



Association of prior feeding success with the use of specific ambush sites in sidewinder rattlesnakes (*Crotalus cerastes*)



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Background Information

Sidewinder rattlesnakes (*Crotalus cerastes*) are considered ambush, or sit-and-wait predators¹. Our study uses newborn sidewinders that have had no prior feeding experience before the start of the study. We are trying to determine if, and how quickly, a pattern of repeatedly used grid locations emerges during their first year of life, in association with known locations of prior feeding events. Behaviors monitored during this study can be applied to adult sidewinders because there are no age-based differences between juvenile and adult sidewinder rattlesnakes².

Subjects and Study Site

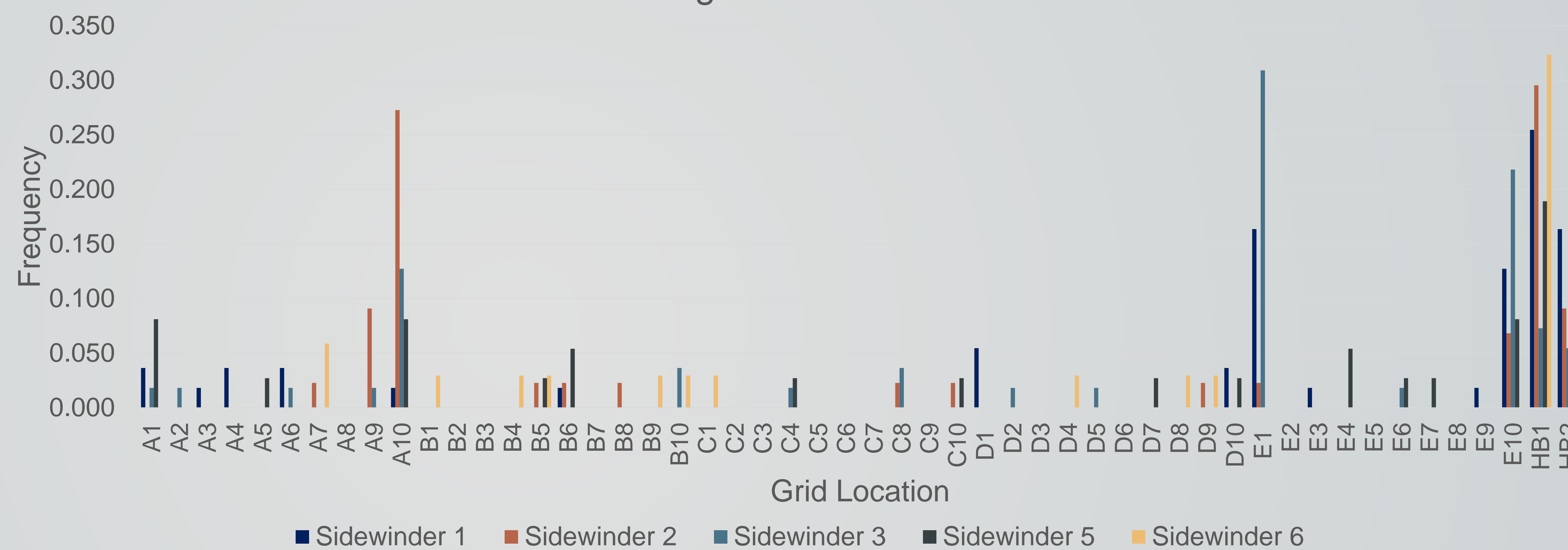
The study took place at Zoo Atlanta, in the herpetology breeding center. Subjects consisted of a litter of newly born sidewinders (n=5), and were kept in 23.5in x 11.8in enclosures. They were housed separately, with each enclosure including two identical hide boxes and one water bowl placed in the same relative positions. The standard newspaper flooring was replaced with pre-printed labeled grid cage liners. Grids were approximately 60mm x 60mm, labeled A1-E10. Cage liners were changed weekly, and at least two days before the next feeding. Sidewinders were offered dead pinky mice on a weekly schedule. Feeding time was not standardized.



Picture of sidewinder enclosure with two hide boxes and water bowl.
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Results

Fig. 4: Frequency of occurrence for each sidewinder rattlesnake in each grid location



Grid Location (figure 4):

After eight weeks of data collection, we can see that sidewinders seem to have preferred grid locations:

- Sidewinder #1: E1, HB1, and HB2
- Sidewinder #2: A10 and HB1
- Sidewinder #3: E1 and E10
- Sidewinder #5: HB1 and HB2
- Sidewinder #6: HB1 and HB2

Grid A1, A10 and E1, E10 are all corners of the enclosure.

Preferred grid locations mimic sidewinders in the wild because they prefer to hide under rocks, leaf litter, and in burrows².

Data Collection

Twice a day, the following data was collected:

- Grid Location of the sidewinder (based on snout)
- Posture of the sidewinder
- Direction of snout orientation

Days fed and days sidewinders shed skin were also recorded.



Fig. 1 (above): hunting position
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Fig. 2 (left): resting position
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Fig. 3 (left): no data, sidewinder was moving
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Sidewinder Postures (modified from Reinert et al, 2011)³

Hunting (H)

- Consists of two full body loops, and 5+ acute body direction changes, with the sidewinder's head resting on or past the outermost coil (Fig. 1).

Resting (R)

- Consists of most snake positions that are not considered hunting. Sidewinders are either loosely coiled or can be sprawled out (Fig. 2).

Not visible (NV)

- Not visible is usually used if the sidewinders are hiding in their hide boxes or are underneath the cage liners.

No data (ND)

- No data is recorded if sidewinder is visible but is moving around the enclosure or went into a defensive position (Fig. 3).

Data from feeding days (table 1):

Since sidewinders are only fed once a week, there are not enough data to make assumptions about whether or not sidewinders return to previous feeding locations. Table 1 shows the data that has been collected so far.

Blank spaces: grid location data was not recorded

'X': sidewinder was not fed on that particular day

Table 1: grid location of sidewinders on days fed

Feeding Date	Sidewinder 1	Sidewinder 2	Sidewinder 3	Sidewinder 5	Sidewinder 6
12-Jun	A6			A1	HB1
17-Jun	E1	A10	A6	X	X
18-Jun	X	X	X	HB2	HB2
24-Jun	A10	A10	A10	E4	
1-Jul	HB1	A7	X	HB1	B10
8-Jul	HB2	HB1	X	HB1	HB2
10-Jul	X	X	E1	X	X
22-Jul	A4	A10	X	A10	X
24-Jul	X	X	B7	X	

Future Analysis

Data collection for this study should be completed by summer 2018. Once data collection is complete, a random-number generating algorithm will be used to represent the null hypothesis that individual sidewinders do not use specific grid locations more frequently. Then correlational analysis will be used to test the hypothesis that sidewinders use specific grid locations more than others and that this non-random use of grid locations is associated with previous feeding events at those locations.

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References

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