlled for.

Component	Eigen Values	% of Variance	Cumulative %
1	3.54	32.20	32.20
2	1.95	17.69	49.89
3	1.23	11.21	61.10
4	1.07	9.69	70.78
5	0.80	7.31	78.10

	Component				
	1	2	3	4	5
lnPlxLnCL	0.71	-0.20	0.06	-0.23	-0:49
lnPLxlnCW	0.76	0.36	0.13	0.09	0.09
lnPLxLnSH	0.58	0.42	0.28	0.19	-0.04
lnPLxlnMass	0.81	-0.03	0.29	0.22	-0.16
lnPLxlnAPW	0.10	0.62	-0.53	0.30	-0.09
lnPLxlnPPW	0.30	0.67	0.32	-0.03	0.36
lnPLxlnDL	0.55	-0.10	-0.31	-0.38	0.51
lnPLxlnFA	0.14	-0.40	-0.21	0.79	0.11
lnPLxlnSA	-0.40	-0.26	0.71	0.12	0.11
lnPLxlnRA	0.43	-0.62	0.02	0.13	0.33
lnPLxlnCCL	0.83	-0.39	-0.13	-0.16	-0.07

Table 17: MANOVA results of shape factors retained from the PCA for *Sternotherus odoratus* captured at Lockport Prairie Nature Preserve Will County, Illinois from 29 June 2004 – 1 August 2004.

Measure	F	*p*	Females	Males	Effect Size
Factor 1	20.14	<0.001	-0.37	0.78	1.15
Factor 2	0.05	0.82	0.02	-0.05	0.07
Factor 3	0.46	0.50	-0.07	0.14	0.21
Factor 4	0.17	0.68	0.04	-0.09	0.13
Factor 5	0.87	0.35	0.09	-0.18	0.28

Table 18: Summary of morphometric variables (mean, standard error, range, and sample size) for all individual partitioned by stage and sex *Emys blandingii* captured at Lockport Prairie Nature Preserve Will County, Illinois from 29 June 2004 – 1 August 2004. The measurements of PL (Plastral Length), CL (Carapace Length), CW (Carapace Width), and SH (Shell Height) are in mm. Mass is in grams.

Females		**PL**	**CL**	**CW**	**SH**	**Mass**
Adult	Mean	192.5	197.0	266.3	76.8	1072.5
	Std. Error	2.8	3.8	134.3	1.1	58.1
	Range	179 - 210	175 - 215	126 - 1475	70 - 84	827 - 1505
	n	10	10	10	10	10
Immature	Mean	141.3	141.3	111.0	57.0	435.0
	Std. Error	13.0	14.4	9.3	5.3	128.8
	Range	125 - 167	124 - 170	93 - 124	49 - 67	263 - 687
	n	3	3	3	3	3
Males						
Adult	Mean	201.8	217.8	144.6	82.6	1374.4
	Std. Error	2.6	4.0	2.7	3.1	63.5
	Range	195 - 210	210 - 233	136 - 150	75 - 90	1198 - 1496
	n	5	5	5	5	5
Unsexable						
Juvenile	Mean	99.0	99.3	75.7	41.0	160.3
	Std. Error	11.7	10.0	6.1	3.2	45.0
	Range	81 - 121	84 - 118	66 - 87	36 - 47	96 - 247
	n	3	3	3	3	3

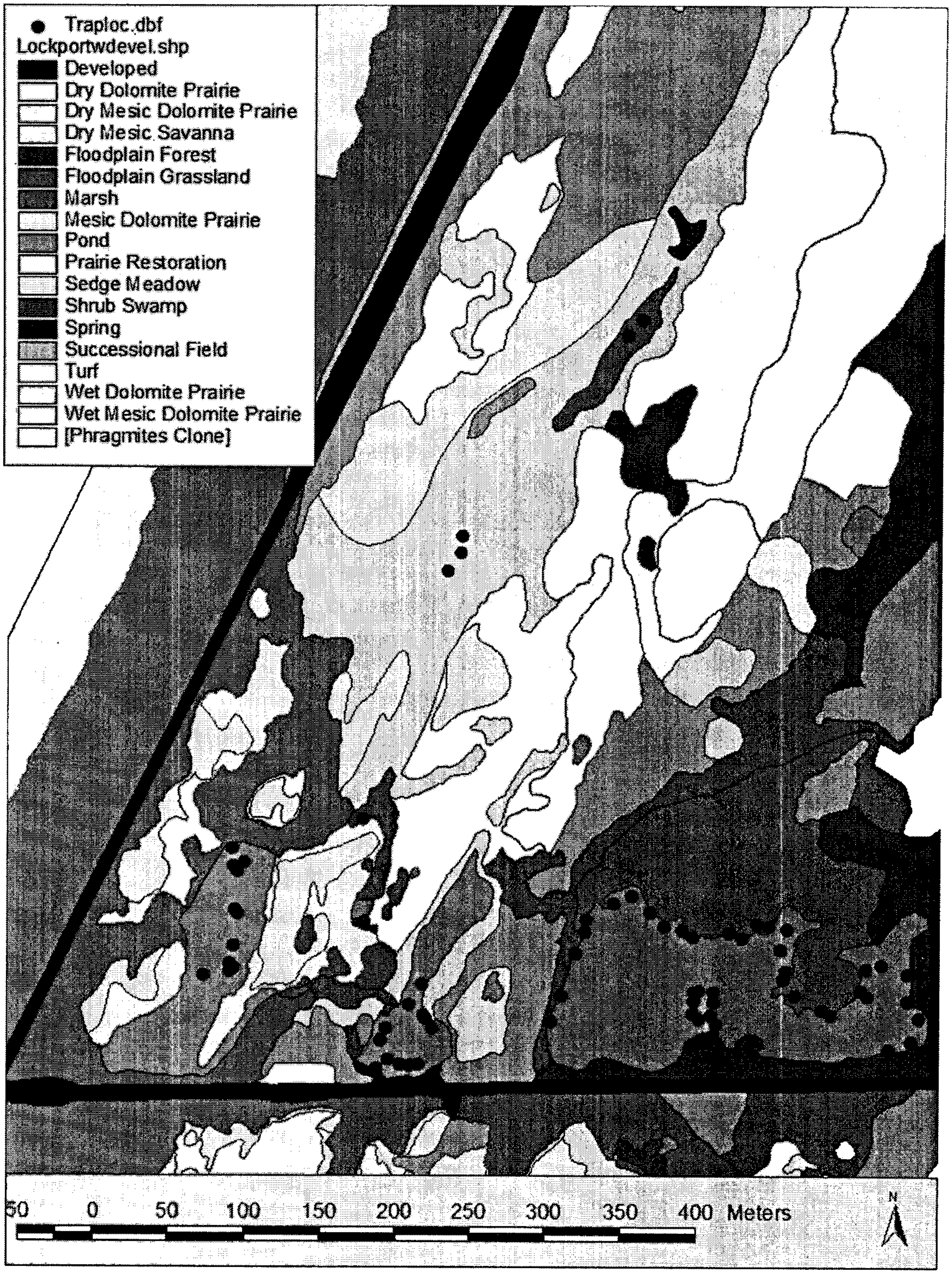


Figure 1: Map of north subunit of Lockport Prairie Nature Preserve, Will County, Illinois with all trap locations represented at dots.

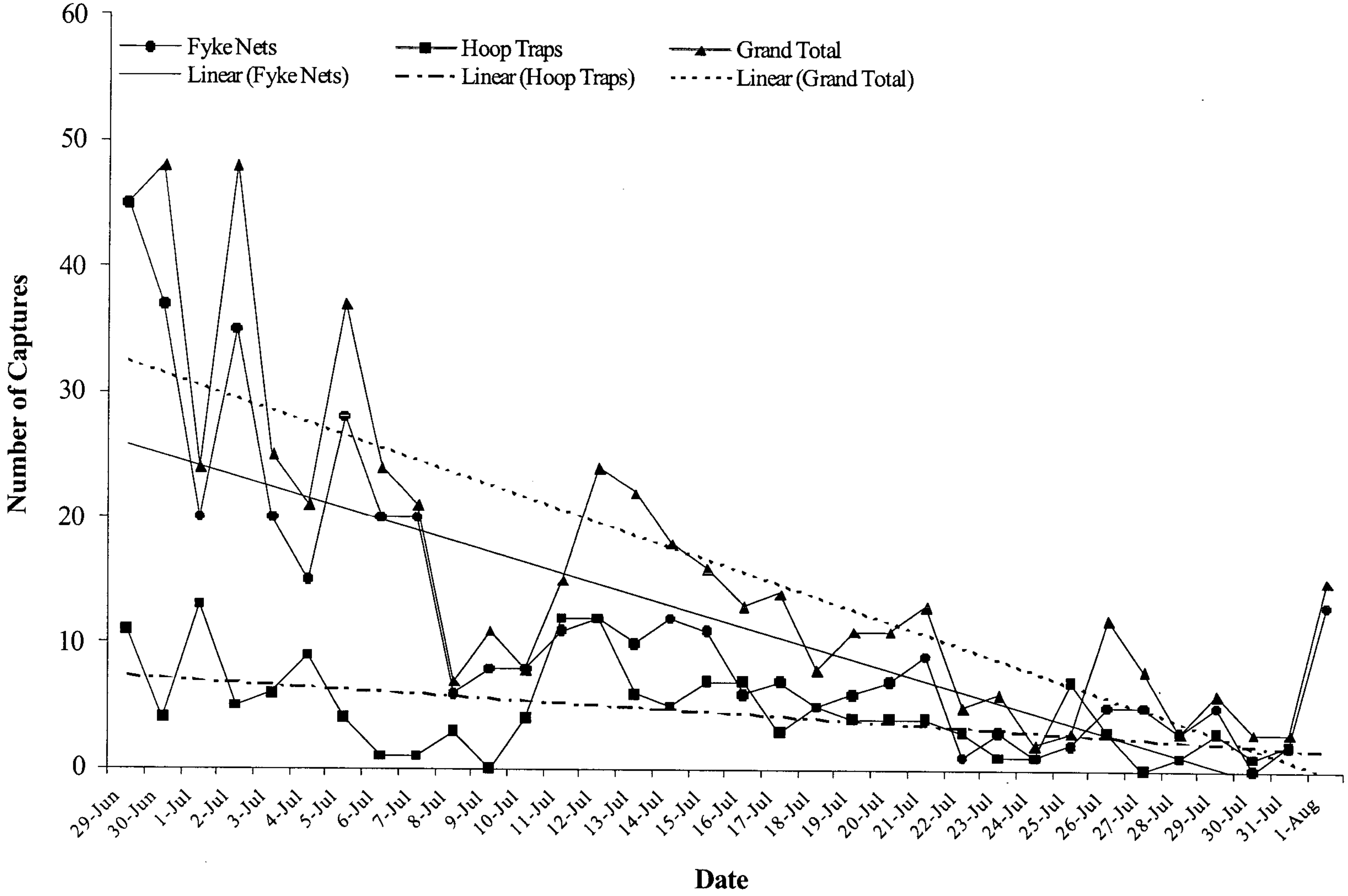


Figure 2: The number of turtle captures for fyke nets broken down by species and day for trapping at Lockport Prairie Nature Preserve, Will County, Illinois from 29 June 2004 – 1 August 2004.

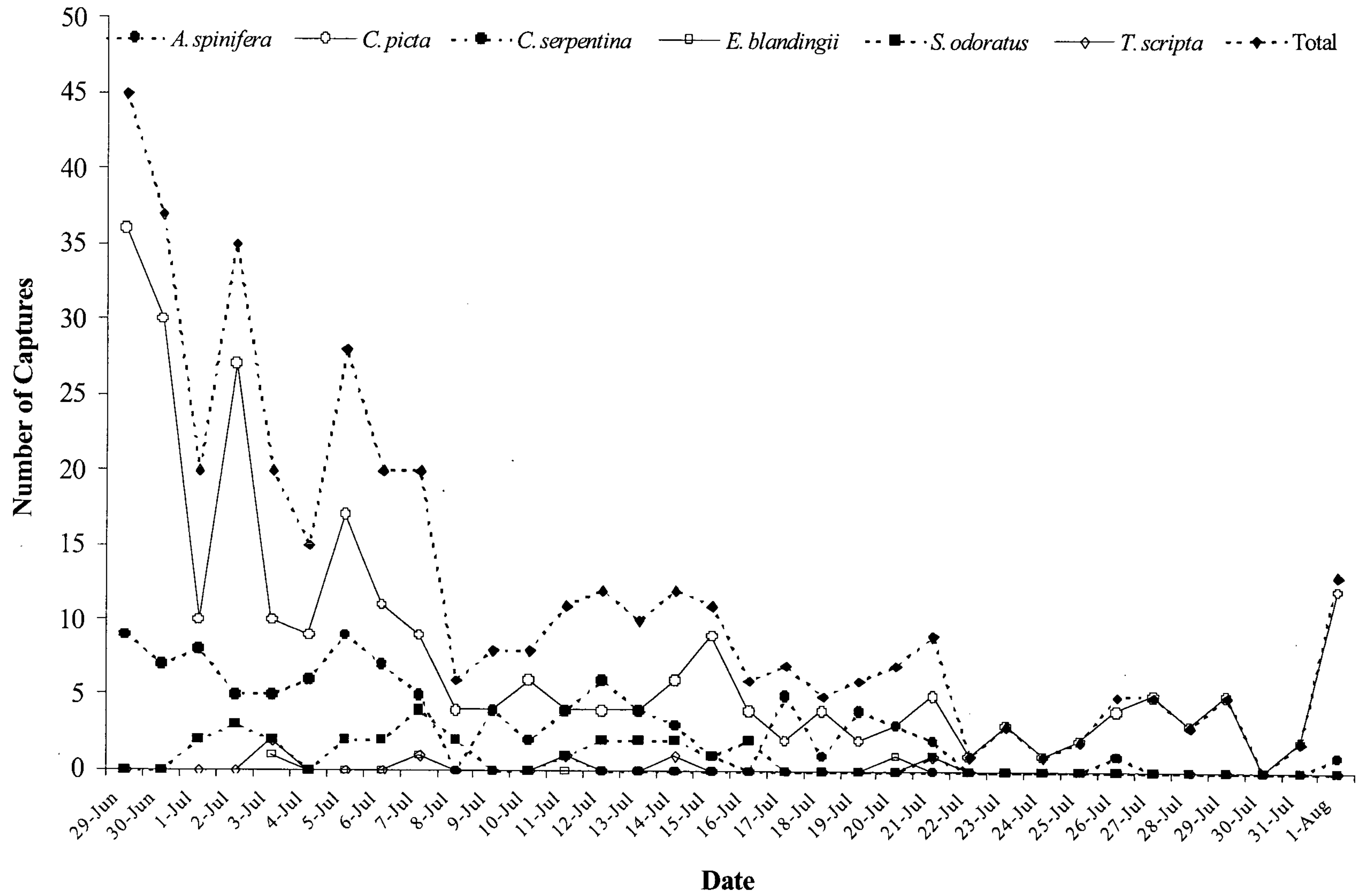


Figure 3: The number of turtle captures for baited hop traps broken down by species and day for trapping at Lockport Prairie Nature Preserve Will County, Illinois from 29 June 2004 – 1 August 2004.

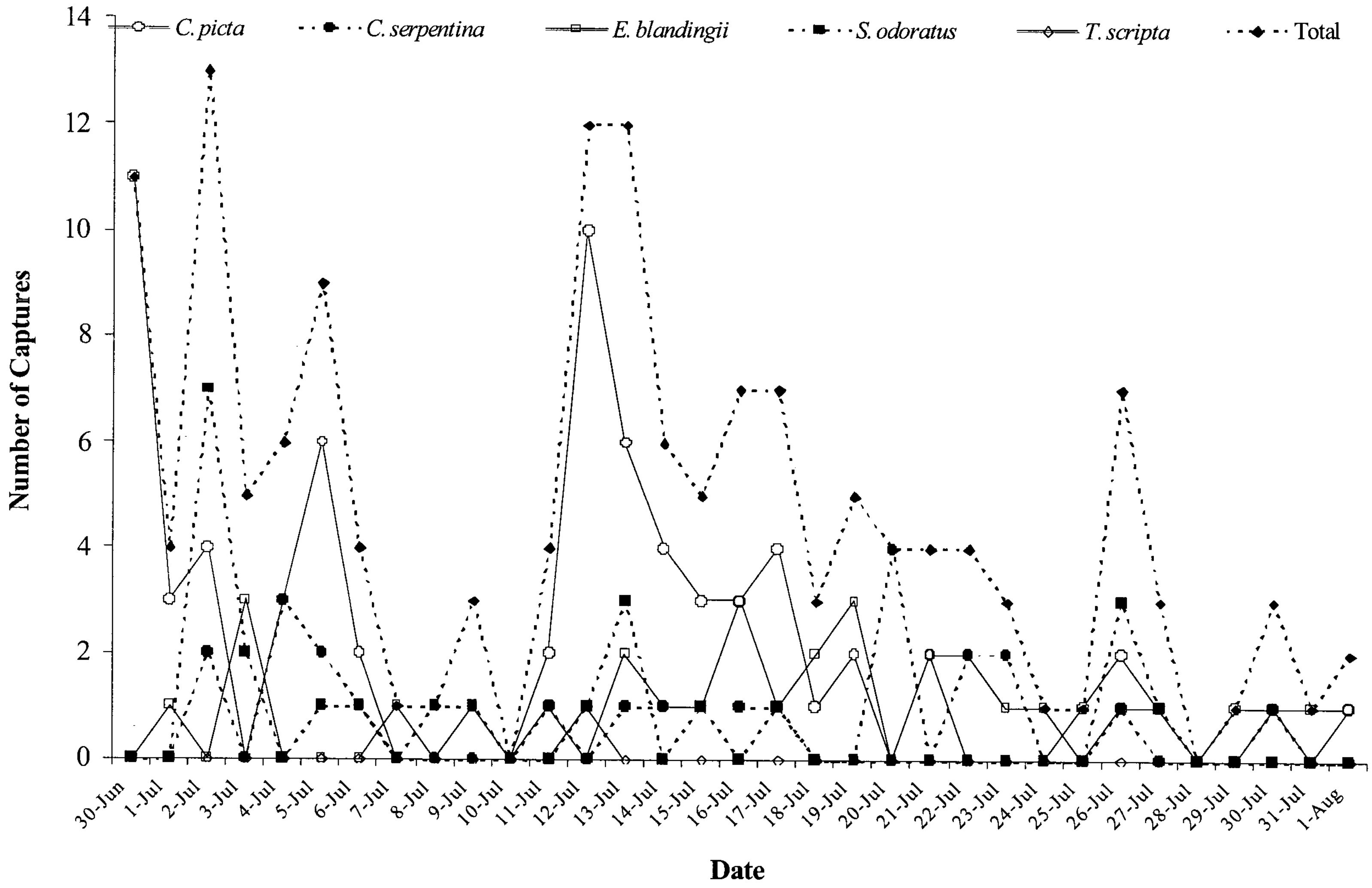


Figure 4: The total number of turtle captures for fyke nets and hoop traps broken down by species and day for trapping at Lockport Prairie Nature Preserve Will County, Illinois from 29 June 2004 – 1 August 2004.

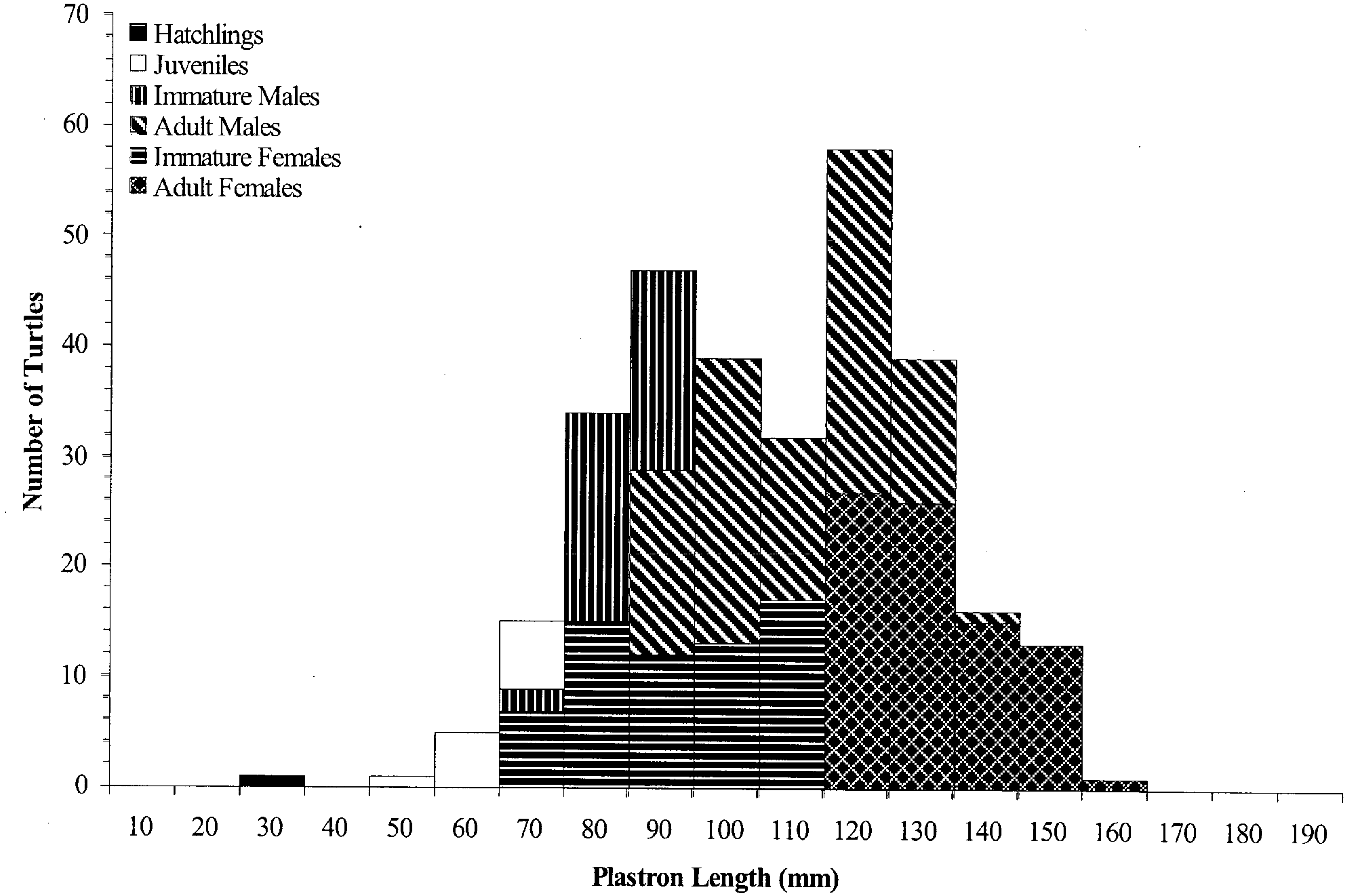


Figure 5: Size frequency histogram for *Chrysemys picta* captured at Lockport Prairie Nature Preserve Will County, Illinois from 29 June 2004 – 1 August 2004.

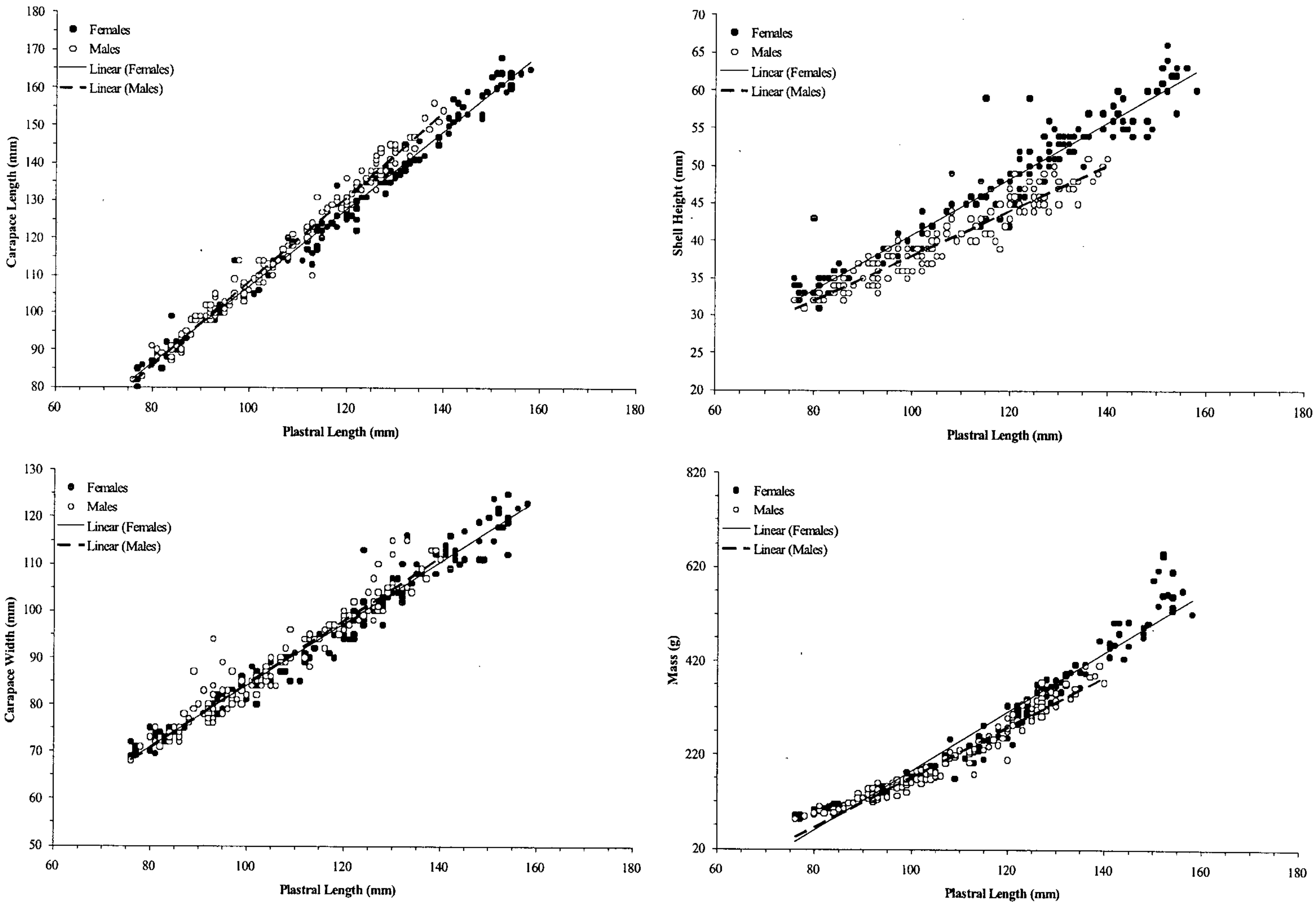


Figure 6: Linear regressions for the body size measures of plastral length, carapace length, carapace width, shell height, and mass by sex for *Chrysemys picta* captured at Lockport Prairie Nature Preserve Will County, Illinois from 29 June 2004 – 1 August 2004.

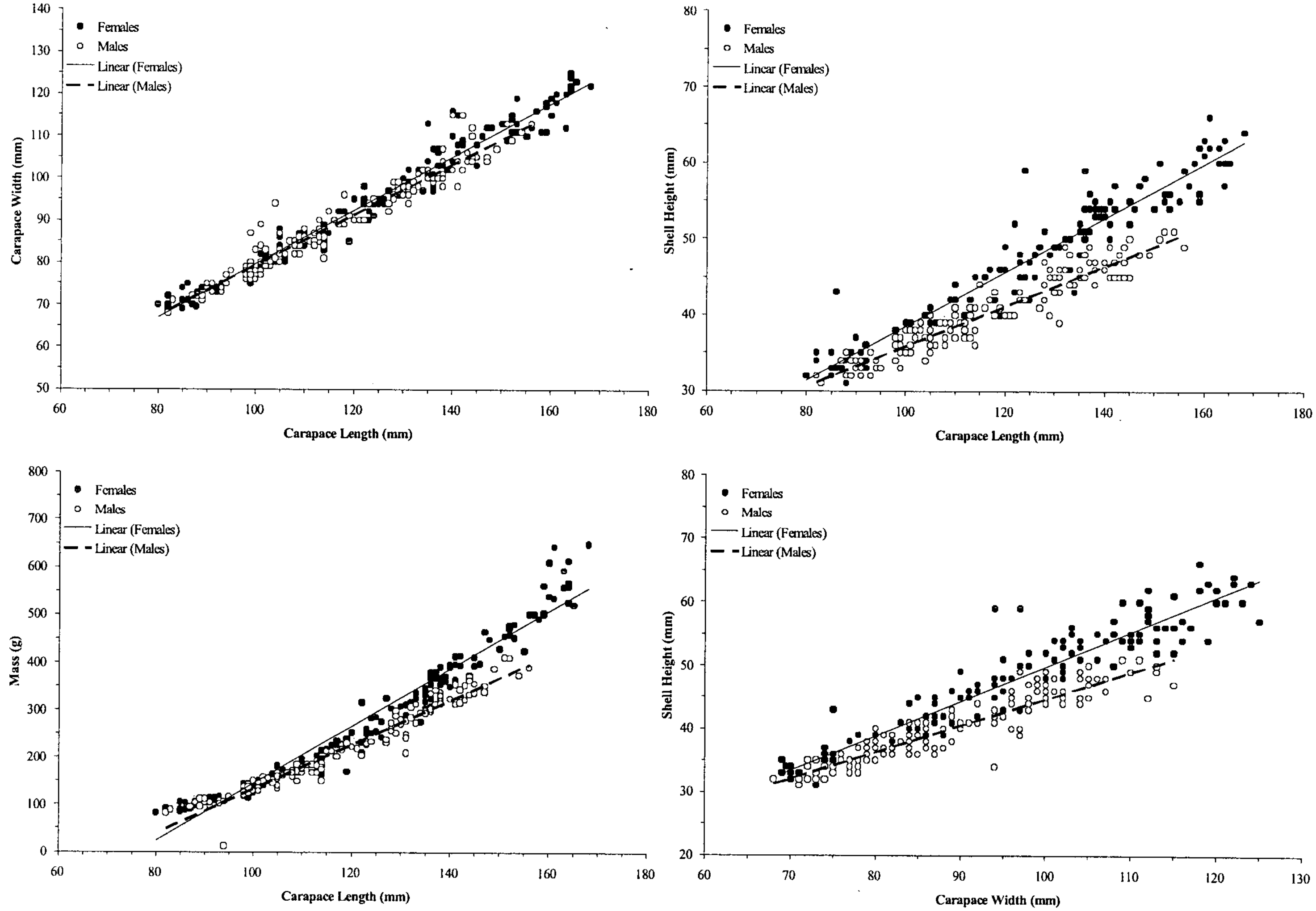


Figure 6 : Linear regressions for the body size measures of plastral length, carapace length, carapace width, shell height, and mass by sex for *Chrysemys picta* captured at Lockport Prairie Nature Preserve Will County, Illinois from 29 June 2004 – 1 August 2004. (Continued).

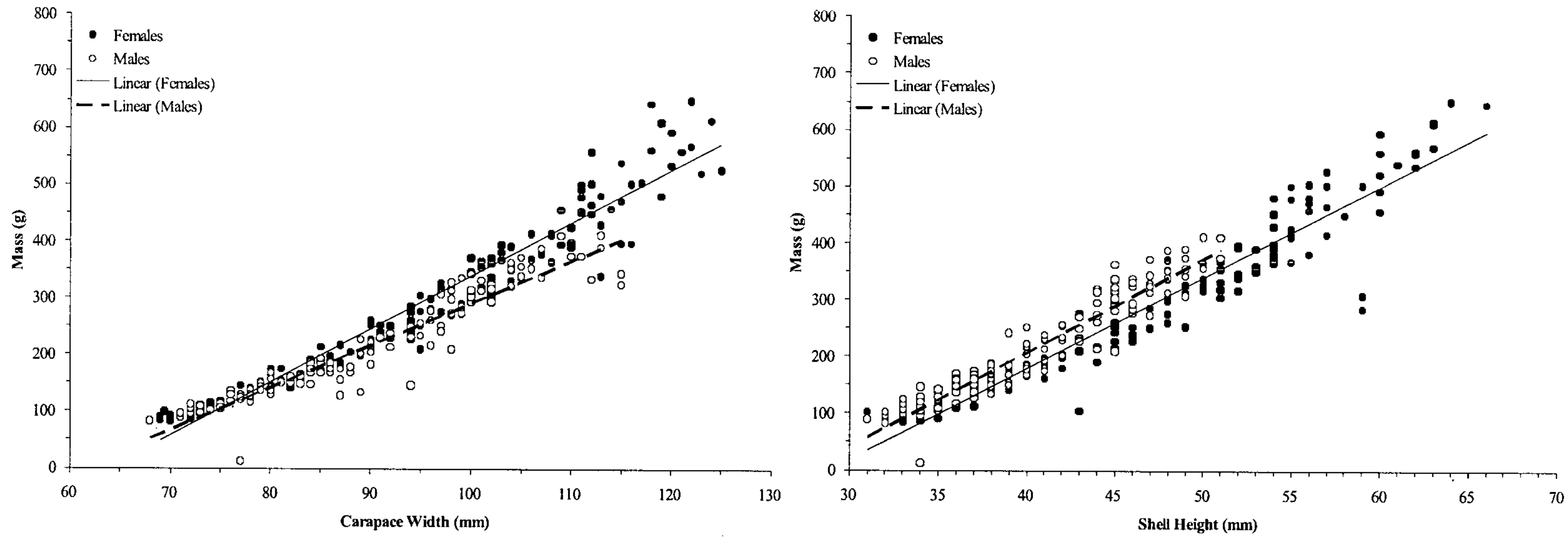


Figure 6: Linear regressions for the body size measures of plastral length, carapace length, carapace width, shell height, and mass by sex for *Chrysemys picta* captured at Lockport Prairie Nature Preserve Will County, Illinois from 29 June 2004 – 1 August 2004. (Continued).

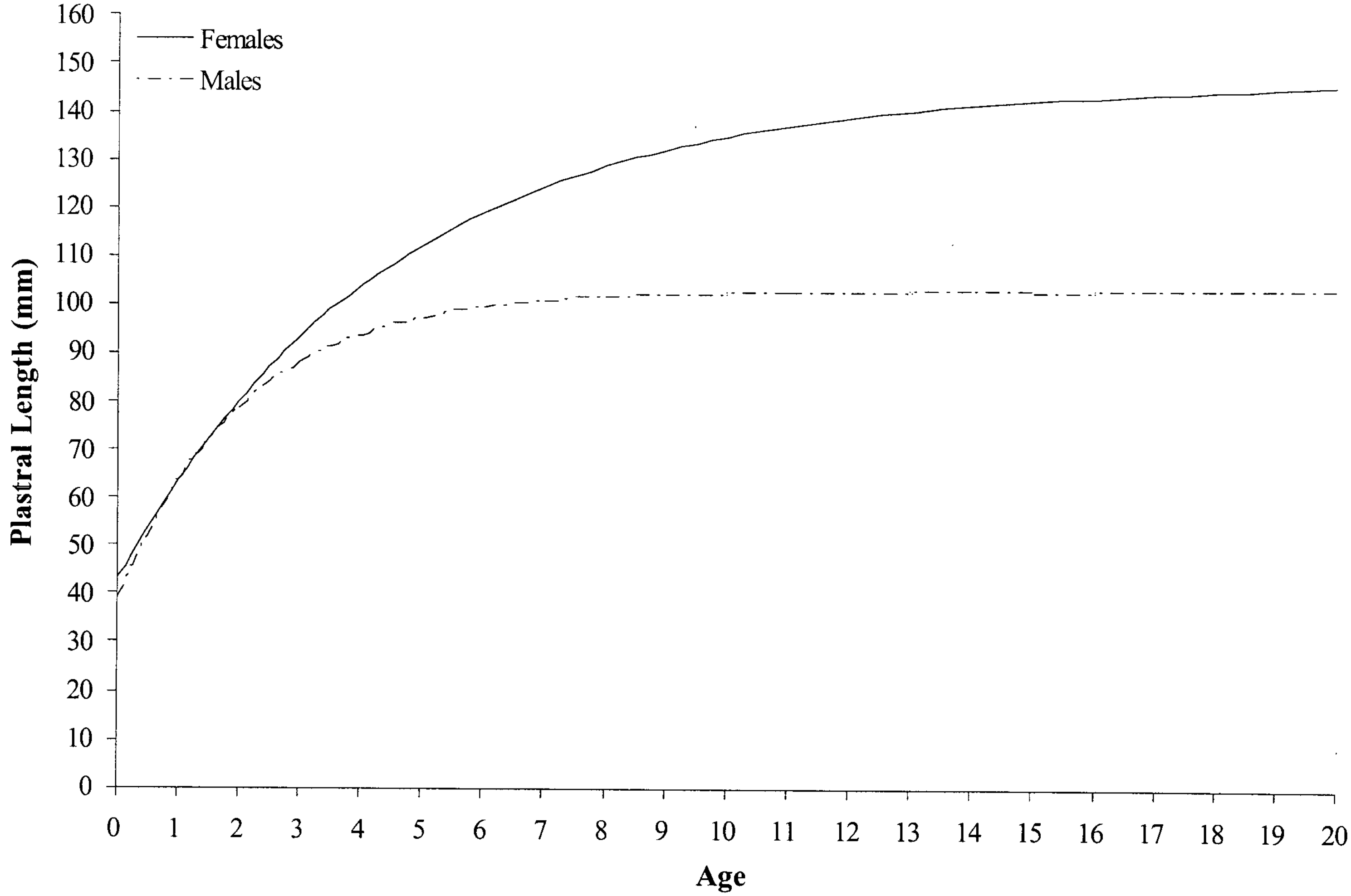


Figure 7: von Bertalanffy growth functions by sex for *Chrysemys picta* captured at Lockport Prairie Nature Preserve Will County, Illinois from 29 June 2004 – 1 August 2004.

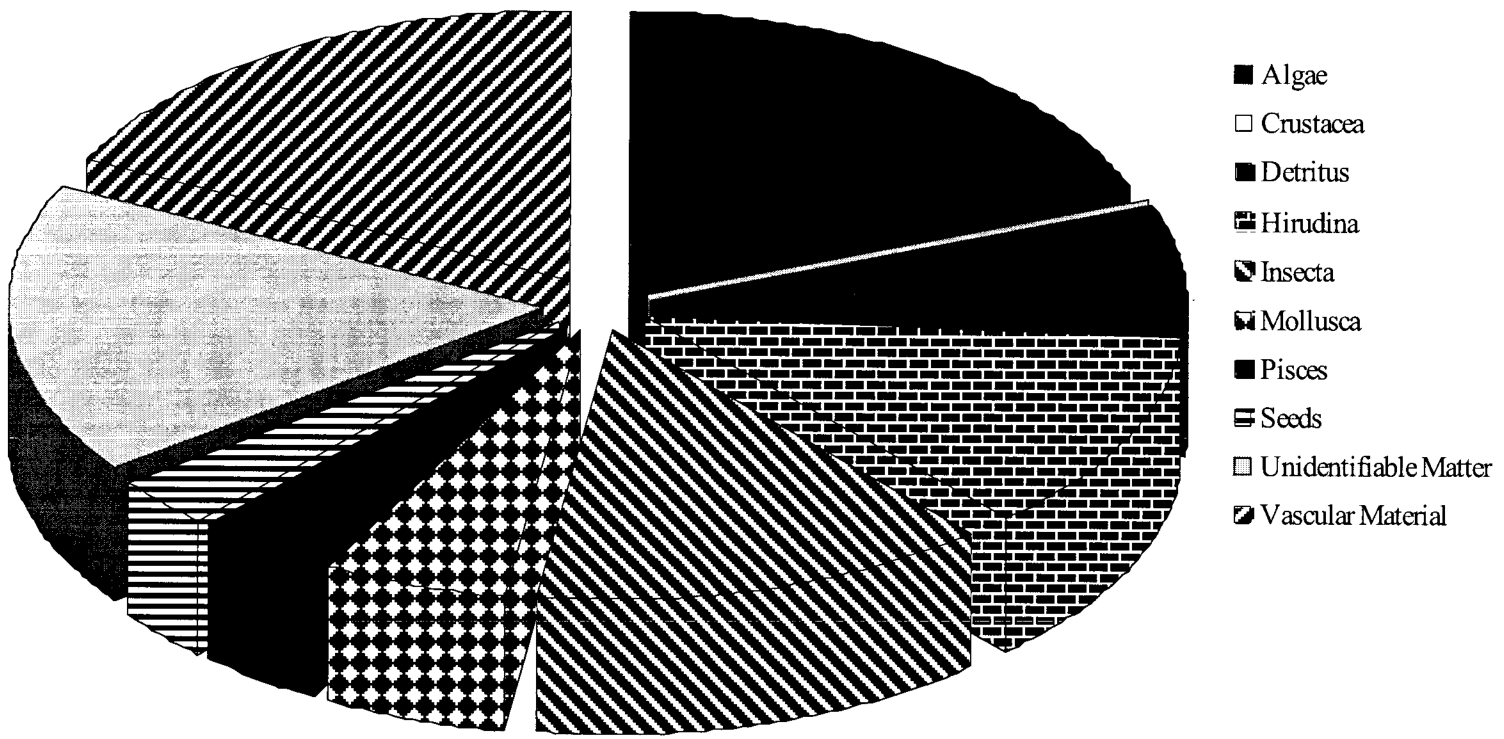


Figure 8: Pie graph representing the proportion of times each dietary item was recorded for fecal samples from *Chrysemys picta* captured at Lockport Prairie Nature Preserve Will County, Illinois from 29 June 2004 – 1 August 2004.

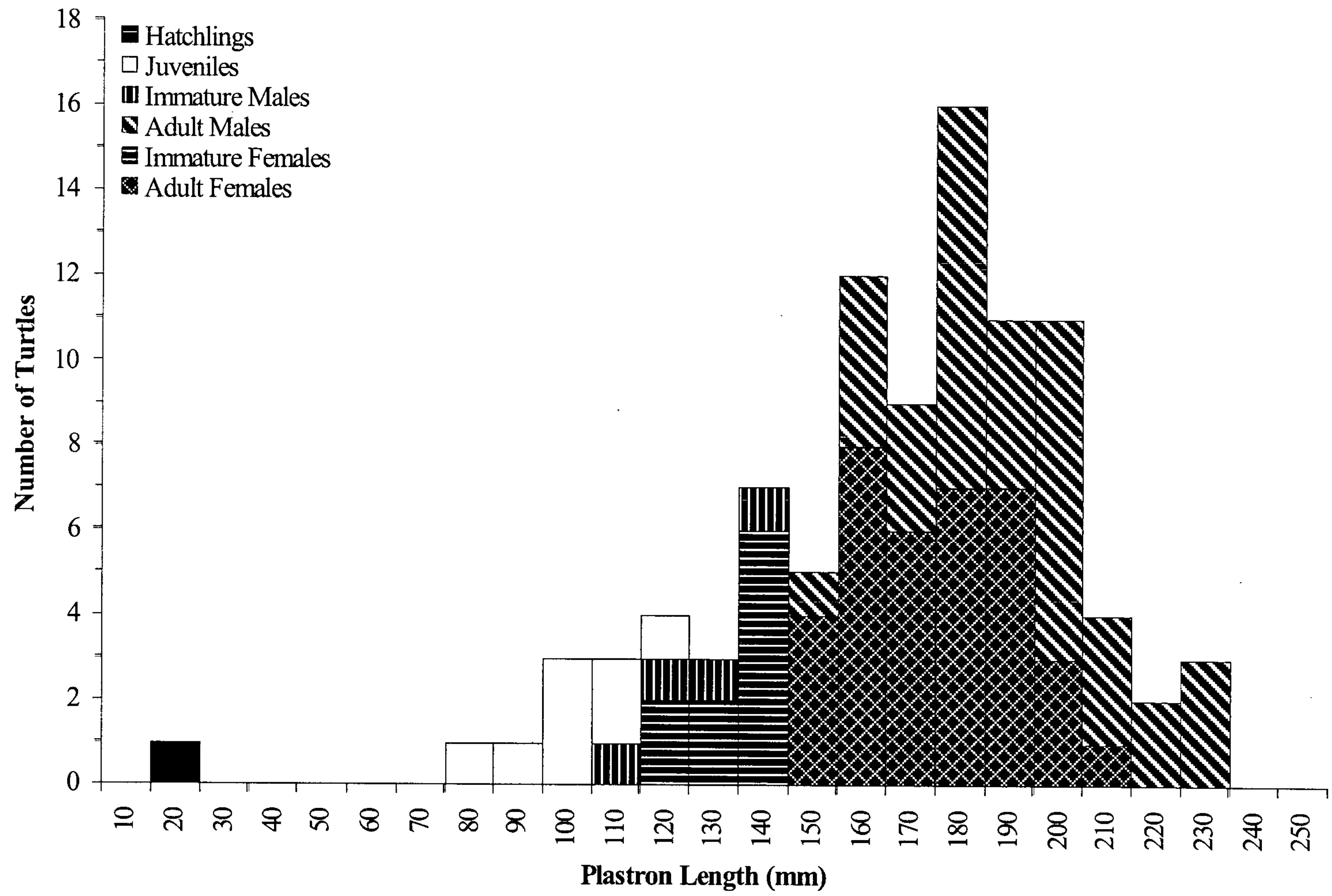


Figure 9: Size frequency histogram for *Chelydra serpentina* captured at Lockport Prairie Nature Preserve Will County, Illinois from 29 June 2004 – 1 August 2004.

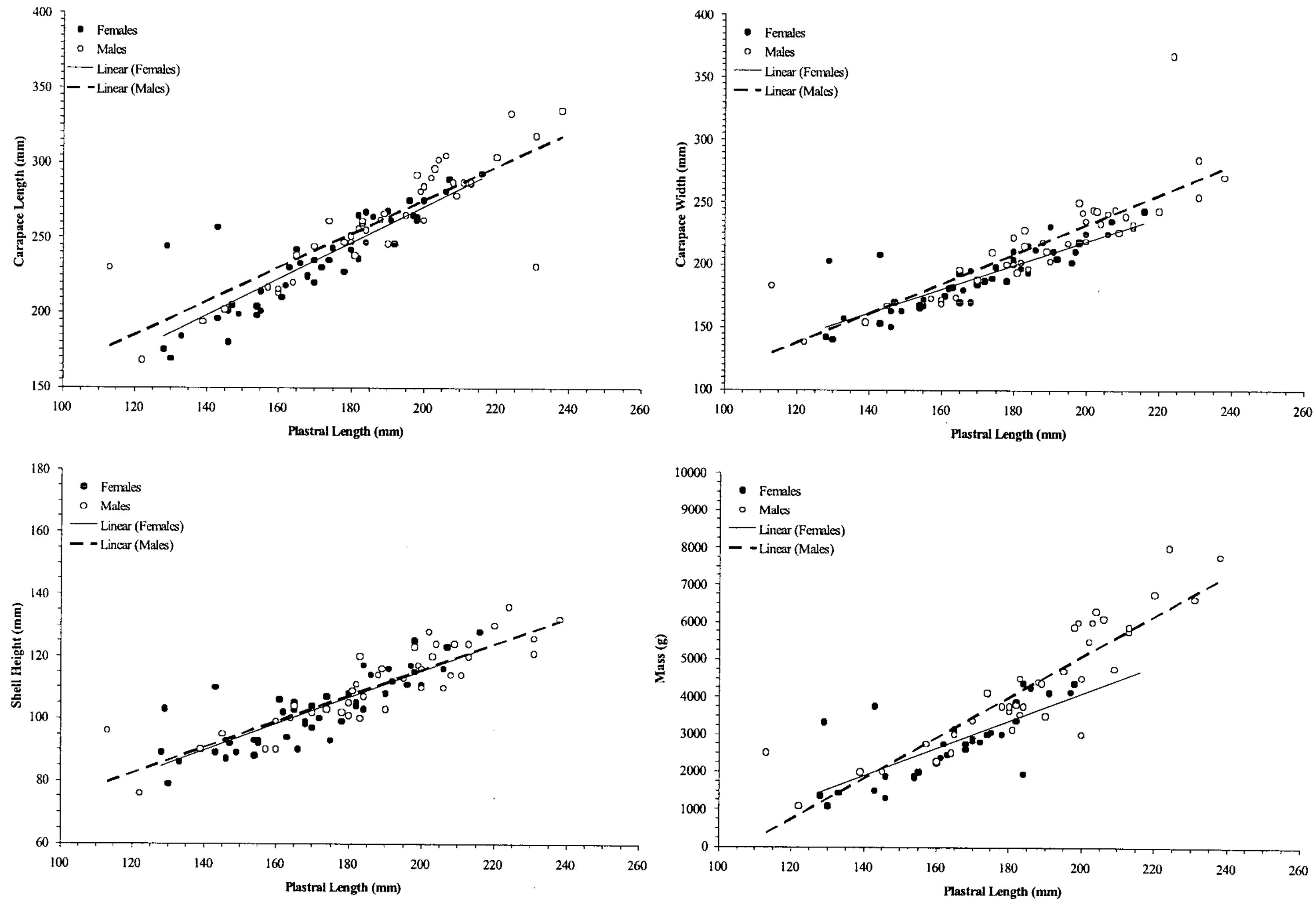


Figure 10: Linear regressions for the body size measures of plastral length, carapace length, carapace width, shell height, and mass by sex for *Chelydra serpentina* captured at Lockport Prairie Nature Preserve Will County, Illinois from 29 June 2004 – 1 August 2004.

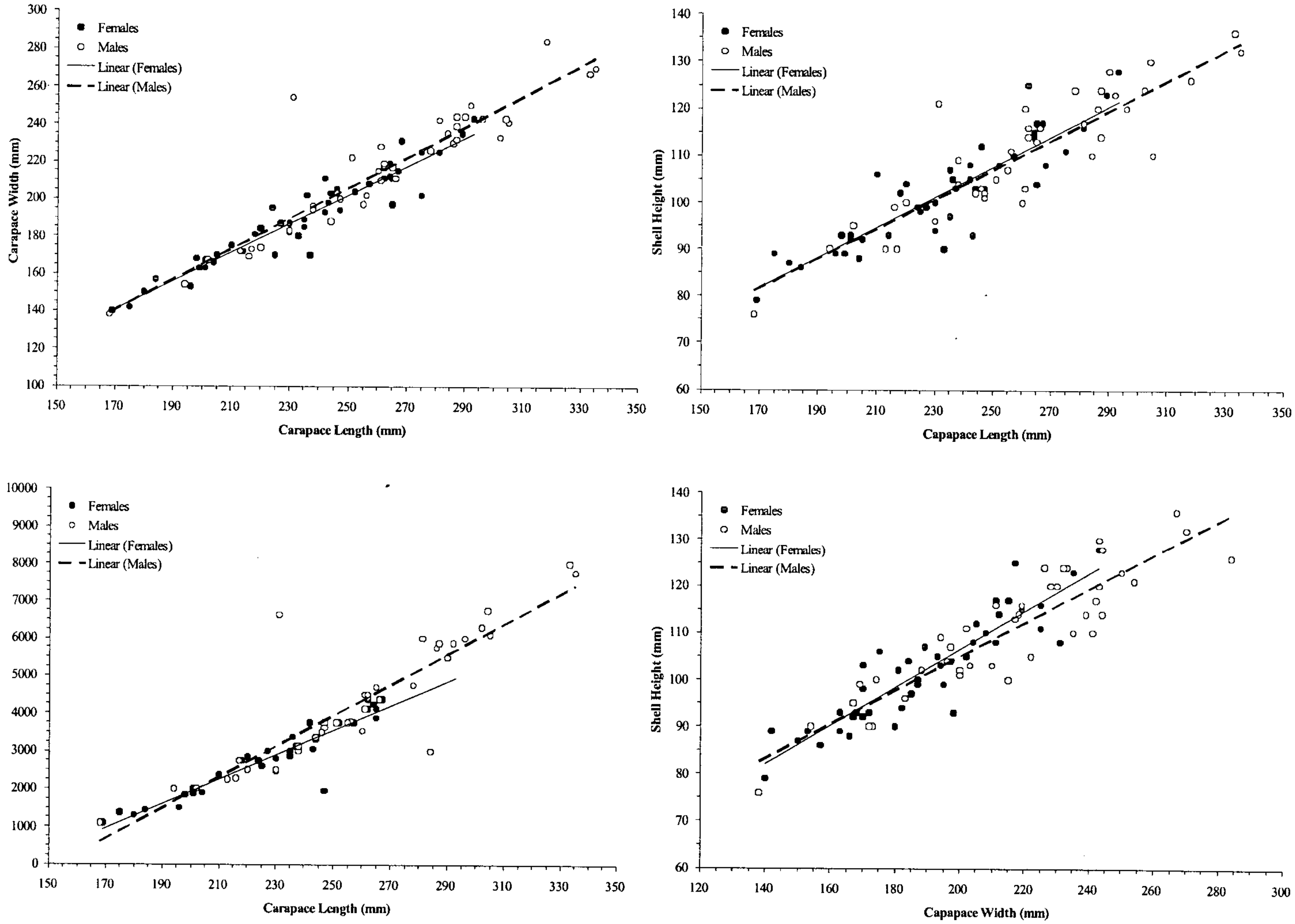


Figure 10: Linear regressions for the body size measures of plastral length, carapace length, carapace width, shell height, and mass by sex for *Chelydra serpentina* captured at Lockport Prairie Nature Preserve Will County, Illinois from 29 June 2004 – 1 August 2004 (Continued).

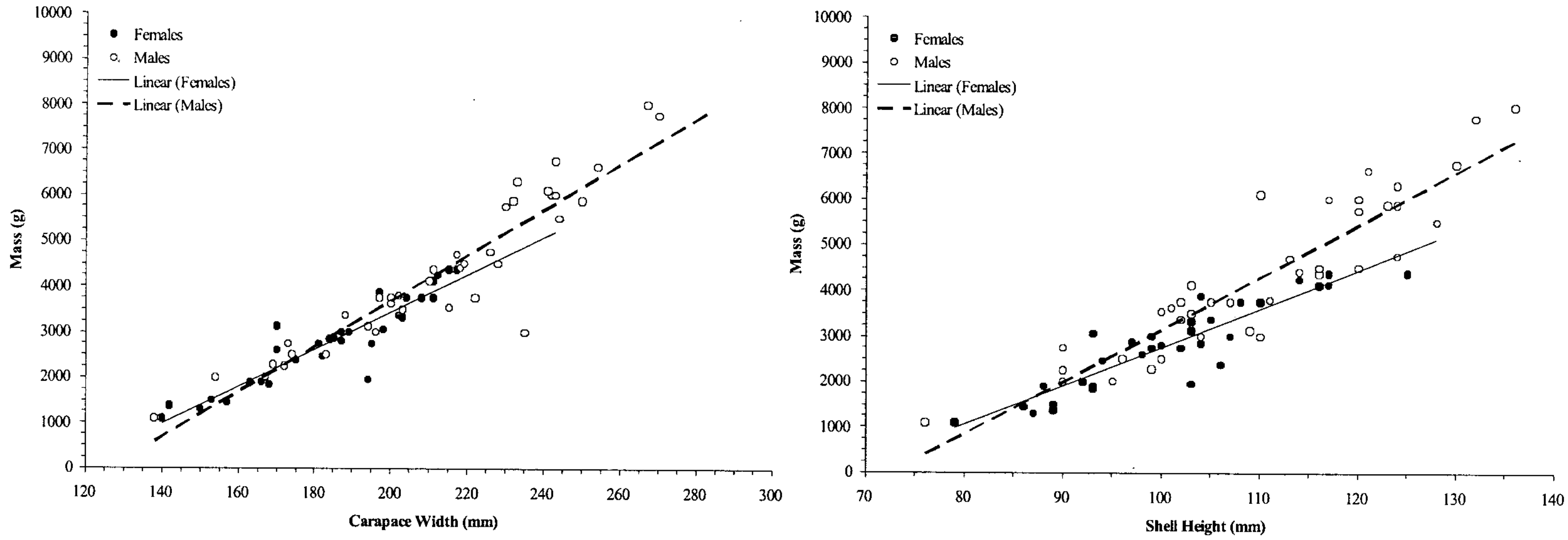


Figure 10: Linear regressions for the body size measures of plastral length, carapace length, carapace width, shell height, and mass by sex for *Chelydra serpentina* captured at Lockport Prairie Nature Preserve Will County, Illinois from 29 June 2004 – 1 August 2004 (Continued).

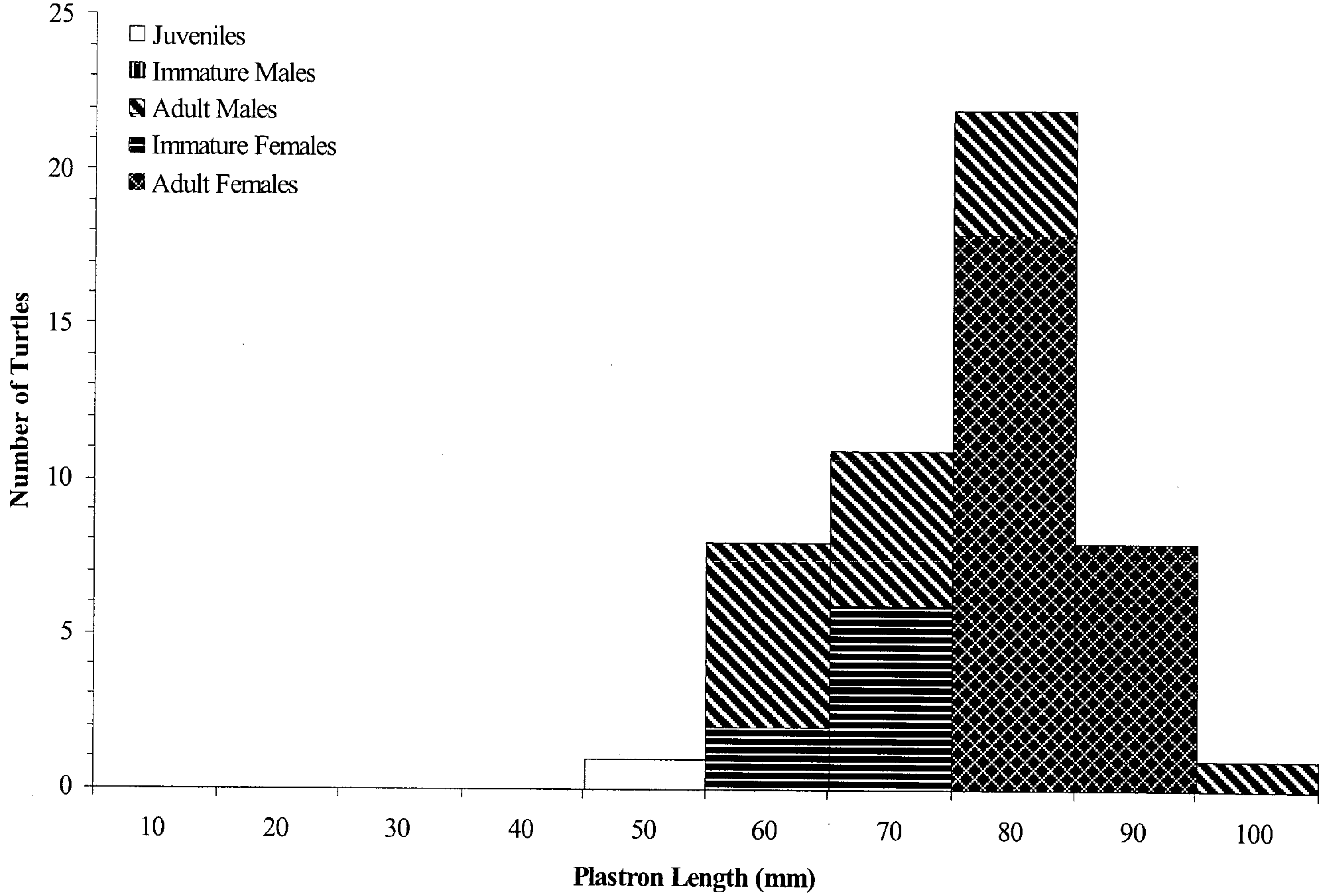


Figure 11: Size frequency histogram for *Sternotherus odoratus* captured at Lockport Prairie Nature Preserve Will County, Illinois from 29 June 2004 – 1 August 2004.

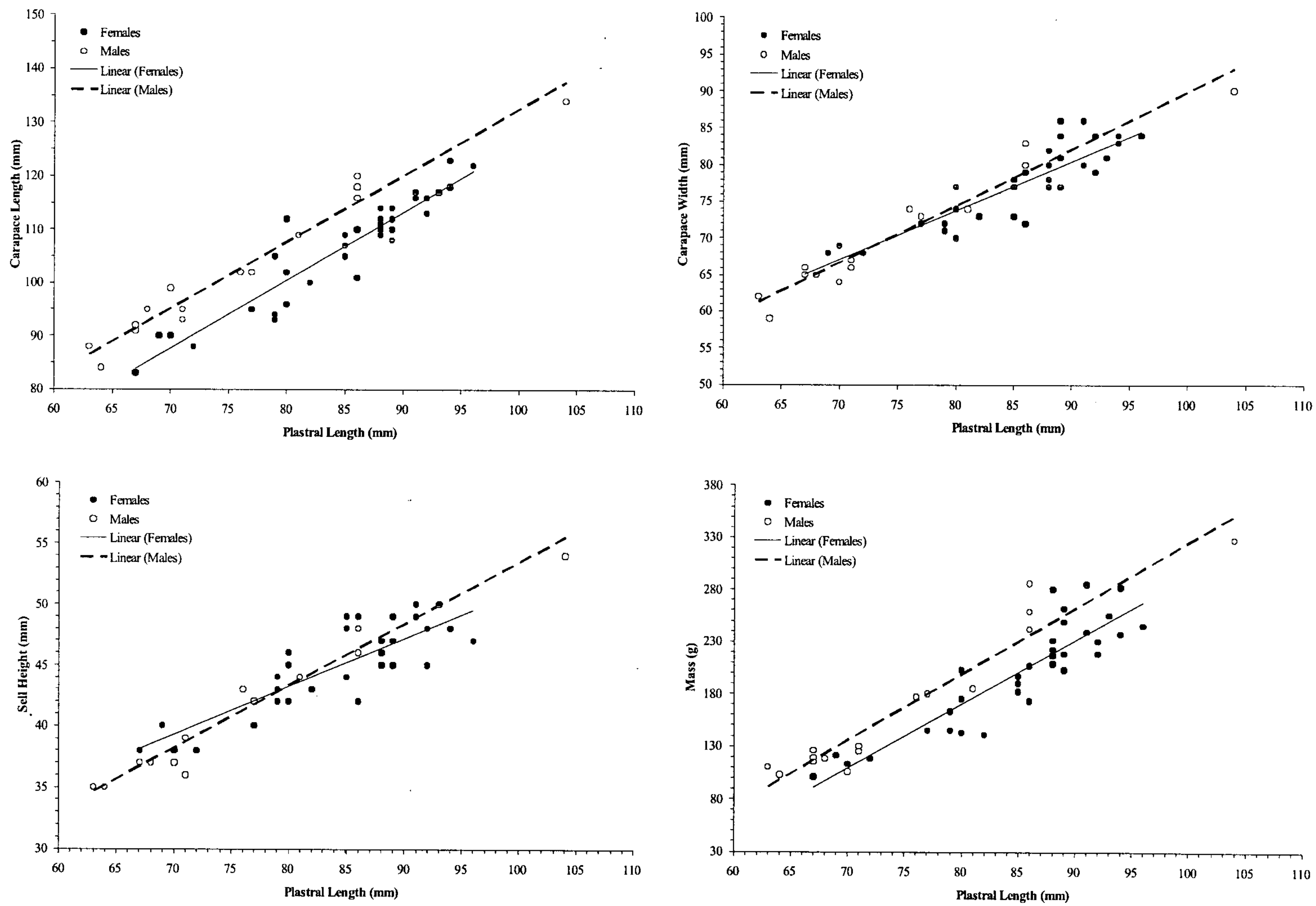


Figure 12: Linear regressions for the body size measures of plastral length, carapace length, carapace width, shell height, and mass by sex for *Sternotherus odoratus* captured at Lockport Prairie Nature Preserve Will County, Illinois from 29 June 2004 – 1 August 2004.

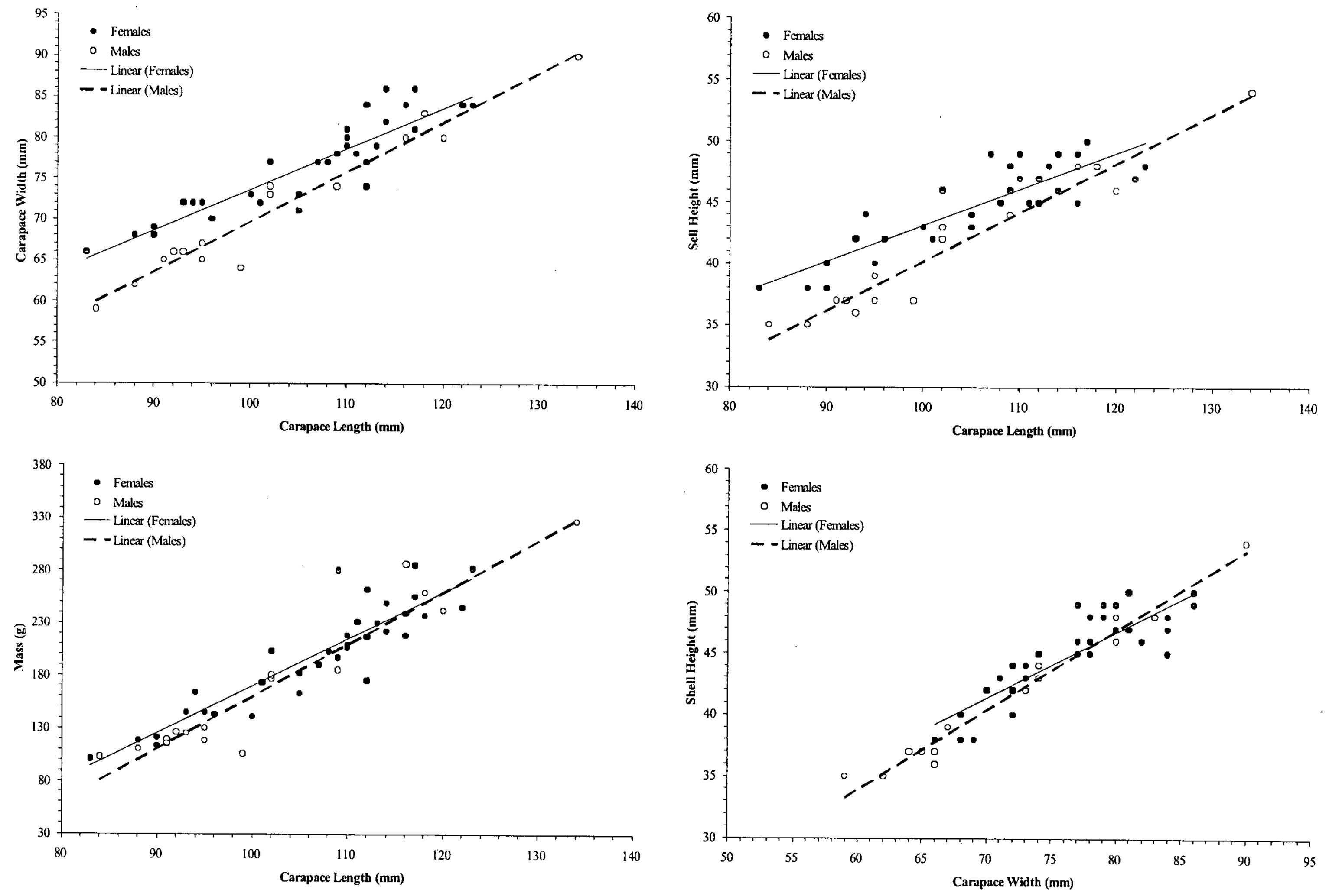
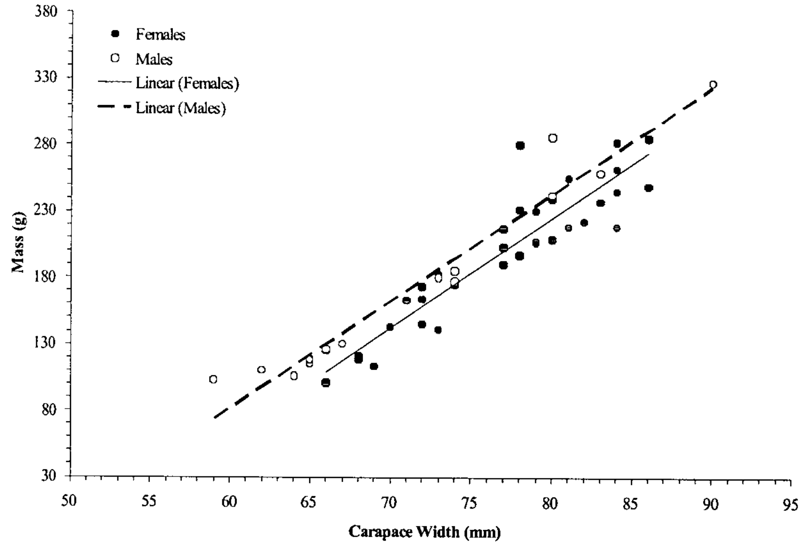


Figure 12: Linear regressions for the body size measures of plastral length, carapace length, carapace width, shell height, and mass by sex for *Sternotherus odoratus* captured at Lockport Prairie Nature Preserve Will County, Illinois from 29 June 2004 – 1 August 2004 (Continued).



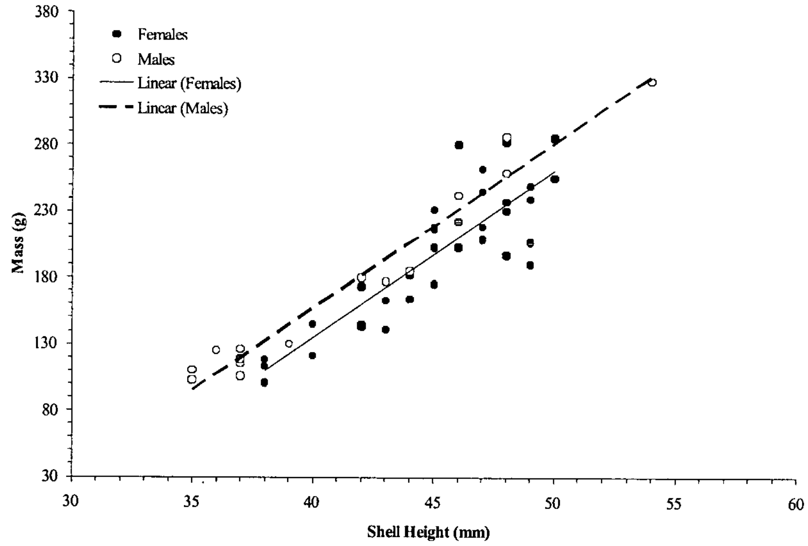


Figure 12: Linear regressions for the body size measures of plastral length, carapace length, carapace width, shell height, and mass by sex for *Sternotherus odoratus* captured at Lockport Prairie Nature Preserve Will County, Illinois from 29 June 2004 – 1 August 2004 (Continued).

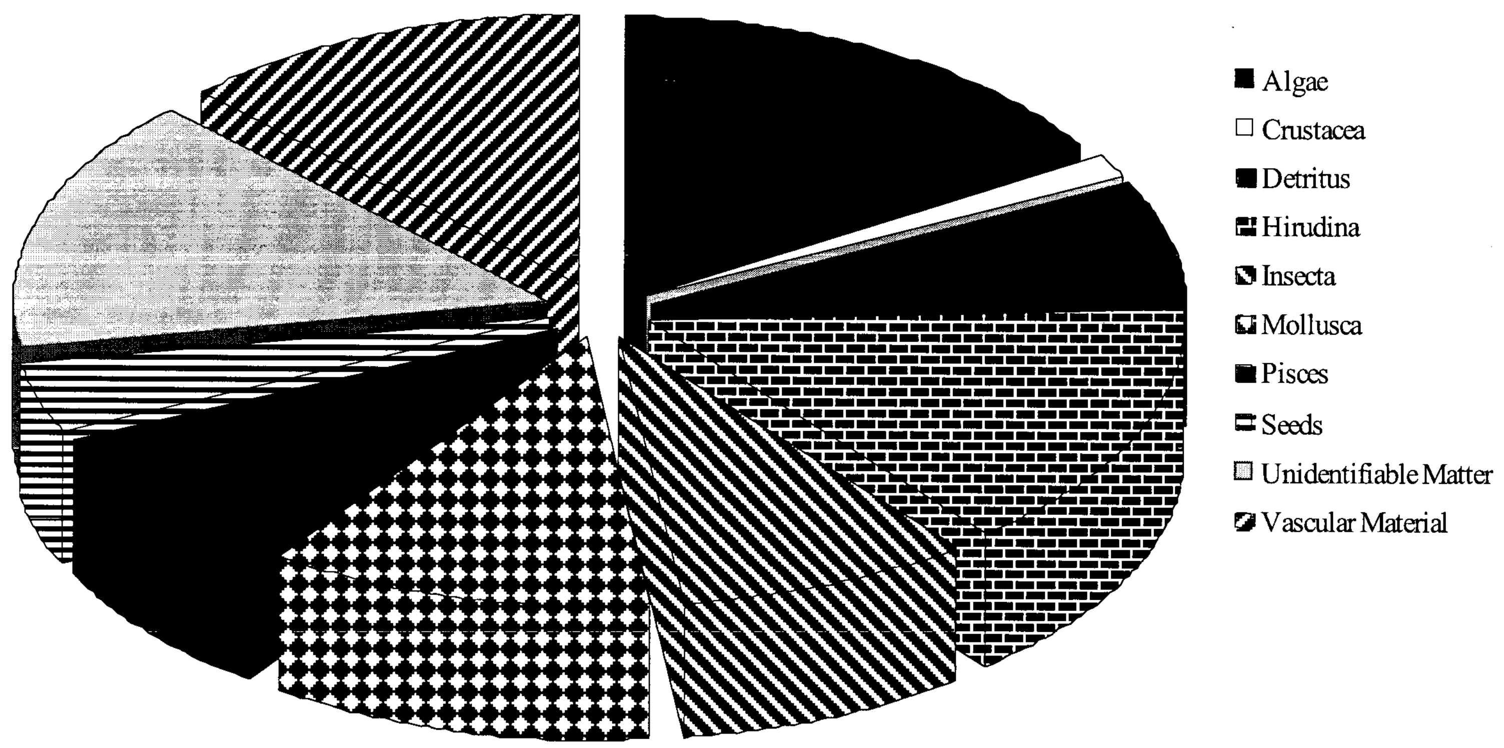


Figure 13: Pie graph representing the proportion of times each dietary item was recorded for fecal samples from *Sternotherus odoratus* captured at Lockport Prairie Nature Preserve Will County, Illinois from 29 June 2004 – 1 August 2004.

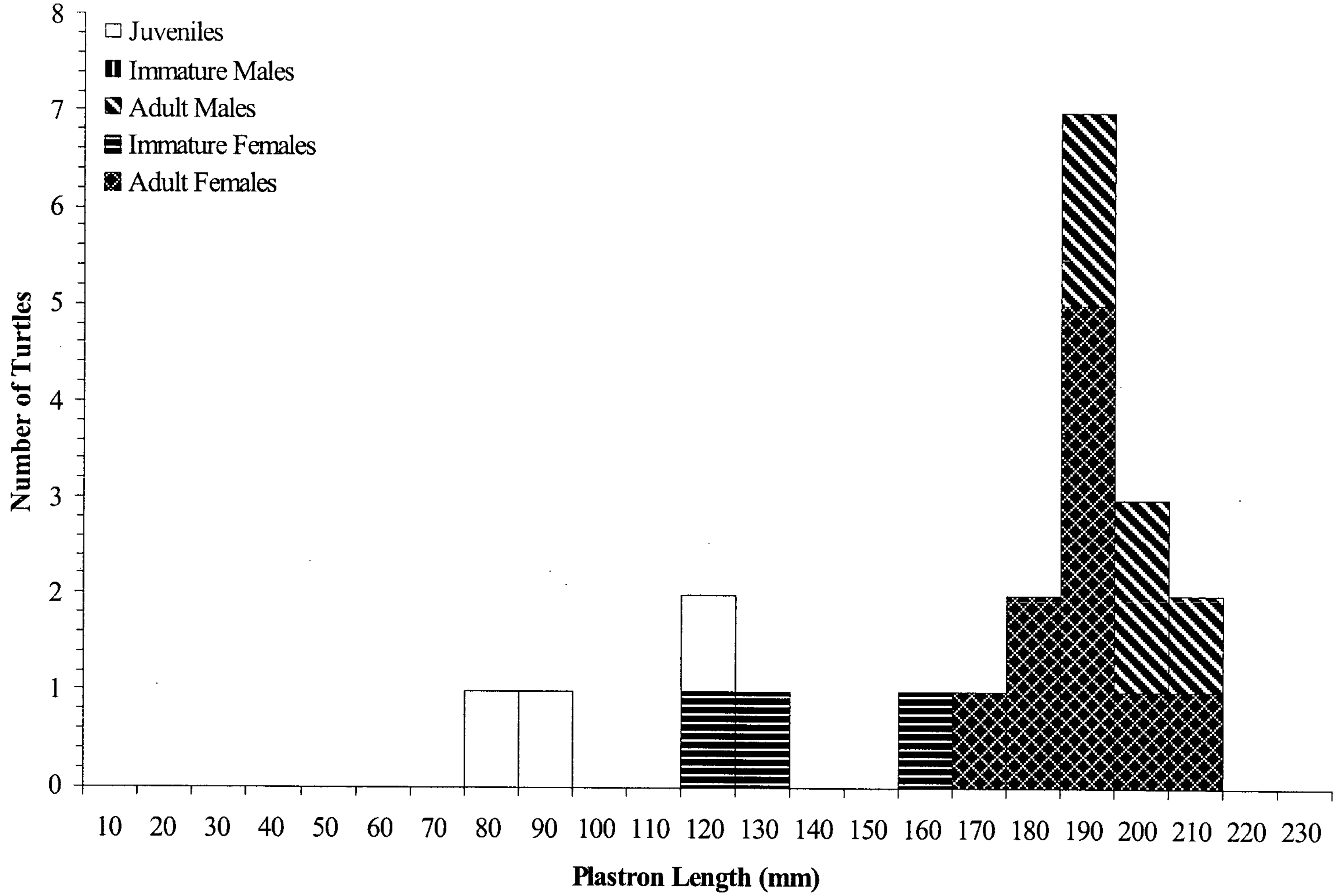


Figure 14: Size frequency histogram for *Emys blandingii* captured at Lockport Prairie Nature Preserve Will County, Illinois from 29 June 2004 – 1 August 2004.

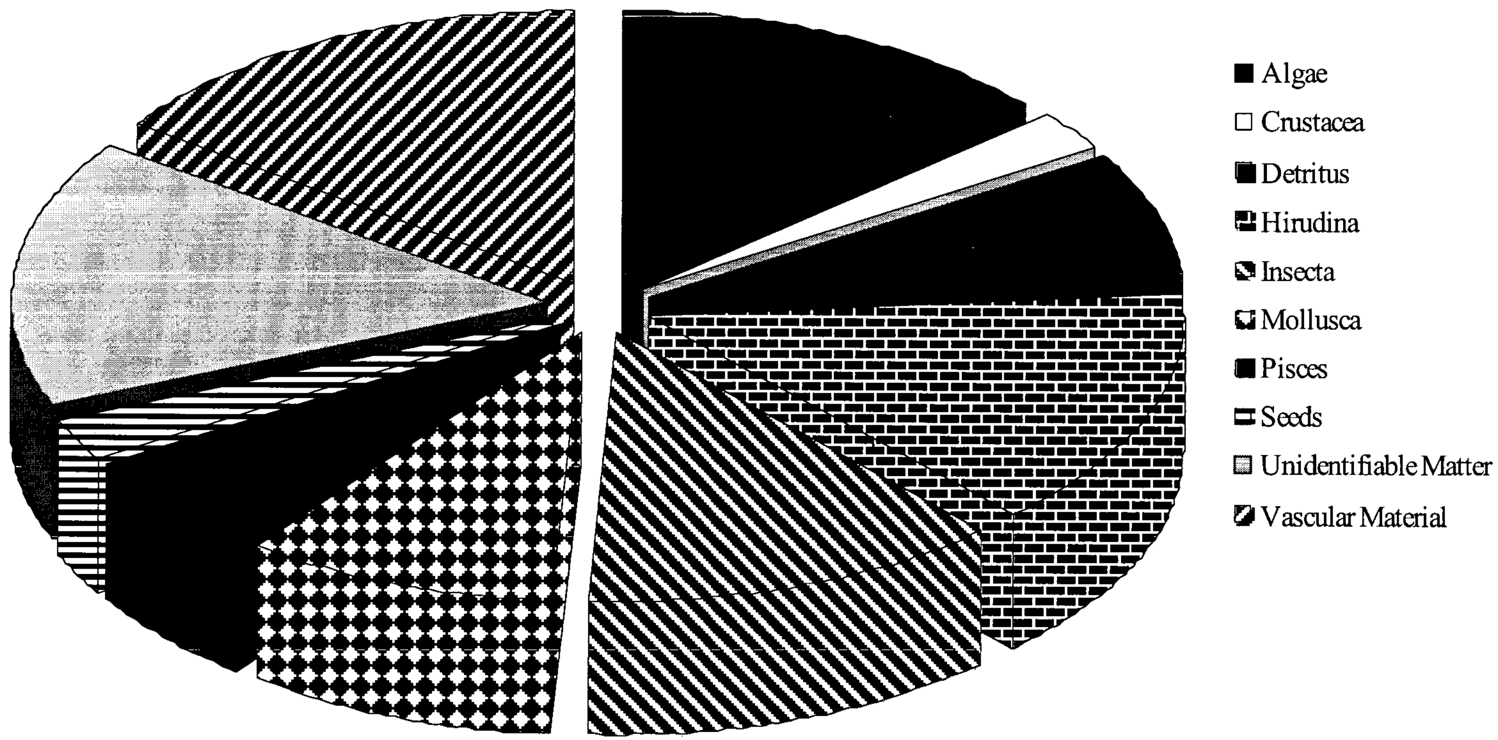


Figure 15: Pie graph representing the proportion of times each dietary item was recorded for fecal samples from *Emys blandingii* captured at Lockport Prairie Nature Preserve Will County, Illinois from 29 June 2004 – 1 August 2004.

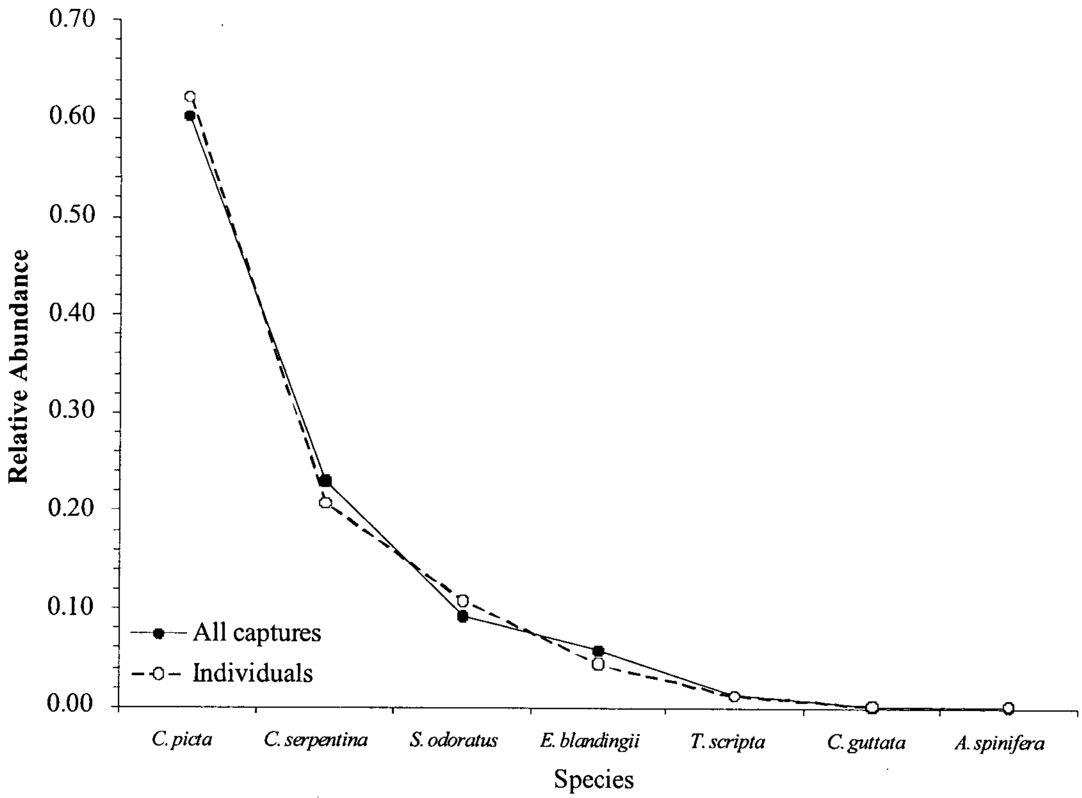


Figure 16: Rank abundance curves, expressed as relative abundance for all captures and all individuals, for species captures at Lockport Prairie Nature Preserve Will County, Illinois from 29 June 2004 – 1 August 2004.

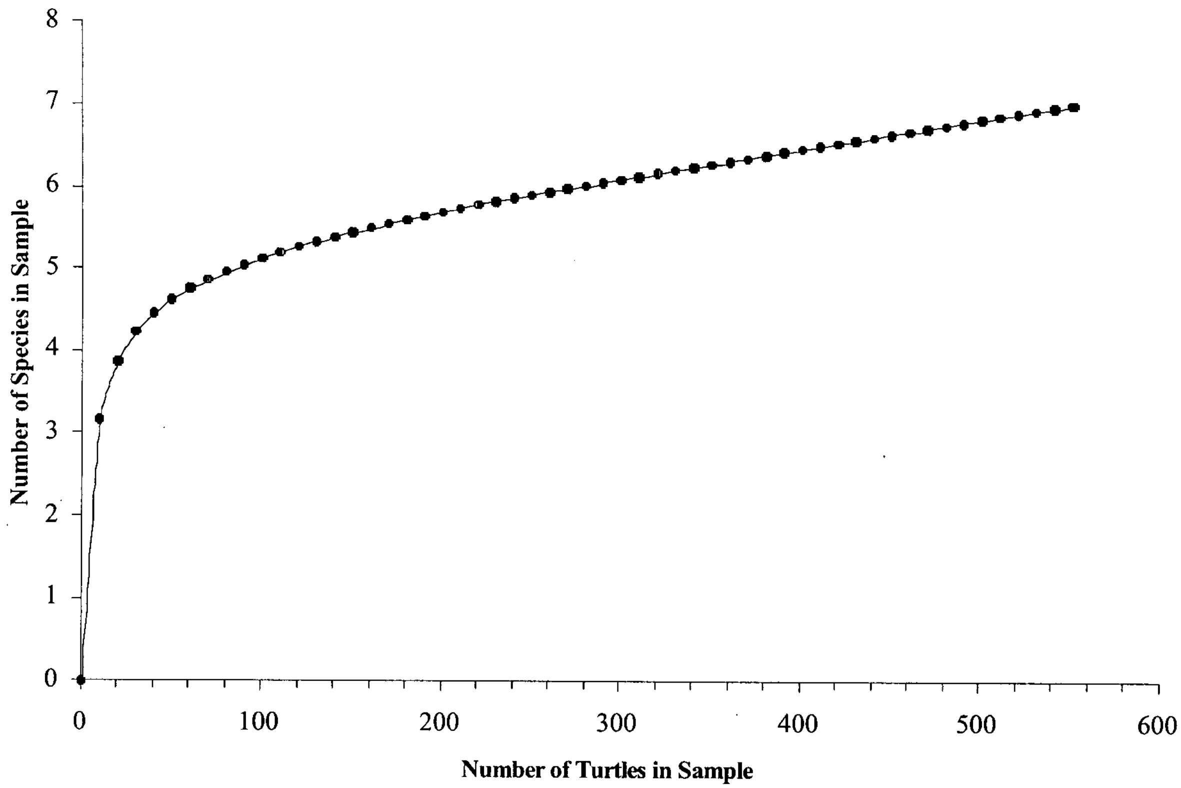


Figure 17: Rareifaction curve for species captures at Lockport Prairie Nature Preserve Will County, Illinois from 29 June 2004 – 1 August 2004. The figure depicts the number of turtle species theoretically present in varying sample sizes.

APPENDIX I
Turtle ID and Size Information

Chelydra serpentina

ID	Sex	Date	Mass	CL	CW	SH	PL
10L (cohort)	Juvenile	7/14/2004	53	62	53	31	47
09L	Juvenile	7/20/2004	64	69	55	33	49
08L	Female	7/5/2004	3125	237	170	103	165
10L	Female	6/29/2004		275	202	111	196
11L	Juvenile	7/5/2004	14.4	36.72	37.46	18.94	26.46
08L-09L	Male	6/29/2004	5875	292	250	123	198
08L-10L	Female	6/29/2004		275	225	111	200
08L-11L	Female	6/29/2004	2464	230	182	94	163
08L-12L	Female	6/29/2004	1946	247	194	103	184
09L-10L	Male	6/29/2004		287	239	114	211
09L-11L	Male	6/29/2004	3544	260	215	100	183
09L-12L	Male	6/29/2004		318	284	126	231
10L-11L	Female	6/29/2004		246	205	112	192
10L-12L	Male	6/30/2004		287	244	114	208
11L-12L	Male	6/30/2004	3625	247	200	101	180
08L-08R	Female	6/30/2004		242	193	105	165
08L-09R	Male	6/30/2004	6100	305	241	110	206
09L-12R	Female	6/30/2004		214	172	93	155
10L-08R	Female	6/30/2004	3750	242	211	108	180
10L-09R	Juvenile	7/1/2004		293	243	128	216
10L-10R	Juvenile	7/1/2004		268	231	108	190
10L-11R	Male	6/30/2004	8000	333	367	136	224
10L-11R	Male	7/21/2004	7750	335	270	132	238
10L-12R	Juvenile	7/1/2004		199	163	89	149
11L-08R	Female	7/1/2004		205	170	92	147
11L-09R	Female	7/1/2004		233	180	90	166
11L-10R	Female	7/1/2004		281	225	116	206
11L-11R	Female	7/1/2004		289	235	123	207
11L-12R	Female	7/1/2004		264	219	115	198
12L-08R	Female	7/2/2004	2875	235	185	97	170
12L-09R	Female	7/2/2004	1900	204	166	88	154
12L-10R	Female	7/2/2004	2375	210	175	196	161
12L-11R	Male	7/2/2004	6000	296	243	120	203
12L-12R	Female	7/2/2004	3000	235	189	107	174
08R-09R	Female	7/2/2004	3050	243	198	93	175
08R-10R	Male	7/3/2004	6300	302	233	124	204
08R-11R	Female	7/3/2004	2750	218	181	102	162
08R-12R	Male	7/3/2004	3750	247	200	102	178
09R-10R	Male	7/3/2004	5750	286	230	120	213

APPENDIX I
Turtle ID and Size Information

Chelydra serpentina

ID	Sex	Date	Mass	CL	CW	SH	PL
09R-11R	Female	7/4/2004	4375	262	217	125	198
09R-12R	Male	7/4/2004	3750	255	197	107	184
10R-11R	Male	7/4/2004	2000	194	154	90	139
10R-12R	Female	7/4/2004	2000	201	167	92	155
11R-12R	Female	7/3/2004	4375	267	215	117	184
08L-09L-10L	Male	7/4/2004	3375	244	188	102	170
08L-09L-11L	Female	7/5/2004	1506	196	153	89	143
08L-09L-12L	Female	7/5/2004	1847	198	168	93	154
08L-10L-11L	Male	7/5/2004	4125	261	210	103	174
08L-10L-12L	Female	7/5/2004	2600	225	170	98	168
08L-11L-12L	Juvenile	7/5/2004	1122	175	145	83	128
09L-10L-11L	Female	7/5/2004	2850	220	184	104	170
09L-10L-12L	Male	7/5/2004	1092	168	138	76	122
09L-11L-12L	Female	7/5/2004	2802	230	187	100	172
09L-11L-12L	Female	7/5/2004	1888	201	163	93	146
10L-11L-12L	Juvenile	7/6/2004	779	153	126	68	117
08L-11L-12R	Male	7/9/2004	2500	220	1714	100	164
08L-08R-09R	Male	7/6/2004	4500	261	228	120	183
08L-08R-10R	Male	7/6/2004	4375	266	211	116	189
08L-08R-11R	Male	7/6/2004	6625	231	254	121	231
08L-08R-12R	Female	7/6/2004	3325	244	203	103	129
08L-09R-10R	Male	7/6/2004	3125	238	194	199	181
08L-09R-11R	Female	7/6/2004	3000	227	187	99	178
08L-09R-12R	Female	7/7/2004	2750	224	195	99	168
08L-10R-11R	Female	7/7/2004	1375	175	142	89	128
08L-10R-12R	Male	7/8/2004	2750	217	173	90	157
09L-08R-09R	Female	7/10/2004	3375	236	202	105	182
09L-08R-10R	Male	7/11/2004	5875	287	232	124	213
09L-08R-11R	Male	7/11/2004	4750	278	226	124	209
09L-08R-12R	Female	7/11/2004	3875	265	197	104	182
09L-09R-10R	Female	7/12/2004	4125	262	211	116	191
09L-09R-11R	Male	7/12/2004	4700	265	217	113	195
09L-09R-12R	Female	7/12/2004	4250	264	212	114	186
09L-10R-11R	Male	7/12/2004	3750	251	222	105	180
09L-10R-12R	Female	7/12/2004	3750	252	204	108	180
09L-11R-12R	Juvenile	7/12/2004	1446	184	157	86	133
10L-08R-09R	Male	7/13/2004	6000	281	242	117	199
10L-08R-10R	Male	7/13/2004	4500	262	219	116	200
10L-08R-11R	Juvenile	7/13/2004	759	151	121	72	102

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Chelydra serpentina

ID	Sex	Date	Mass	CL	CW	SH	PL
10L-08R-11R	Juvenile	7/13/2004	759	151	121	72	102
10L-09R-10R	Male	7/15/2004	2500	230	183	96	113
10L-09R-11R	Male	7/15/2004	2250	213	172	90	160
10L-09R-12R	Male	7/16/2004	3000	238	196	104	165
10L-10R-12R	Male	7/17/2004	3500	246	203	103	190
10L-11R-12R	Female	7/17/2004	3750	257	208	110	143
11L-08R-09R	Male	7/18/2004	3000	284	235	110	200
11L-08R-10R	Male	7/14/2004	2006	202	167	95	145
11L-08R-11R	Female	7/19/2004	4136	265	211	117	197
11L-08R-12R	Male	7/19/2004	4413	262	218	114	188
11L-09R-10R	Male	7/19/2004	5500	290	244	128	202
11L-09R-11R	Male	7/20/2004	3796	256	202	111	182
11L-09R-12R	Male	7/21/2004	6750	304	243	130	220
11L-10R-11R	Female	7/21/2004	1087	169	140	79	130
11L-11R-12R	Juvenile	7/22/2004	1301	180	150	87	146
12L-08R-09R	Juvenile	7/14/2004	531	135	112	63	101
12L-08R-10R	Juvenile	7/23/2004	668	144	121	65	119
12L-08R-11R	Male	7/24/2004	2282	216	169	99	160
09L-09R-10R-11R	Juvenile	7/11/2004	416	122	105	56	92
11L-08R-11R-12R	Juvenile	7/20/2004	430	122	104	57	89

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Turtle ID and Size Information

Chrysemys picta

ID	Sex	Date	Mass	CL	CW	SH	PL	LPECT
N/A	Male	7/26/2004	112	89	72	34	86	13.63
1L	Juvenile	7/4/2004	12.3	38.29	38.54	17.06	33.79	4.95
8R	Juvenile	7/2/2004	33.9	58.65	53	23.5	52.8	7.23
01L-02L	Male	6/29/2004	389	156	113	49	138	15.93
01L-03L	Male	6/29/2004	351	147	104	48	134	14.47
01L-08L	Male	6/29/2004	374	154	111	51	140	16.29
01L-09L	Male	6/29/2004	339	147	105	48	133	13.44
01L-10L	Female	6/29/2004	396	140	116	54	133	22.46
01L-11L	Female	6/29/2004	480	153	113	56	143	15.86
01L-12L	Male	6/29/2004	316	142	102	45	126	13.16
02L-03L	Male	6/29/2004	327	138	98	47	123	12.47
02L-08L	Male	6/29/2004	331	138	101	46	127	15.47
02L-09L	Female	6/29/2004	316	132	97	50	128	20.91
02L-10L	Male	6/29/2004	342	137	100	49	127	15.47
02L-11L	Male	6/29/2004	284	132	99	46	121	13.04
02L-12L	Male	6/29/2004	343	142	115	47	133	14.12
03L-08L	Male	6/29/2004	249	131	94	43	114	13.16
03L-09L	Female	6/29/2004	396	141	115	52	133	13.44
03L-10L	Male	6/29/2004	312	133	101	48	126	18.33
03L-11L	Female	6/29/2004	339	135	113	52	124	16.79
03L-12L	Male	6/29/2004	229	123	94	42	113	21.95
08L-09L	Male	6/29/2004	213	116	90	41	107	13.89
08L-10L	Female	6/29/2004	226	117	89	46	112	17.08
08L-11L	Male	6/29/2004	335	136	99	48	124	16.25
08L-12L	Male	6/29/2004	138	98	79	37	89	12.67
09L-10L	Female	6/29/2004	190	110	84	44	102	16.19
09L-11L	Female	6/29/2004	204	113	88	42	113	16.82
09L-12L	Female	6/29/2004	229	118	92	42	114	19.27
10L-11L	Male	6/29/2004	155	105	87	36	97	13.47
10L-12L	Female	6/29/2004	213	114	85	45	111	17.91
11L-12L	Male	6/29/2004	151	114	81	36	98	12.19
01L-08R	Male	6/29/2004	156	103	80	38	99	15.61
01L-09R	Male	6/29/2004	161	106	82	36	100	12.33
01L-10R	Male	6/29/2004	89	83	71	31	78	11.89
01L-11R	Juvenile	6/29/2004	115	92	74	34	85	14.44
01L-12R	Juvenile	6/29/2004	106	89	74	35	81	12.51
02L-01R	Juvenile	6/29/2004	93	82	70	34	77	12.54
02L-02R	Juvenile	6/29/2004	106	88	72	35	83	13.32
02L-03R	Female	6/29/2004	500	159	111	55	149	20.21

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Chrysemys picta

ID	Sex	Date	Mass	CL	CW	SH	PL	LPECT
02L-08R	Male	6/30/2004	411	151	113	50	139	20.22
02L-09R	Female	6/30/2004	471	152	115	56	148	20.18
02L-10R	Female	6/30/2004	174	106	81	39	100	15.25
02L-11R	Female	6/30/2004	308	130	100	49	122	16.55
02L-12R	Male	6/30/2004	252	129	97	40	117	13.34
03L-01R	Female	6/30/2004	346	135	100	52	128	17.23
03L-03R	Male	6/30/2004	158	108	82	36	102	17.25
03L-08R	Male	6/30/2004	298	136	100	45	120	16.89
03L-09R	Female	6/30/2004	251	124	91	45	117	18.76
03L-12R	Male	6/30/2004	159	102	83	38	96	14.83
08L-02R	Male	6/30/2004	299	135	100	45	125	18.49
08L-03R	Male	6/30/2004	324	140	102	46	126	12.72
08L-08R	Female	6/30/2004	414	142	108	57	136	17.11
08L-09R	Female	6/30/2004	455	151	109	60	142	18.46
08L-10R	Male	6/30/2004	336	138	107	146	126	17.87
08L-11R	Male	6/30/2004	169	108	85	36	99	13.31
08L-12R	Male	6/30/2004	137	99	78	37	91	16.01
09L-01R	Female	6/30/2004	250	123	92	47	116	17.45
09L-08R	Female	6/30/2004	286	125	94	47	122	18.14
09L-09R	Female	6/30/2004	365	136	101	54	127	17.64
09L-10R	Female	6/30/2004	478	152	111	55	143	22.3
09L-11R	Female	6/30/2004	381	137	103	56	128	18.26
09L-12R	Female	6/30/2004	232	122	94	43	114	18.5
10L-01R	Female	6/30/2004	197	114	89	41	105	17.89
10L-02R	Female	6/30/2004	504	159	117	56	145	22.01
10L-03R	Male	6/30/2004	355	145	105	50	129	14.06
10L-08R	Female	6/30/2004	354	136	101	51	126	19.31
10L-11R	Male	6/30/2004	307	132	97	49	121	11.91
10L-12R	Male	6/30/2004	277	131	96	46	120	15.87
12L-01R	Male	6/30/2004	219	121	90	40	109	15.09
12L-02R	Male	6/30/2004	185	109	85	39	101	14.42
12L-03R	Male	6/30/2004	136	101	80	35	92	14.4
12L-08R	Male	6/30/2004	111	90	75	33	81	12.35
12L-09R	Male	6/30/2004	171	108	84	37	103	14.18
12L-10R	Male	6/30/2004	129	99	80	35	90	11.58
12L-11R	Male	6/30/2004	104	88	72	35	84	13.68
12L-12R	Female	6/30/2004	186	110	87	41	102	16.2
13L-13R	Female	6/29/2004	316	122	98	52	122	17.12
01R-02R	Juvenile	6/30/2004	77	80	67	32	72	9.58

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ID	Sex	Date	Mass	CL	CW	SH	PL	LPECT
01R-03R	Female	6/30/2004	144	99	80	37	93	14.99
01R-08R	Female	6/30/2004	502	156	112	59	143	18.13
01R-09R	Male	7/1/2004	270	130	98	43	120	14.55
01R-10R	Male	7/1/2004	135	99	76	35	92	14.04
01R-11R	Male	7/1/2004	372	144	105	47	132	18.45
01R-12R	Male	7/1/2004	129	100	76	35	93	14.38
02R-03R	Male	7/1/2004	175	112	87	37	104	16.41
02R-08R	Male	7/1/2004	233	124	95	42	113	16.53
02R-09R	Juvenile	7/1/2004	91	85	71	32	77	12.19
02R-10R	Female	7/1/2004	174	106	80	39	102	15.59
02R-11R	Female	7/1/2004	179	105	88	39	101	13.89
02R-12R	Female	7/1/2004	325	127	97	49	120	19.4
03R-08R	Juvenile	7/1/2004	72	79	66	30	73	11.91
03R-09R	Female	7/1/2004	569	164	122	63	156	24.48
03R-10R	Male	7/1/2004	322	143	104	45	127	13.97
03R-11R	Male	7/2/2004	256	128	95	42	119	16.65
03R-12R	Juvenile	7/2/2004	102	88	73	31	81	10.69
08R-09R	Male	7/2/2004	222	120	90	40	112	12.95
08R-10R	Juvenile	7/2/2004	110	92	73	33	83	15.02
08R-11R	Female	7/2/2004	391	138	104	54	132	20.71
08R-12R	Female	7/2/2004	197	110	86	42	104	15.28
09R-10R	Female	7/2/2004	397	146	110	54	135	19.31
09R-11R	Male	7/2/2004	209	131	98	45	120	14.04
09R-12R	Female	7/2/2004	364	141	108	50	135	19.79
10R-11R	Female	7/2/2004	368	137	106	51	130	17.21
10R-12R	Male	7/2/2004	333	144	112	45	130	16.24
11R-12R	Female	7/2/2004	502	157	116	57	142	17.24
01L-02L-03L	Male	7/2/2004	362	144	104	45	134	13.17
01L-02L-08L	Male	7/2/2004	336	145	105	45	130	16.68
01L-02L-08L	Male	7/6/2004	314	138	100	44	128	14.71
01L-02L-09L	Male	7/2/2004	387	149	107	48	137	18.24
01L-02L-10L	Male	7/2/2004	312	137	100	47	125	15.09
01L-02L-11L	Female	7/2/2004	276	126	95	48	118	19.34
01L-02L-12L	Male	7/2/2004	230	119	1	41	110	14.95
01L-03L-08L	Male	7/2/2004	178	110	88	40	113	14.35
01L-03L-09L	Female	7/2/2004	179	109	87	42	102	17.83
01L-03L-10L	Female	7/2/2004	152	102	81	37	94	13.9
01L-03L-11L	Male	7/2/2004	124	99	77	33	93	11.49
01L-03L-12L	Female	7/2/2004	142	101	79	38	95	16.11

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Chrysemys picta

ID	Sex	Date	Mass	CL	CW	SH	PL	LPECT
01L-08L-09L	Male	7/2/2004	112	90	75	34	86	9.97
01L-08L-10L	Male	7/2/2004	161	105	83	38	99	12.86
01L-08L-11L	Male	7/2/2004	146	104	94	34	93	14.02
01L-08L-12L	Male	7/2/2004	125	100	78	35	92	14.16
01L-09L-10L	Female	7/2/2004	164	114	83	38	97	16.24
01L-09L-11L	Female	7/2/2004	145	98	77	38	93	10.95
01L-09L-12L	Juvenile	7/2/2004	87	82	72	34	76	12.85
01L-10L-11L	Juvenile	7/2/2004	104	86	75	43	80	12.99
01L-10L-12L	Female	7/3/2004	354	138	104	53	131	25.16
01L-11L-12L	Female	7/3/2004	298	129	96	48	120	18.01
02L-03L-08L	Male	7/3/2004	204	122	90	40	112	11.32
02L-03L-09L	Female	7/3/2004	215	114	87	45	108	16.49
02L-03L-10L	Male	7/3/2004	216	118	96	40	109	14.69
02L-03L-11L	Male	7/3/2004	312	141	98	45	126	12.5
02L-03L-12L	Male	7/3/2004	293	135	102	45	122	16.32
02L-08L-09L	Female	7/3/2004	218	115	87	44	107	18.31
02L-08L-10L	Male	7/3/2004	12	94	77	34	88	11.44
02L-08L-11L	Male	7/3/2004	175	110	86	41	105	16.33
02L-08L-12L	Male	7/3/2004	83	82	68	32	76	12.53
02L-09L-10L	Juvenile	7/4/2004	275	134	97	43	118	14.96
02L-09L-11L	Male	7/4/2004	319	138	104	44	125	15.83
02L-09L-12L	Female	7/4/2004	480	153	119	54	148	22.17
02L-10L-11L	Female	7/4/2004	643	161	118	66	152	22.05
02L-10L-12L	Female	7/4/2004	370	139	102	54	132	19.93
02L-11L-12L	Female	7/4/2004	360	139	102	53	128	19.28
03L-08L-09L	Male	7/4/2004	185	112	84	38	105	17.63
03L-08L-10L	Female	7/4/2004	227	116	90	45	113	17.04
03L-08L-11L	Female	7/4/2004	448	148	112	58	141	12.87
03L-08L-12L	Male	7/4/2004	185	111	85	39	103	14.78
03L-09L-10L	Male	7/5/2004	352	43	106	48	130	19.68
03L-09L-11L	Female	7/5/2004	331	135	104	51	129	21.99
03L-09L-12L	Male	7/5/2004	160	105	82	37	93	11.32
03L-10L-11L	Female	7/5/2004	307	136	97	59	124	15.54
03L-10L-12L	Female	7/5/2004	141	100	78	39	94	16.04
03L-11L-12L	Male	7/5/2004	185	113	86	40	104	17.21
08L-09L-10L	Female	7/5/2004	259	123	90	45	118	18.27
08L-09L-11L	Male	7/5/2004	193	113	85	41	103	15.72
08L-09L-12L	Female	7/5/2004	562	159	118	62	153	21.02
08L-10L-11L	Male	7/5/2004	294	134	102	44	122	12.1

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Chrysemys picta

ID	Sex	Date	Mass	CL	CW	SH	PL	LPECT
08L-10L-12L	Male	7/5/2004	293	135	100	46	125	20.07
08L-11L-12L	Female	7/5/2004	325	136	98	50	124	18.58
09L-10L-11L	Female	7/5/2004	255	125	95	42	120	18.4
09L-10L-12L	Male	7/5/2004	281	130	96	45	118	15.7
09L-10L-13L	Male	7/5/2004	168	113	88	37	104	16.85
09L-11L-12L	Female	7/5/2004	165	104	80	40	99	14.79
10L-11L-12L	Female	7/5/2004	458	152	114	56	141	15.66
01L-02L-01R	Male	7/6/2004	142	99	79	35	93	15.23
01L-02L-02R	Male	7/6/2004	137	99	79	36	93	15.39
01L-02L-03R	Female	7/6/2004	393	145	103	52	132	15.29
01L-02L-09R	Female	7/6/2004	521	165	123	60	158	18.7
01L-02L-10R	Male	7/6/2004	273	133	98	44	123	15.56
01L-02L-11R	Female	7/6/2004	311	131	102	49	124	18.75
01L-02L-12R	Female	7/6/2004	172	112	85	40	105	16.48
01L-03L-01R	Male	7/6/2004	149	102	79	37	92	15.48
01L-03L-03R	Female	7/6/2004	142	102	82	38	95	16.12
01L-03L-08R	Male	7/6/2004	128	100	78	35	92	14.51
01L-03L-09R	Juvenile	7/6/2004	89	86	71	33	78	9.6
01L-03L-10R	Female	7/7/2004	389	140	110	53	132	18.36
01L-03L-11R	Male	7/7/2004	104	90	74	34	84	13.86
01L-03L-12R	Female	7/7/2004	535	161	120	62	154	18.86
01L-08L-01R	Male	7/7/2004	302	136	100	45	127	12.7
01L-08L-02R	Male	7/7/2004	96	91	73	32	80	11.09
01L-08L-03R	Female	7/7/2004	167	105	86	39	99	16.03
01L-08L-08R	Male	7/7/2004	117	95	78	33	87	15.3
01L-08L-09R	Female	7/8/2004	304	128	95	51	122	13.93
01L-08L-10R	Male	7/8/2004	151	104	81	37	97	
01L-08L-11R	Male	7/8/2004	168	107	85	39	99	16.05
01L-08L-12R	Female	7/10/2004	290	131	99	46	123	22.63
01L-09L-01R	Female	7/10/2004	240	119	91	46	112	17.77
01L-09L-02R	Female	7/10/2004	183	105	84	40	99	14.78
01L-09L-03R	Female	7/10/2004	593	163	120	60	150	21.14
01L-09L-08R	Female	7/10/2004	425	155	110	55	144	16.75
01L-09L-09R	Female	7/11/2004	539	160	115	61	151	17.49
01L-09L-10R	Male	7/11/2004	171	109	86	38	102	15.2
01L-09L-11R	Female	7/11/2004	151	101	82	39	94	13.33
01L-09L-12R	Female	7/11/2004	253	120	90	49	108	16.48
01L-10L-01R	Male	7/11/2004	96	89	71	32	82	12.85
01L-10L-02R	Female	7/12/2004	114	99	75	36	84	13.72

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ID	Sex	Date	Mass	CL	CW	SH	PL	LPECT
01L-10L-03R	Female	7/12/2004	560	164	121	60	152	18.18
01L-10L-08R	Female	7/12/2004	302	135	102	48	127	17.73
01L-10L-09R	Male	7/12/2004	133	101	89	38	95	13.45
01L-10L-10R	Male	7/12/2004	213	115	92	44	108	19.54
01L-10L-11R	Male	7/12/2004	410	152	109	51	136	29.3
01L-10L-12R	Female	7/12/2004	251	120	95	46	115	16.65
01L-11L-01R	Male	7/12/2004	151	103	79	38	96	12.8
01L-11L-02R	Male	7/12/2004	130	101	78	35	95	11.99
01L-11L-03R	Male	7/12/2004	153	103	81	39	95	14.22
01L-11L-08R	Male	7/12/2004	260	128	96	44	116	14.67
01L-11L-09R	Male	7/12/2004	169	110	86	37	102	14.35
01L-11L-10R	Male	7/12/2004	140	105	80	35	99	14.63
01L-11L-11R	Juvenile	7/12/2004	92	87	70	33	80	11.81
01L-11L-12R	Male	7/12/2004	231	127	94	41	115	14.39
01L-12L-01R	Female	7/12/2004	112	90	74	37	85	12.11
01L-12L-02R	Male	7/12/2004	118	98	76	36	88	12.84
01L-12L-03R	Male	7/9/2004	175	114	84	38	106	16.93
01L-12L-08R	Female	7/9/2004	614	164	124	63	151	16.39
01L-12L-09R	Female	7/8/2004	492	158	111	60	148	14.1
01L-12L-10R	Female	7/13/2004	242	126	94	45	121	20.79
01L-12L-11R	Juvenile	7/13/2004	91	82	69	35	76	10.4
01L-12L-12R	Male	7/13/2004	324	140	115	47	130	19.34
02L-03L-01R	Female	7/12/2004	161	105	83	41	97	16.64
02L-03L-02R	Juvenile	7/13/2004	84	85	69	33	77	11.15
02L-03L-03R	Juvenile	7/13/2004	170	119	85	40	109	13.76
02L-03L-08R	Male	7/13/2004	97	91	73	33	84	11.51
02L-03L-09R	Male	7/13/2004	133	105	80	37	97	13.66
02L-03L-10R	Male	7/13/2004	106	94	75	33	86	12.82
02L-03L-11R	Juvenile	7/14/2004	54	72	60	28	65	9.25
02L-03L-12R	Male	7/14/2004	187	114	86	38	102	14.79
02L-08L-01R	Male	7/14/2004	150	109	82	39	97	14.31
02L-08L-02R	Male	7/14/2004	95	87	72	34	84	11.95
02L-08L-03R	Male	7/14/2004	129	101	77	35	92	14.78
02L-08L-08R	Male	6/30/2004	151	100	83	38	95	13.63
02L-08L-09R	Male	7/14/2004	128	99	87	37	89	14.61
02L-08L-10R	Male	7/15/2004	182	113	90	40	105	13.31
02L-08L-12R	Juvenile	7/15/2004	83	80	70	32	77	11.61
02L-09L-01R	Female	7/15/2004	236	117	92	46	114	18.71
02L-09L-02R	Male	7/15/2004	104	91	75	34	85	12.41

APPENDIX I
Turtle ID and Size Information

Chrysemys picta

ID	Sex	Date	Mass	CL	CW	SH	PL	LPECT
02L-09L-03R	Male	7/15/2004	178	114	84	41	103	9.96
02L-09L-08R	Juvenile	7/15/2004	73	76	67	32	70	12.03
02L-09L-09R	Juvenile	7/15/2004	78	81	67	33	75	10.56
02L-09L-10R	Male	7/15/2004	168	108	84	39	103	14.78
02L-09L-11R	Male	7/15/2004	201	117	89	42	107	16.98
02L-09L-12R	Male	7/16/2004	273	128	99	47	120	15.7
02L-10L-01R	Juvenile	7/16/2004	55	72	64	29	66	8.44
02L-10L-02R	Male	7/16/2004	102	93	74	32	86	13.58
02L-10L-03R	Juvenile	7/16/2004	61	75	65	30	69	9.22
02L-10L-08R	Female	7/16/2004	649	168	122	64	152	16.71
02L-10L-09R	Juvenile	7/17/2004	55	71	63	28	66	9.14
02L-10L-10R	Male	7/17/2004	227	123	94	43	112	15.1
02L-10L-11R	Female	7/17/2004	370	136	100	48	126	20.14
02L-10L-12R	Female	7/17/2004	610	160	119	63	154	12.36
02L-11L-01R	Male	7/12/2004	128	98	78	34	91	12.77
02L-11L-02R	Female	7/18/2004	336	133	102	50	126	19
02L-11L-03R	Female	7/18/2004	325	133	102	46	122	16.04
02L-11L-08R	Female	7/18/2004	411	145	108	55	139	25.4
02L-11L-09R	Juvenile	7/19/2004	105	85	74	35	82	13.2
02L-11L-10R	Juvenile	7/19/2004	118	93	75	35	87	11.5
02L-11L-11R	Juvenile	7/19/2004	105	91	75	33	84	13
02L-11L-12R	Juvenile	7/19/2004	115	91	74	35	84	13.83
02L-11L-12R	Male	7/20/2004	374	144	110	49	127	13.71
02L-12L-01R	Male	7/20/2004	354	141	104	49	129	14.13
02L-12L-02R	Female	7/20/2004	527	164	125	57	154	15.85
02L-12L-03R	Male	7/21/2004	238	127	92	41	116	17.1
02L-12L-08R	Male	7/21/2004	226	118	89	43	108	14.24
02L-12L-09R	Female	7/21/2004	464	147	112	57	139	24.68
02L-12L-10R	Female	7/21/2004	413	141	106	55	134	21.05
02L-12L-11R	Female	7/21/2004	376	137	107	54	131	18.26
02L-12L-12R	Male	7/21/2004	147	101	84	36	93	14.76
03L-08L-01R	Male	7/23/2004	168	112	85	39	104	15.03
03L-08L-02R	Female	7/23/2004	429	150	113	54	141	17.29
03L-08L-03R	Female	7/25/2004	367	138	103	55	129	18.41
03L-08L-08R	Male	7/26/2004	120	98	77	34	92	13.99
03L-08L-09R	Female	7/26/2004	558	163	112	62	154	22.88
03L-08L-10R	Female	7/26/2004	274	126	94	48	120	17.76
03L-08L-11R	Male	7/27/2004	102	88	72	32	81	11.51
03L-08L-12R	Female	7/27/2004	99	87.75	69.44	34	81	12.6

APPENDIX I
Turtle ID and Size Information

Chrysemys picta

ID	Sex	Date	Mass	CL	CW	SH	PL	LPECT
03L-09L-01R	Male	7/27/2004	167	105	80	40	97	15.09
03L-09L-02R	Female	7/27/2004	318	135	101	51	128	18.95
03L-09L-03R	Juvenile	7/28/2004	57	73	63	29	68	9.81
03L-09L-08R	Female	7/28/2004	452	153	111	54	145	18.69
03L-09L-09R	Male	7/28/2004	168	109	84	38	101	16.14
03L-09L-11R	Male	7/29/2004	298	129	98	45	120	14.87
03L-09L-12R	Male	7/29/2004	288	129	99	46	121	15.63
03L-10L-01R	Male	7/29/2004	109	93	73	35	86	13.8
03L-10L-02R	Female	7/30/2004	379	136	107	54	130	17.28
03L-10L-03R	Female	7/30/2004	77	79	68	32	74	10.44
03L-10L-08R	Female	8/1/2004	349	140	104	53	130	17.82
03L-10L-09R	Female	8/1/2004	394	142	109	54	136	15.91
03L-10L-10R	Female	8/1/2004	259	123	94	48	114	16.01
03L-10L-11R	Female	8/1/2004	283	124	94	59	115	16.3
03L-10L-12R	Female	8/1/2004	210	122	95	43	115	19.83
03L-11L-01R	Male	8/1/2004	148	102	83	38	91	12.5
03L-11L-02R	Female	8/1/2004	110	92	74	36	86	13.67
10L-10R-11R	Female	7/17/2004	2000	216	173	98	168	
02L-03L-02R-03R	Male	7/13/2004	241	131	97	39	118	13.79
03L-09L-10R-11R	Juvenile	7/29/2004	74	80	65	32	72	9.8

APPENDIX I
Turtle ID and Size Information

Sternotherus odoratus

ID	Sex	Date	Mass	CL	CW	SH	PL	LPECT
08L-09L	Female	6/29/2004	175	112	74	45	80	9.85
08L-10L	Female	7/1/2004	203	102	77	46	80	10.67
08L-11L	Male	7/1/2004	242	120	80	46	86	13
10L-11L	Male	7/2/2004	103	84	59	35	64	8.4
08L-08R	Female	7/2/2004	218	110	81	47	89	9.77
08L-09R	Female	7/2/2004	249	114	86	49	89	11.02
08L-10R	Female	7/2/2004	203	108	77	45	89	9.73
08L-11R	Male	7/2/2004	126	92	66	37	67	9.33
09L-08R	Female	7/2/2004	231	111	78	45	88	7.5
09L-09R	Male	7/2/2004	286	116	80	48	86	13.1
09L-10R	Female	7/2/2004	255	117	81	50	93	10.02
09L-11R	Female	7/2/2004	182	105	73	44	85	14.23
10L-08R	Female	7/2/2004	285	117	86	50	91	13.56
10L-09R	Female	7/3/2004	118	88	68	38	72	9.5
10L-10R	Male	7/3/2004	110	88	62	35	63	6.32
10L-10R	Male	7/5/2004	177	102	74	43	76	9
10L-11R	Male	7/5/2004	106	99	64	37	70	9.99
11L-08R	Male	7/5/2004	259	118	83	48	86	12.44
11L-09R	Female	7/3/2004	113	90	69	38	70	8.88
11L-10R	Female	7/3/2004	218	116	84	45	92	12.14
11L-11R	Female	7/6/2004	143	96	70	42	80	8.96
08R-09R	Female	7/6/2004	190	107	77	49	85	11.37
08R-10R	Female	7/6/2004	121	90	68	40	69	9.09
08R-11R	Male	7/7/2004	119	91	65	37	67	8.32
09R-10R	Female	7/7/2004	173	101	72	42	86	12.15
09R-11R	Male	7/7/2004	115	91	65	37	67	7.49
10R-11R	Female	7/7/2004	245	122	84	47	96	11.09
08L-09L-10L	Male	7/8/2004	180	102	73	42	77	10.14
08L-09L-11L	Female	7/8/2004	217	112	77	45	88	10.35
08L-10L-11L	Female	7/11/2004	237	118	83	48	94	14.41
09L-10L-11L	Female	7/12/2004	101	83	66	38	67	9.07
08L-09L-08R	Female	7/12/2004	164	94	72	44	79	10.72
08L-09L-09R	Female	7/12/2004	163	105	71	43	79	12.69
08L-09L-10R	Male	7/13/2004	185	109	74	44	81	9.71
08L-09L-11R	Male	7/13/2004	130	95	67	39	71	8.22
08L-10L-08R	Female	7/13/2004	141	100	73	43	82	9.51
08L-10L-09R	Female	7/13/2004	209	110	80	47	88	11.44
08L-10L-10R	Female	7/14/2004	280	109	78	46	88	11.23
08L-10L-11R	Female	7/14/2004	207	110	79	49	86	10.67

APPENDIX I
Turtle ID and Size Information

Sternotherus odoratus

ID	Sex	Date	Mass	CL	CW	SH	PL	LPECT
08L-11L-08R	Female	7/15/2004	197	109	78	48	85	9.82
08L-11L-09R	Female	7/15/2004	239	116	80	49	91	10.53
08L-11L-10R	Female	7/15/2004	230	113	79	48	92	10.43
08L-11L-11R	Female	7/16/2004	145	93	72	42	79	8.49
09L-10L-08R	Female	7/16/2004	222	114	82	46	88	12.43
09L-10L-09R	Male	7/26/2004	125	93	66	36	71	10.58
09L-10L-10R	Female	7/26/2004	145	95	72	40	77	9.79
09L-10L-11R	Male	7/24/2004	327	134	90	54	104	14.46
09L-11L-08R	Female	7/26/2004	282	123	84	48	94	11.33
09L-11L-09R	Female	7/27/2004	262	112	84	47	89	12.42
10L-10R-11R	Male	7/20/2004	118	95	65	37	68	5.87
08L-09L-10L-11L	Juvenile	7/21/2004	73	75	56	35	57	7.33

Clemmys guttata

ID	Sex	Date	Mass	CL	CW	SH	PL	LPECT
02L-09L-10R	Female	7/14/2004	107	88	71	37	80	16.04

Trachemys scripta

ID	Sex	Date	Mass	CL	CW	SH	PL	LPECT
01L-02L	Male	7/3/2004	464	160	127	57	146	19.62
01L-03L	Female	7/3/2004	219	112	94	41	103	15.6
01L-08L	Male	7/7/2004	298	129	101	48	118	17.29
01L-09L	Male	7/11/2004	774	183	136	65	167	23.44
01L-10L	Male	7/12/2004	579	166	128	62	150	17.32
01L-11L	Female	7/14/2004	1212	206	156	84	194	24.01

APPENDIX I
Turtle ID and Size Information

Emys blandingii

ID	Sex	Date	Mass	CL	CW	SH	PL	LPECT
01L-08L	Female	7/17/2004	263	124	124	49	125	19.7
01L-11L	Male	7/24/2004	1243	210	136	75	195	27.82
01L-12L	Juvenile	7/31/2004	96	84	66	36	81	12.07
01L-13L	Female	6/22/2004	827	191	126	70	179	30.88
08L-09L	Juvenile	7/16/2004	138	96	74	40	95	13.83
08L-10L	Female	7/22/2004	1096	206	136	75	193	32.87
09L-11L	Female	7/1/2004	1055	199	135	77	194	34.44
09L-12L	Male	7/3/2004	1461	233	150	90	210	36.59
10L-11L	Female	7/9/2004	1161	206	136	78	193	28.02
10L-12L	Female	7/31/2004	1097	203	137	80	200	36.24
11L-12L	Male	7/14/2004	1496	217	149	88	205	27.43
01L-02R	Female	7/3/2004	903	182	126	76	181	29.08
01L-03R	Male	7/13/2004	1198	212	141	76	198	33.83
01L-08R	Female	7/13/2004	976	198	130	77	194	28.86
01L-09R	Female	7/18/2004	1119	175	132	76	194	31.85
01L-10R	Female	7/18/2004	355	130	93	55	132	18.41
01L-11R	Male	7/16/2004	1474	217	147	84	201	34.98
01L-12R	Female	7/22/2004	986	195	130	75	187	32.07
02L-01R	Juvenile	7/23/2004	247	118	87	47	121	17.95
09L-11R	Female	7/21/2004	1505	215	1475	84	210	33.36
01L-09L-03R	Female	7/15/2004	687	170	116	67	167	25.57

APPENDIX II
Recapture Information

Chelydra serpentina

ID	Sex	Recapture 1	Recapture 2	Recapture 3	Recapture 4	Recapture 5	Recapture 6
09L-11L	Male	7/4/2004 12:30 - Fyke I					
08R-10R	Male	7/7/2004 10:30 - Fyke 2	7/12/2004 15:00 - Fyke 1				
10L-08R	Female	7/7/2004 11:15 - Fyke I					
11L-12L	Male	7/7/2004 10:30 - Fyke II	7/14/2004 12:30 - Fyke I				
09R-12R	Male	7/9/2004 12:30 - Fyke I					
10L-11R	Male	7/9/2004 12:30 - Fyke I	7/13/2004 12:30 - Fyke I	7/19/2004 12:30 - Fyke I			
08L-09L	Male	7/10/2004 12:00 - Fyke 2					
12L-11R	Male	7/11/2004 12:00 - Fyke I	7/15/2004 11:01 - HT 57				
09L-08R-11R	Male	7/12/2004 13:00 - Fyke I	7/20/2004 12:00 - Fyke I				
10L-11L	Female	7/12/2004 15:00 - Fyke I					
08L	Female	7/12/2004 14:00 - Fyke II	7/14/2004 13:00 - Fyke II				
09L-08R-09R	Female	7/12/2004 16:47 - HT 74					
09L-10L	Male	7/13/2004 12:30 - Fyke I					
08L-09R	Male	7/14/2004 12:00 - Fyke I					
09L-12L	Male	7/14/2004 11:00 - Fyke II					
09L-09R-11R	Male	7/15/2004 11:01 - HT 57					
08L-08R-10R	Male	7/16/2004 12:30 - Fyke I					
09L-09R-10R-11R	Juvenile	7/17/2004 13:14 - Fyke II	7/30/2004 11:35 - HT 78				
12L-08R-09R	Juvenile	7/22/2004 11:02 - HT 90					
09L-11R-12R	Juvenile	7/22/2004 11:10 - HT 77					
11L-11R	Female	7/22/2004 11:50 - Fyke II					
09L-09R-10R	Female	7/23/2004 11:41 - HT 72					
11L-10R-11R	Female	8/1/2004 9:48 - Fyke I					

APPENDIX II
Recapture Information

Chrysemys picta

ID	Sex	Recapture 1	Recapture 2	Recapture 3	Recapture 4	Recapture 5	Recapture 6
03L-03R	Male	6/30/2004 17:48 - HT 47	7/21/2004 9:50 - HT 49				
09R-11R	Male	7/4/2004 13:30 - Fyke I	7/8/2004 10:50 - Fyke II				
02L-03L-08L	Male	7/5/2004 11:27 - HT 65					
03R-10R	Male	7/5/2004 11:00 - SP	7/7/2004 9:20 - M-fyke				
10L-11R	Male	7/5/2004 11:40 - Fyke I					
01L-02L	Male	7/5/2004 11:40 - Fyke I	7/11/2004 12:00 - Fyke I	7/13/2004 12:00 - Fyke II	7/15/2004 12:55 - Fyke I	7/26/2004 13:00 - Fyke I	7/31/2004 13:01 - Fyke I
08L-10R	Male	7/7/2004 11:15 - Fyke I					
03R-08R	Juvenile	7/9/2004 11:06 - HT 45					
03R-09R	Female	7/10/2004 11:30 - M-fyke	7/12/2004 14:30 - Fyke II				
01L-03L	Male	7/13/2004 12:30 - Fyke I	7/25/2004 1151 - Fyke I				
01L-09L-11R	Female	7/14/2004 14:56 - HT 75					
02L-08R	Male	7/14/2004 12:01 - HT 52	7/24/2004 11:45 - Fyke I				
02L-03L-03R	Juvenile	7/15/2004 12:55 - Fyke I					
08L-09L	Male	7/16/2004 9:50 - Fyke I					
8R	Juvenile	7/17/2004 12:33 - HT 49					
02L-12L-02R	Female	7/18/2004 11:05 - Fyke I					
01L-11L-08R	Male	7/18/2004 11:03 - Fyke I					
02L-09L-10L	Juvenile	7/18/2004 10:34 - HT 49					
10L-10R-11R	Female	7/20/2004 12:00 - Fyke I					
09L-11R	Female	7/20/2004 12:00 - Fyke I					
03L-10L	Male	7/22/2004 10:45 - Fyke I					
01L-08L	Male	7/22/2004 11:20 - Fyke I					
10R-12R	Male	7/23/2004 11:53 - Fyke III					
08L-09L-12L	Female	7/28/2004 11:51 - Fyke I					
02L-10L-11L	Female	7/29/2004 10:17 - HT 57					
02R-12R	Female	8/1/2004 9:48 - Fyke I					
02L-10L	Male	8/1/2004 9:48 - Fyke I					
01L-12L	Male	8/1/2004 9:48 - Fyke I					
09L-10L-13L	Male	8/1/2004 9:48 - Fyke I					
01L-10L-11R	Male	8/11/2004 9:48 - Fyke I					
02L-12R	Male	7/3/2004 11:00 - SP	7/14/2004 12:30 - Fyke I				

APPENDIX II
Recapture Information

Emys blandingii

ID	Sex	Recapture 1	Recapture 2	Recapture 3	Recapture 4	Recapture 5	Recapture 6
01L-13L	Female	7/2/2004 10:30 - HT 60	7/20/2004 9:43 - HT 42				
01L-02R	Female	7/7/2004 9:20 - M-fyke					
09L-11L	Female	7/7/2004 9:30 - HT-63	7/16/2004 11:16 - HT 74	7/18/2004 11:14 - HT 88	7/21/2004 10:00 - HT 77		
09L-12L	Male	7/11/2004 11:40 - HT-49	7/27/2004 10:21 - HT 53				
01L-03R	Male	7/14/2004 10:46 - HT 52					
01L-08L	Female	7/19/2004 10:46 - HT 52					
01L-11R	Male	7/20/2004 11:30 - Fyke II					
01L-12R	Female	7/27/2004 14:56 - HT 82					
01L-09R	Female	8/1/2004 11:22 - HT 59					

Sternotherus odoratus

ID	Sex	Recapture 1	Recapture 2	Recapture 3	Recapture 4	Recapture 5	Recapture 6
8L-11R	Male	7/8/2004 10:10 - HT 59					
08L-10R	Female	7/9/2004 11:30 - HT 60	7/12/2004 13:00 - HT 54				

Trachemys scripta

ID	Sex	Recapture 1	Recapture 2	Recapture 3	Recapture 4	Recapture 5	Recapture 6
01L-10L	Male	7/21/2004 11:50 - Fyke I					

APPENDIX III
Table of UTM Locations for Traps

Trap	Set Date	Pull Date	Days Set	Easting	Northing	EPE (m)	Site
Trap58A	7/21/2004 14:05	7/25/2004 15:57	4.1	410378	4604420	4.0	Bullrush Pond
Trap60B	7/21/2004 14:10	7/25/2004 15:57	4.1	410388	4604430		Bullrush Pond
MicroFyke	7/24/2004 13:09	7/30/2004 9:18	5.8	410269	4604286	4.9	Bullrush Pond
MiniHoop	7/25/2004 15:57	7/30/2004 9:15	4.7	410378	4604420	4.0	Bullrush Pond
Trap58C	7/1/2004 16:49	7/21/2004 10:25	19.7	410329	4603960	4.3	East Pond
Trap63	7/1/2004 16:53	8/1/2004 11:16	30.8	410336	4603977	4.3	East Pond
Trap65	7/1/2004 17:00	8/1/2004 11:18	30.8	410346	4604006	4.3	East Pond
Trap61A	7/1/2004 17:05	7/21/2004 11:00	19.7	410352	4604020	4.6	East Pond
Trap60A	7/1/2004 17:25	7/21/2004 10:13	19.7	410371	4604039	5.2	East Pond
Trap66A	7/1/2004 17:25	7/21/2004 10:16	19.7	410353	4604028	4.6	East Pond
Trap56A	7/1/2004 17:45	7/21/2004 10:10	19.7	410383	4604044	4.9	East Pond
Trap59	7/1/2004 17:49	8/1/2004 11:22	30.7	410395	4604033	4.9	East Pond
Trap57A	7/4/2004 11:17	7/9/2004 11:37	5.0				East Pond
Trap75	7/11/2004 16:37	8/1/2004 11:25	20.8	410404	4604024	9.4	East Pond
Trap78A	7/11/2004 16:39	7/21/2004 10:05	9.7	410416	4604021	4.9	East Pond
Trap62A	7/11/2004 16:43	7/21/2004 10:03	9.7	410423	4604017	4.3	East Pond
Trap74B	7/11/2004 16:47	7/12/2004 13:30	0.9				East Pond
Trap72A	7/11/2004 16:50	7/21/2004 10:01	9.7	410447	4604019	4.3	East Pond
Trap77A	7/11/2004 16:53	7/24/2004 10:54	12.8	410456	4604016	4.0	East Pond
Trap86	7/14/2004 14:23	8/1/2004 11:34	17.9	410491	4603977	4.0	East Pond
Trap87	7/14/2004 14:27	8/1/2004 11:32	17.9	410483	4603988	3.7	East Pond
Trap73A	7/14/2004 14:31	7/24/2004 10:47	9.8	410485	4603994	3.7	East Pond
Trap88	7/14/2004 14:35	7/28/2004 12:29	13.9	410482	4604008	4.0	East Pond
Trap90	7/14/2004 14:40	7/28/2004 12:24	13.9	410486	4604022	4.0	East Pond
Trap85A	7/14/2004 14:41	7/22/2004 10:57	7.8	410509	4603968	4.0	East Pond
Trap74A	7/14/2004 14:45	8/1/2004 11:26	17.9	410474	4604024	4.0	East Pond
Trap57B	7/14/2004 14:49	7/15/2004 11:01	0.8	410466	4604025	4.0	East Pond
Dnet	7/19/2004 13:00	7/30/2004 11:30	10.9	410539	4603977	4.3	East Pond
Minnow6	7/23/2004 11:00	7/29/2004 12:40	6.1	410427	4603981	4.3	East Pond
Minnow5	7/23/2004 11:00	7/29/2004 12:40	6.1	410424	4603974	4.6	East Pond
Minnow4	7/23/2004 11:00	7/29/2004 12:40	6.1	410423	4603965	5.2	East Pond
Minnow3	7/23/2004 11:00	7/29/2004 12:40	6.1	410427	4603962	5.2	East Pond
Minnow2	7/23/2004 11:00	7/29/2004 12:40	6.1	410439	4603958	4.6	East Pond
Minnow1	7/23/2004 11:00	7/29/2004 12:40	6.1	410425	4603945	4.9	East Pond
Flapper	7/23/2004 11:00	7/29/2004 12:40	6.1	410432	4603948	5.2	East Pond
Minnow11	7/23/2004 11:00	7/29/2004 12:40	6.1	410436	4603951	4.9	East Pond
Minnow10	7/23/2004 11:00	7/29/2004 12:40	6.1	410435	4603964	4.9	East Pond
Minnow8	7/23/2004 11:00	7/29/2004 12:40	6.1	410437	4603973	4.9	East Pond
Minnow7	7/23/2004 11:00	7/29/2004 12:40	6.1	410437	4603980	4.9	East Pond
Minnow9	7/23/2004 11:00	7/29/2004 12:40	6.1	410424	4603980	4.3	East Pond
Trap45B	7/25/2004 14:40	8/1/2004 10:44	6.8	410515	4603964	5.2	East Pond
Trap73B	7/25/2004 14:45	8/1/2004 10:17	6.8	410535	4603981	5.2	East Pond
Trap57C	7/25/2004 14:48	8/1/2004 10:39	6.8	410538	4603995	5.2	East Pond
Trap78C	7/25/2004 14:52	8/1/2004 10:37	6.8	410549	4603998	4.3	East Pond
Trap72B	7/25/2004 14:55	8/1/2004 10:35	6.8	410566	4603992	4.3	East Pond
Trap81	7/25/2004 14:58	8/1/2004 10:31	6.8	410566	4603974	4.3	East Pond
Trap55B	7/25/2004 15:03	8/1/2004 10:27	6.8	410574	4603963	4.0	East Pond
Trap85B	7/25/2004 15:07	8/1/2004 10:25	6.8	410568	4603947	4.0	East Pond
Trap77B	7/25/2004 15:11	8/1/2004 10:24	6.8	410554	4603942	4.6	East Pond

APPENDIX III
Table of UTM Locations for Traps

Trap	Set Date	Pull Date	Days Set	Easting	Northing	EPE (m)	Site
Trap49	6/29/2004 10:38	7/30/2004 10:20	31.0	410213	4603929	4.6	Middle Pond
Trap55A	6/29/2004 10:40	7/20/2004 11:36	21.0	410221	4603935	4.6	Middle Pond
Trap54	6/29/2004 10:45	7/30/2004 10:17	31.0	410229	4603932	4.9	Middle Pond
Trap47	6/29/2004 10:47	7/30/2004 10:13	31.0	410235	4603931	4.9	Middle Pond
Trap42A	6/29/2004 10:52	7/21/2004 9:40	22.0	410250	4603956	4.9	Middle Pond
Trap53	6/29/2004 10:53	7/28/2004 11:42	29.0	410244	4603964	5.2	Middle Pond
Trap51A	6/29/2004 10:59	7/21/2004 9:50	22.0	410243	4603985	4.9	Middle Pond
Trap50	6/29/2004 11:01	7/28/2004 11:46	29.0	410235	4603971	4.3	Middle Pond
Trap43	6/29/2004 11:05	7/30/2004 10:08	31.0	410216	4603948	4.6	Middle Pond
Trap52	6/29/2004 11:07	7/30/2004 10:05	31.0	410219	4603956	4.3	Middle Pond
Trap45A	6/29/2004 11:14	7/21/2004 9:35	21.9	410241	4603932	4.9	Middle Pond
Trap41A	6/29/2004 11:18	7/21/2004 7:37	21.8	410246	4603962	4.9	Middle Pond
Trap41B	7/21/2004 14:25	7/30/2004 9:27	8.8	410268	4604275	5.2	ORV Pools
Trap60C	7/25/2004 16:05	7/29/2004 9:27	3.7	410260	4604263	5.2	ORV Pools
Trap83	7/14/2004 11:15	7/31/2004 11:33	17.0	410116	4603994	6.4	West Marsh
Trap79	7/14/2004 11:28	7/31/2004 11:37	17.0	410099	4603991	4.9	West Marsh
Trap80	7/14/2004 11:35	7/31/2004 11:27	17.0	410116	4603999	4.6	West Marsh
Trap84	7/14/2004 11:38	7/31/2004 11:27	17.0	410119	4603996	4.6	West Marsh
Trap82	7/14/2004 11:43	7/31/2004 11:33	17.0	410119	4604011	4.6	West Marsh
Trap78B	7/21/2004 12:30	7/24/2004 10:57	2.9	410120	4604035	7.9	West Marsh
Trap66B	7/21/2004 12:43	7/31/2004 11:38	10.0	410126	4604067	6.7	West Marsh
Trap56B	7/21/2004 12:50	7/31/2004 11:28	9.9	410119	4604064	5.8	West Marsh
Trap61B	7/21/2004 13:00	7/31/2004 11:25	9.9	410118	4604076	6.1	West Marsh
Trap62B	7/21/2004 13:10	7/31/2004 11:33	9.9	410121	4604061	4.0	West Marsh
Trap51B	7/21/2004 14:44	7/30/2004 9:30	8.8	410204	4604096	4.9	West Marsh
Trap42B	7/24/2004 10:57	7/31/2004 11:43	7.0	410120	4604035	7.9	West Marsh
Trap58B	7/25/2004 16:20	7/31/2004 14:43	5.9	410121	4604032	6.4	West Marsh

APPENDIX IV
UTM Locations for *Emys blandingii*

Turtle	Sex/Stage	Capture	Date	Easting	Northing
01L-08L	Female	Initial	7/17/2004	410250	4603956
01L-08L	Female	Recapture	7/19/2004	410219	4603956
01L-11L	Male	Initial	7/24/2004	410119	4604064
01L-12L	Juvenile	Initial	7/31/2004	410119	4604064
01L-13L	Female	Recapture	7/2/2004	410371	4604039
01L-13L	Female	Recapture	7/20/2004	410250	4603956
08L-09L	Juvenile	Initial	7/16/2004	410119	4604011
08L-10L	Female	Initial	7/22/2004	410268	4604275
09L-11L	Female	Initial	7/1/2004	410219	4603956
09L-11L	Female	Recapture	7/7/2004	410336	4603977
09L-11L	Female	Recapture	7/16/2004	410474	4604024
09L-11L	Female	Recapture	7/18/2004	410482	4604008
09L-11L	Female	Recapture	7/21/2004	410456	4604016
09L-12L	Male	Initial	7/3/2004	410235	4603931
09L-12L	Male	Recapture	7/11/2004	410213	4603929
09L-12L	Male	Recapture	7/27/2004	410244	4603964
10L-11L	Female	Initial	7/9/2004	410395	4604033
11L-12L	Male	Initial	7/14/2004	410456	4604016
01L-02R	Female	Initial	7/3/2004	410219	4603956
01L-03R	Male	Initial	7/13/2004	410404	4604024
01L-03R	Male	Recapture	7/14/2004	410219	4603956
01L-08R	Female	Initial	7/13/2004	410456	4604016
01L-09R	Female	Initial	7/18/2004	410486	4604022
01L-09R	Female	Recapture	8/1/2004	410395	4604033
01L-10R	Female	Initial	7/18/2004	410395	4604033
01L-11R	Male	Initial	7/16/2004	410474	4604024
01L-12R	Female	Initial	7/22/2004	410229	4603932
01L-12R	Female	Recapture	7/27/2004	410119	4604011
02L-01R	Juvenile	Initial	7/23/2004	410119	4604064
09L-11R	Female	Initial	7/21/2004	410244	4603964
01L-09L-03R	Female	Initial	7/15/2004	410099	4603991