

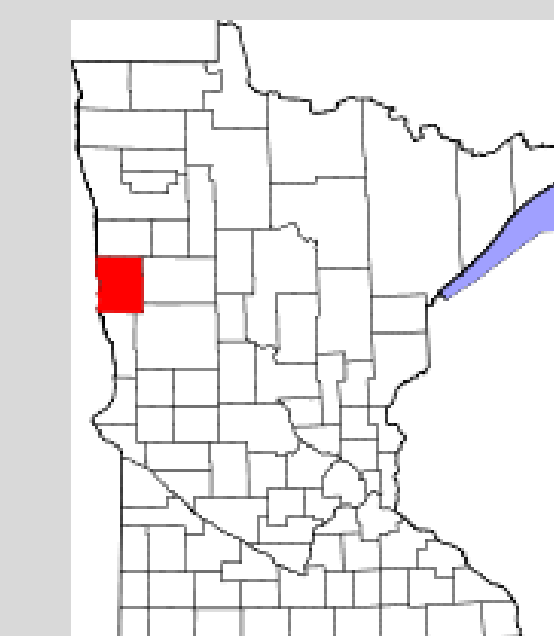
Physical Features and Behaviors of Painted Turtles (*Chrysemys picta bellii*) Moving between Sloughs in Clay County, Minnesota



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Abstract

Capture-and-release is a largely used and effective way that scientists use to collect data on different species. For our study, we used floating turtle traps to capture painted turtles (*Chrysemys picta*) near Rollag, Minnesota. The research was conducted in late May until late August or early September from 2001-2019. Multiple traps were set upon 3 different nearby sloughs and were checked every-other-day. Carapace length and curvature, plastron length, mass, sex, and age were recorded for each capture. We documented recaptures based on ID from scute notches, PIT tags, and, for very small turtles, fingernail polish designs. The objective of this poster is to document movement patterns of painted turtles between 2006 (when we first started using PIT tags) and 2019 and see if there were any physical (size or sex) characteristics of the turtles who showed the most frequent movement between sloughs. We will also compare what time of year the most movement occurred between the 3 sloughs and make inferences based on this. We want to document how much movement occurs early in the summer during breeding season (i.e., May-June) and later in the summer when breeding is finished. We will also document how much movement occurred between years, i.e., how much movement happened after our trapping season ended in the August/September and the following May when we started trapping again. Movements during these "off-season" months might be associated with finding hibernation sites. We will also see if any particular slough(s) are associated with more turtles moving to or from it.

Introduction

As a continuing study started in 2001, live-trapping of painted turtles has been researched by many MSUM students over the last 19 years. The purpose of the research is to study population characteristics, behaviors, survival, and physical features. Painted turtles are known to sunbathe, especially during summer morning hours due to their thermoregulatory nature (Peterman and Ryan, 2009). This can be done on rocks, sunken logs, floating debris and land. Because of this nature, we were able to use floating live-traps to collect turtle data. Turtles are ectothermic so they have been believed to move based on their environmental conditions (Edwards and Blouin-Demers, 2007). Female turtles also travel far to find suitable conditions for laying eggs due to their temperature-dependent sex determination (Mitchell *et al.*, 2013). In this poster, we are investigating if turtle movements are related to size, sex or time of year.

Hypotheses

Null Hypothesis: There is no relationship between turtle movements and size, sex or time of year

Alternate Hypothesis: There is a relationship between turtle movement and size, sex and/or time of year

Methods

Data collected from May to August of 2001 to 2019 were used to study turtles between three different sloughs, Aakre, Middle and Stockrahm (Figure 7). There were a total of 15 traps, 6 in Aakre and Stockrahm each and 3 in Middle. Aakre slough was not added to the data collection until 2011. Once captured, size measurements and weight were collected including carapace length/width/curvature and sex. We separated turtles based on sex, size and movement between sloughs. We used data from 2006 to 2019 because Passive Integrated Transponder (PIT) tags were not used until 2006. Movers were chosen as individuals that were captured in more than one slough. Sizes were categorized based on carapace length grouped by size values of 10.1-13.0 cm, 13.1-16.0 cm, 16.1 - 19.0 cm, and > 19.1 cm.



Figure 1. Measuring carapace length of *Chrysemys picta bellii* with calipers.

Results

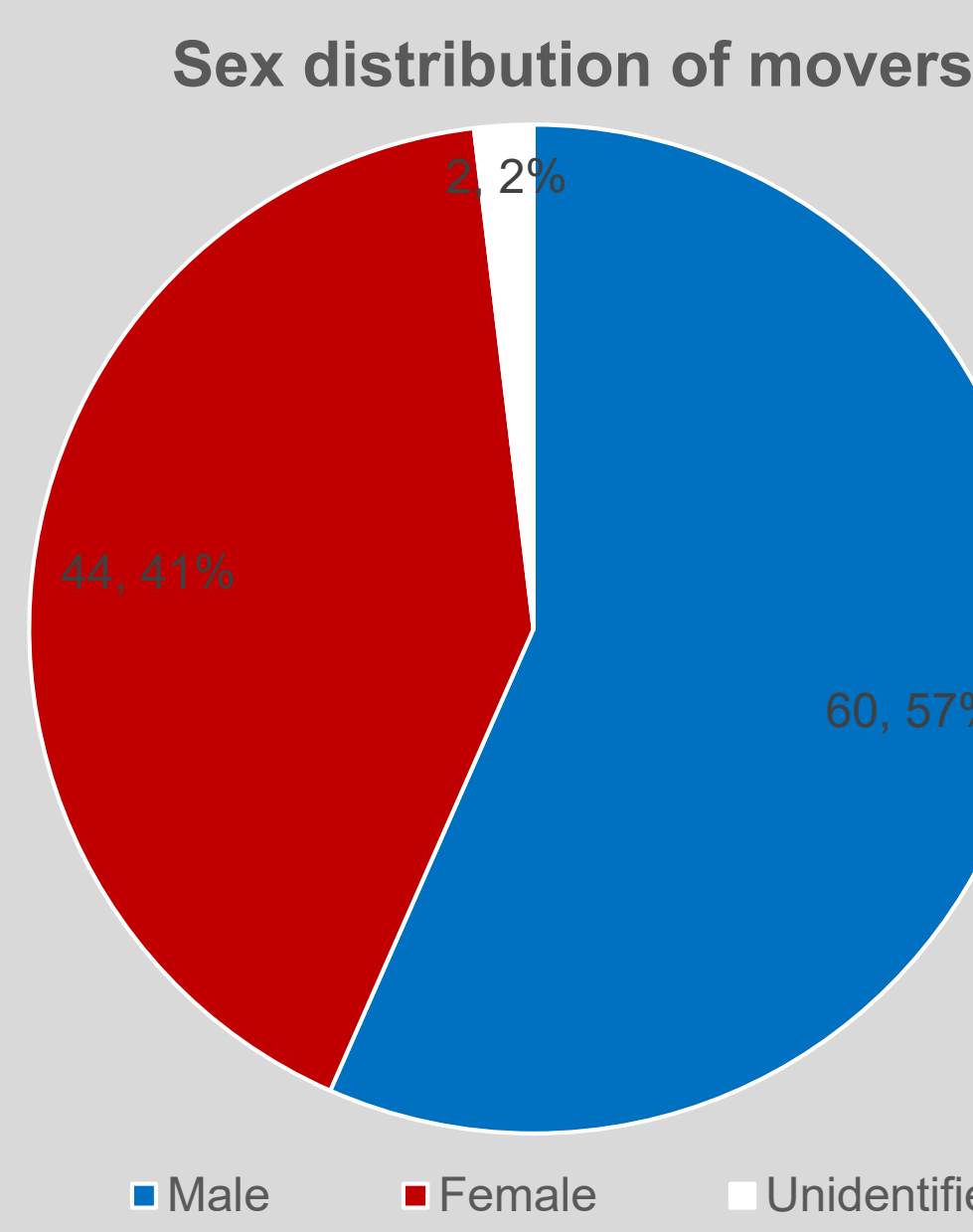


Figure 2. Sex distribution of painted turtles that showed movement ($X^2=2.463$, d.f.=1, $p=0.1167$) (n=106).

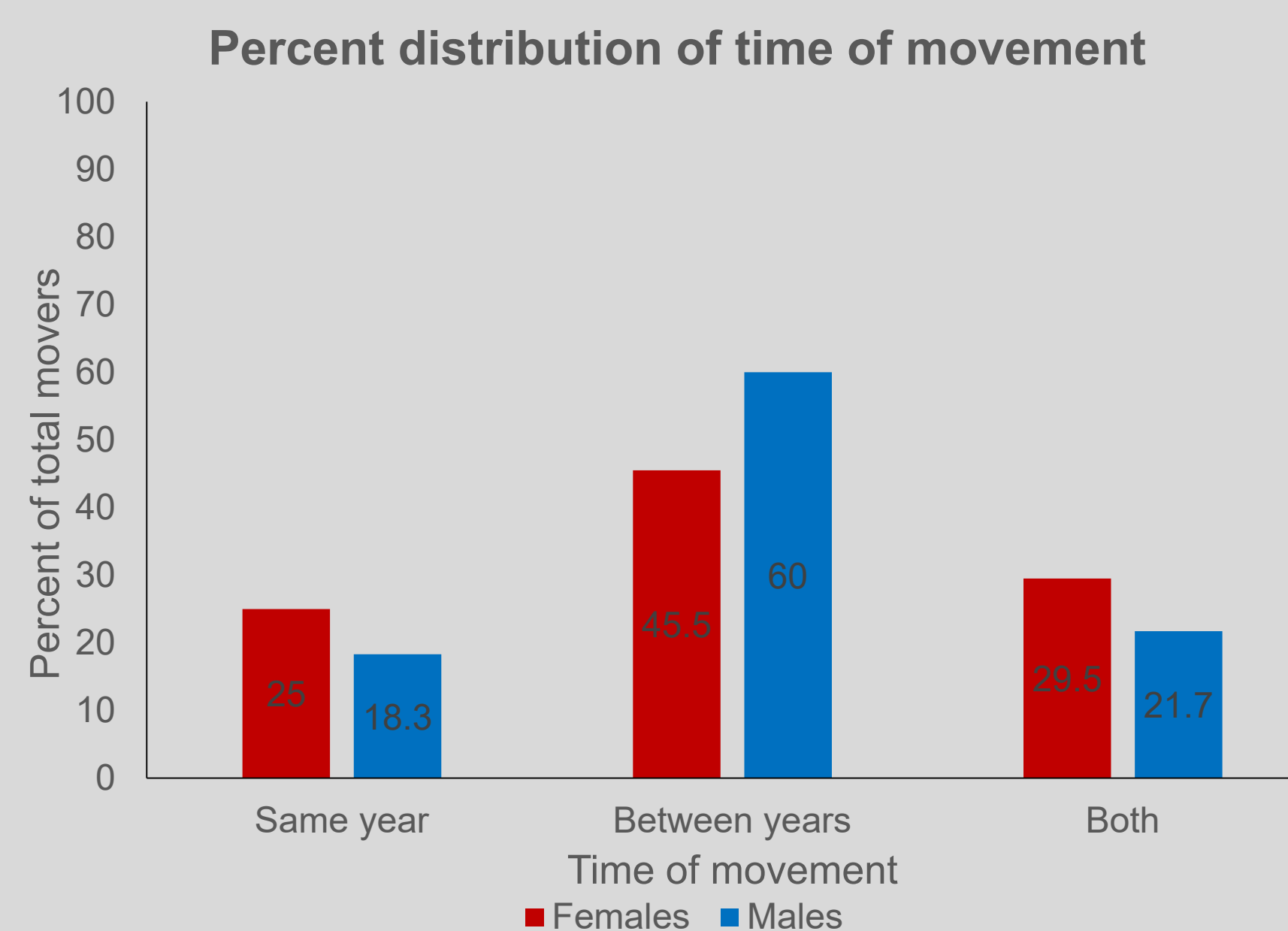
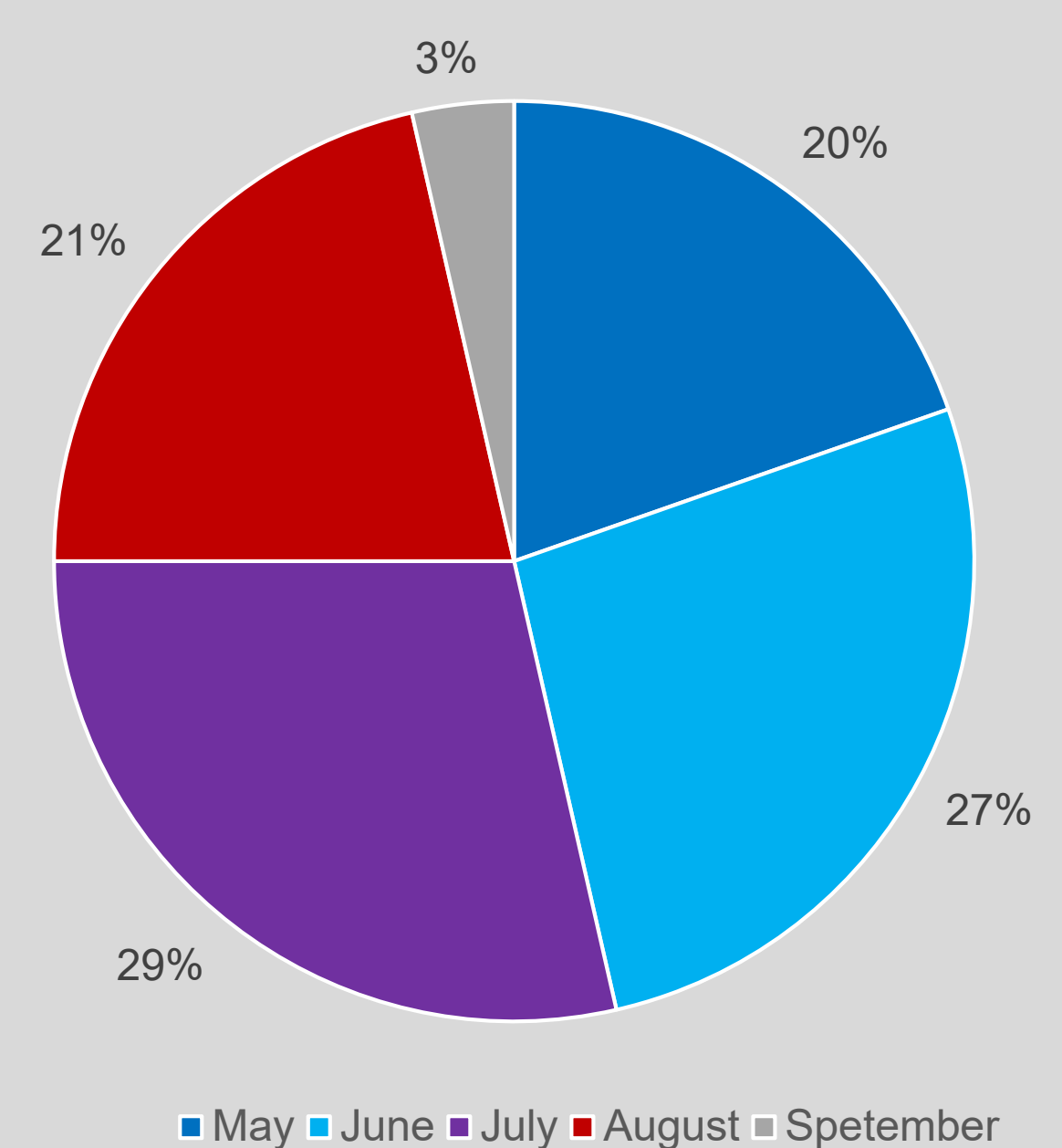


Figure 3. Percent distribution of time of movement for painted turtles (n=104).

Males: Month of Movement Within Year



Females: Month of Movement Within Year

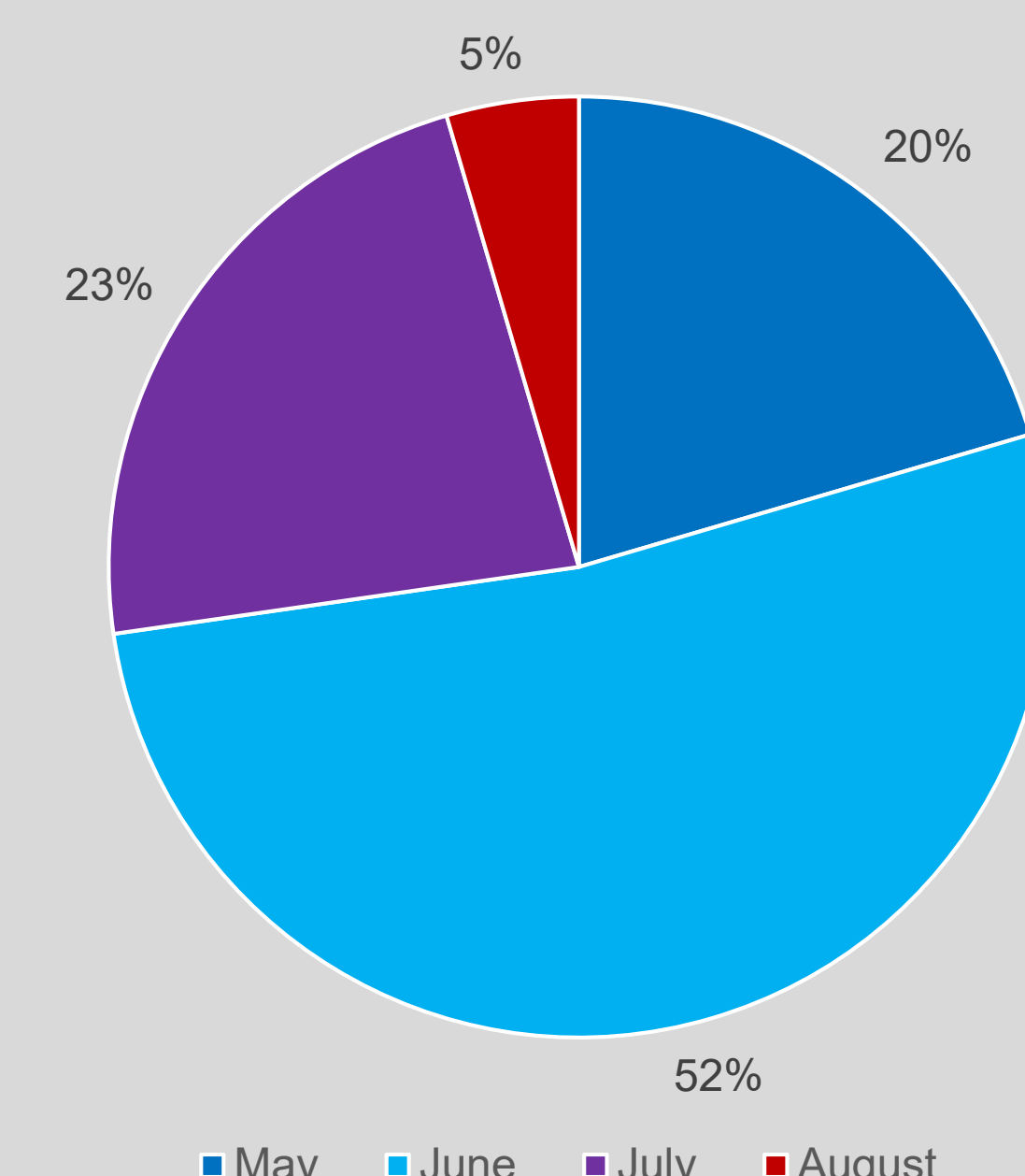


Figure 4. Percent distribution of the month of movement male and female painted turtles that moved within a year.

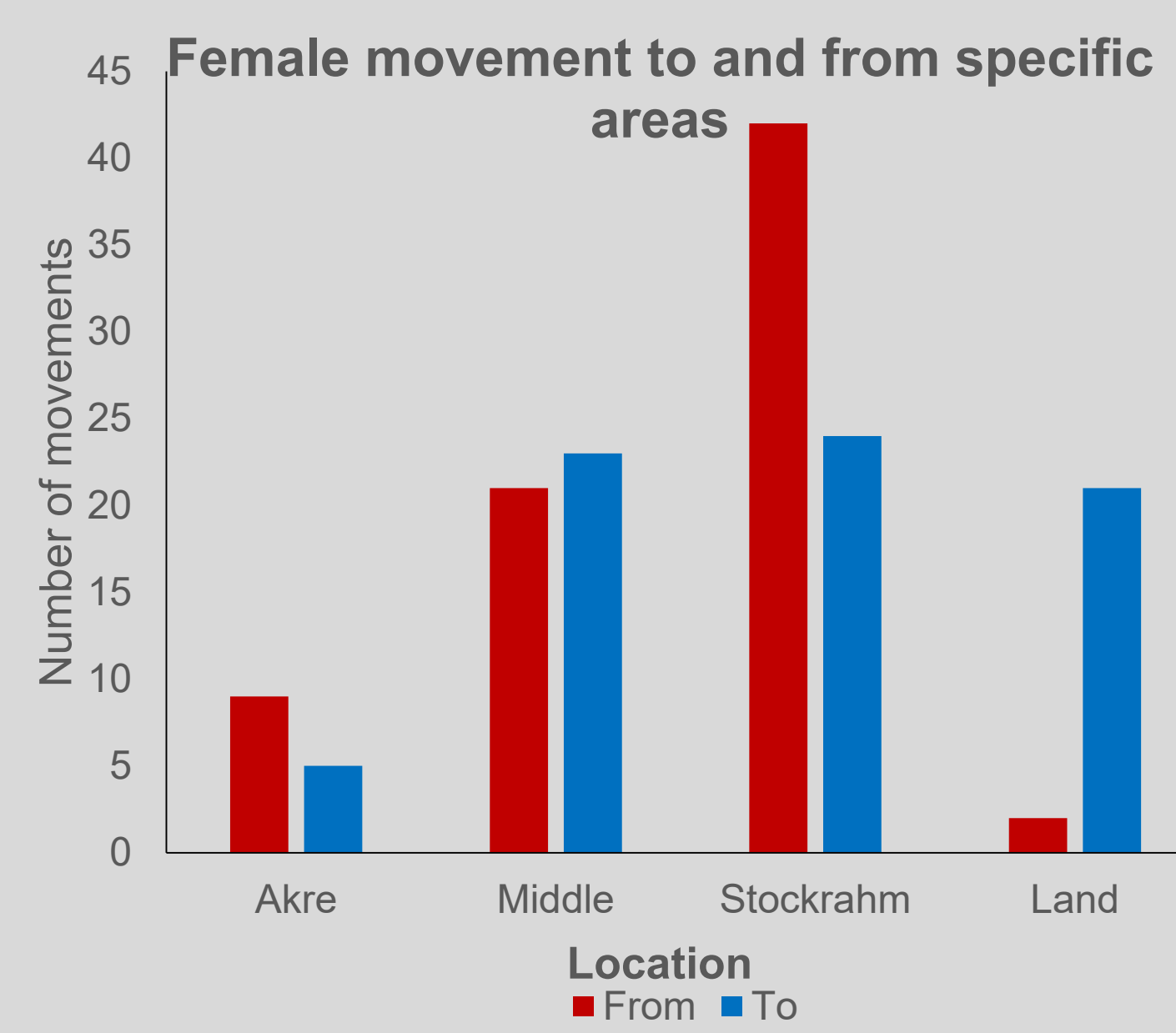


Figure 5. Number movements to or from specific areas for male (n=172) and female (n=147), painted turtles.

Male and Female movers by size class

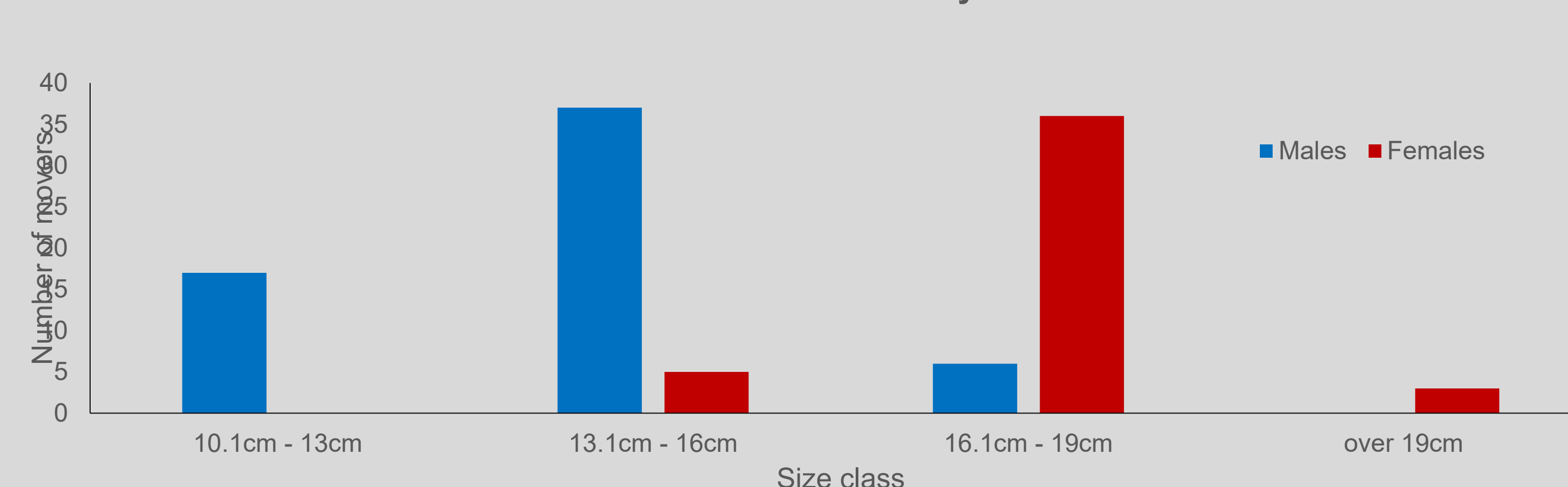


Figure 6. Distribution of size class for female and male painted turtles that showed movement (n=104).

Study Sites



Figure 7. Aerial view of Aakre, Middle, and Stockrahm Sloughs located in Clay County, MN.

Results (continued) & Discussion

We collected data on 106 turtles that were recaptured between sloughs (60 males, 44 females, 2 unknown sex). The male:female ratio of movers was not significantly different from 50:50 ($p=0.1167$) (Figure 2). Both sexes moved within years (i.e., 1 season) and between years (Figure 3). Both sexes did a lot of moving in May and June, especially females (72%) (Figure 4), which corresponded to the mating/nesting season. Movement occurred to/from all 3 sloughs for both sexes (Figure 5). Females were reported on land more often than males, usually associated with nesting/egg-laying behaviors. Previous studies have also found that females are more active during these months in search of areas to nest (Gibbons, 1968). Females also nest on land, in areas near freshwater (Legler, 1954) which was supported by our data. We found that larger females tended to move more than smaller females (Figure 6). There is evidence of selection towards larger females who are able to produce larger eggs (Iverson, and Smith, 1993), and perhaps this was a factor in our study. Male movement is generally motivated by finding females to mate with (Gibbons, 1968). The spring and early summer have been known as times which mating occurs for painted turtles, which would suggest that more movement would occur during those months (Gist *et al.*, 1990). The size of females that showed movement was larger than that of males (Figure 6), but adult females are generally larger than adult males. The carapace length of adult females is known to be bigger than that of adult males. Females have been found to be roughly 22% larger than males (Rowe, 1997). The time of year that movement occurred for females varied compared to males. This could suggest differences in the motive of movement. Hibernation was initially thought to be a possible reason for turtle movement, but our data did not support this. St. Clair and Gregory (1990) found that painted turtles generally do not move between bodies of water to hibernate, and they usually stay in the same location and hibernate 1m deep in the mud of wetlands. Each slough in our study was deeper than 1m, suggesting compatibility for turtle hibernation. Movement seemed to be more evenly distributed during later summer months, but most live-trapping terminated during late August, limiting data collection in the fall. Overall, the general trends of the data suggested that females tend to move more during the late-spring and early-summer months, while males did not seem to show such a strong trend. Females also tended to move to land as well, while males were seldom documented on land.

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