From: Mike Cardwell
Sent: Wednesday, November 26, 2014 12:36 PM
To: Mike Cardwell
Subject: Rattlesnake update

Greetings everyone,

As nighttime low temps threaten to drop below 40F, it appears that the 2014 rattlesnake season is over. Female 39 and male 40 have been stationary since 6 and 27 October, respectively. Similarly, males 38 and 35 and female 41 have not moved since 4, 11, and 13 November. Male 37 has been inaccessible high on the hillside along the northwestern boundary of the preserve since 13 October and triangulation on his radio signal indicates he has moved little, if at all, over the past month. I was finally able to climb to his location yesterday and found it to be under a thick mat of old tree trimmings on a very steep slope just over the fence from a residential backyard.

However, as the rattlesnakes went down, one by one, for the winter, an interesting situation developed. You may have heard me talk about communal winter denning being common only where the winter climate is far more harsh than here, with suitable thermal shelters being correspondingly scarce (i.e., deep permanent shelters are necessary to escape freezing temps). In our climate, two or three rattlesnakes may occasionally spend the winter together but that's not the norm and they usually don't return to the same refuge winter after winter. Well, four of our telemetered rattlesnakes are currently under the same large log! Plus, I saw the tail of an unmarked rattlesnake (no paint in the rattle) protruding from under the same log on 15 November (see photo below). The radio signals of males 35, 38 and 40 seem to be together near the center of the log while female 39's signal emanates from about 10 feet away near one end. Coincidence? If so, it seems like a big one. The real test will be to see where they all go this time next year. Of all the similar-looking old logs laying around the preserve, could this one be special? What could make this one so attractive? We'll see if it really is in a year. Of the remaining snakes, female 41 is deep in the base of a large (living) live oak and male 37 is over-wintering on the hillside, as described above.

Since we did not track the rattlesnakes from spring emergence this year, our home range data are incomplete for 2014. Furthermore, our two females were both pregnant, so their movement data are limited to a few weeks of postpartum activity, and data from male 36 ceased when his transmitter failed in early September. Nonetheless, these data are instructive. The males' home ranges are shown on the aerial photo below. As before, the females' activity areas are much smaller and not shown on the photo. Average male home range size was 3.6 ha (ha = hectare; 100 meters X 100 meters; an NFL playing field is 0.446 ha); the average of our two postpartum female home ranges is ¼ that of the males, at 0.89 ha. Female 39 is spending the winter 75 meters (82 yards) from where she gave birth to her kids and female 41 is 196 meters from her nursery refuge.

Finally, George Nyberg published his video of our rattlesnake study on YouTube a couple of weeks ago. You can find it at http://youtu.be/lrjaBYks4gg and I encourage you to take a look. There is also a link on the Effie Yeaw webpage. The 7½ - minute video represents many hours of field work by George as he accompanied me on numerous outings at Effie Yeaw, plus post-production work, editing, and the donated services of professional narrator Susan Hayward. Great job, George; thanks!

This will probably be the last update until spring emergence. Winter activity will involve collecting occasional body temperature data (calculated from transmitter pulse intervals) and installing a temperature data recorder, or maybe an entire weather station, at the nature center to collect local hourly weather data for comparison to body temps and snake activity. The study is off to a great start

and will begin the 2015 season with four male and two female rattlesnakes telemetered (we have permits for transmitters in seven rattlesnakes of each sex). And, since we saw male 36 courting female 41 last month (via the BurrowCam), I'm confident we will be able to recapture him next year and replace his faulty transmitter. The 2014 data suggest preliminary answers to some of our original questions about Effie Yeaw's rattlesnakes: Do they give birth or spend the winter under the buildings? No. In fact, we never found a rattlesnake under the buildings this year. How often do they stray outside the preserve? Apparently, not often. One male spent a few days in some nearby backyards in August and one post-partum female briefly ventured into the berry thicket on the other side of San Lorenzo Way in September. Otherwise, they engaged in pretty typical rattlesnake behavior within the preserve.

So, that's it for this year... Happy Thanksgiving to everyone!

Best wishes,

Mike