

*{An Email I wrote Asking for Advice back on 5-29-08.}
{I got a great nice response back.}
{Tim Pearce was amazingly helpful, so thanks Tim.}*

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This email is just a lark, so make of it what you will.

I'm Interested to Know How I can Mark Individual Garden Snails to track their movements

I live in Hawaii, and our garden is infested with snails. We typically take them off and dump them in the compost and the next day they all seem to be right back in the garden again.

We were talking, and it's probably just a momentary thing, but it seemed like this might not be such a bad idea for a research project: you know, tracking the snails and their movements. See how they respond to us dumping them in different parts of the lawn.

I was wondering how you would go about marking individual snails in the wild. Like I was thinking of putting dabs of White Out on them or numbering them or something.

Anyhow, long story short, when I did a cursory web search to try to find if this had been done before, I saw your picture on the Carnegie Museum site... and then again another blogger thanked you for some help you gave him, so I figured you might be the go to guy in this field.

Whatever help you can give me would be appreciated... copy of an article where this has been done, the reference, whatever.

Specifically what I want to know is: How can I mark snails so that it doesn't kill them, and I'll be able to tell them apart in the wild a month or two down the road.

Just typical garden snails, about an inch in diameter full grown.

Thanks in advance, Brett Paufler

{Actually, before I had gotten Tim Pearce's response, I had put together the following experimental procedure, tossed snails out of my garden for about a month and then lost interest. Green permanent marker either is no way to mark a snail or there were so many of them, I never got a repeat. And thus ended my snail wrangling career.}

Snail Experiments

Experiment One: Getting Started

Purpose: To get started. To get in the habit of collecting and observing snails, and to gain some experience marking and handling them. To train my eye to look for experimental markings, and to determine if snails will “preferentially” return to a feeding area.

Procedure: Collect snails from four garden bins and bag of dirt on compost pile in front yard. (All known dependable sites for snails.) Mark all snails with a green permanent marker by drawing a wide line around the leading edge of the shell, before releasing on top of front sprinkler (by electric service hatch about 75' away from collection point).

Data Points kept: Number of snails collected. Snails damaged in collection or handling are to be neither marked or counted. If it is marked, it is counted. Data = Date of Harvest & Quantity. Note: Collection is not expected to occur daily.

Possible Observations:

Q = Quantity

T = Date (or running number of days since start of experiment)

Z = Days since last collection (T1 - T2 in days for any sequential Ts)

Effect on Population due to Experiment (Overall Population Thinning)

Quantity versus Time (Q vs T as a line graph)

Quantity versus Time averaged by days since collection (Q/Z vs T as a line graph)

Quantity versus Time totaled over a suitable expanse of time (per week, per month) ($Q_1 + Q_2 + Q_3$ (where $Z_1 + Z_2 + Z_3 =$ some predetermined total, say 7 or 30) versus T as a bar graph)
For all graphs, expect quantities to decrease over time.

Effect on Population Due to Resource Availability

Q of $Z=1$, compared to Q of $Z=2$, Q of $Z=3$ (as bar graph)

$Q/1$ of $Z=1$, compared to $Q/2$ of $Z=2$, $Q/3$ of $Z=3$ (as bar graph, and as overlapping line graphs--expected to be bell shaped)

Don't have good names for these yet.

Expect Q to increase as Z increases, but not linearly. Expect results to level off and point towards some limit, some maximum collection value whether $Z=5$ or $Z=10$

Green Bands to be noted as third data column if they are ever detected. Occurrence of green bands is expected to be low.

If we assume random walk, and a target area of around 10 degrees: then $1/36$ random direction and 1 in 10 actually willing to travel the 75', gives 1 in 360. Probably a bit low, my gut tells me 1 in 100 snails collected will be repeats... but there are other factors... a road, buildings, and fences which are expected to channel snail's movement, and the need of the snails to keep on searching until a suitable home is found. There are other variables as well like water rich pathways (who irrigates their lawn), pesticide use, and so on, which will not be considered at this time.

If for now we let:

G=Green (for the Green band markings)

$G_{total}=G$ summed over experiment

Then if sufficient data is collected we can graph

G versus T (as bar graph)

G_{total} versus T (as increasing line graph)

G versus Q as an overall average ($G_{total}/Q_{total}=\text{some number}$)

G versus Q as a data point average (G_x versus Q_x as a scatter graph)

© Brett Paufler, because I habitually copyright everything and would it would seem like walking out the door without wearing any pants to post anything to the web without a proper © notice. But what anyone else could possibly do with this, is well beyond me. If you have an interest/need, let me know. I would truly be interested to know of the application.

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{Oh, and if you're interested in why snails:

They were there

There's a biogenetic connection

And before I found computers, something biologically based seemed like it would fit as a second hobby. Then I discovered Javascript and from there it was all downhill, or uphill, or whatever way the electron's flow.}

Full Data

6/2/08	29	First Collection
6/6/08	19	Garden in Flux, Being Redone
6/8/08	10	collected in morning
6/13/08	13	
6/19/08	17	
6/29/08	28 1or2	Partials 1or2 is probably an error, mixing groups, found some good non standard caches
7/3/08	**	99 snails on lettuce and onuza, 2 squares only
7/5/08		5 Partial
7/8/08		3
7/14/08		7
7/16/08		4

Experimental Proceedure written up 5-7-08 (because facts like this are important to historians and I am nothing if not arrogant)

Email to Tim Pearce on 5-29-08

Tim Pearce's response on 5-30-08!!!

Have I mentioned that Tim Pearce is an amazing guy?

Well, if I have, I probably haven't said it enough.

He's everything I want in... whatever he does exactly, a snail biologist, I believe.

Good job Tim.

And thanks, again!!!