

Wild and Domestic Canid Activity in the Lakeshore Nature Preserve



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Forest and Wildlife Ecology
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On- vs Off- Leash

Domestic Dog Activity

Wildlife Avoidance

Predatory Behavior

Coyote and Red Fox Activity

Diurnal → Nocturnal

Follow recreational trails

New food sources

Increased Marking - Coyotes



Lewis et al. 2021, Farmer and Allen 2019;
Mueller, Drake, Allen, 2018; Moll et al. 2018

Objectives

Domestic dog abundance

On versus off leash

Peak temporal activity

Interference with red foxes and coyotes



04/22/2022

WILD AND DOMESTIC CANID ACTIVITY

62°F 17°C

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Method

Lakeshore Nature Preserve
Madison, WI

Camera traps

Trail Intersections



Temporal Analysis

$\hat{D}$

0 = No temporal overlap
1 = Complete temporal overlap



Spatial Analysis

Species	Variables	Hypothesis
Red Fox	Coyote	Red fox will show avoidance of coyotes
Red Fox	On Leash Dogs	Red fox will show avoidance of dogs
Red Fox	Off Leash Dogs	Red fox will show avoidance of dogs
Red Fox	Humans	Red fox will show avoidance of humans
Red Fox	Coyote + Humans	Red fox will show avoidance of coyotes and humans
Red Fox	Coyote + Off Leash Dogs	Red fox will show avoidance of coyotes and dogs

Species	Variables	Hypothesis
Coyote	Red Fox	Coyotes will show aggregation with red fox
Coyote	On Leash Dogs	Coyotes will show avoidance of dogs
Coyote	Off Leash Dogs	Coyotes will show avoidance of dogs
Coyote	Humans	Coyotes will show avoidance of humans
Coyote	Red Fox + Humans	Coyotes will show avoidance of humans, but more aggregation with red fox
Coyote	Red Fox + Off Leash Dogs	Coyotes will show avoidance of dogs, but more aggregation with red fox

Total Trap Nights	Red Fox Detections	Coyote Detections	Human Detections	Dog Detections	
249	9	11	24,551	On Leash 2,688	Off Leash 493

Total Coyote RAB	Total Red Fox RAB	Total Human RAB	Total On Leash RAB	Total Off Leash RAB
31.43	32.85	102,211.67	10,503.14	1,593.12



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51 °F 11 °C

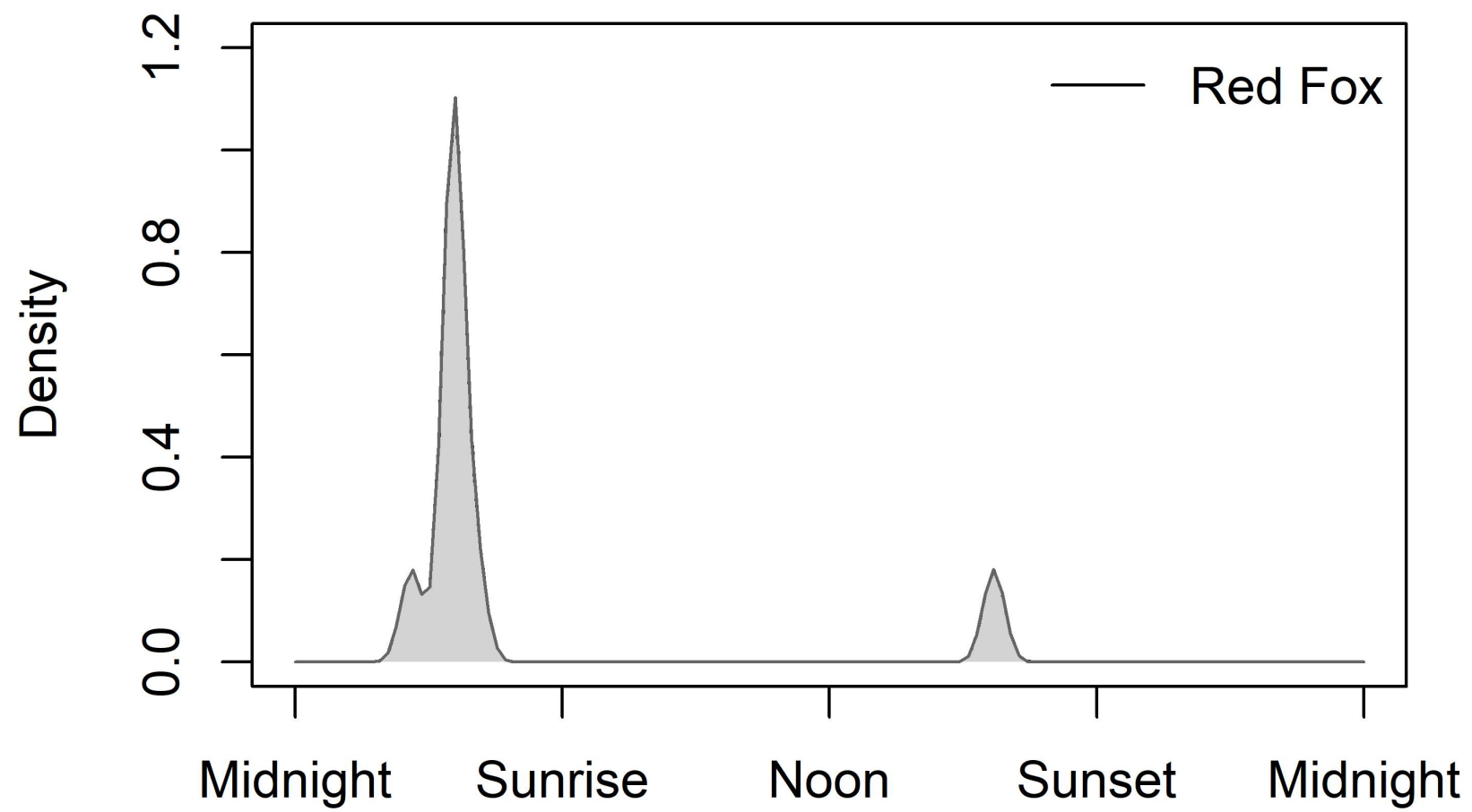
WILD AND DOMESTIC CANID ACTIVITY

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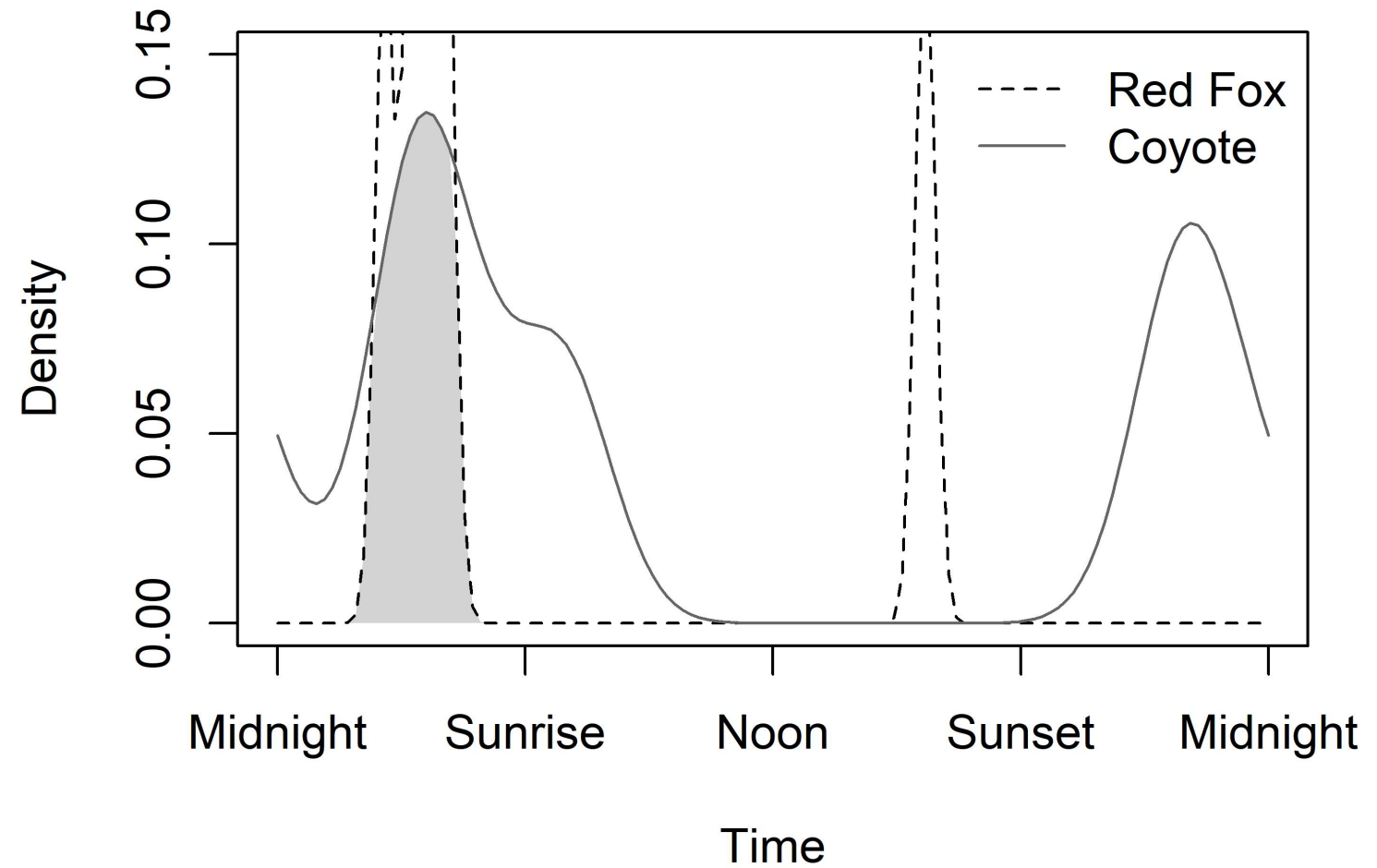
8



Temporal Overlap

$$\hat{D} = .276$$

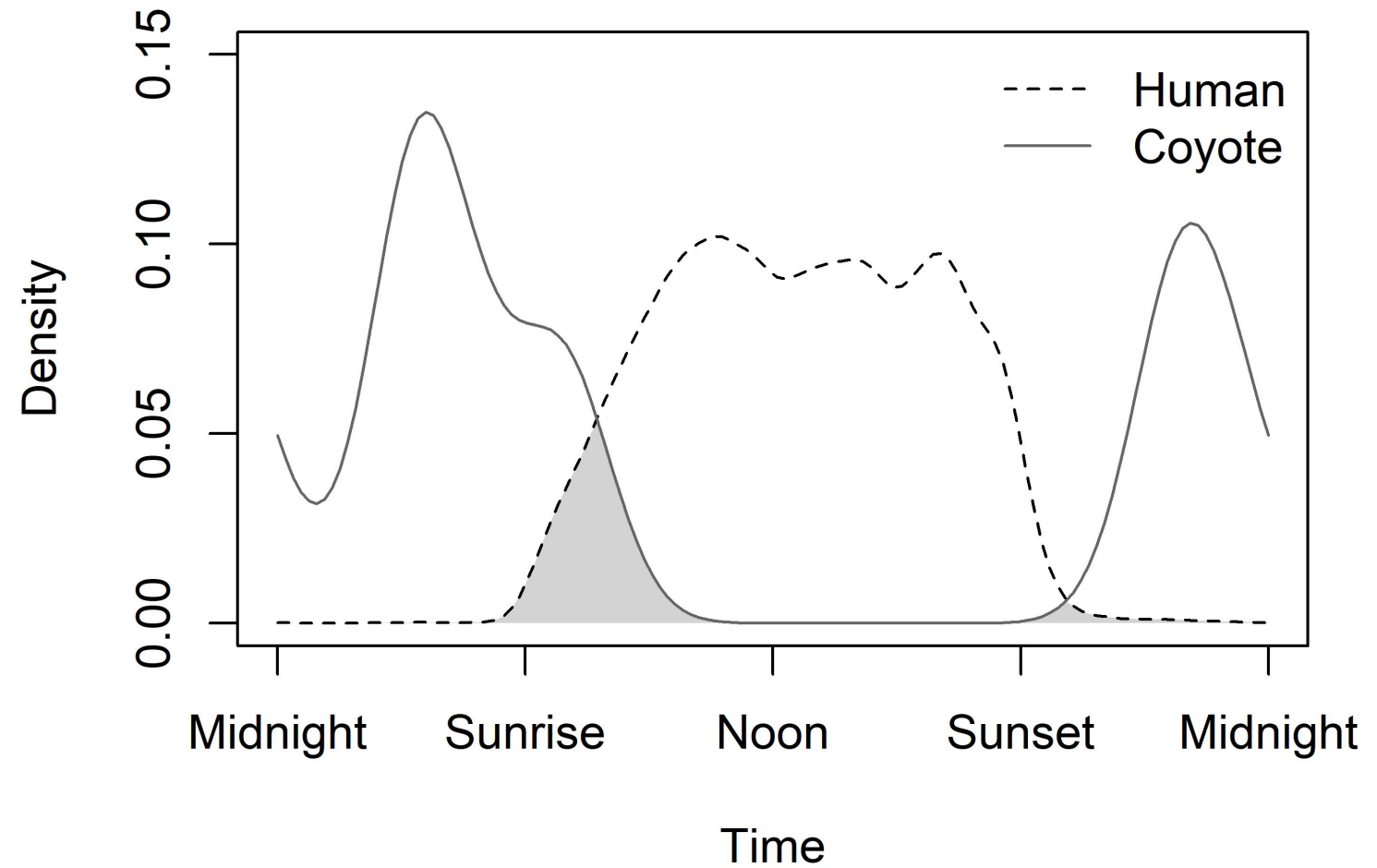
95% CI =
(0.116, 0.487)



Temporal Overlap

$$\hat{D} = 0.105$$

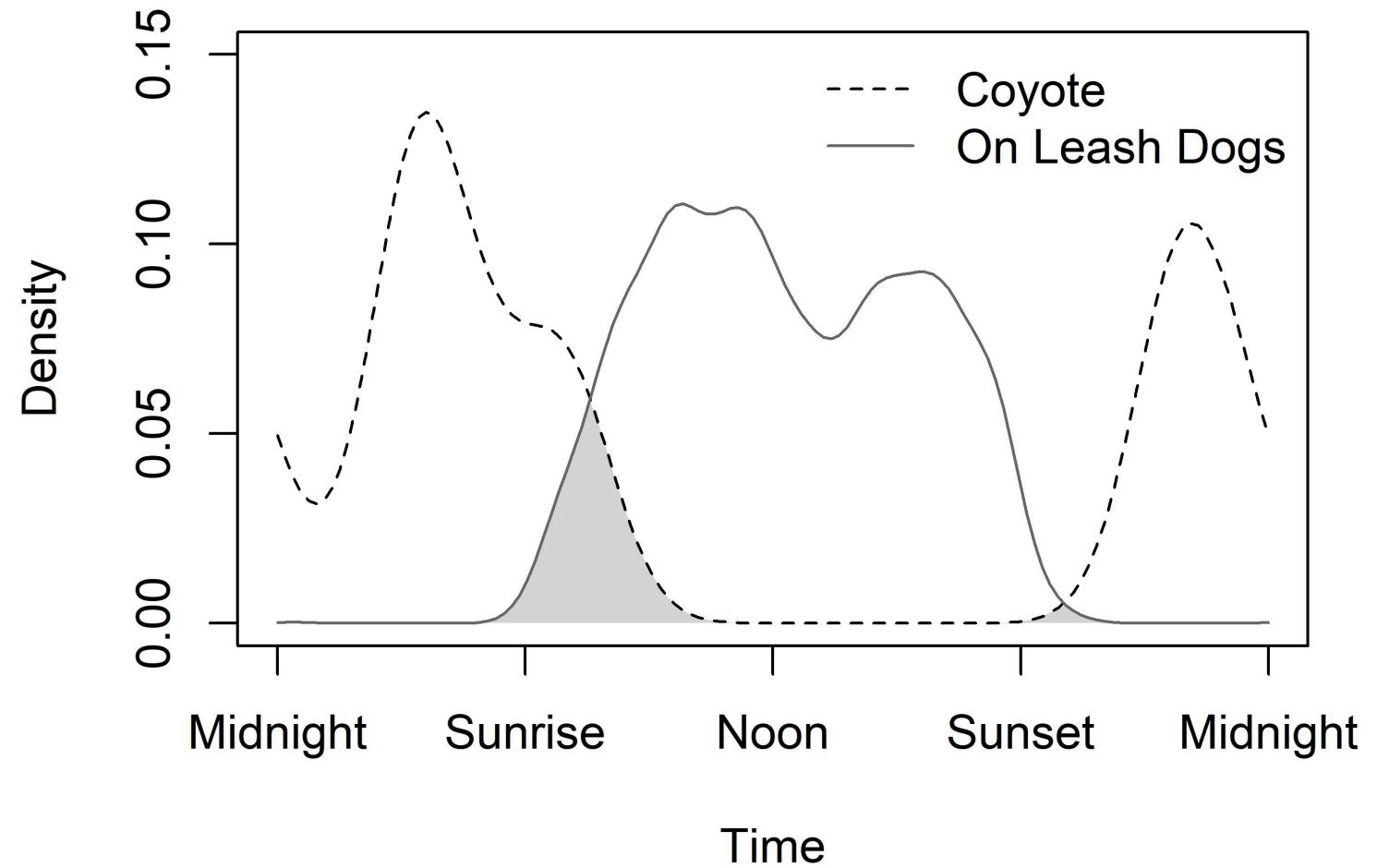
95% CI =
(0.003, 0.226)



Temporal Overlap

$$\hat{D} = 0.107$$

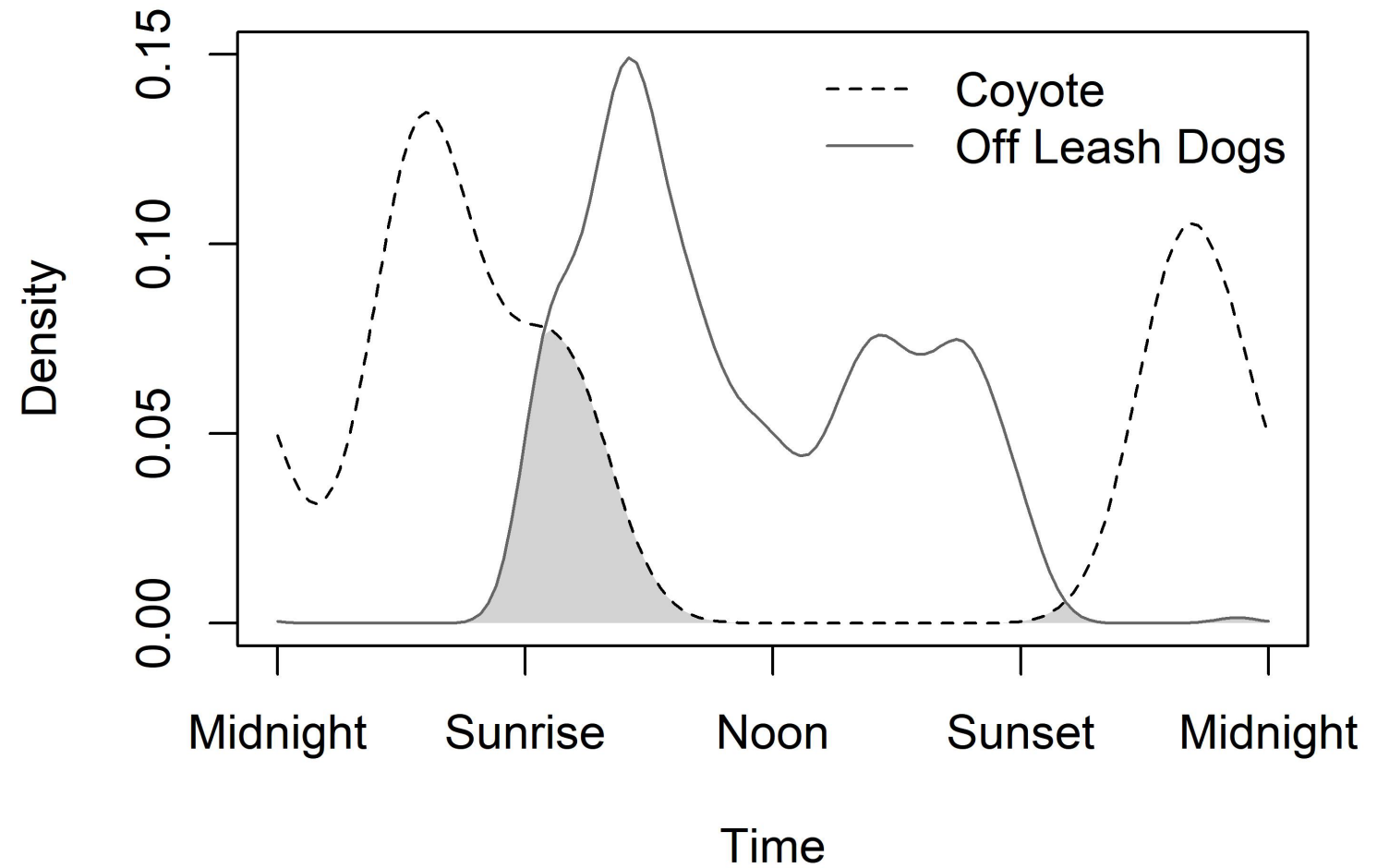
95% CI =
(0.000, 0.234)



Temporal Overlap

$$\hat{D} = 0.107$$

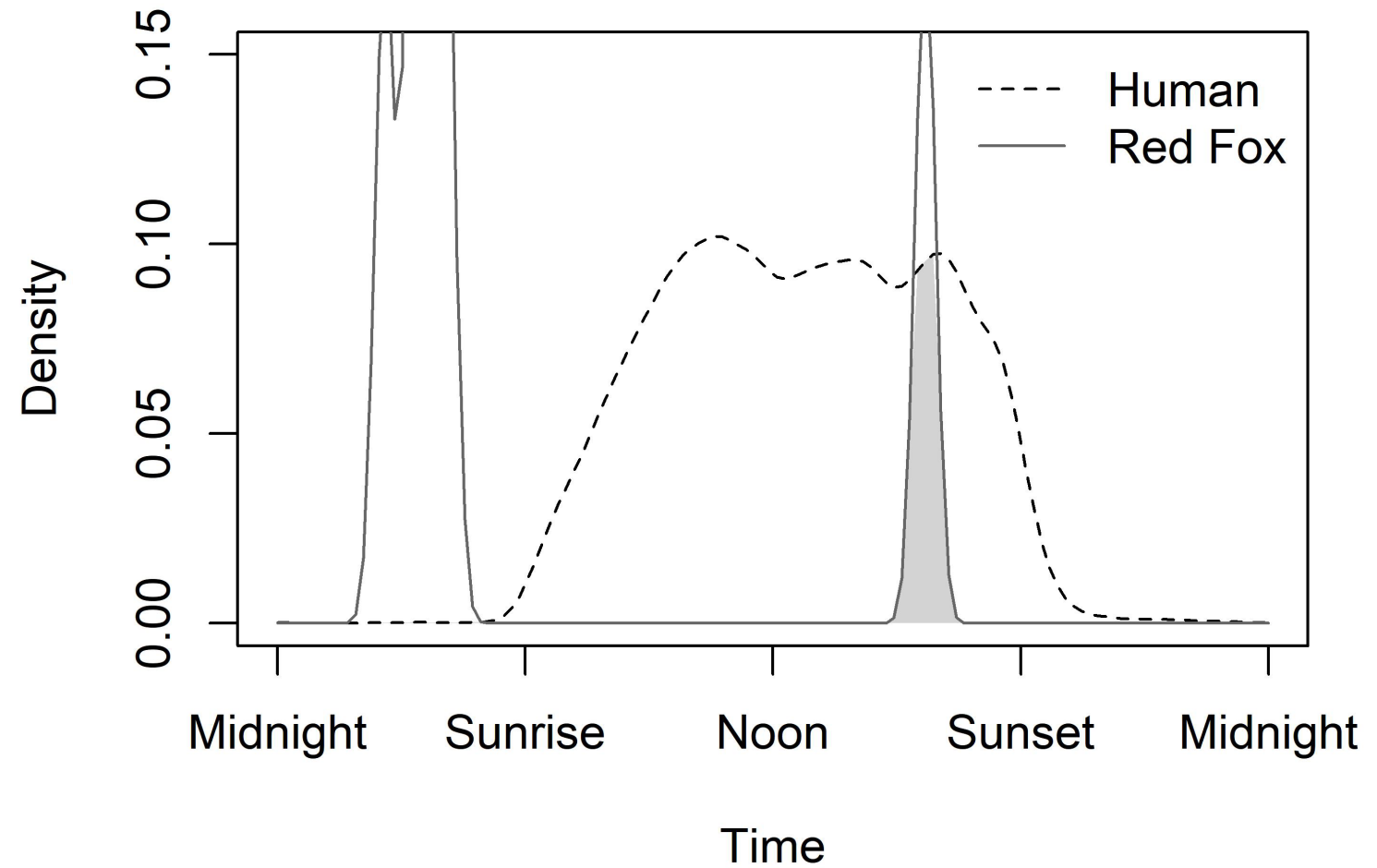
95% CI =
(0.040, 0.357)



Temporal Overlap

$$\hat{D} = 0.073$$

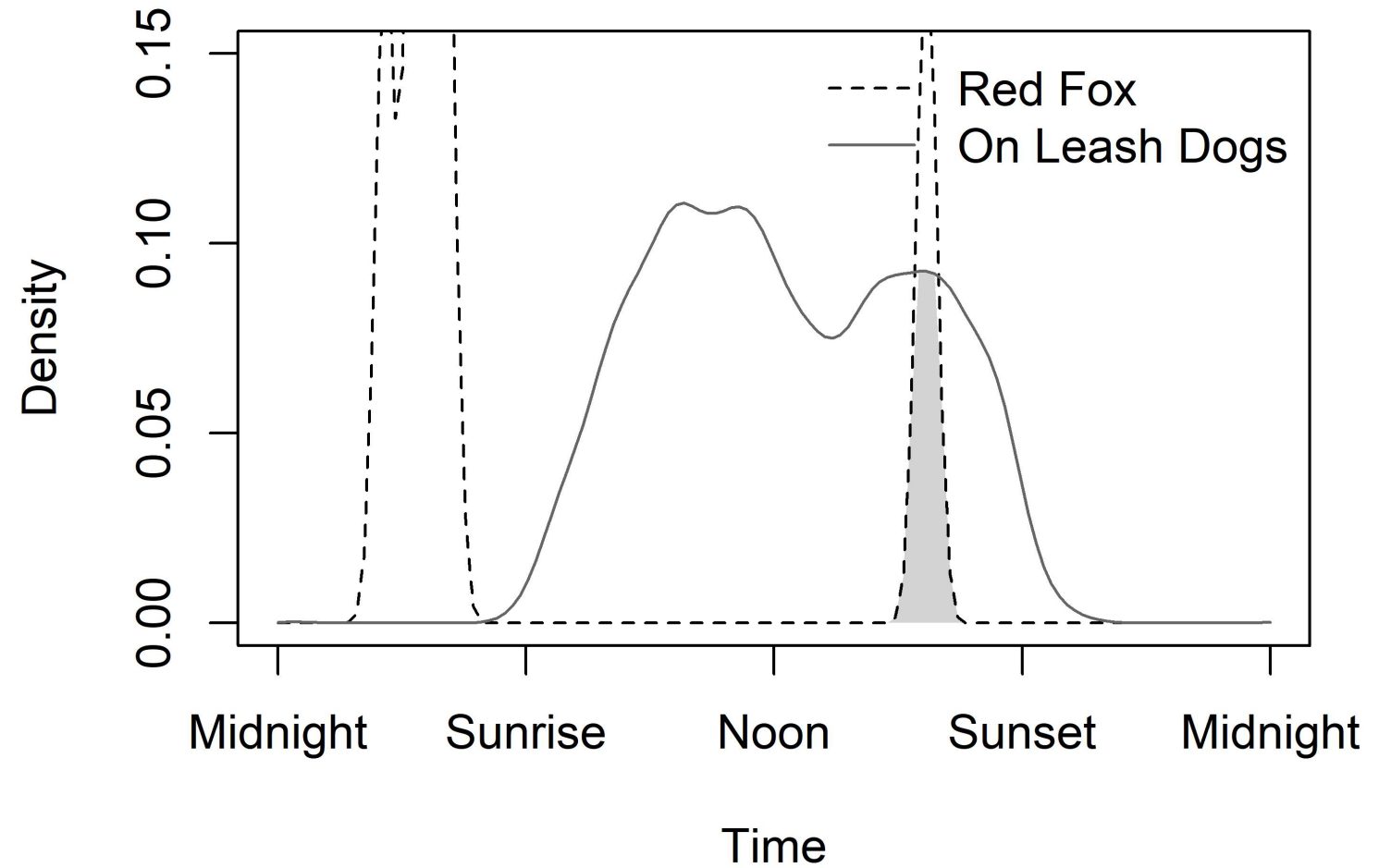
95% CI =
(0.006, 0.180)



Temporal Overlap

$$\hat{D} = 0.070$$

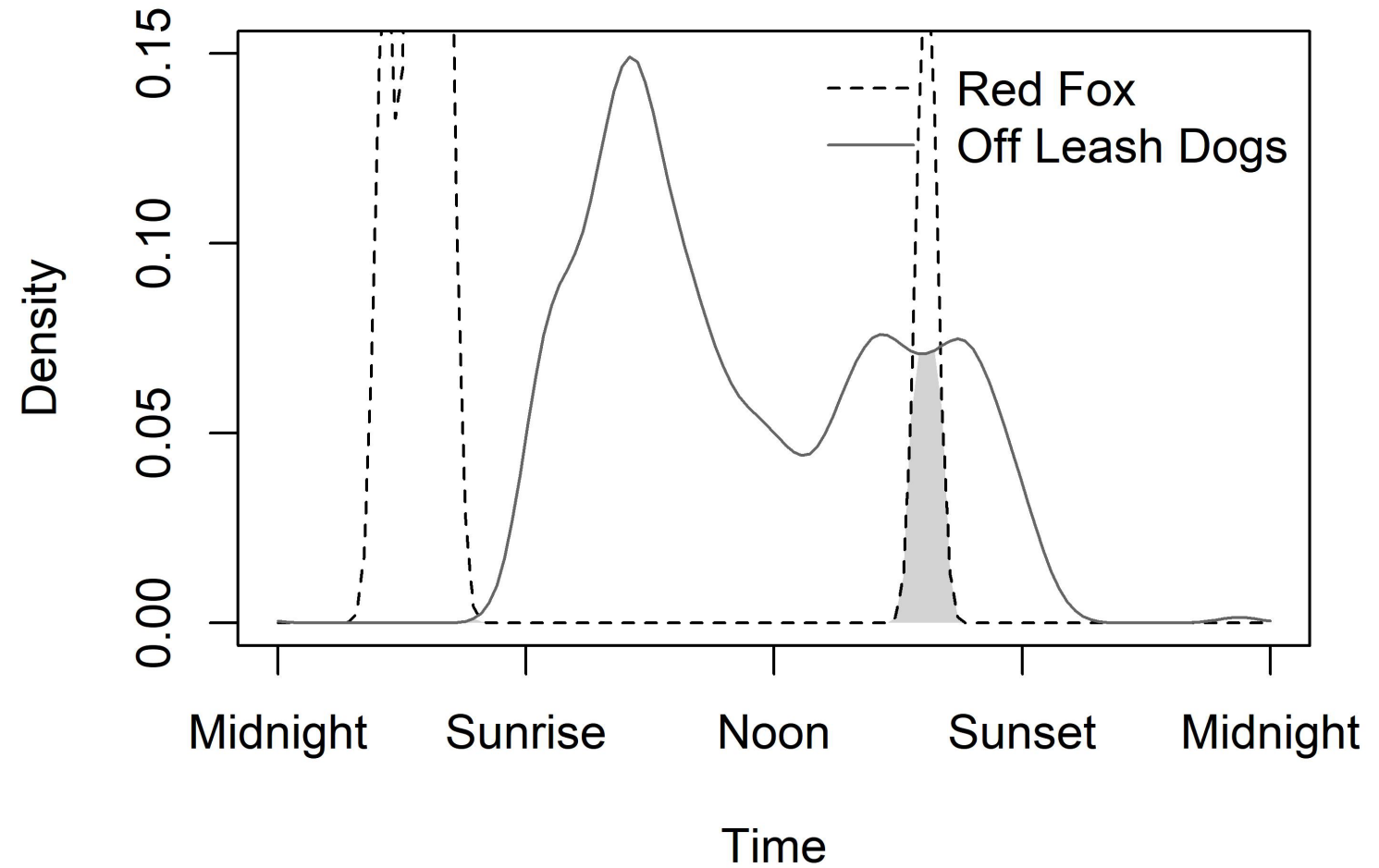
95% CI =
(0.005, 0.178)



Temporal Overlap

$$\hat{D} = 0.053$$

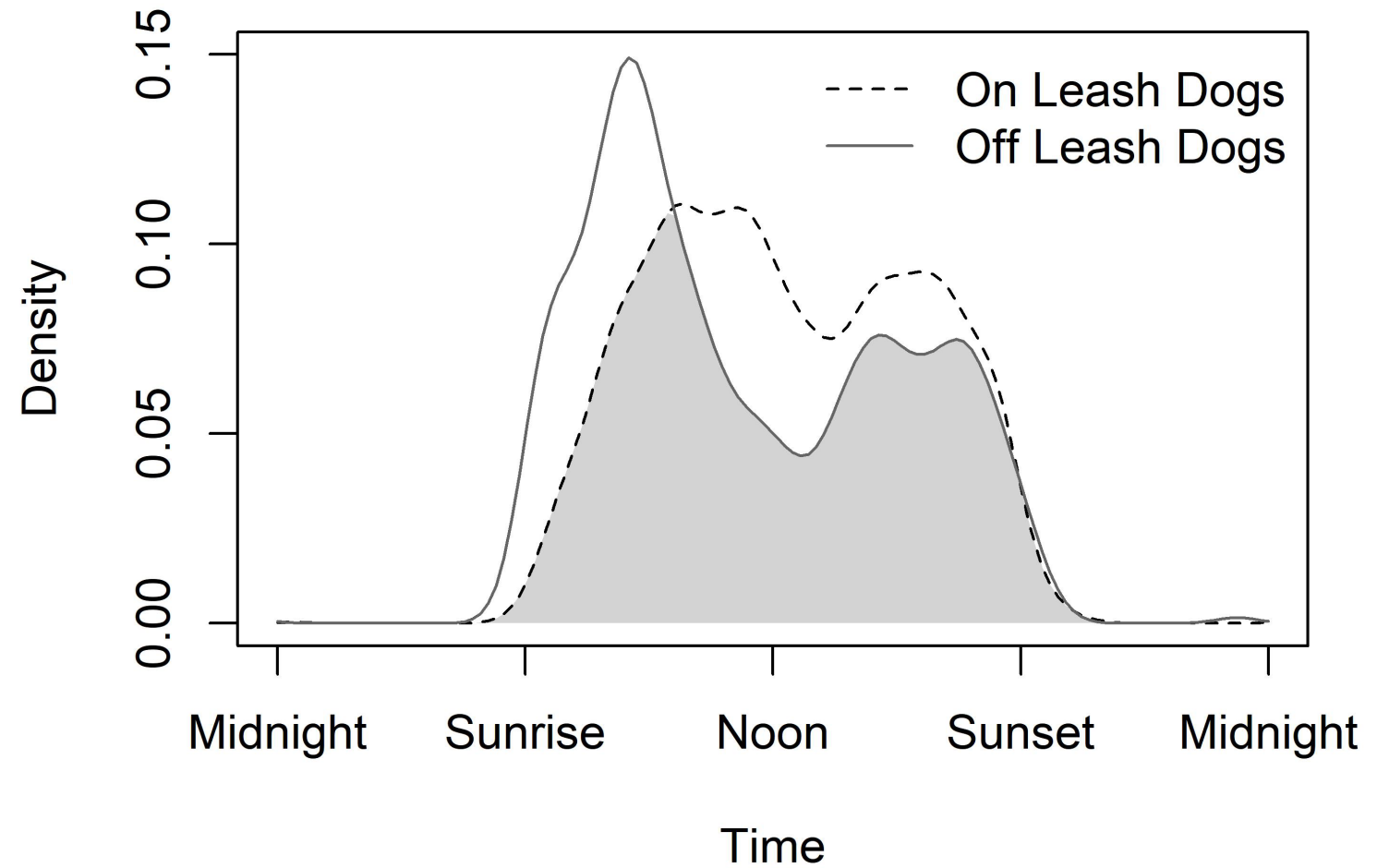
95% CI =
(0.000, 0.162)



Temporal Overlap

$$\hat{D} = 0.804$$

95% CI =
(0.762, 0.845)



Spatial Results- Coyote

Model	Coefficient Estimates			AICc	wAICc	Cumulative Weight
Off Leash	0.01538			14.1346	0.32	0.32
Null	0.2231			14.9367	0.22	0.54
RF + Off Leash	RF= 9.21842	Off Leash= 0.02016		15.545	0.16	0.70
RF	8.6119			15.5607	0.16	0.86
Global	RF= 2.246e+01	Off Leash= -5.601e-03	Humans= -2.262e-04	18	0.05	0.90
Humans	-1.484e-05			18.263	0.04	0.94
On Leash	0.0001720			18.2742	0.04	0.99
RF + Humans	RF= 8.562	Humans= -8.423e-06		20.3306	0.01	1.00

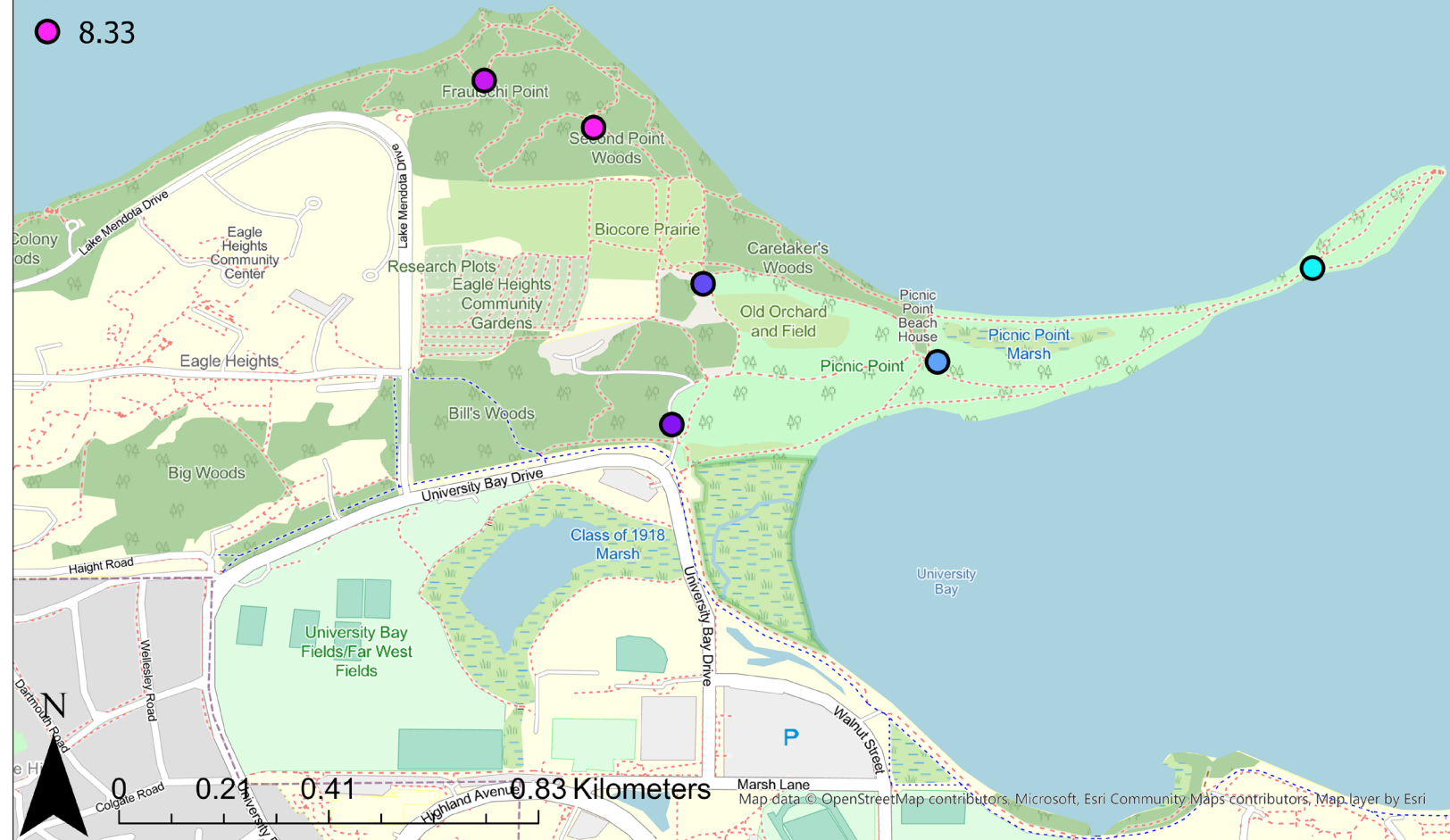
Spatial Results- Red Fox

Model	Coefficient Estimates			AICc	AICc Weight	Cumulative Weight
Coyote	1.145			10.0808	0.42	0.42
Coyote + Off Leash	Coyote= 9.3232	Off Leash= -0.1585		10.8	0.29	0.72
Null	-1.2528			12.1061	0.15	0.87
Coyote + Humans	Coyote= 1.115	Humans= -1.852e-05		14.8759	0.04	0.91
Humans	-2.139e-05			15.4198	0.03	0.94
Off Leash	-0.001176			15.4949	0.03	0.96
On Leash	1.924e-05			15.5339	0.03	0.99
Global	Coyote= 9.681	Off Leash= -1.882e-01	Humans= 9.105e-04	18	0.01	1.00

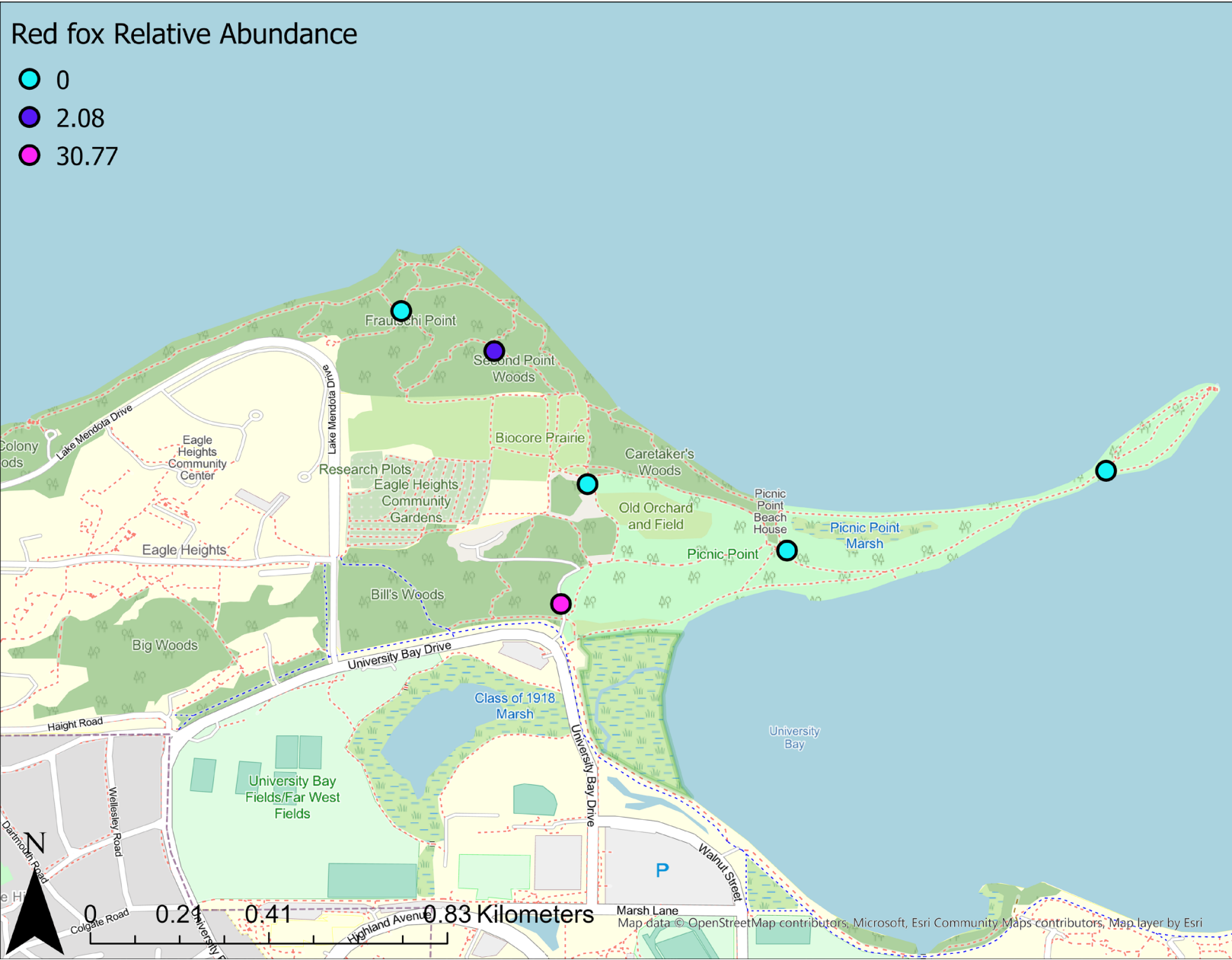
Coyote Relative Abundance per location

Coyote Relative Abundance

- 0
- 3.45
- 3.85
- 7.69
- 8.11
- 8.33



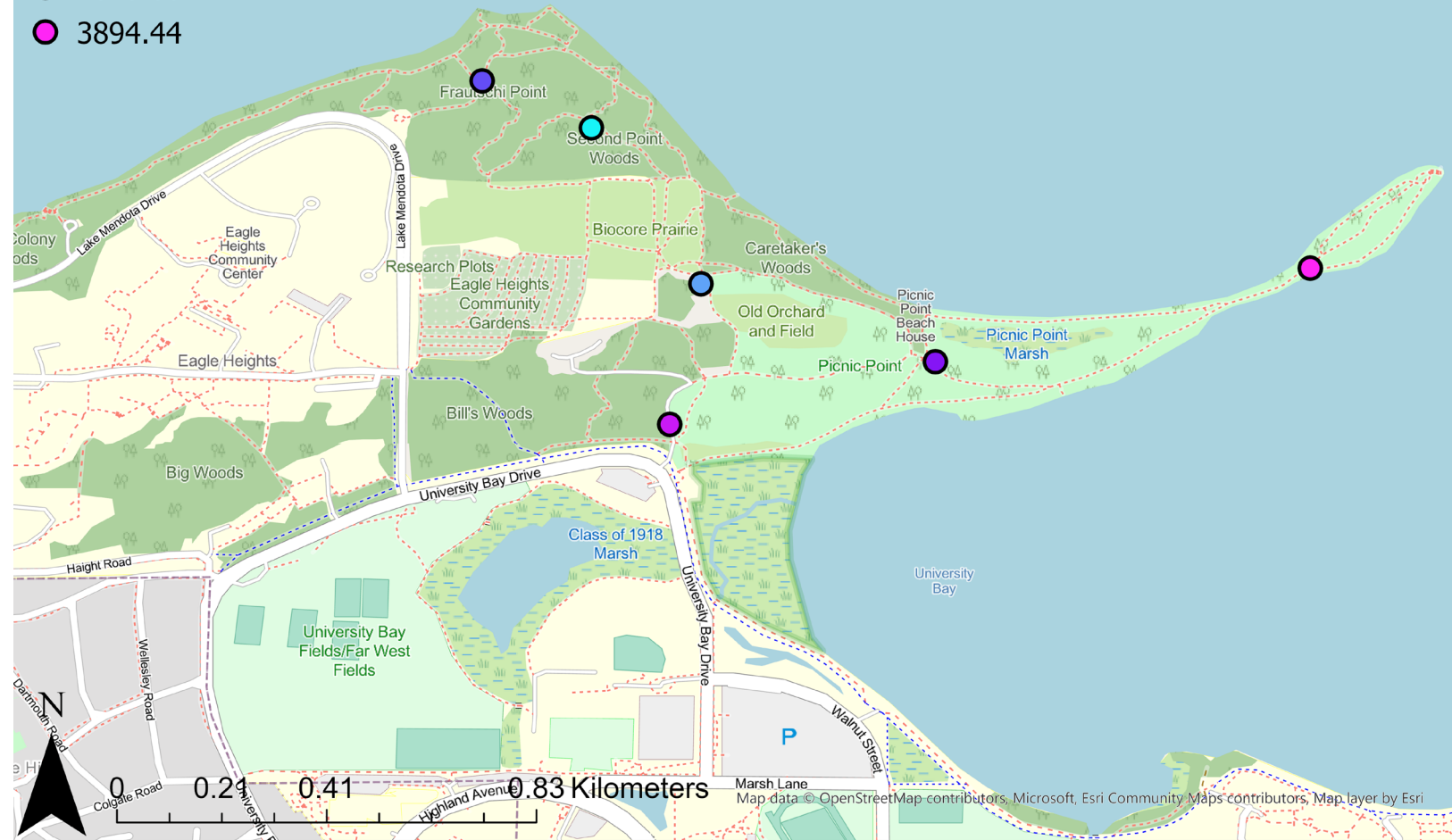
Red Fox Relative Abundance per location



On Leash Relative Abundance per location

On leash domestic dog Relative Abundance

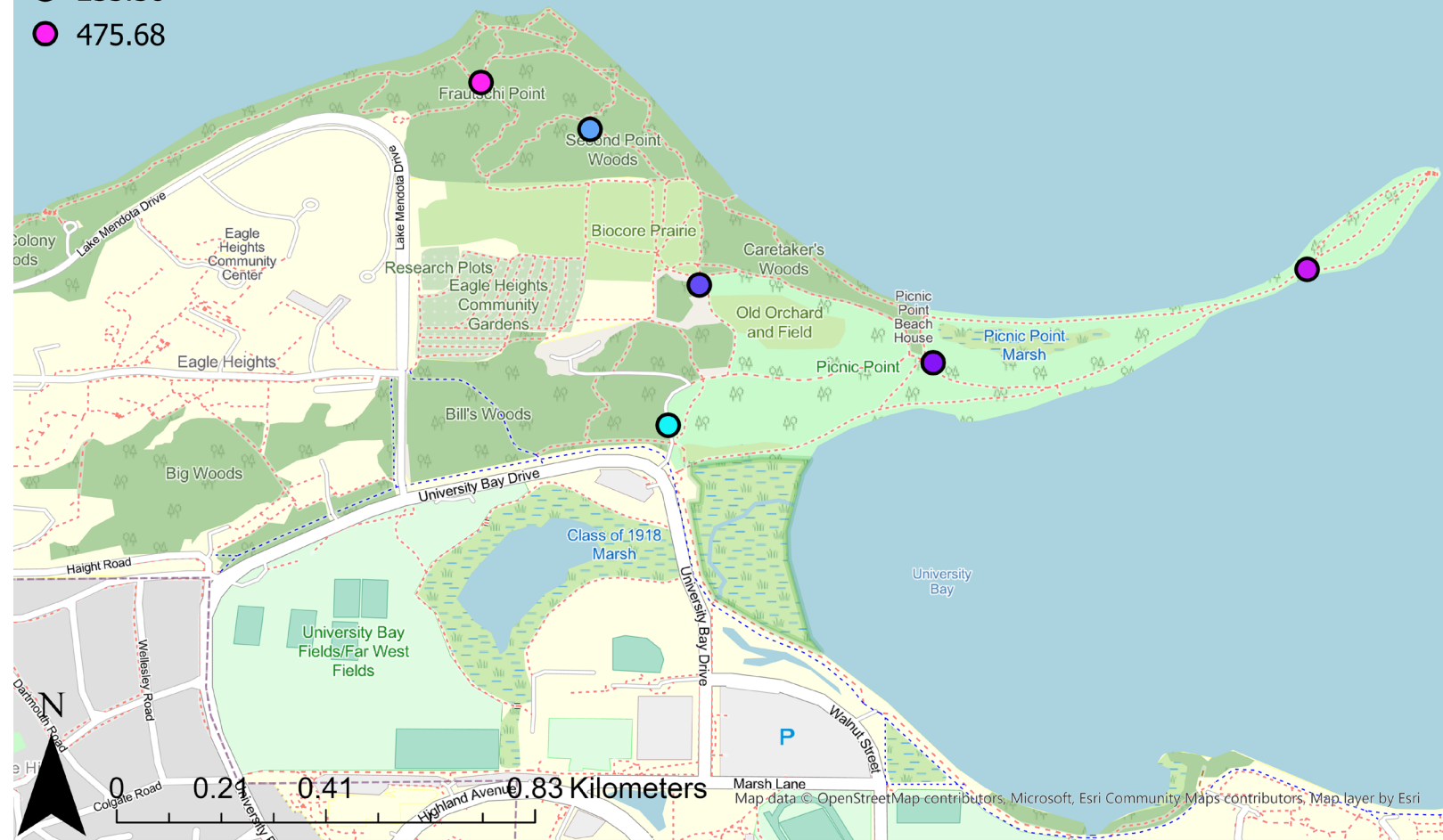
- 304.17
- 911.54
- 1529.73
- 1551.72
- 2073.08
- 3894.44



Off Leash Relative Abundance per location

Off leash domestic dog Relative Abundance

- 138.46
- 181.25
- 226.92
- 234.48
- 255.56
- 475.68





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Photo courtesy of Bryn Scriver

Outreach

- Monday (19 July 2021), Tuesday (20 July 2021), Wednesday (21 July 2021), and Saturday (24 July 2021)
- 7 am to 9 am Monday through Wednesday
- 8 am to 11 am on Saturday
- Main Entrance, dog treats and handouts
- Visited the entrances to Frautschi Point and Raymer's Cove Tuesday

Calculated RAB

- On and Off
- Before and After

Two-sided t-test



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Photo courtesy of Bryn Scriver

Outreach Results

- 60 people
- ~25 without dogs
- 35 with an on leash dog
- 2 people with off leash dogs
- On leash dogs: p-value = 0.022, mean of the differences = 1185.918 (fewer after)
- Off leash dogs: p-value = 0.0058, mean of the differences = 182.966 (fewer after)

Summary

Temporal avoidance at all levels

Little undisturbed time for wild canids

Coyote conflict risk for off leash dogs

Off leash dogs pose management problem

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Management Suggestions and Future Research

- Targeted outreach
 - After sunrise, before noon
 - Locations 4, 5, 6
- Seasonal differences
- Vegetation density
- Prey species
- Breeding and hunting

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WILD AND DOMESTIC CANID INTERFERENCE PRESENTATION

68°F 20°C

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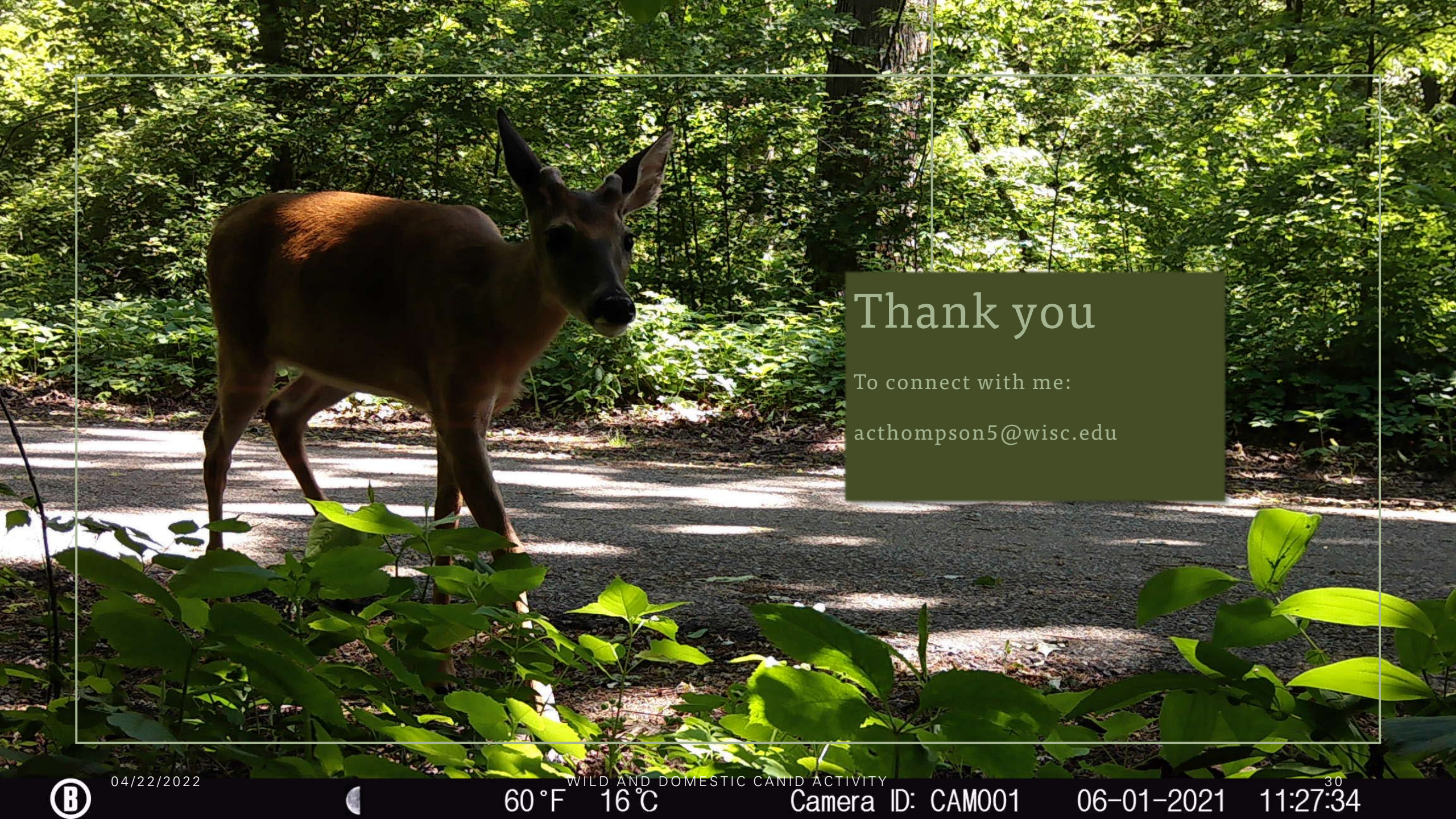
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Acknowledgements

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Thank you

To connect with me:

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04/22/2022



60°F 16°C

WILD AND DOMESTIC CANID ACTIVITY

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