

From: Mike Cardwell [mailto:mikecardwell@comcast.net]
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To: Mike Cardwell [mailto:mikecardwell@comcast.net]
Subject: Rattlesnake update 20 July

Well, there's lots to report:

Refurbished transmitters arrived and our second female (#41) was implanted Saturday and released yesterday. When anesthetized, she was found to contain 7 or 8 embryos... probably 7, as the last mass felt suspiciously like a fecal bolus. So we have two telemetered females and both are pregnant! Female #39, released on 8 July, has been out of sight in the same place for the past 10 days; that's probably where she'll stay until she has her kids in a couple of months.

Male #38 has returned from the top of the hill behind the homes on Edgehill Lane (thankfully, as it was a treacherous climb to check on him). He was set up late yesterday in the mouth of a ground squirrel burrow back on flat ground in the park, as was male #37 but in a different burrow dozens of meters away.

However, the most noteworthy recent observation occurred when Denise and I investigated a California ground squirrel's repeated alarm calls late Saturday. We found a nursing female squirrel in a dead berry vine looking into the grass below her as she called. We found an adolescent ground squirrel pup (probably a little larger than a chipmunk) gasping his last in the grass and soon spotted our male #36 rattlesnake nearby. We watched for nearly an hour and discovered that the snake had envenomated two pups. As the snake searched for the pups, the adult squirrel repeatedly confronted the snake, flagging furiously with her puffed-up tail and pushing large amounts of dry grass at the snake. When the snake eventually found the other pup and started swallowing it, the female got so close and pushed so much grass at the snake that she had it rattling... put it never stopped swallowing. Once only the tail was protruding from the snake's mouth, the female simply turned and walked the short distance back to the other dead pup and climbed back into the dry foliage above it. Denise and I shot nearly 30 minutes of video and I have attached two frame grabs below: first is the female challenging the approaching snake with the second bitten pup just inches behind her (the dark area in the grass at far left) and then a shot of the female squirrel furiously tail-flagging at the snake as it begins to swallow the second pup. The snake never found (and maybe never looked for) the first pup after it ate the second one.

It's easy to feel bad for the mother squirrel, especially for us as we stood there watching from just a few feet away as she tried to save her pups, but we have to remember that without the rattlesnakes (and gophersnakes, hawks, coyotes, weasels, etc.), the ecosystem would be overrun with ground squirrels. And besides the natural chaos that would cause, it is these ground squirrels that dig holes through our levees and carry fleas that sometimes transmit plague to humans. The bottom line is... the natural world is not a kind world, despite what most people want to believe, and most animals' lives end in the jaws of another animal.

As you may know, there has been years of on-going research into the interaction between California ground squirrels and northern Pacific rattlesnakes (our only species at EYNC), initially at UC Davis and now at San Diego State. The adult squirrels are highly resistant to the snakes' venom and routinely survive bites; in fact, our adult female from Saturday had a large healing wound on her left hip that is probably a rattlesnake bite. The squirrel pups, however, are not immune and the snakes feed on the

pups regularly. The behavioral studies focus on the harassment of the snakes by the adult squirrels, what it means, and how/why the behavior of both species evolved as it has. I'll share our observations and video with Rulon Clark and his grad students at San Diego State, as it may be useful in their studies. If you are interested in this research, check out Rulon's website at http://www.bio.sdsu.edu/pub/clark/Site_3/Project_Homepage.html.

Best,

Mike



