

Notebook

Partitioning by Space

Your claim: There may be some differences, but in general all four species are found across the park.

Your notes to justify your claim:

In the image of the map%2Fdata provided, we see that no two species occupy completely distinct areas of the park. Although, a thing that we can't help but notice is that all the species prefer to feed in the Woodland regions. However, if we consider the overall distribution, all the species are, more or less, evenly distributed across the park.

Edit Answer

Partitioning by Time

Your claim: There is some overlap, but at least one pair of species forages at different times.

Your notes to justify your claim:

As is clearly visible from the data provided, some of the species do partition their niches by time. We see that the Cape Buffalo was mostly seen at night, whereas none of the other species were seen as frequently during nighttime. The Dik-Diks on the other hand were more observed in the morning as compared to the other species. Since one pair of species forages at different times of the day, we can conclude that different species do partition their niches by time.

Edit Answer

Partitioning by Food

Your claim: There is some overlap, but at least one pair of species eats different types of plants.

Your notes to justify your claim:

It can be observed from the given data that one pair of species eats different types of plants. The Dik-Dik feeds mostly on browse whereas the Grevy's Zebra feeds mainly on Grass. Thus, different species partition niches by the types of plants they eat.

Edit Answer

Module 1 Conclusion

Based on your analysis, do the data support the hypothesis that herbivores in Mpala exhibit niche partitioning? Explain your answer.

Your notes:

Based on the data analysis that we've performed, we conclude that the herbivore species of Mpala do partition niches mainly on the basis of food. The spatial and temporal separations, although provided a slight hint indicating partitioning of niches, but overall nothing was too conclusive about those modes of separation.

Edit Answer

What additional data would you like to collect to help you answer the question above?

First of all, in order to reach to a more concrete conclusion, we would certainly have to increase the number of samples that we've considered. Apart from that, data regarding the prey-predator relationship between the species and the interspecies relationships would help a lot in determining partition of niches by these species.

Edit Answer

Module 2 Conclusion

Based on the data you collected, would you conclude that these four herbivores in Mpala are partitioning niches by the plants they eat?

Your notes:

We can say that the four herbivores in Mpala are partitioning niches based on the plants they eat. If we observe the data from Sorenson's Index, it is pretty clear that all of the values are less than 0.5, so the overlap between the foods of the different between herbivores is pretty less considering the fact that the value 0.5 is pretty small.

Edit Answer

In general, do the results from Module 2 support the results you obtained in Module 1? Explain how they are similar and different.

In Module 1 we just studied different herbivores based on different ecological parameters, whereas in Module 2 we studied the food habits of different herbivores and tried to find conclusive evidence about the partitioning of the niches based on food. In both the modules we notice partitioning of niches on the basis of the food. In Module 1, we merely differentiated the foods as grass and browse but in the 2nd Module, we found the specific plant species by DNA metabarcoding.

Edit Answer

Data Collection





Data from 73 Locations					
Species Name	Longitude	Latitude	Time	Time Category	Food
Buffalo	36° 53' 34"	0° 21' 12"	6:15am	morning	grass
Buffalo	36° 53' 18"	0° 21' 19"	4:45am	night	grass
Buffalo	36° 52' 24"	0° 23' 5"	8:35am	morning	browse
Buffalo	36° 53' 57"	0° 17' 34"	9:12pm	night	grass
Buffalo	36° 52' 31"	0° 19' 7"	8:58pm	night	grass
Buffalo	36° 54' 38"	0° 20' 25"	9:18am	morning	grass
Buffalo	36° 54' 20"	0° 25' 23"	5:32pm	evening	browse
Buffalo	36° 54' 51"	0° 20' 40"	8:41pm	night	grass
* Buffalo	36° 54' 48"	0° 24' 34"	5:44pm	evening	grass
Buffalo	36° 55' 24"	0° 21' 17"	8:12pm	night	browse
Buffalo	36° 49' 24"	0° 29' 30"	4:32am	night	browse
Buffalo	36° 55' 24"	0° 21' 17"	9:42am	morning	grass
Buffalo	36° 52' 25"	0° 18' 0"	11:37pm	night	browse
Buffalo	36° 52' 52"	0° 17' 47"	5:16pm	evening	grass
Buffalo	36° 54' 30"	0° 24' 12"	11:04pm	night	browse
Zebra	36° 52' 46"	0° 18' 29"	9:08pm	night	grass
Zebra	36° 52' 47"	0° 18' 27"	6:12am	morning	grass
Zebra	36° 53' 56"	0° 17' 59"	9:31am	morning	grass
Zebra	36° 52' 49"	0° 18' 24"	6:48am	morning	grass
Zebra	36° 55' 30"	0° 22' 34"	8:31pm	night	grass
Zebra	36° 53' 45"	0° 17' 22"	6:56pm	evening	browse
Zebra	36° 53' 23"	0° 21' 9"	6:41pm	evening	grass
Zebra	36° 51' 33"	0° 26' 29"	7:52pm	evening	grass
Zebra	36° 55' 42"	0° 22' 22"	6:10pm	evening	grass
Zebra	36° 53' 16"	0° 18' 44"	7:15am	morning	grass
Zebra	36° 51' 33"	0° 26' 39"	7:41pm	evening	grass
* Zebra	36° 53' 1"	0° 21' 19"	7:23am	morning	grass
Zebra	36° 51' 39"	0° 26' 25"	7:11pm	evening	grass
Zebra	36° 54' 32"	0° 20' 30"	5:34am	morning	grass
Zebra	36° 51' 35"	0° 26' 23"	6:56pm	evening	grass
Zebra	36° 53' 0"	0° 18' 23"	6:12pm	evening	grass
Zebra	36° 54' 6"	0° 20' 44"	5:47am	morning	browse
Zebra	36° 53' 39"	0° 21' 29"	5:04pm	evening	grass
Zebra	36° 55' 26"	0° 22' 36"	4:31pm	evening	grass
Zebra	36° 53' 31"	0° 16' 53"	4:30pm	evening	grass
Dik-dik	36° 54' 36"	0° 20' 15"	4:11pm	evening	browse
Dik-dik	36° 53' 14"	0° 16' 51"	4:08pm	evening	grass
Dik-dik	36° 53' 25"	0° 17' 21"	8:12pm	night	browse
Dik-dik	36° 55' 1"	0° 23' 50"	8:37am	morning	browse
Dik-dik	36° 54' 8"	0° 22' 5"	5:18pm	evening	browse
Dik-dik	36° 53' 30"	0° 17' 28"	8:48am	morning	browse
Dik-dik	36° 53' 2"	0° 17' 44"	5:56pm	evening	browse
Dik-dik	36° 52' 3"	0° 27' 16"	8:41am	morning	browse
* Dik-dik	36° 51' 58"	0° 25' 44"	9:23am	morning	browse
Dik-dik	36° 52' 15"	0° 25' 2"	5:42pm	evening	browse

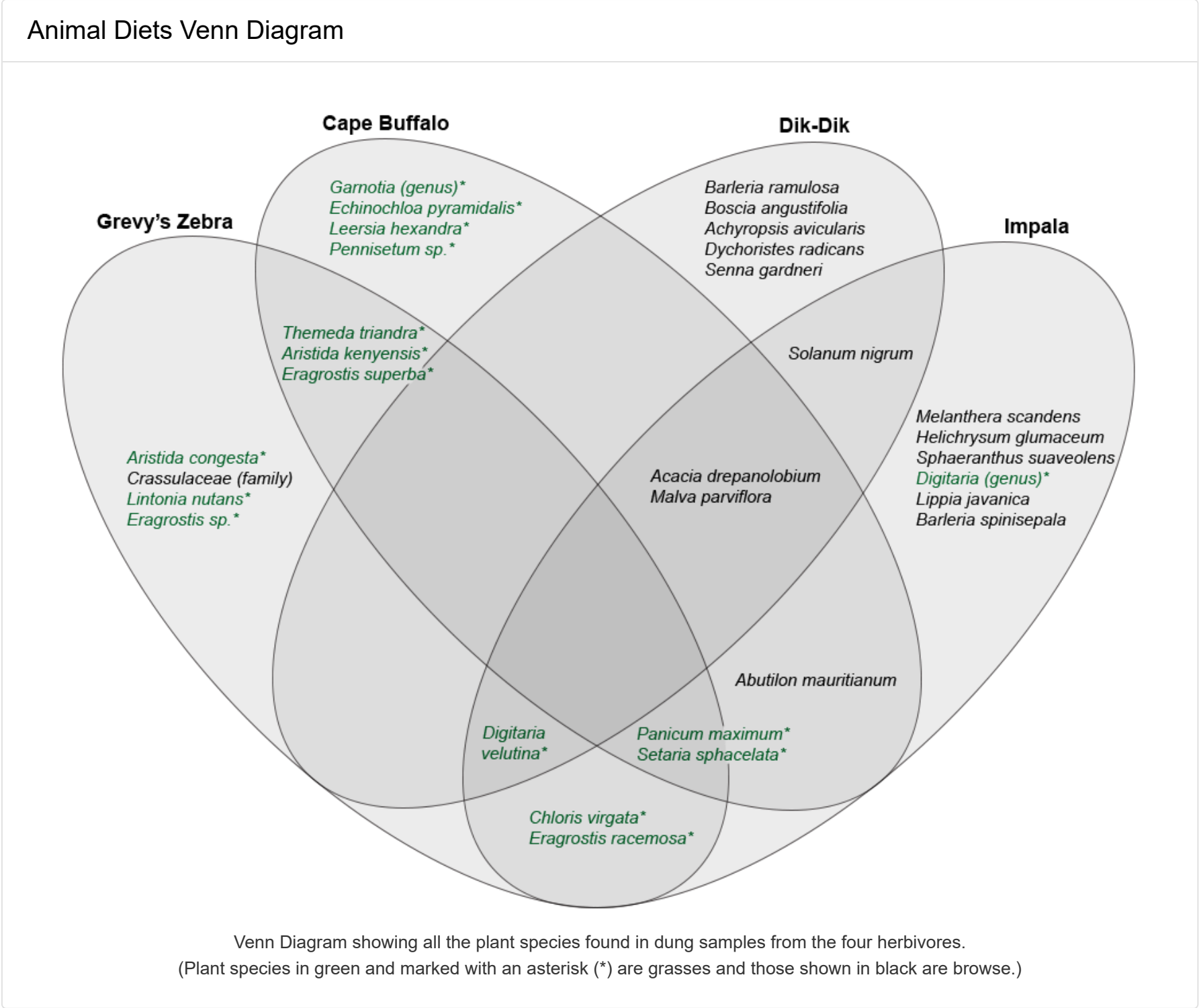
Species Name	Longitude	Latitude	Time	Time Category	Food
Dik-dik	36° 55' 38"	0° 22' 23"	8:51pm	night	browse
Dik-dik	36° 53' 53"	0° 24' 32"	8:30am	morning	browse
Dik-dik	36° 55' 24"	0° 21' 34"	5:57pm	evening	browse
Dik-dik	36° 54' 39"	0° 24' 48"	9:43am	morning	browse
Dik-dik	36° 51' 34"	0° 28' 44"	9:18am	morning	browse
Dik-dik	36° 52' 6"	0° 28' 33"	9:01pm	night	browse
Dik-dik	36° 51' 33"	0° 27' 41"	5:12pm	evening	browse
Dik-dik	36° 51' 21"	0° 29' 37"	5:01am	morning	browse
Dik-dik	36° 53' 44"	0° 18' 6"	5:34am	morning	browse
Dik-dik	36° 54' 33"	0° 24' 12"	6:12am	morning	browse
Impala	36° 53' 33"	0° 21' 12"	4:02pm	evening	browse
Impala	36° 52' 29"	0° 21' 43"	9:45am	morning	browse
Impala	36° 55' 1"	0° 22' 29"	4:19pm	evening	grass
Impala	36° 53' 30"	0° 17' 28"	8:12pm	night	browse
Impala	36° 54' 1"	0° 20' 29"	9:21am	morning	browse
Impala	36° 51' 7"	0° 26' 5"	4:22pm	evening	browse
Impala	36° 51' 53"	0° 25' 57"	8:12am	morning	grass
Impala	36° 54' 44"	0° 24' 10"	7:32am	morning	browse
Impala	36° 54' 1"	0° 20' 29"	8:37pm	night	browse
Impala	36° 54' 42"	0° 24' 8"	7:01am	morning	grass
Impala	36° 52' 51"	0° 18' 29"	5:23pm	evening	browse
Impala	36° 53' 28"	0° 17' 22"	6:56am	morning	browse
Impala	36° 54' 8"	0° 25' 34"	5:27pm	evening	browse
* Impala	36° 51' 34"	0° 28' 44"	7:17pm	evening	browse
Impala	36° 54' 1"	0° 20' 29"	6:03am	morning	grass
Impala	36° 51' 48"	0° 24' 1"	6:31pm	evening	browse
Impala	36° 53' 17"	0° 16' 49"	6:04am	morning	grass
Impala	36° 52' 29"	0° 21' 43"	9:02pm	night	browse

Complete Data Set

Foraging Time of Day						
Animal	Morning		Evening		Night	
Dik-dik	50%	(10)	35%	(7)	15%	(3)
Zebra zebra	35%	(7)	55%	(11)	10%	(2)
Impala	44%	(8)	39%	(7)	17%	(3)
Buffalo	27%	(4)	20%	(3)	53%	(8)

Foraging Classification					
Animal	Grass		Browse		Classification
Dik-dik	5%	(1)	95%	(19)	browser
Zebra zebra	90%	(18)	10%	(2)	grazer
Impala	28%	(5)	72%	(13)	browser
Buffalo	60%	(9)	40%	(6)	grazer

Diet Profile Sequence Identification	
DNA Fragment 1 of 2	
tag	barcode sequence
5'— CCTATAGC — ATCCTATTATTTTACGAAAATAAACATAAACAAAAGTTCAGCAAGCGAGAATA·	
	
Sample 1	Plant Species: <i>Abutilon mauritianum</i> Category: browse
DNA Fragment 2 of 2	
tag	barcode sequence
5'— GGTCTACA — ATCCTGTTTTCCGAAAACCAAGAAGAGTTCAGAAAAGGAGAATAAAAAAAG·	
	
Sample 2	Plant Species: <i>Abutilon drepanolobium</i> Category: browse



Sorenson's Index Values

	Grevy's Zebra	Cape Buffalo	Impala	Dik-dik
Grevy's Zebra				
Cape Buffalo	.42			
Impala	0.37	.37		
Dik-dik	0.10	0.19	0.33	

Test Your Knowledge

Module 1 Review
1) Correct! Your answer: B 2) Correct! Your answer: C 3) Correct! Your answer: B 4) Correct! Your answer: C
Venn Diagram Review
1) Correct! Your answer: A 2) Correct! Your answer: B 3) Correct! Your answer: B
Sorenson's Index Review
1) Correct! Your answer: C 2) Correct! Your answer: D 3) Correct! Your answer: C
Module 2 Review
1) Correct! Your answer: C 2) Correct! Your answer: B 3) Correct! Your answer: C