Lupine and Ragwort Dependent on Grade

The Moose on the Loose team

Background

Our campsite was next to a meadow full of wildflowers, and we tried to identify a flower each day.

The most populous flowers were the silvery lupine and the thick-leaved ragwort, with the lupine growing towards the bottom of the hill and the ragwort at the steeper part.

KEY TERMS

Grade

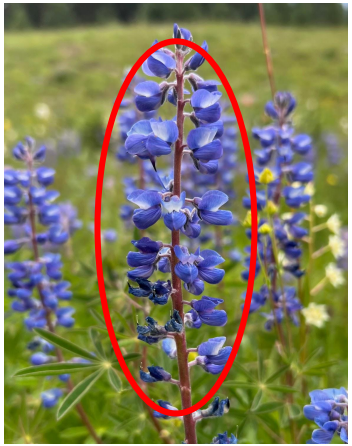
The slope of the hill, measured in degrees. We used hills near our camp with slopes of 1 to 27 degrees.

Aspect

The direction the hill faces, measured in degrees clockwise from north. Our hills faced east, from 93 to 100 degrees.

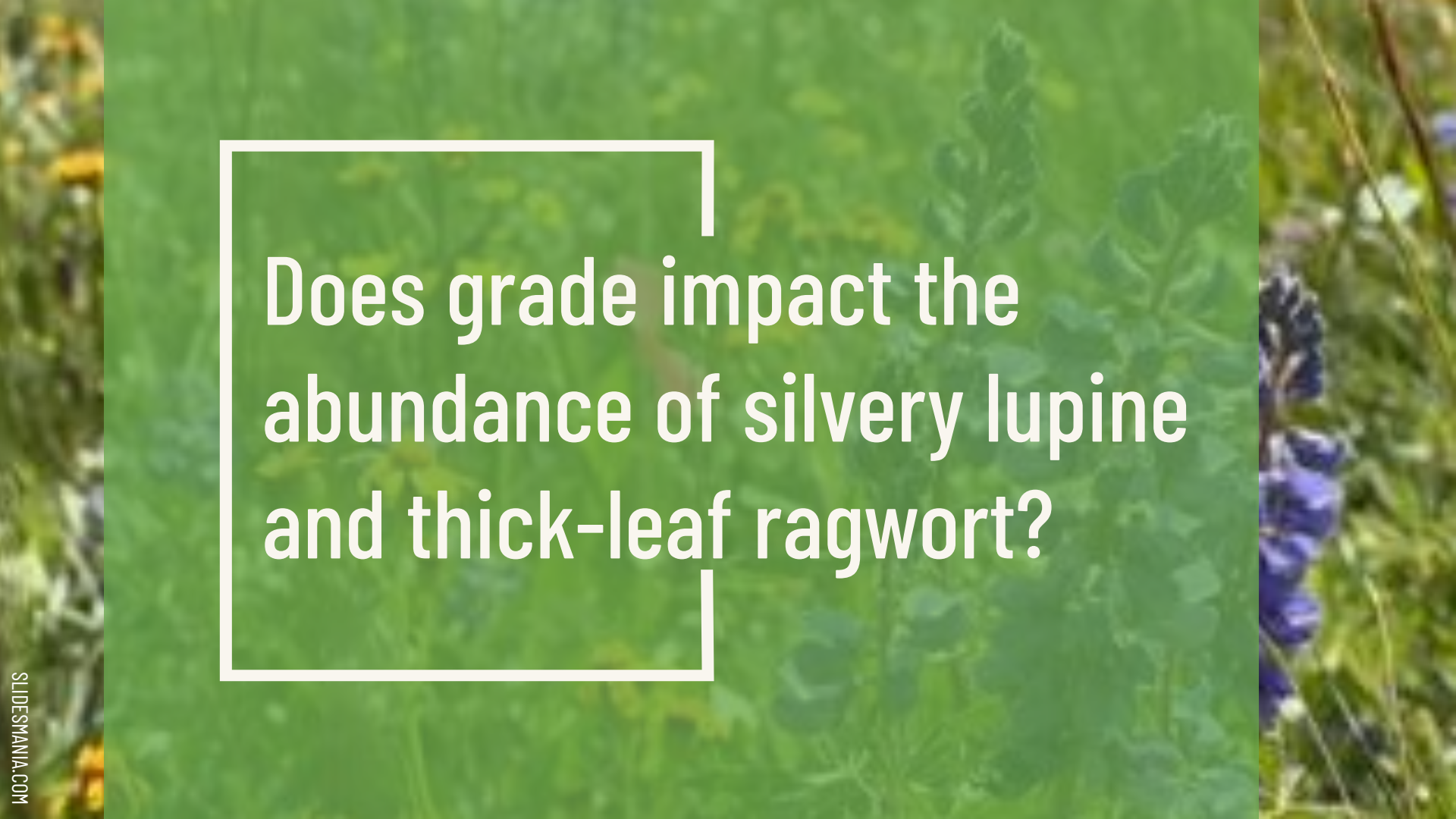
Silver Lupine
Lupinus argenteus

A purple flower native to western North America. Grows in clusters. One flower head is depicted below.



Thick-Leaf Ragwort
Senecio crassulus

A yellow flower common in the Rockies with several flower heads in a terminal cluster.

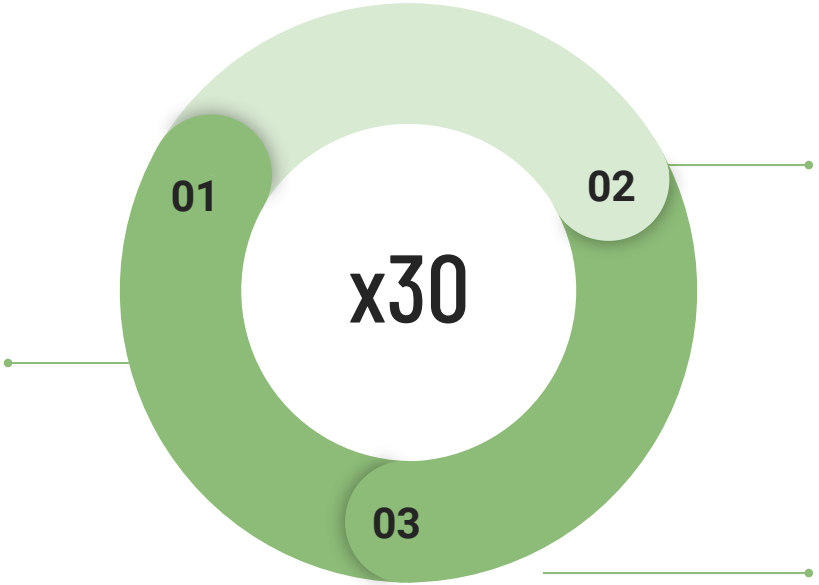


Hypothesis

Thick-leaf ragwort will grow in greater abundance on steeper grades than silvery lupine.

METHOD

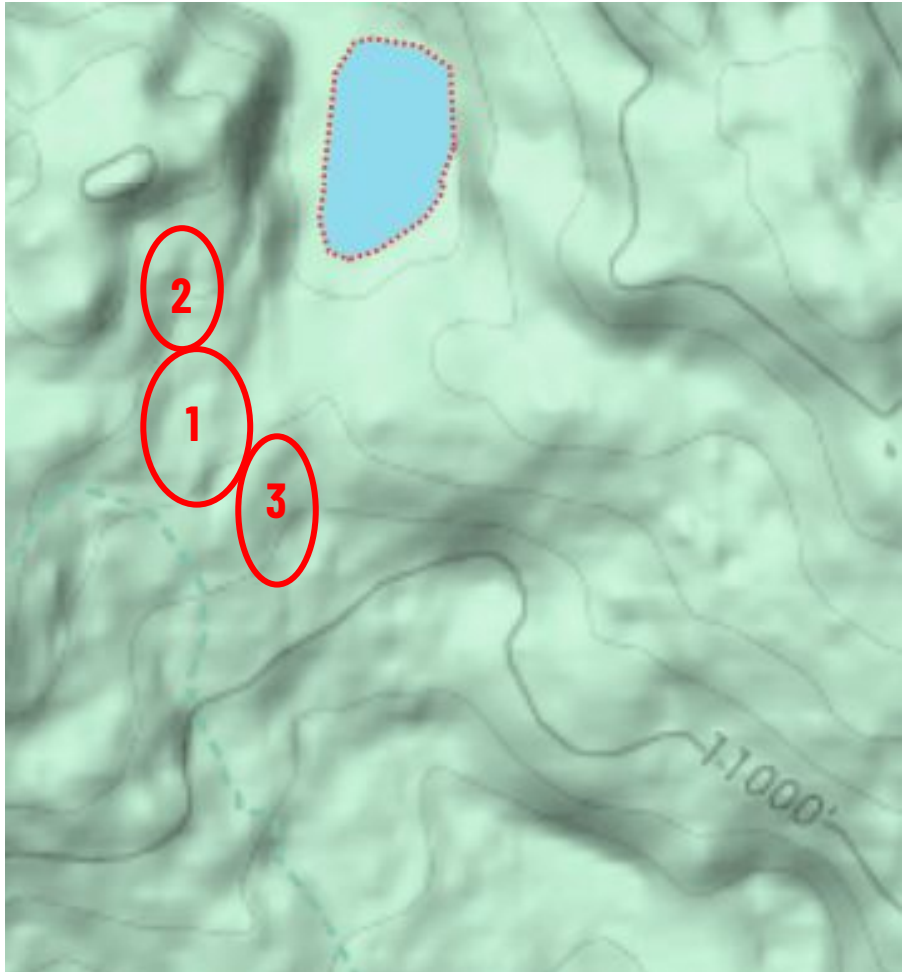
First, we created 2x2 meter plots on east-facing hills in the meadow around the Wheeler Lakes.

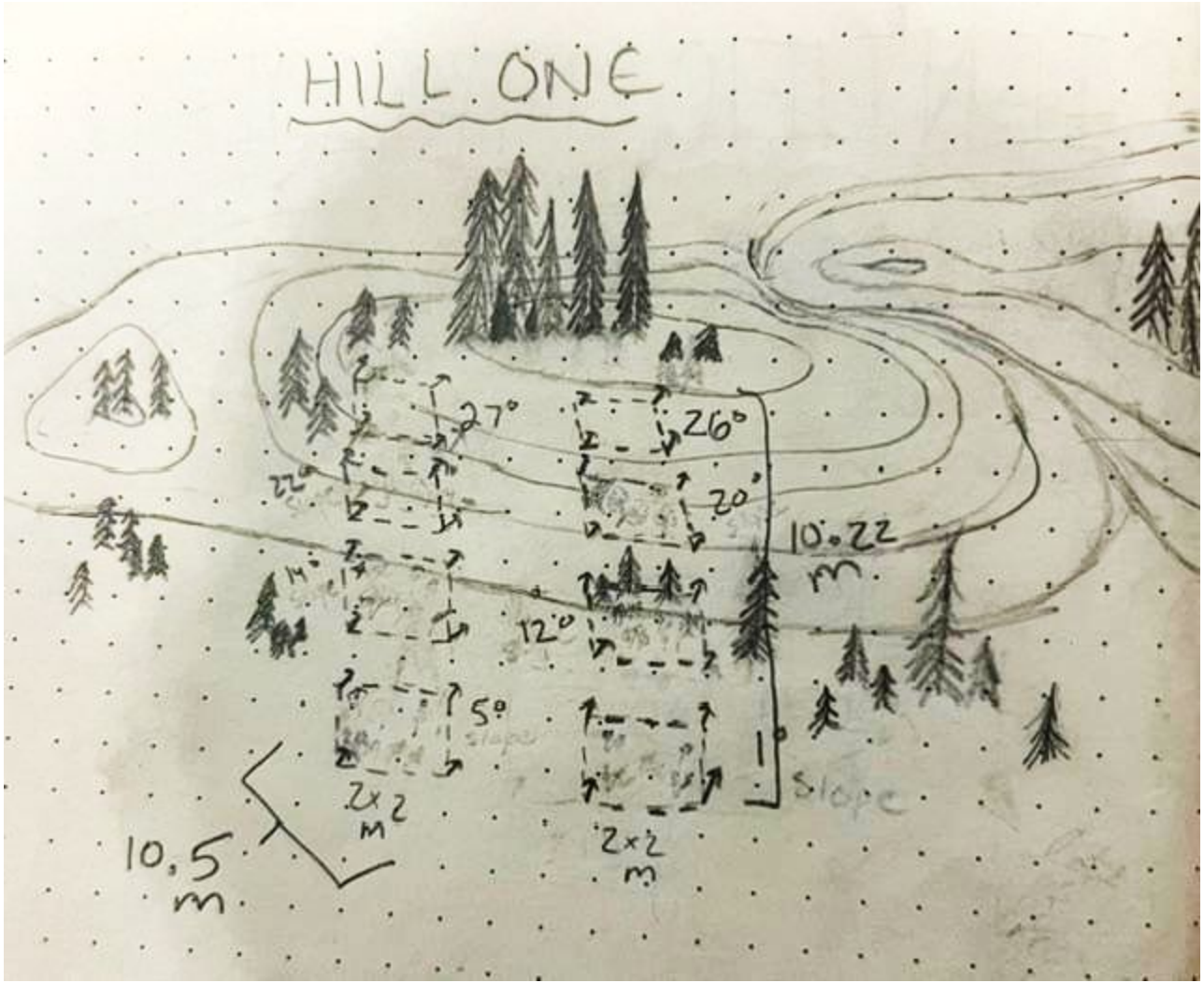


We measured the gradient in multiple spots in our plots and then averaged them to find the average grade.

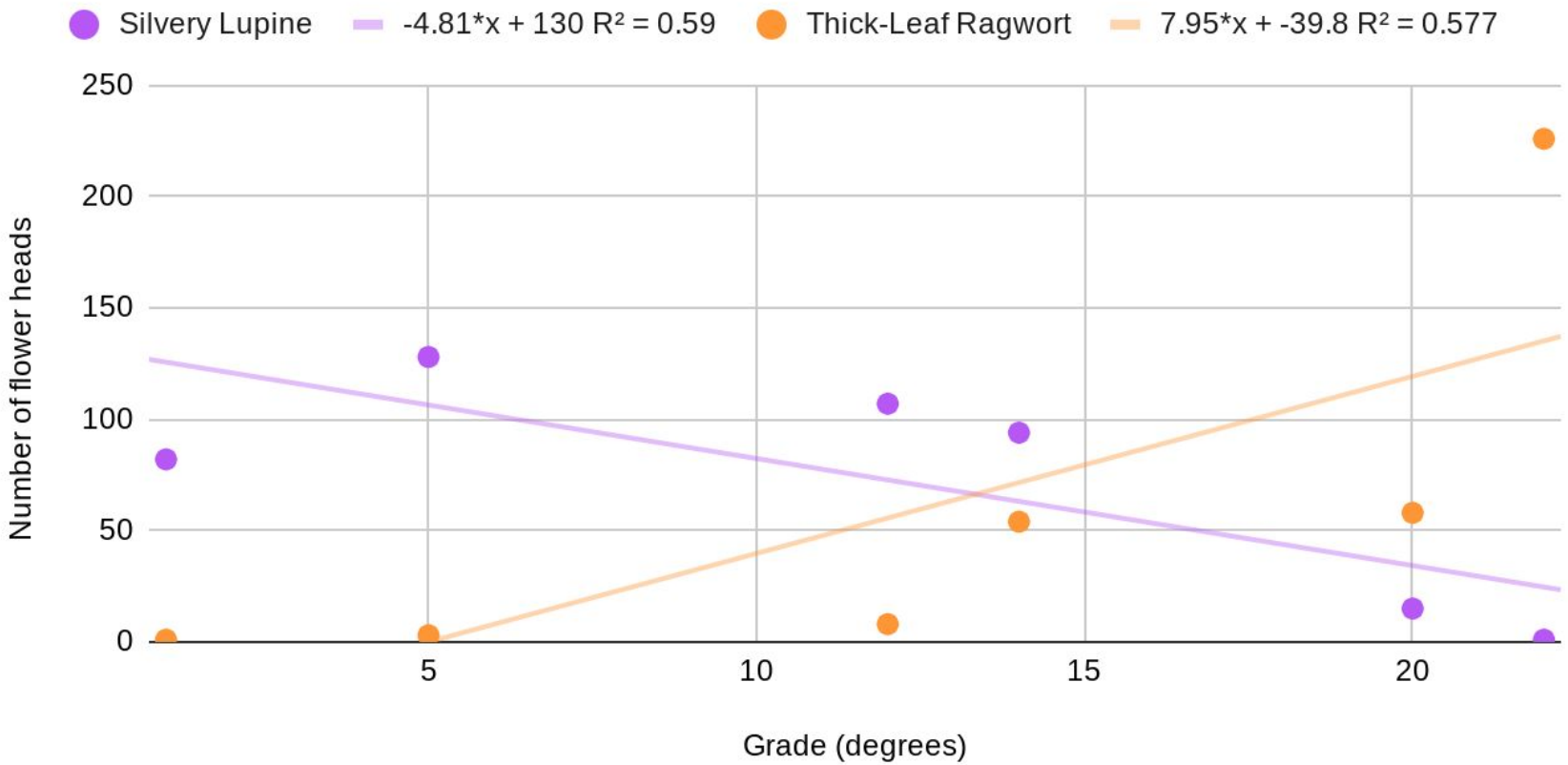
Finally, we counted the number of flower species, number of lupine heads, and number of ragwort heads in each plot.

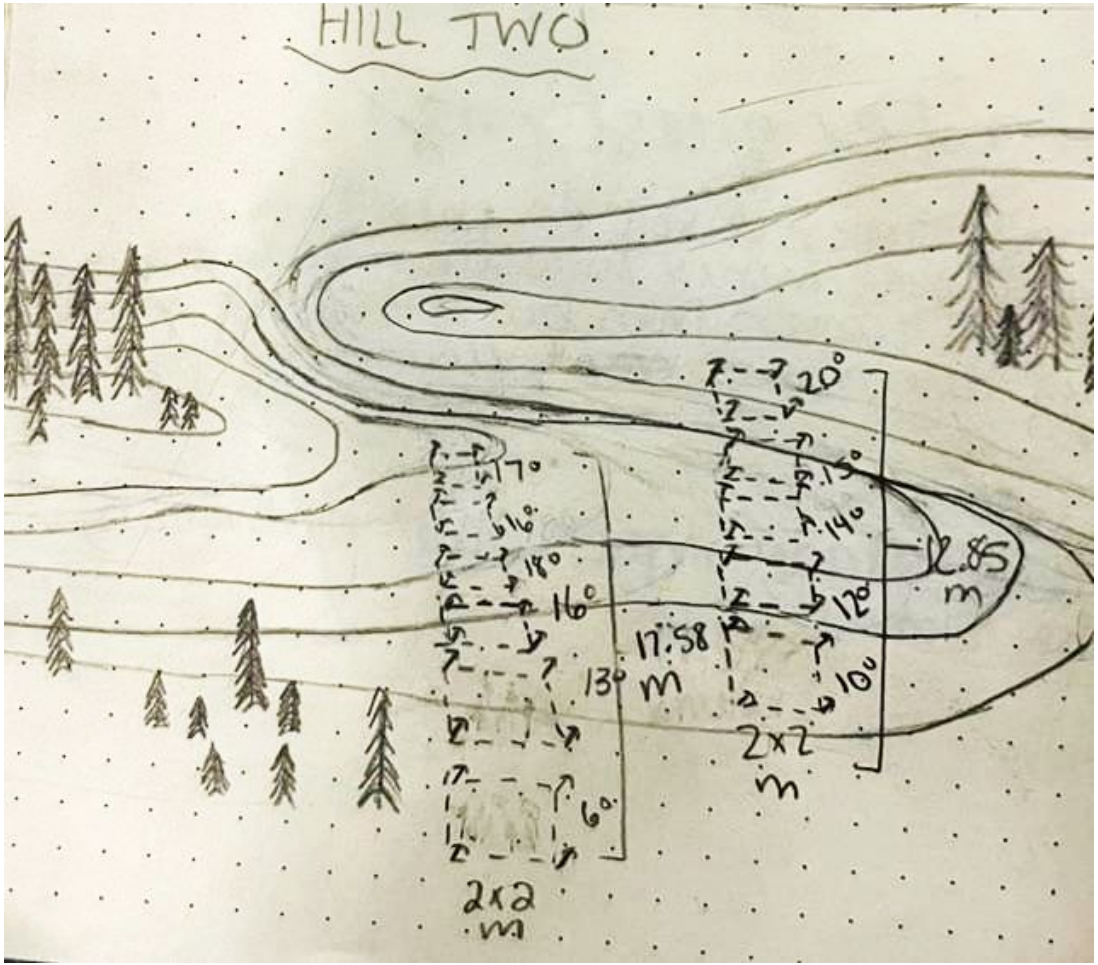

Wheeler Lakes
2
1
3


2
1
3
1-1000'

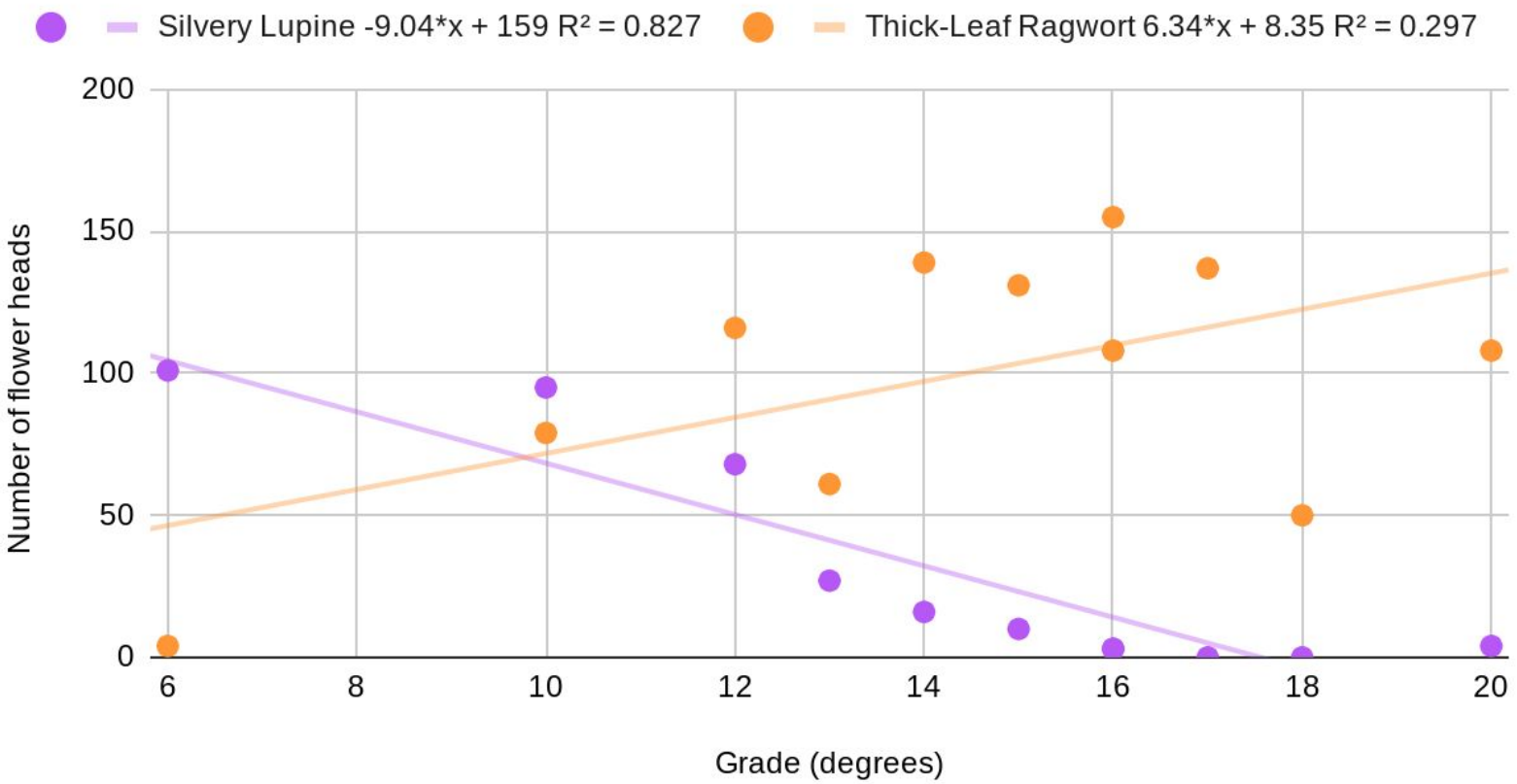


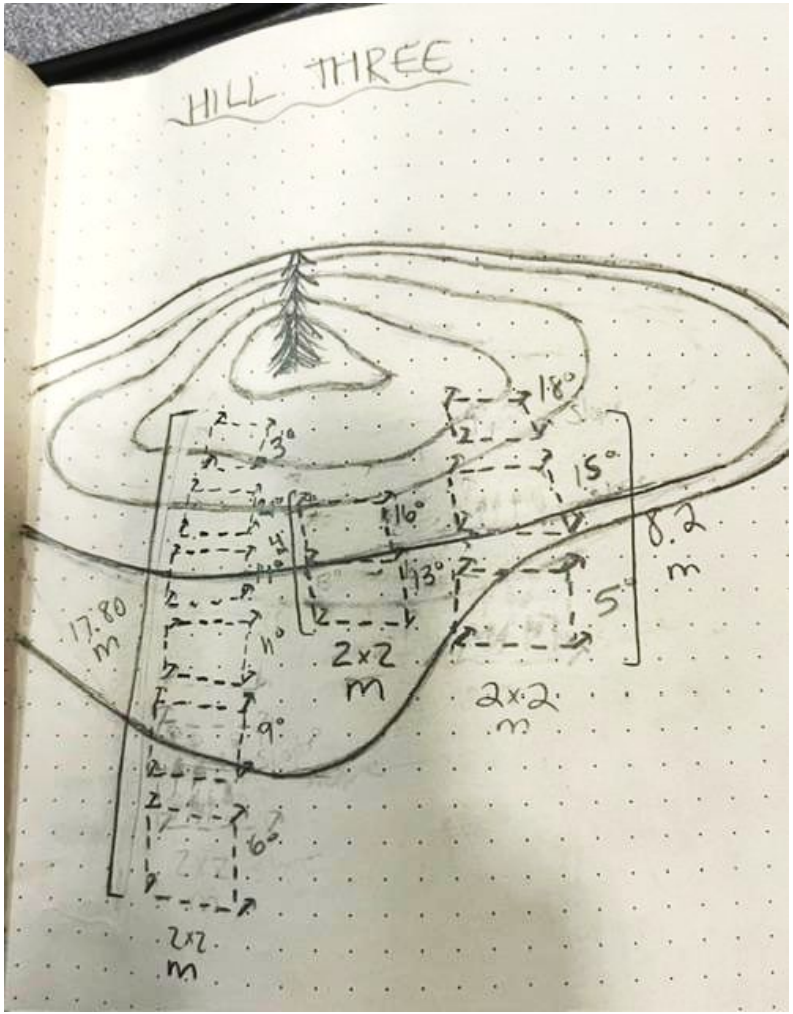
Hill 1, Grade vs. Lupine and Ragwort





Hill 2, Grade vs. Lupine and Ragwort





Hill 3, Grade vs. Lupine and Ragwort

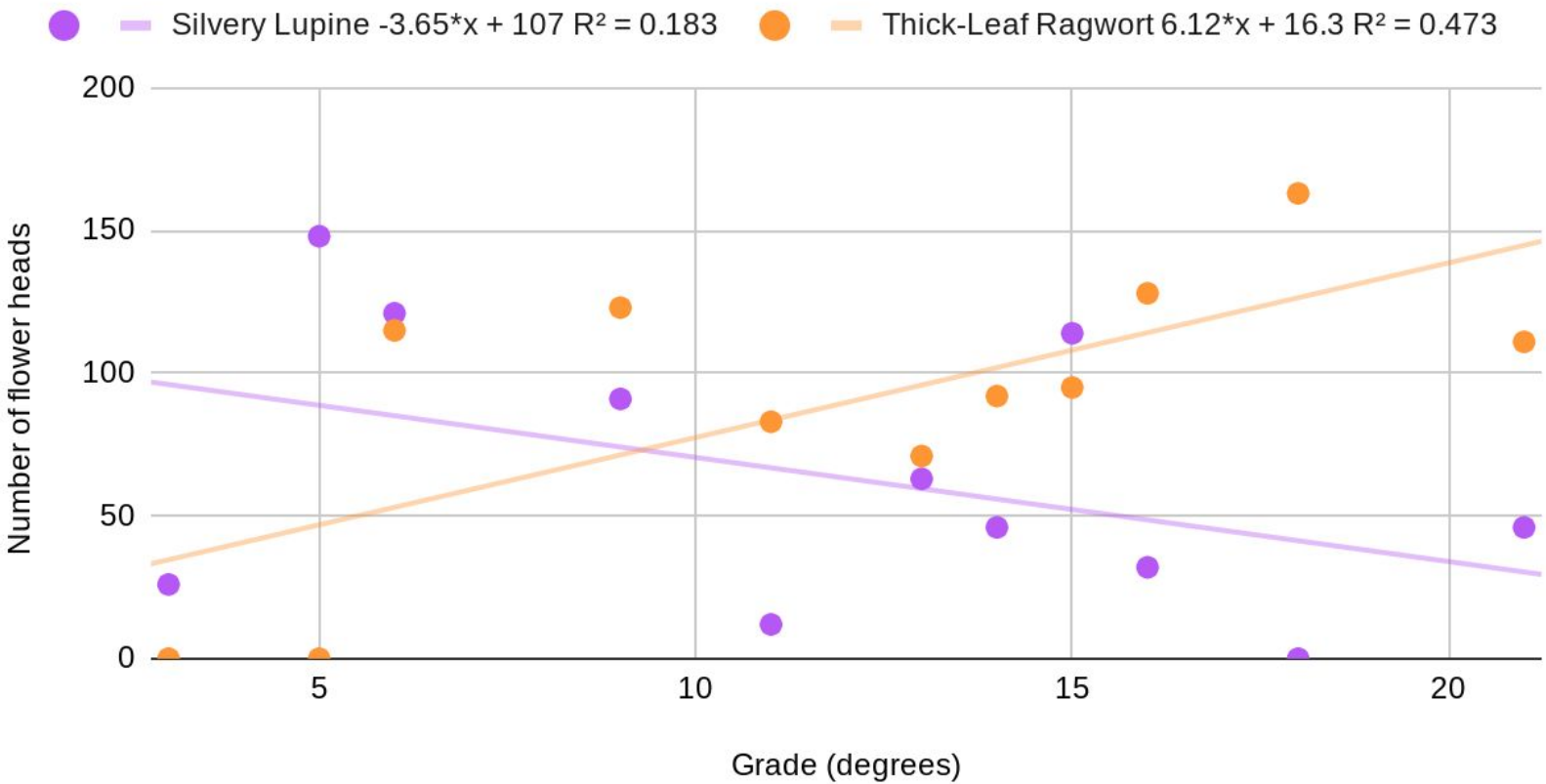
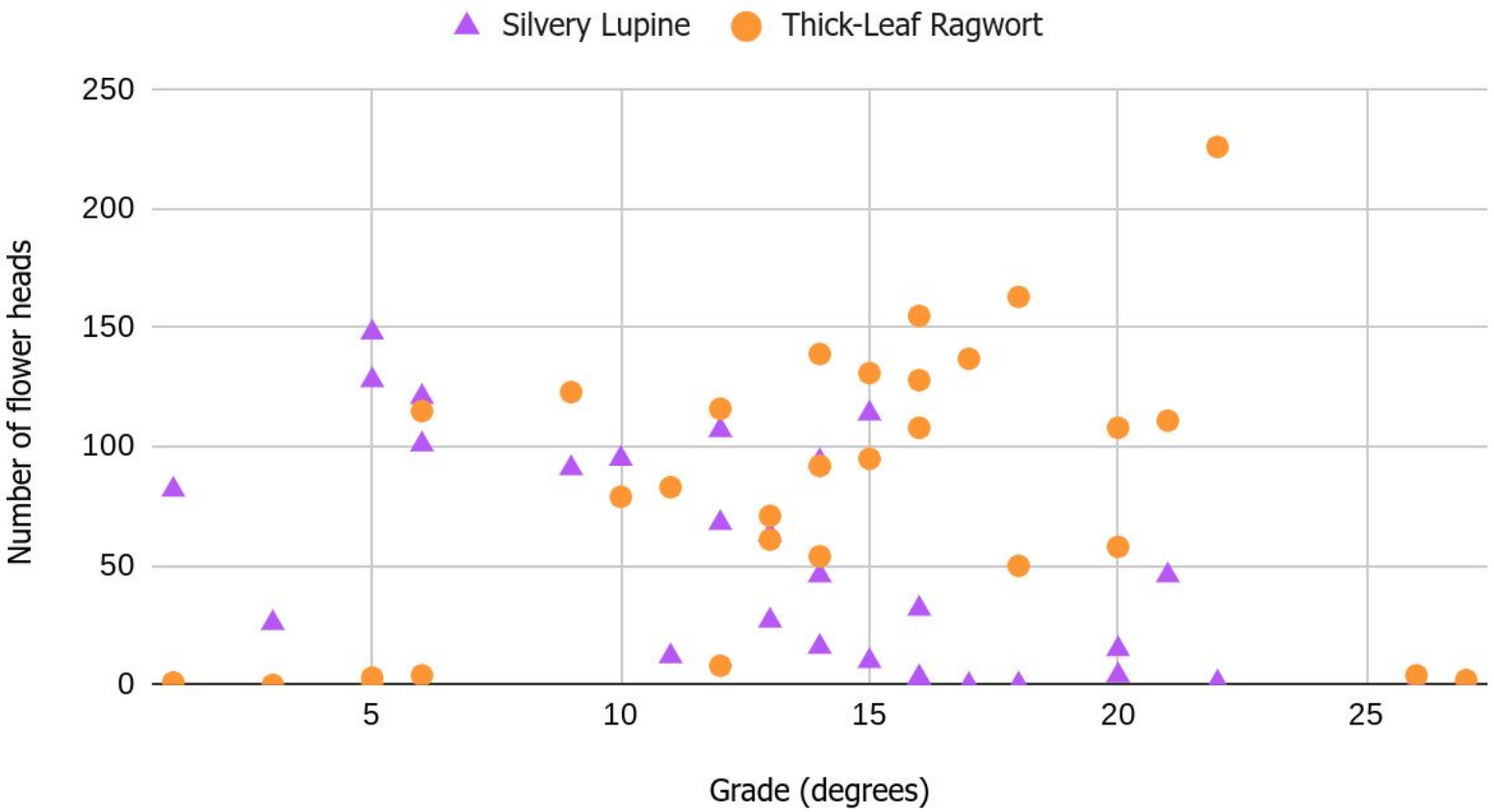


Table 1: Grade and Abundance

Grade (deg)	Silvery Lupine heads	Thick-Leaf Ragwort heads
1	82	1
3	26	0
5	128	3
5	148	0
6	121	115
6	101	4
9	91	123
10	95	79
11	12	83
12	107	8
12	68	116
13	63	71
13	27	61
14	94	54

Grade (deg)	Silvery Lupine heads	Thick-Leaf Ragwort heads
14	46	92
14	16	139
15	114	95
15	10	131
16	32	128
16	3	108
16	3	155
17	0	137
18	0	163
18	0	50
20	15	58
20	4	108
21	46	111
22	1	226
26	1	4
27	0	2

Number of Lupine and Ragwort Flowers vs. Grade



Number of Lupine and Ragwort Flowers vs. Grade

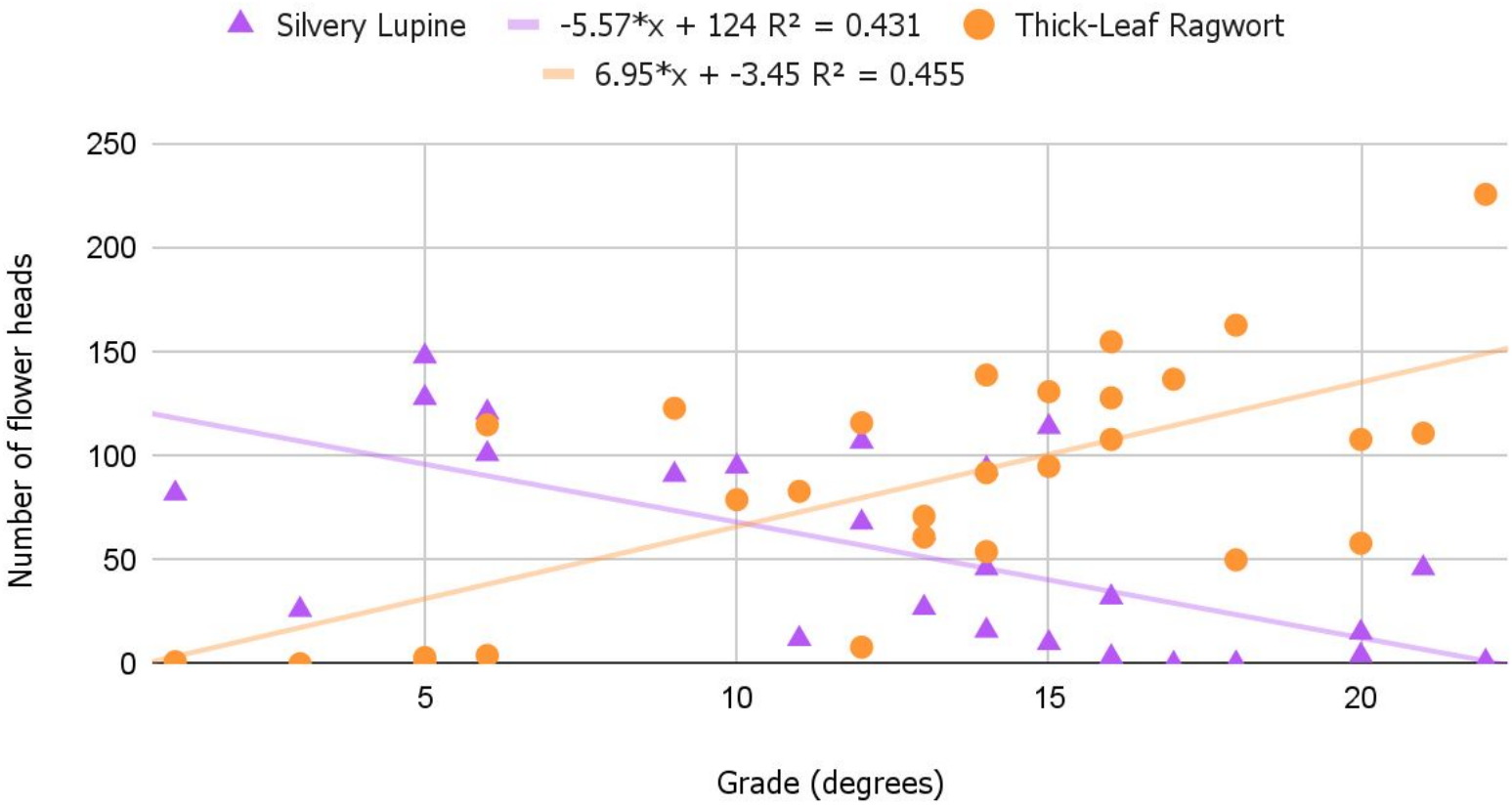
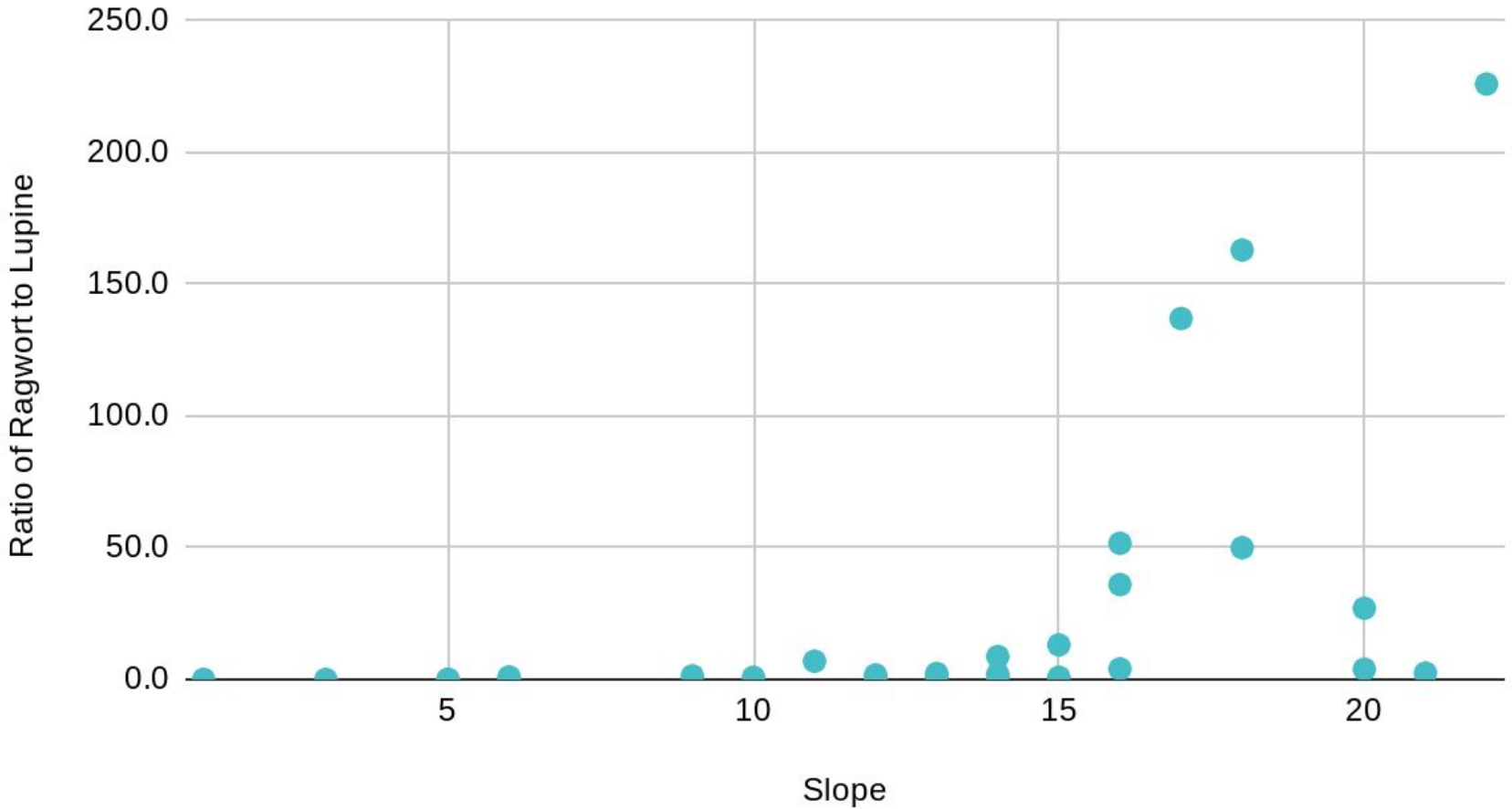


Table 2: Grade vs. Ratio of Ragwort to Lupine

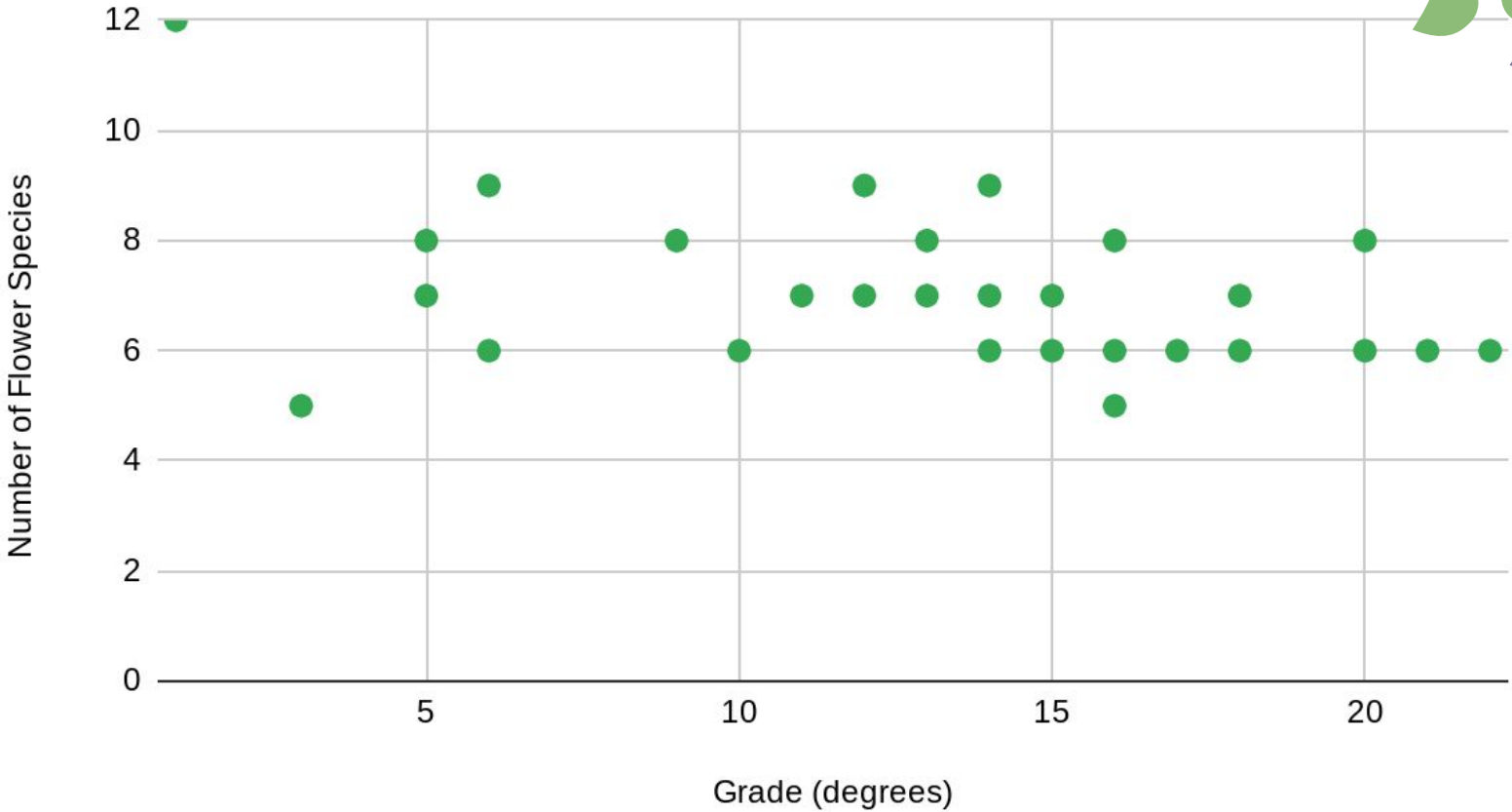
Grade (degs)	Ratio of Ragwort to Lupine
3	0.0
5	0.0
5	0.0
6	1.0
6	0.0
9	1.4
10	0.8
11	6.9
12	0.1
12	1.7
13	1.1
13	2.3
14	0.6
14	2.0

Grade (degs)	Ratio of Ragwort to Lupine
14	8.7
15	0.8
15	13.1
16	4.0
16	36.0
16	51.7
17	137.0
18	163.0
18	50.0
20	3.9
20	27.0
21	2.4
22	226.0
26	4.0
27	2.0

Ratio of Ragwort to Lupine vs. Slope



Number of Flower Species vs. Grade



Silvery Lupine is a legume that prefers dry, rocky soils and can withstand drought (University of Texas at Austin, 2014).

Originally, we believed that lupine might prefer flatter areas due to the collection of moisture in those areas. We can now see that we were incorrect.

SILVERY LUPINE

Lupinus argenteus

THICK-LEAF RAGWORT

Senecio crassulus

Thick-leaf ragwort prefers moist soils and tend to grow on slopes (The American Southwest, n.d.).

Our data supports existing research. Note: there seems to be very little pre-existing information about thick-leaf ragwort.

NEXT STEPS

Planting lupine and ragwort at different slopes could offer further and more accurate information about their preferences.

Additionally, all our slopes were east-facing. Measuring flower abundance on different aspects could provide more holistic data about lupine and ragwort at high altitude.

Knowledge of the state of the ecosystem could help us observe how biodiversity and wildflower resilience develop over time. Wildflowers are important to the health and growth of their environment.

Thank you!