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*Wildlife Research*

### Supplementary Material

#### **Can non-invasive methods replace radiocollar-based winter counts in a 50-year wolf study? Lessons learned from a three-winter trial**

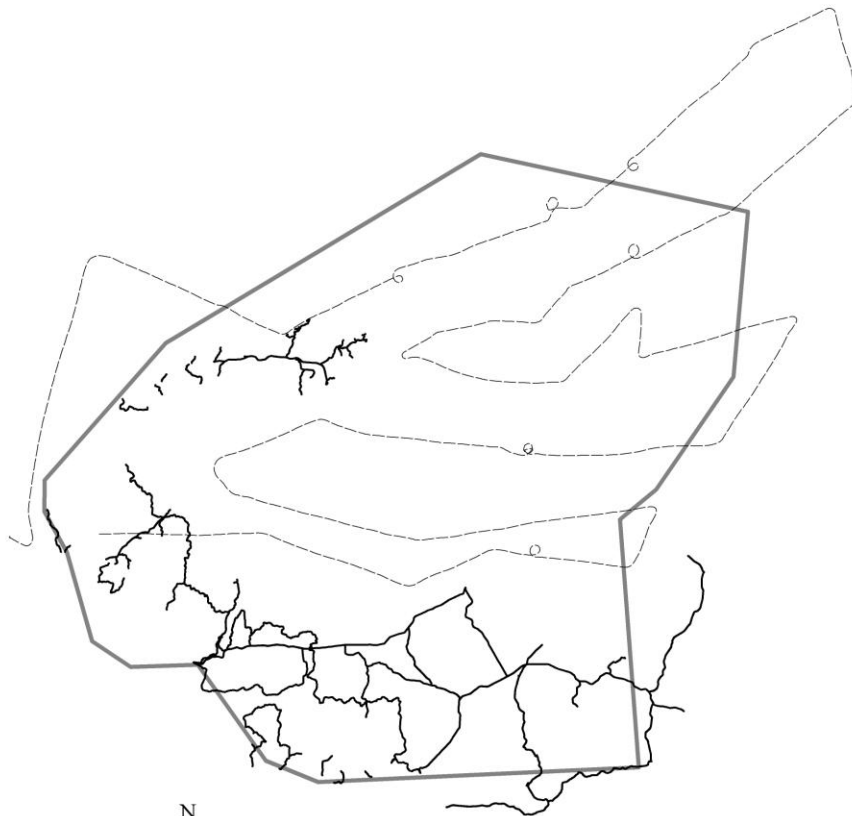
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Fig. S1. Aerial wolf snow-tracking route (dashed gray line) during winter 2021 and ground snow-tracking routes (solid black line) overlaid on the study area (solid gray line) in the Superior National Forest in northeastern Minnesota, USA.

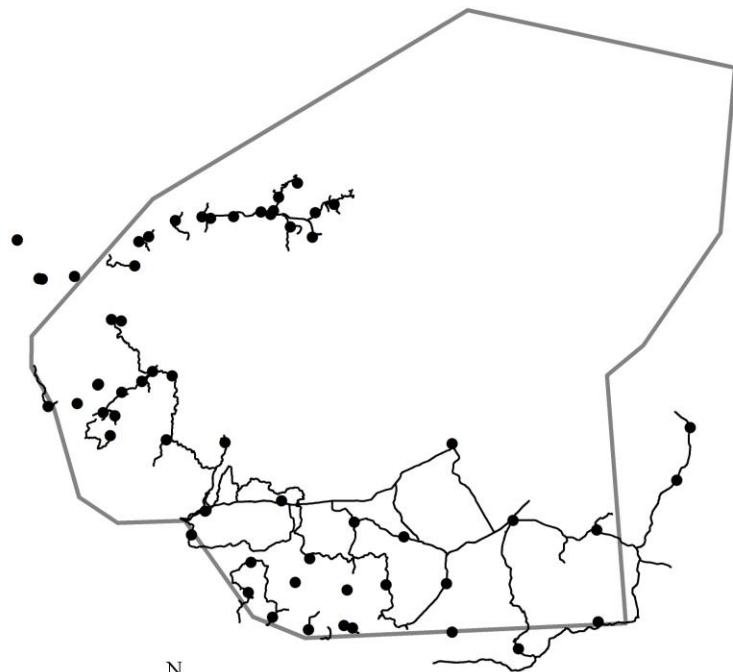


0 5 10 20 Kilometers

### Legend

- Aerial snow-track survey
- ▭ Wolf study area
- Ground snow-track survey

Fig. S2. Camera-trap locations (circles) during winter 2021 and ground snow-tracking routes (solid black line) overlaid on the study area (solid gray line) in the Superior National Forest in northeastern Minnesota, USA.

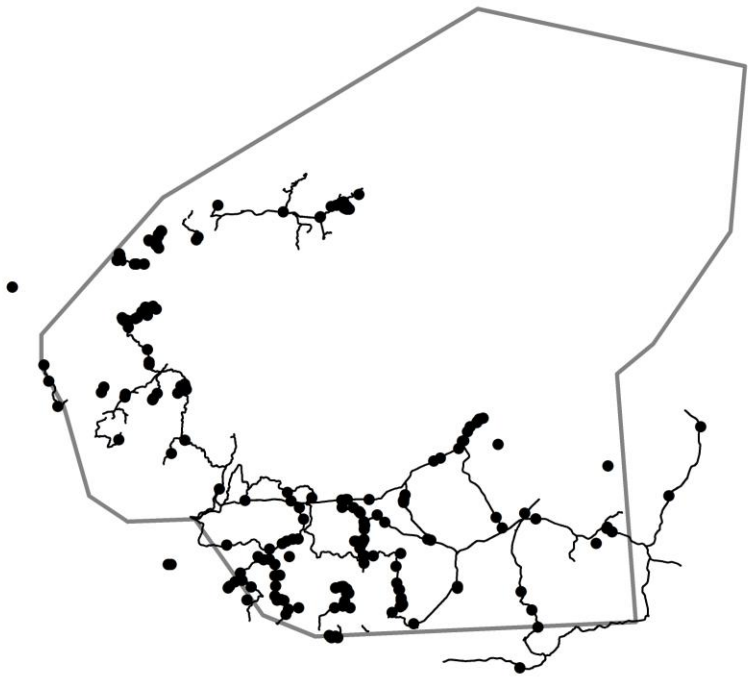


0 5 10 20 Kilometers

**Legend**

- Camera locations
- Wolf study area
- Ground snow-track survey

Fig. S3. Locations of wolf sign observations made (circles) during winter 2020 while conducting ground snow-tracking surveys (solid black line) and deploying cameras overlaid on the study area (solid gray line) in the Superior National Forest in northeastern Minnesota, USA.

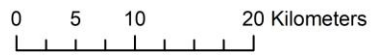


**Legend**

- Ground observations
- Wolf study area
- Ground snow-track survey

Fig. S4. Locations of wolf scats opportunistically collected (circles) during winter 2019 ground snow-tracking surveys (solid black line) overlaid on the study area (solid gray line) in the Superior National Forest in northeastern Minnesota, USA.





**Legend**

- Scat collected
- Wolf study area
- Ground snow-track survey