

possible presence of baitfish during trapping. Quantitative volumetric analysis was not possible due to time constraints.

Algae and bird material were the most frequent items found in the gastrointestinal tract (Table 1), although fish, snails, and crayfish were also common. A single neotenic *Ambystoma mavortium* was the only amphibian found. Algae was present in 40 of the 49 individuals (82%), and bird remains (primarily feathers) were found in 22 turtles (45%). Generally, the feathers found in the gut were from small, unidentifiable birds; all large identifiable feathers and/or legs or bones were from coots (*Fulica*). Birds increased in frequency in the diet when body size reached ca. 325 mm carapace length (Table 1). Only 4 of the 22 (18%) smaller turtles included bird remains whereas 18 of the 27 (67%) of larger turtles did ($\chi^2 = 26.5$; $P < 0.0001$).

A comparison of our data with previous studies (Table 2) confirms that Snapping Turtles are omnivorous and likely opportunistic in their diet, and hence diet varies considerably across their range. Except in habitats with dense waterfowl populations (Table 2), the frequency of game birds in the diet is quite low, supporting the statement by Breckenridge (1944. Reptiles and Amphibians of Minnesota. University of Minnesota Press, Minneapolis. 202 pp.) who noted: "It is probable that the seriousness of the snapper's preying upon our waterfowl has been greatly exaggerated."

We thank the staff at Crescent Lake National Wildlife Refuge for allowing us to salvage the gastrointestinal tracts from the culled turtles.

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CHRYSEMYS PICTA (Painted Turtle). MOUTH ANOMALY.

Chrysemys picta is a small omnivorous freshwater turtle common throughout much of the eastern and central United States (Carr 1952. Handbook of Turtles: The Turtles of the United States, Canada, and Baja California. Comstock Publishing Associates, Ithaca, New York. 542 pp.). There are few reports of anomalies in *C. picta* outside of occasional developmental malformations in juveniles, which may result in lower survival and low prevalence in adults. Facial deformities such as unfused premaxilla and maxilla bones, shortened jaws, or missing eyes in aquatic turtle embryos may have detrimental effects and are seldom observed in adults (Bell et al. 2006. Environ. Pollut. 142:457–465). However, proportions of injury from predation and deformity in other aquatic turtles such as the Northern Map turtle, *Graptemys geographica*, can be as high as 14% in some populations (Bennett and Litzgus 2014. J. Herpetol. 48:262–266) and recessed jaws have been observed

in 3.8% of Snapping Turtles, *Chelydra serpentina* (Bishop et al. 1998. Environ. Pollut. 101:143–156). However, in *Chrysemys*, facial or jaw deformities have been observed to be relatively rare in studied populations, ~1% (Davy and Murphy 2009. Can. J. Zool. 87:433–439).

On 2 April 2018 at 1250 h, we observed an adult female *C. picta* (straight line carapace length = 133 mm, mass = 260 g) on the shore surrounding a small pond on the Wingate University Campus, Wingate, North Carolina, USA (34.9873°N, 80.4283°W; WGS 84) with facial deformities that included both eyes and the majority of the upper jaw missing and recessed (Fig. 1A). This individual *C. picta* was basking within five meters of the water and displayed normal behavior and movement upon our encounter and examination. Initially we assumed the turtle was recently injured but the individual showed no signs of recent trauma or injury and was released. We observed this same individual on two separate occasions (within one week) basking following the initial encounter. Therefore, we conclude this otherwise healthy individual may be able to forage successfully while lacking eyesight, diminished nostrils and the majority of the anterior upper jaw (premaxilla, maxilla, and prefrontal bones) as seen in Fig 1B. The observed anomalies could be developmental or result from previous injury (such as from mammalian predators or possibly even Snapping Turtles, *Chelydra serpentina*, often encountered in this same pond). However, despite these striking facial abnormalities, this turtle was apparently able to survive for an extended (but indeterminate) period of time. We thank North Carolina Wildlife Resources Commission for permits.

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CHRYSEMYS PICTA (Painted Turtle). BASKING BEHAVIOR.

It is not uncommon to find *Chrysemys picta* basking on natural structures extending from the water, including logs, rocks, small islands, sand bars, or the banks of water bodies (Ernst and Lovich 2009. Turtles of the United States and Canada. John Hopkins University Press, Baltimore, Maryland. 840 pp.). *C. picta* have also been observed basking on conspecifics and other turtle species, including *Chelydra serpentina* and *Apalone spinifer* (Moriarty and Hall 2014. Amphibians and Reptiles in Minnesota. University of Minnesota Press, Minneapolis, Minnesota. 370 pp.),



FIG. 1. A) Adult female *Chrysemys picta*, as found near a pond, showing facial abnormality; B) same individual, medial view of head, missing eyes and upper jaw, but no signs of recent trauma.



FIG. 1. A) *Chrysemys picta* basking on a dead *Castor canadensis*. B) *C. picta* basking on a dead *Cyprinus carpio*.

and even on the roofs of partially submerged automobiles (Ernst and Lovich 2009, *op. cit.*). At 1200 h on 14 May 2018, we observed *C. picta* basking on a dead *Castor canadensis* (American Beaver; Fig. 1A) and on a dead *Cyprinus carpio* (Common Carp; Fig. 1B) at Medicine Lake in Hennepin County, Minnesota, USA. To our knowledge, this is the first report of *C. picta* basking on animal carcasses.

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CLEMMYS GUTTATA (Spotted Turtle). HABITAT USE. *Clemmys guttata* is known to inhabit a wide variety of wetland types, such as shallow grassy marshes, forest swamps, ponds, and even bays of large lakes (Ernst 1976. J. Herpetol. 10:25–33; Litzgus and Brooks 2000. J. Herpetol. 34:178–185; Stevenson et. al. 2015. Chelon. Conserv. Biol. 14:136–142). *C. guttata* populations inhabiting wetland complexes often display seasonal shifts in habitat use (Ward et. al. 1976. Herpetologica 32:60–64; Beaudry et. al. 2009. J. Herpetol. 43:636–645). Individuals have also been documented moving among wetlands over short time intervals, sometimes remaining within a wetland for only one day (Haxton and Berrill 2001. J. Herpetol. 35:606–614). Previous studies indicate that movement among wetlands typically involves walking through terrestrial habitat, sometimes traveling up to 250 m from water (Ernst, *op. cit.*; Litzgus and Brooks, *op. cit.*; Rasmussen and Litzgus 2010. Copeia 2010:86–96).

Few published studies have investigated the use of streams as habitat or as a factor influencing habitat connectivity for *C. guttata*. Individuals have been documented occupying slow-moving water systems such as drainage ditches and backwater areas of rivers (Stevenson et. al., *op. cit.*), and hibernating on the bottom of shallow (ca. 0.2 m) streams (Ernst 1982. J. Herpetol. 16:112–120). Streams with moderate or rapid flow rates bisecting wetlands could act as barriers to movement, but could also function as travel corridors among wetland patches. Here, we report radiotelemetry-based data showing that individuals in a *C. guttata* population often cross a moderate-flow stream while moving among wetland patches, as well as an observation of apparent use of the stream as a travel corridor.

In spring of 2018, we conducted a radiotelemetry study using six *C. guttata* in a 20-ha wetland complex in Hampshire County, West Virginia, USA (specific location withheld in compliance with state of West Virginia sensitive species data practices). The wetland complex consists of a matrix of seasonally flooded shallow grassy marshes, forest ponds, and dry upland grassland and forest. The wetland complex is bisected by a small, moderate-flow stream (2–4 m wide, 0.2–1.2 m deep, ca. 0.029 cm/s flow rate during the study period). *C. guttata* were outfitted with 3.6-g glue-on radiotransmitters (Advanced Telemetry Systems [ATS], Isanti, Minnesota), and tracked from 5 April to 7 May using a R410 scanning receiver (ATS) and 3-element folding yagi antenna. Each individual was located a minimum of three times per week.

During the study, five of the *C. guttata* made stream crossings to access additional wetlands. The females (N = 2) crossed the stream to access a wetland adjacent to the one previously occupied, whereas the males (N = 3) appeared to use the stream as a corridor to move to other wetlands. For example, on 1 May 2018, a male *C. guttata* was tracked into a shallow grassy

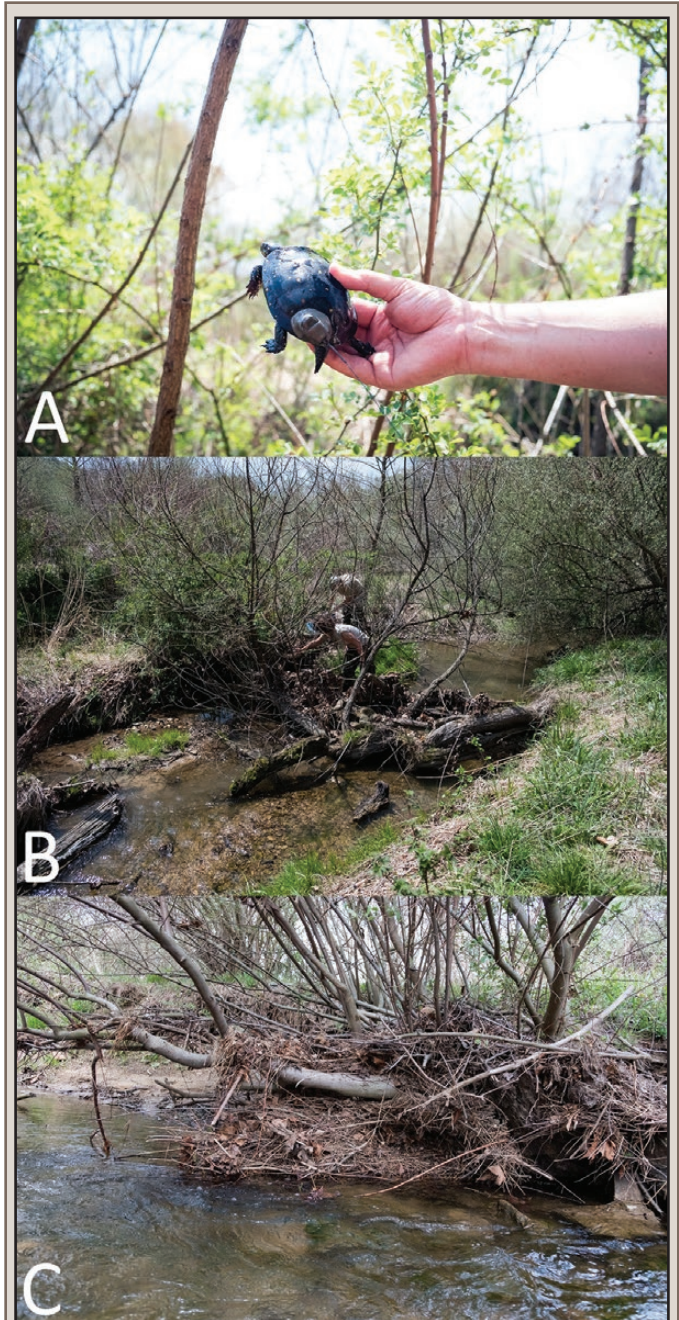


FIG. 1. A) Radiotracked *Clemmys guttata* captured in a stream on 3 May 2018 in Hampshire County, West Virginia, USA; B) Upstream detection location at ca. 1030 h; C) downstream detection location at ca. 1400 h. The individual moved 0.05 stream km between observations.

marsh. On 3 May 2018, at ca. 1030 h, the same individual was tracked a straight-line distance of 0.04 km into the stream and located among a collection of wood and debris that had been trapped by a tree limb that had fallen across the water (Fig. 1). At ca. 1400 h on the same day, the individual was tracked 0.05 km downstream from its previously tracked location, into another wood and debris collection that had developed among the vegetation growing along the bank of the stream. On 4 May 2018, the individual was located in a temporary shrub-sedge wetland, a straight-line distance of 0.05 km from the previously tracked location. On 7 May 2018, the individual was then tracked back