FIGURES CAPTIONS

Figure 1. Representative images showing a sequence of the progressive stages in a self-righting snapping turtle. **(A)** initial contact of ❶ the neck to the ground; **(B)** ❷ extension of the neck, which ❸ begins lifting the shell off the ground; **(C)** ❹ full extension, ❺ twisting of the neck, and ❻ rotation of the shell about its axis; and **(D)** completion of the self-righting maneuver, with all four limbs contacting the ground. White lines with arrows represent the direction of motion. The biomechanical effort involved for different body areas is depicted as **(E)** a representative image showing the maximum-force peaks integrated over the self-righting maneuver, highlighting the dynamic distribution of forces across the turtle and the concentration of force application via the neck. The relative magnitude of the force (F magnitude) production is indicated by colours, as shown in the panel legend. **(F)** Representative traces of absolute total force (F_{total}; black line) in Newtons (N) produced by a snapping turtle during one self-righting maneuver and recorded by a force plate (indicated in the panel legend). A pressure pad recorded the contribution of neck force (F_{neck}; blue line) and total force (red line) exerted by the turtle during self-righting (indicated in the panel legend to the left). The sequence of the self-righting maneuver labelled from A to D, to match the corresponding panels are indicated over the blue F_{neck} line. The red, blue, and purple rectangular sections found under the x-axis correspond to the pre-neck latency – time it took for a turtle to place its head on the ground to initiate the self-righting maneuver, self-righting – when force is being applied via the neck, and post-neck latency - the duration of time to complete the self-righting maneuver when the turtle no longer used the neck to flip over times that are shown in Fig. S2 for reference.

Figure 2. Relationships with body mass between (A) carapace length (red triangles), carapace width (blue triangles), and shell height (green triangles); (B); shell shape (sphericity and flatness indices); (C) neck length, during ontogeny; and (D) self-righting time, during ontogeny, in female common snapping turtles (N = 33). All morphometric parameters positively correlated with body mass. Carapace length, carapace width, and shell height followed isometric growth, whereas neck length followed a negative allometric pattern. Self-righting time, during which a snapping turtle uses its head to flip over, is positively correlated with body mass and follows isometric scaling. Simple linear regressions were used to produce best-fit lines through the data. The ages (in years) of snapping turtles used in this study are indicated by closed triangles, for 1.5 y (n = 26); open triangles, for 4.5 y (n = 4); and half-closed triangles, for 5.5 y (n = 3), as shown in the figure legend. Abbreviations: body mass, M_b; grams, g; length, L; width, W; height, H, t; time.

Figure 3. Relationship between body mass and (A) kinetic-energy equivalent, (B) power-output equivalent, or (C) normalized height-change equivalent, during ontogeny, in female common snapping turtles (N = 33). All three variables are positively correlated to body mass. Simple linear regressions were used to produce best-fit lines through the data. Height-change equivalent was normalized to carapace width. The ages in years of snapping turtles used in this study are indicated by closed circles, for 1.5 y (n = 26); open circles, for 4.5 y (n = 4); and half-closed circles, for 5.5 y (n = 3), as shown in the figure legend. Abbreviations: gram, g; body mass, M_b; kinetic-energy equivalent, KEE; power-output equivalent, PE; height-change equivalent, ΔHE.