Canada Goose Habitat Selection in Response to Hunting Pressure

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Understanding how waterfowl respond to hunting pressure can **inform population & land management** and **elucidate behavioral adaptations** for coping with disturbance and predation. We analyzed changes in home range size and overlap, and fit resource selection functions to understand habitat use.
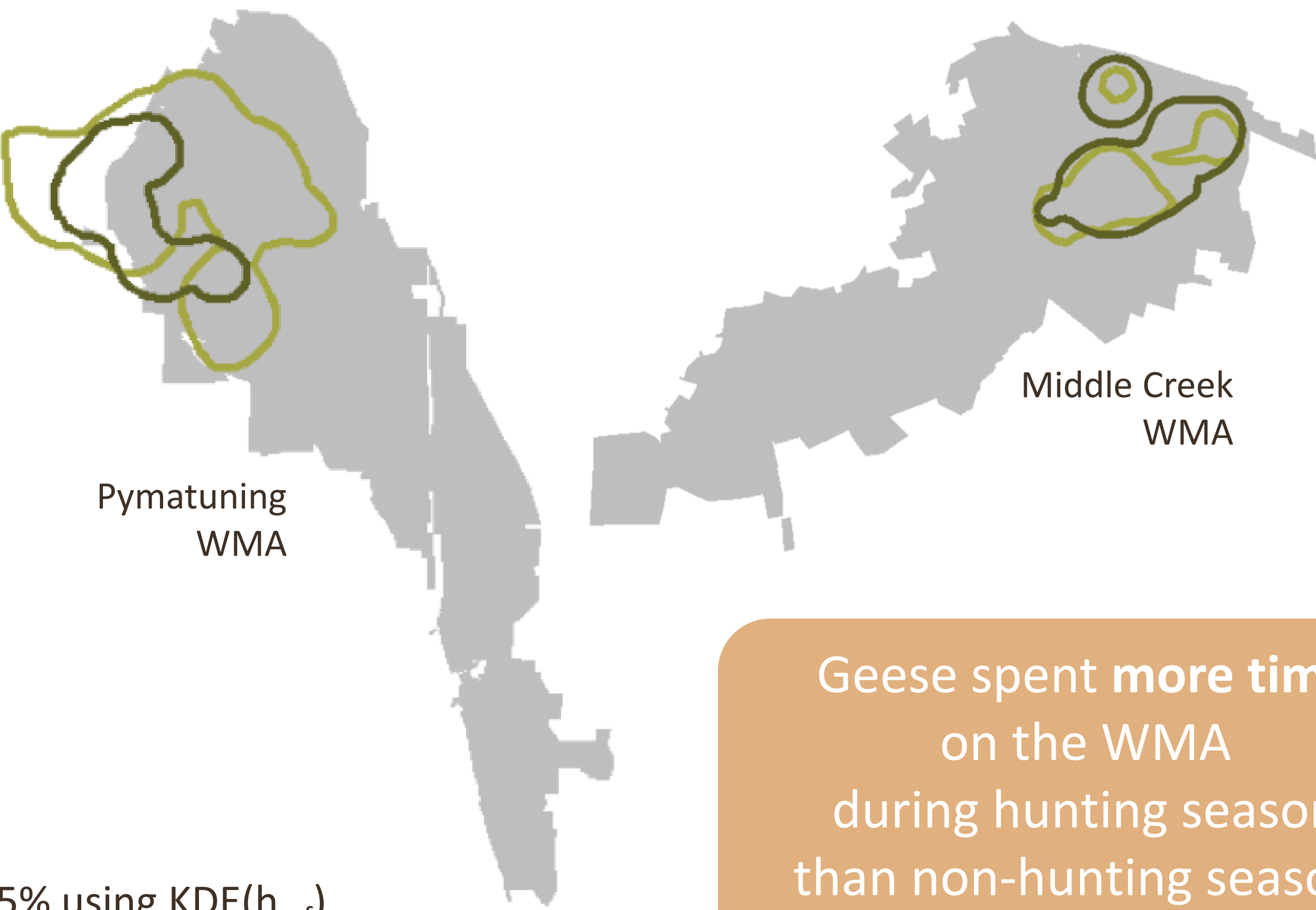
Analysis at Two Spatiotemporal Scales

	Coarse	Fine
Area	WMA + 10 mi	WMA
Hunting Period	Seasonal	Daily
Land Cover	NLCD	Crop-specific
Hunting Metrics	-none-	Hunter location & success rate

PRIOR RESEARCH
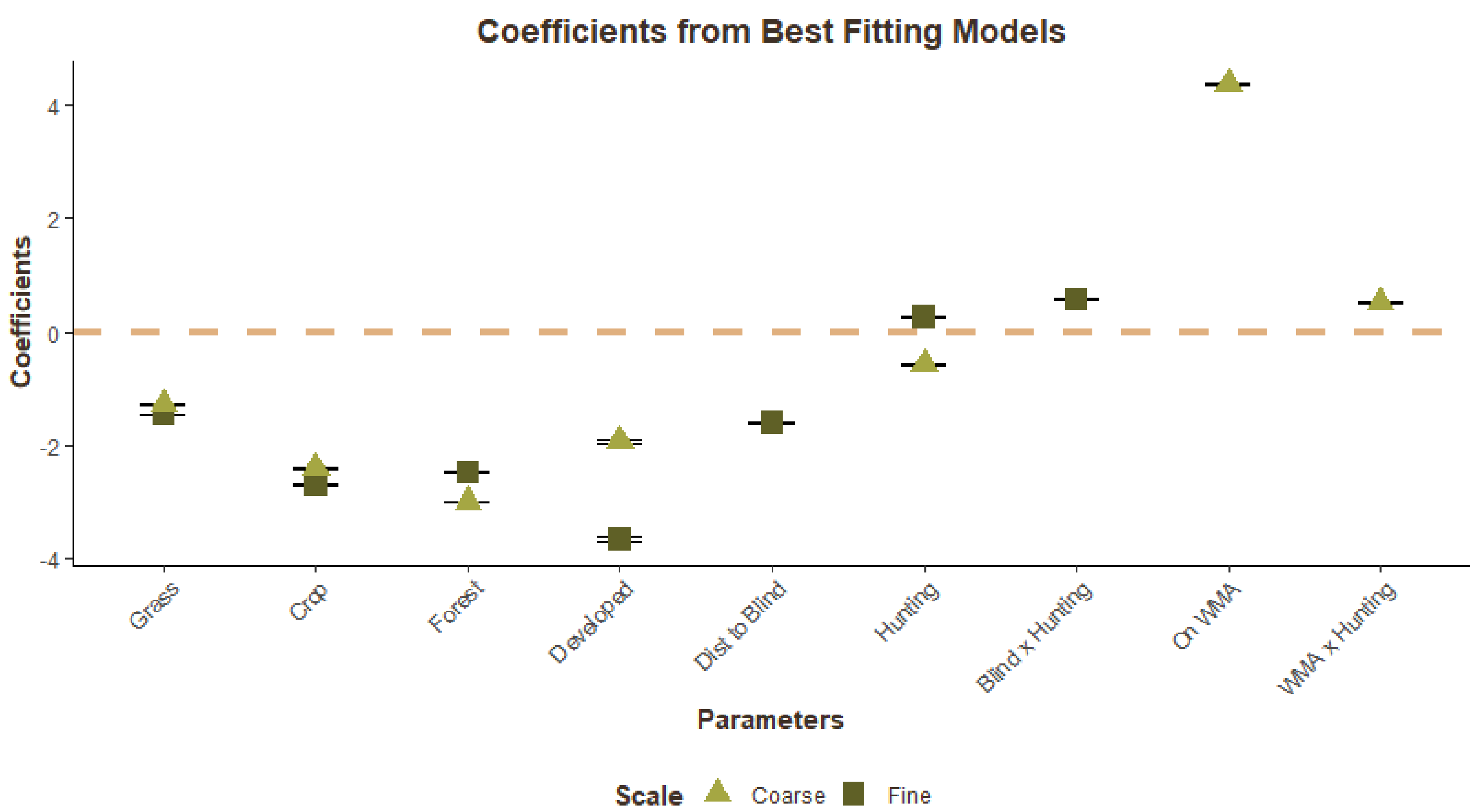
Individual Estimated Home Ranges[†]

Season ☐ Hunting ☐ Non-Hunting

Pymatuning WMA

Middle Creek WMA

[†]95% using KDE(h_ref)

Geese spent **more time** on the WMA during hunting season than non-hunting season.

CURRENT RESEARCH

Resource Selection Function Model	Δ AIC	Num. Parameters
Coarse Scale		
~ Land Cover + On WMA * Hunting Day	0	8
~ Distance to Water	461,223	2
~ Land Cover + Hunting Season	635,644	6
~ Land Cover	636,716	5
Fine Scale		
~ Land Cover + Distance to Blind * Hunting Day	0	8
~ Distance to Water	86,887	2
~ Land Cover + Hunting Day	217,847	6
~ Land Cover	219,966	5

Coefficients from Best Fitting Models

Parameters: Grass, Crop, Forest, Developed, Dist to Blind, Hunting, Blind x Hunting, On WMA, WMA x Hunting

Scale: ▲ Coarse ■ Fine

Of the models we fit, habitat use was best explained by land cover type and an interaction between area and hunting. Future analyses will include a random effect of individual.

Scale	Dates	Num. Individuals		Observations			
		Middle Creek	Pymatuning	Total	Middle Creek	Pymatuning	Mean per Individual
Coarse	Aug 25 – Feb 19	31	31	179,386	43%	57%	2,893
Fine	Oct 26 – Feb 19	17	26	492,991	40%	60%	11,465

FUTURE RESEARCH

To further evaluate how goose movement and behavior changes in response to hunting pressure, we will fit a **hidden Markov model** at each spatiotemporal scale, where the unobserved states are determined by step lengths and turning angles.

2 study sites

Pymatuning WMA
Middle Creek WMA

9,600 acres   6,200 acres
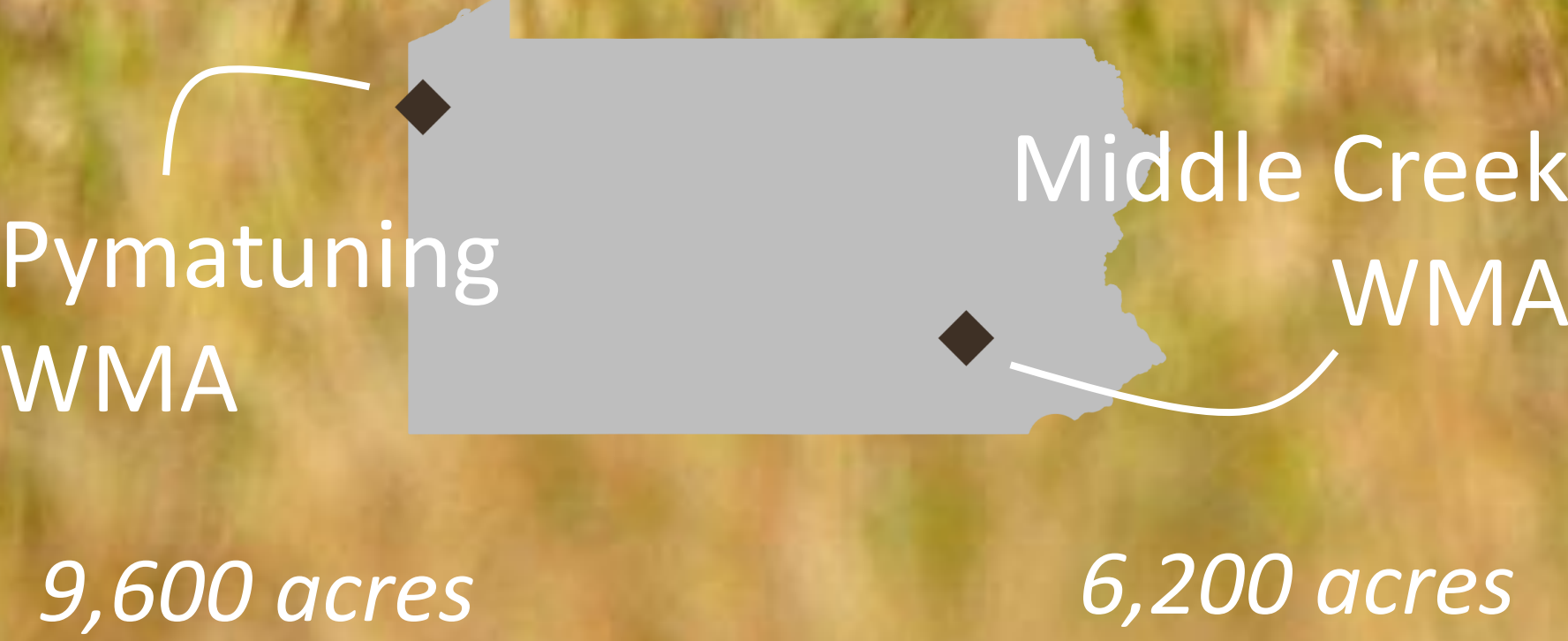
138 geese { **resident after-hatch-year female**

locations collected every **10 minutes**

June 2021 through **March 2023**

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