Refining the Hunting Zones of Hunter-Covey Interface Models

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Harvest Management

Hunter-covey Interface

$K_t = m_t * p_t * (N_t */c_t)$

where…

m_t = mean number of birds shot per covey flushed on day t,

p_t = the probability of encountering a covey on day t,

N_t = the total quail population at the beginning of day t, and

c_t = average covey size on day t

Probability of Encountering a Covey

$p_t = a_t / A$

where…

a_t = the area effectively hunted on day t,

and

A = the area available for hunting

Effective Area

$a_t = v_t * h_t * w_t$

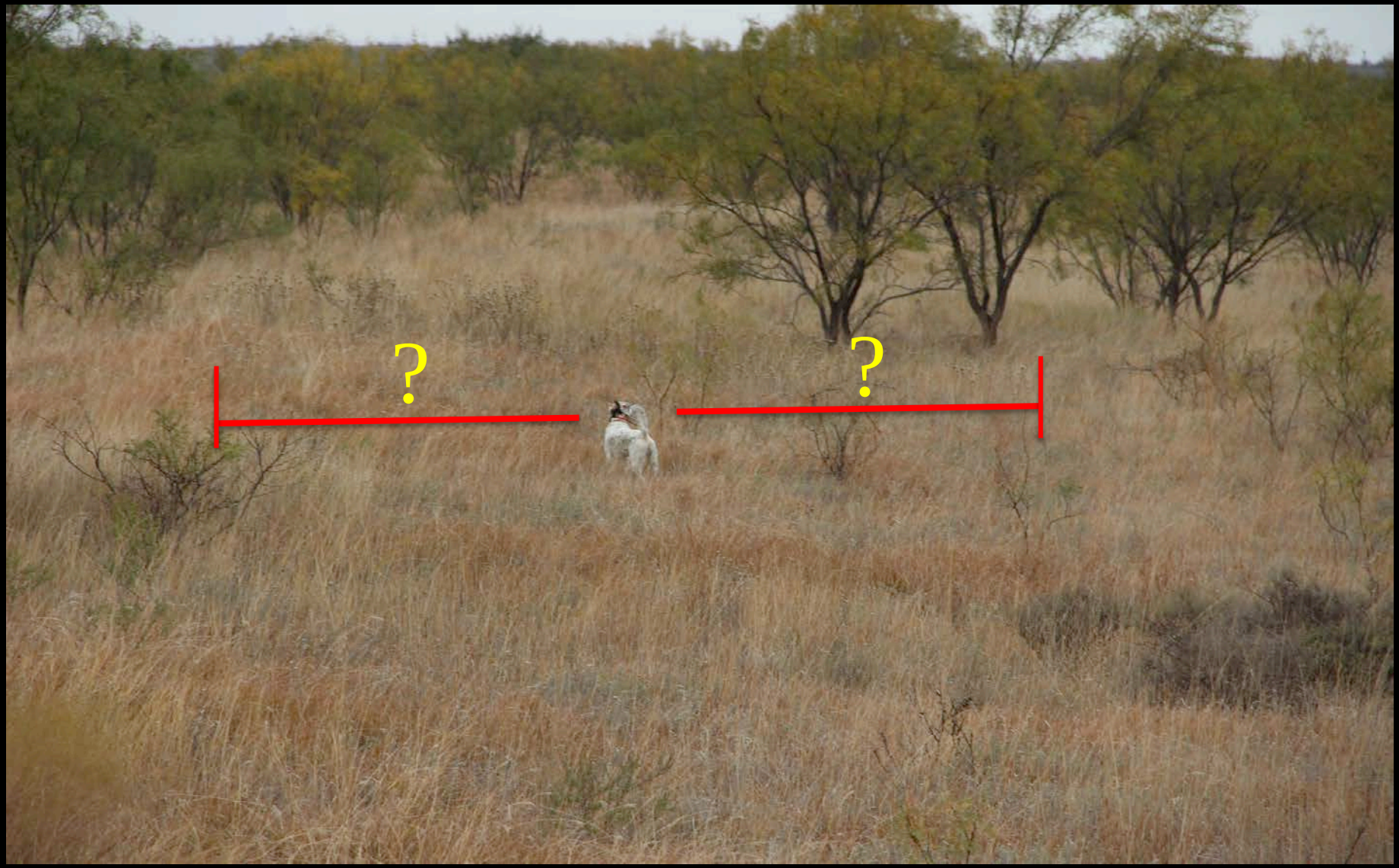
where…

v_t = velocity at which hunters travel on day t

h_t = hours spent hunting on day t

w_t = the effective width of the hunting zone on day t

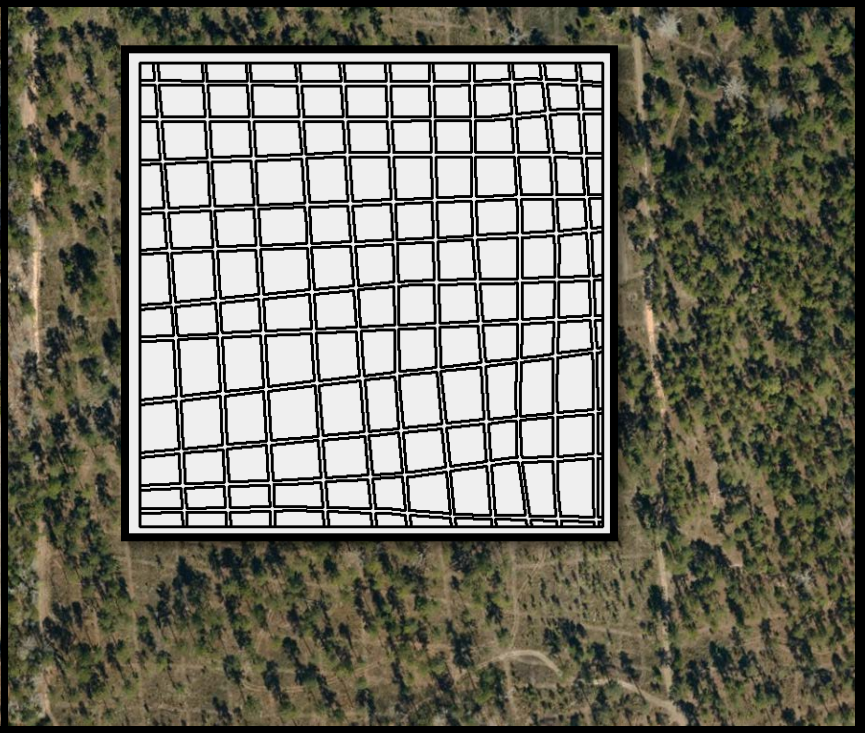
Effective Area



Study Areas

Effects of Hunting Paths

Average Sum of Edge: 15067 meters



Average Sum of Edge: 9164 meters

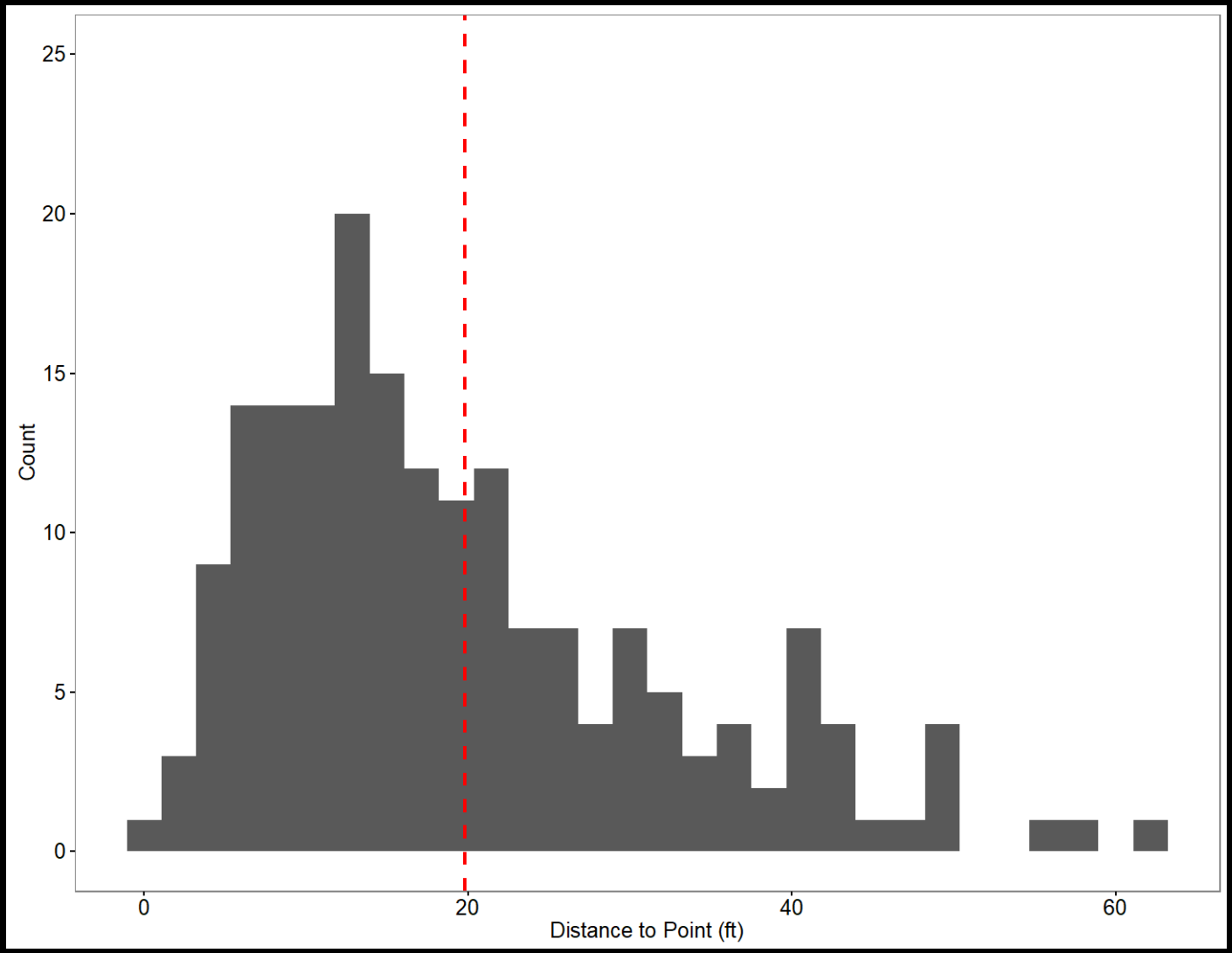
Trials

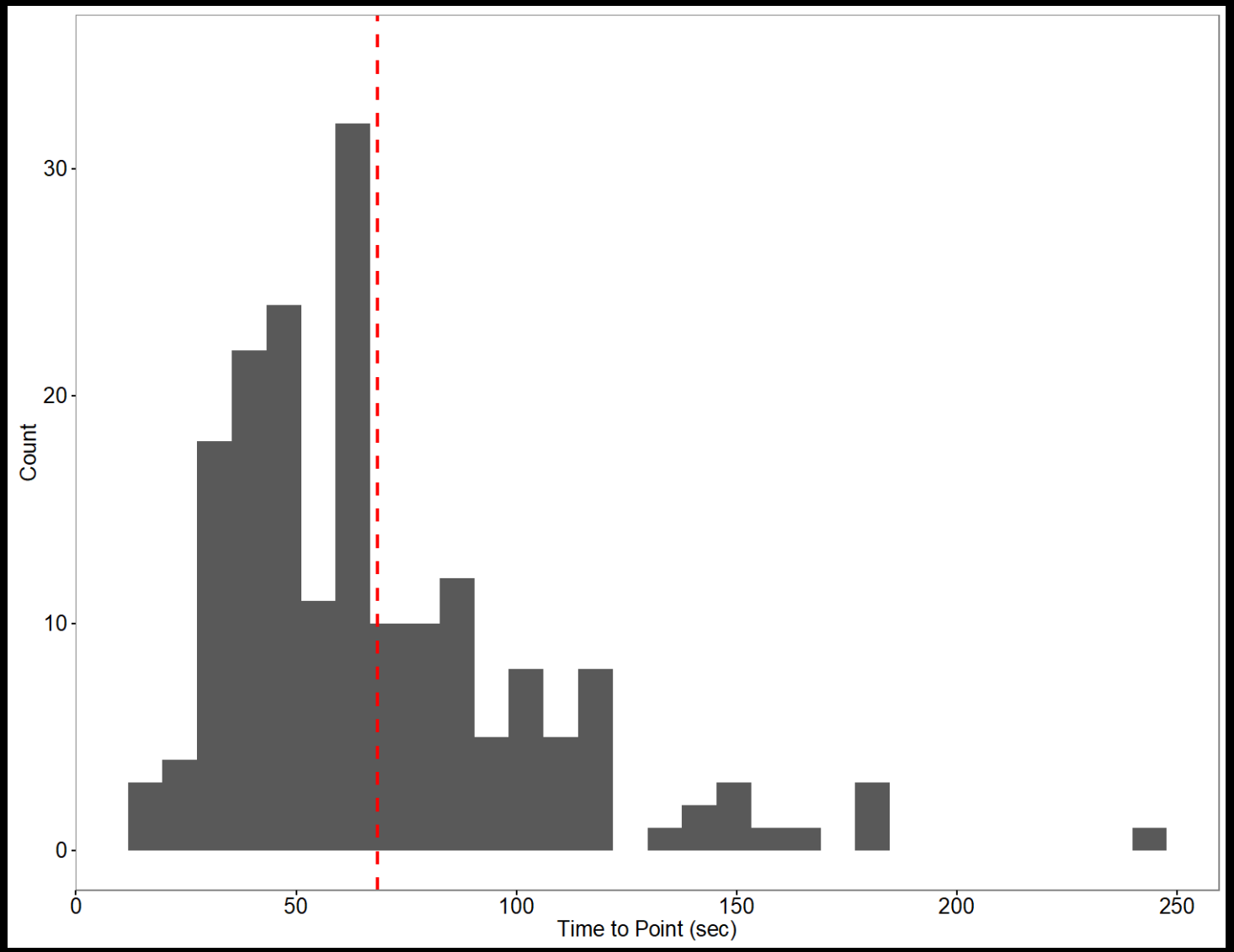


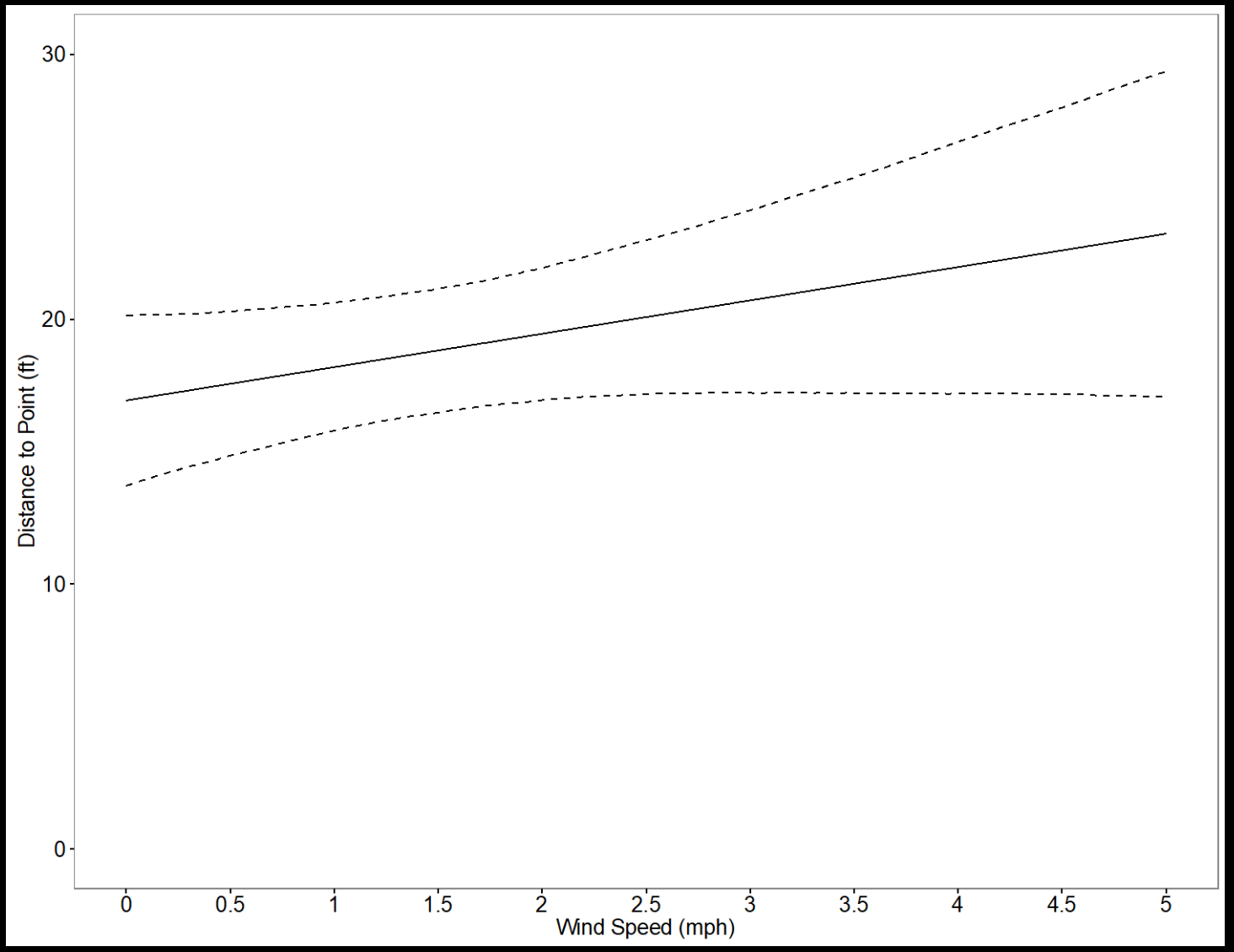
Wind

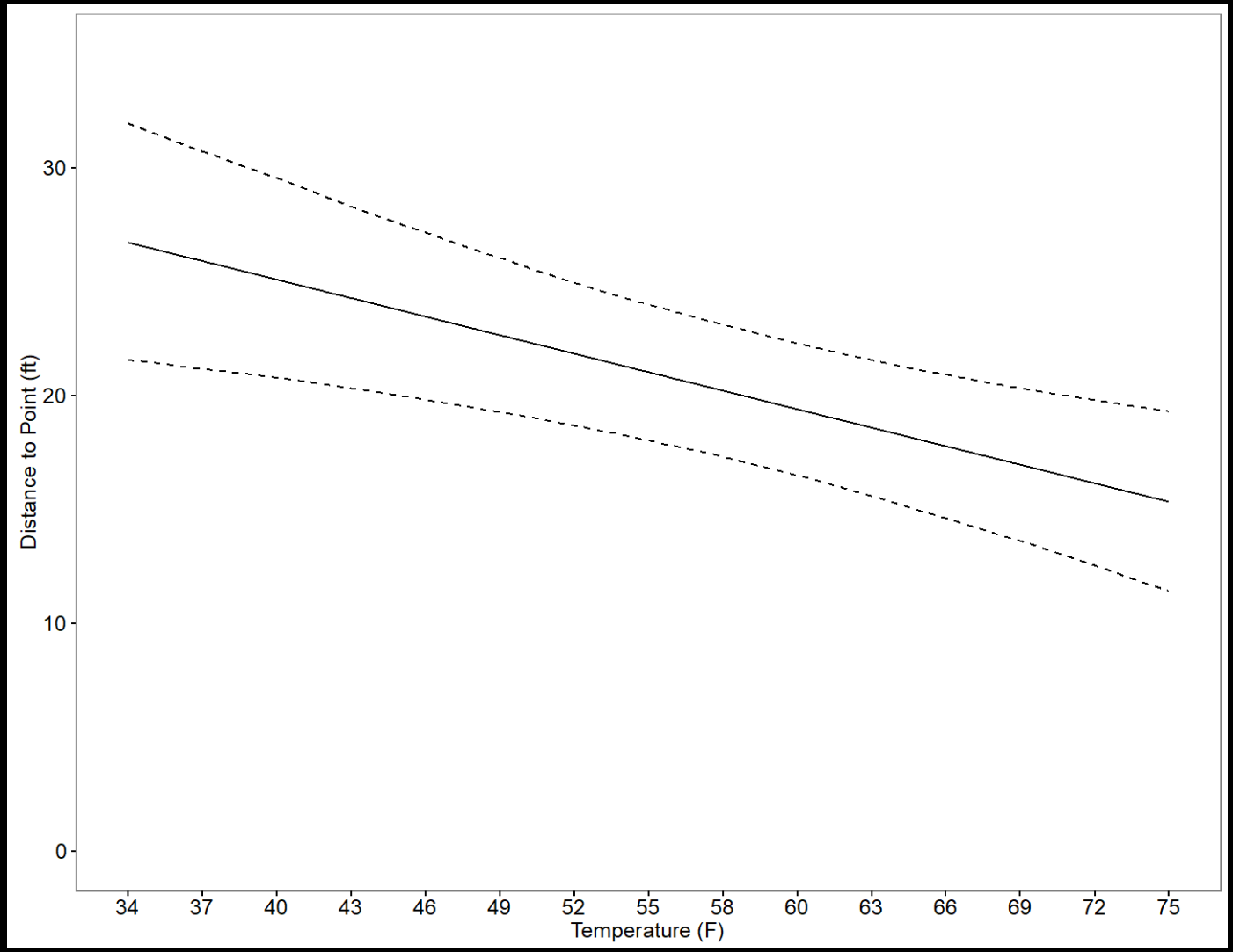

Analysis

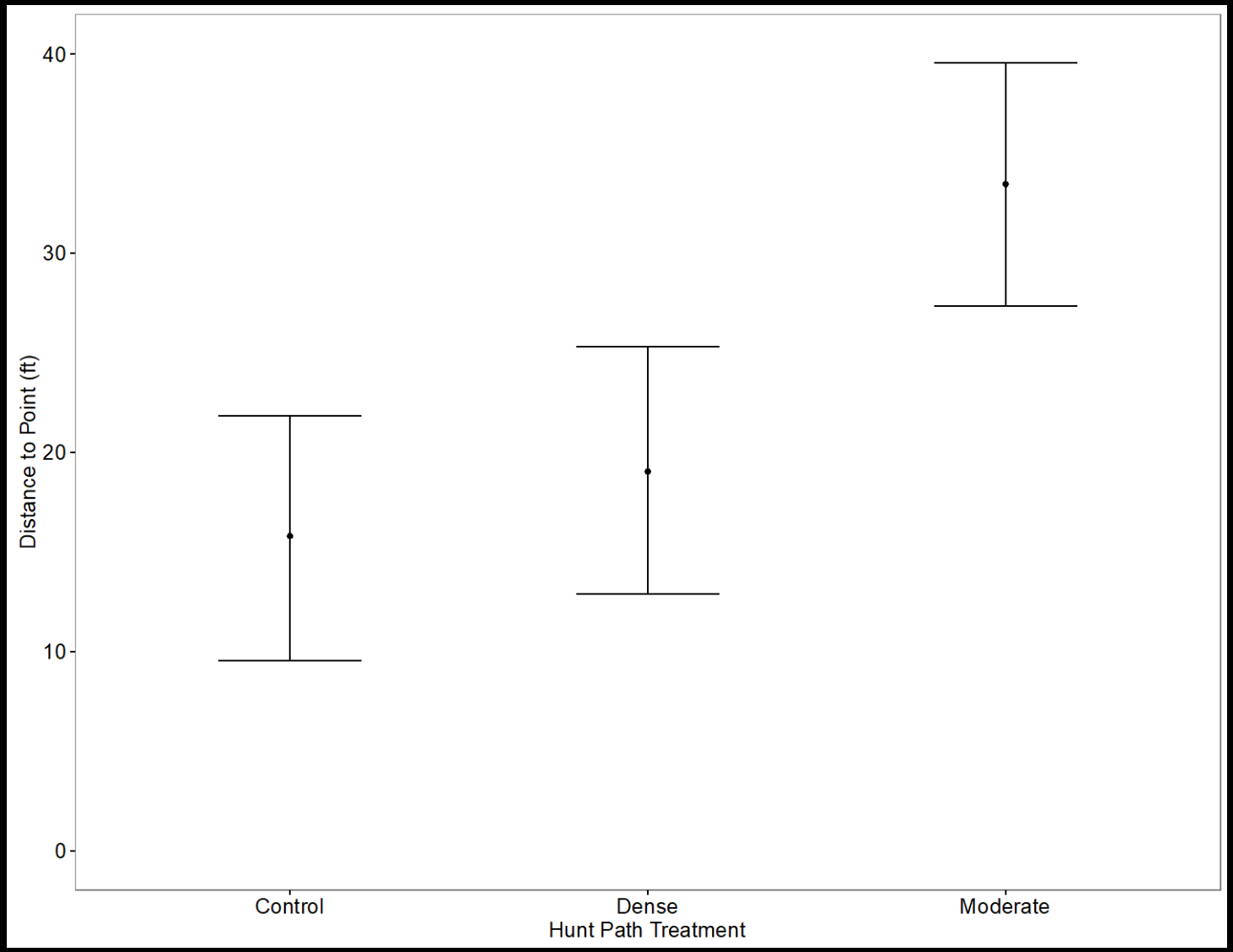
- Linear regression in Bayesian framework
  - Response variables
    - Distance to point & Time to point
  - Explanatory variables
    - Wind speed, Humidity, and Temperature, Hunting Paths

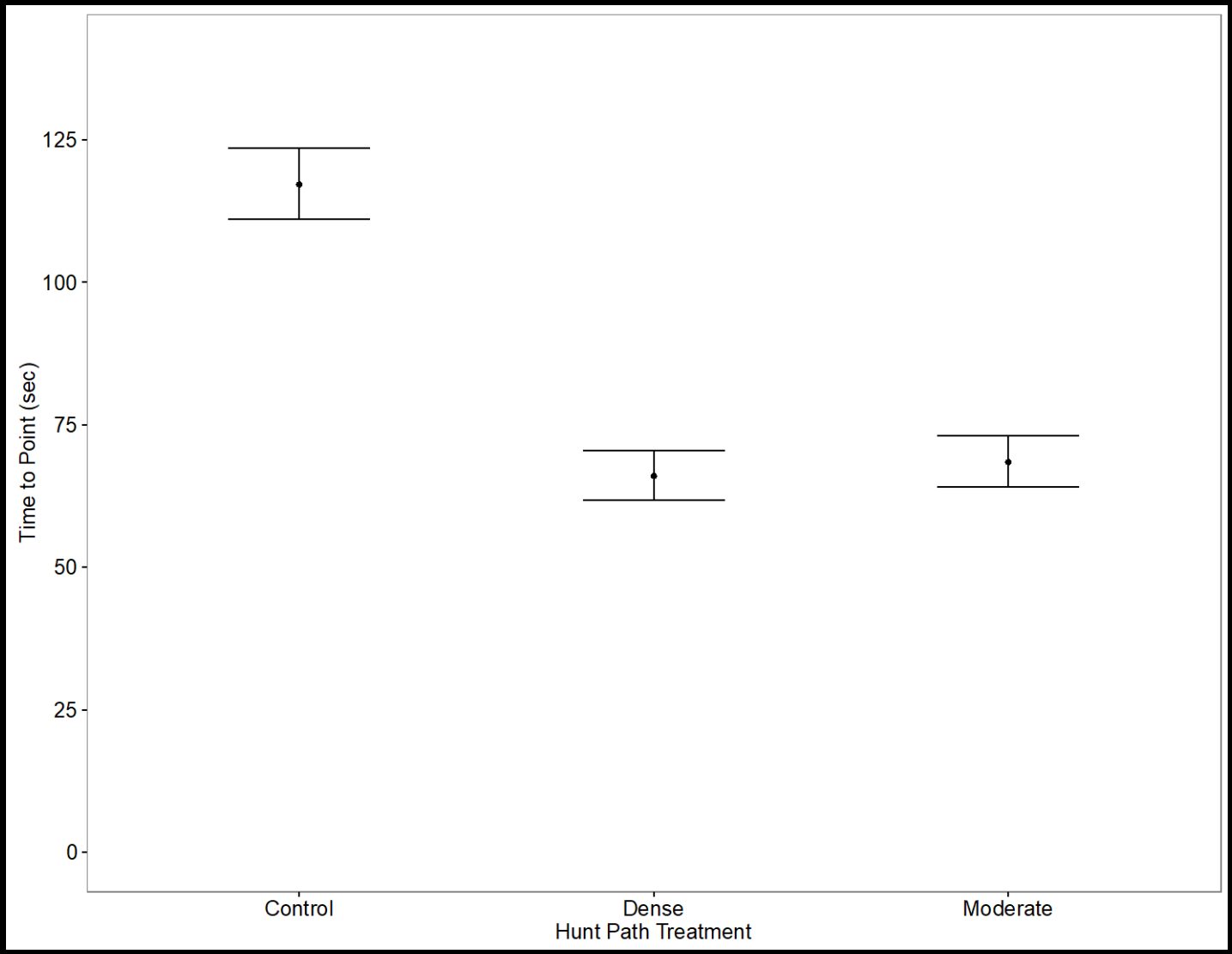

25
20
15
10
5
0
Count
0
20
40
60
Distance to Point (ft)


Count
30
20
10
0
0
50
100
150
200
250
Time to Point (sec)


30
20
10
0
Distance to Point (ft)
0
0.5
1
1.5
2
2.5
3
3.5
4
4.5
5
Wind Speed (mph)


Distance to Point (ft)
30
20
10
0
34
37
40
43
46
49
52
55
58
60
63
66
69
72
75
Temperature (F)


40
30
20
10
0
Distance to Point (ft)
Control
Dense
Moderate
Hunt Path Treatment


125
100
75
50
25
0
Time to Point (sec)
Control
Dense
Moderate
Hunt Path Treatment

Naïve Kill Rate

$a_t = v_t * h_t * w_t$ 96. 4 acre = (3500 ft/hr * 3 hr * 40 ft) / 43, 560 $ft^{2/ac}$

$p_t = a_t / A$ 0.385 = 96. 4 acre / 250 ac

$K_t = m_t * p_t * (N_t * / c_t)$ 13 = 1.25*0.38*((250*1.5)/14)

However…

- Overlap of the dog track
- Dog endurance
- This ignores behavioral response of coveys to hunters over space and time (see next talks)

Questions?

TALL TIMBERS

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GAMEBIRD AND MANAGED ECOSYSTEM LAB
"TENACITY FOR VALIDITY"