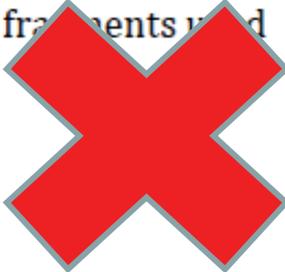


Pronghorn Monitoring in the Pinedale Anticline Project Area

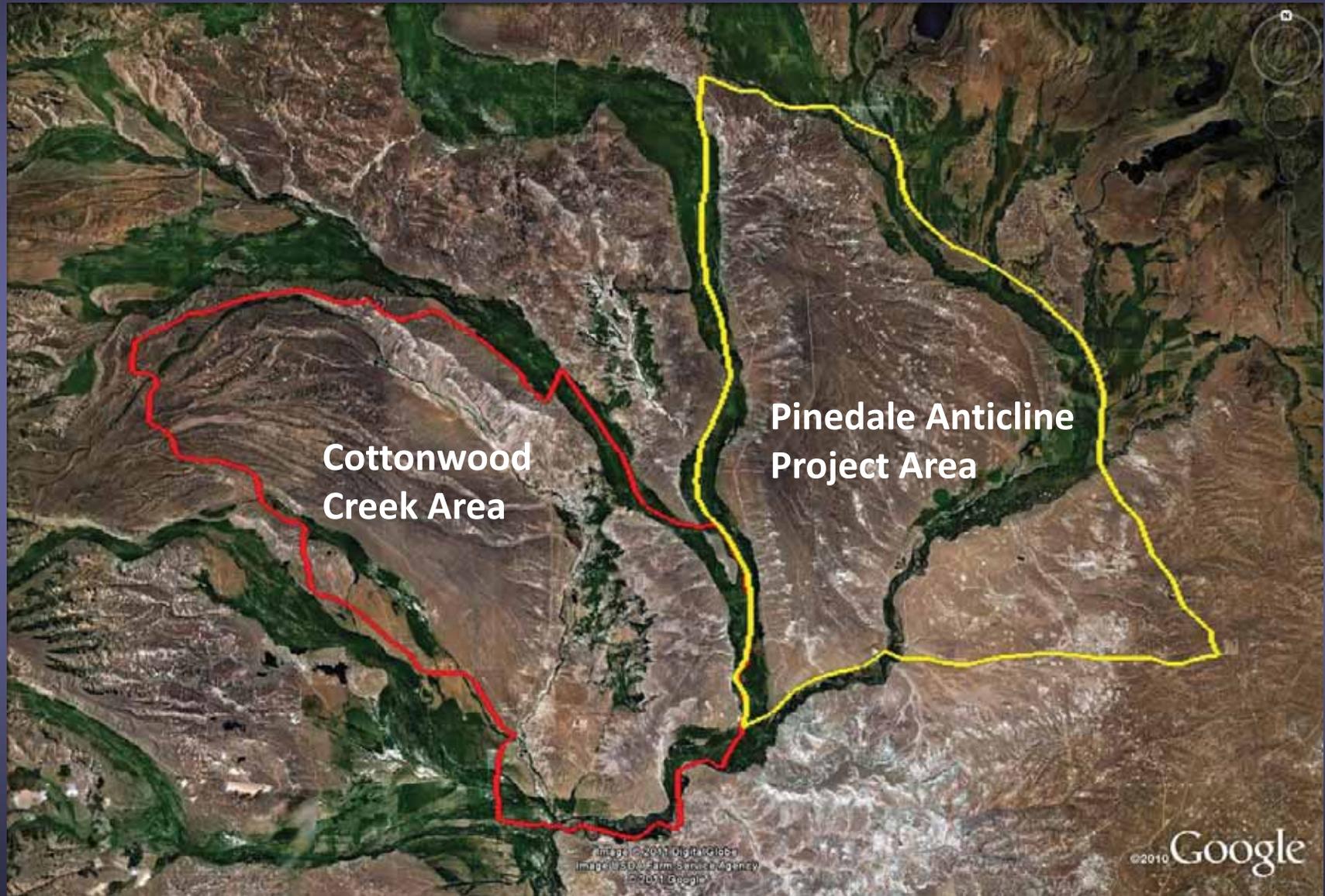
Ryan Nielson and Hall Sawyer



Wildlife Monitoring and Mitigation Matrix (WMMM)

Criteria	Method	Changes that will be monitored	Specific change requiring mitigation
Change in Anticline antelope numbers	Present WCS antelope study; Present TRC project and use of WGFD data	Change in antelope numbers in any year, or a cumulative change over all years, initially compared to first year of available antelope data	15% decline in any year, or cumulatively over all years, compared to reference area (Sublette antelope herd unit or other, mutually agreeable area)
Size of habitat fragments used 		Use by antelope in any year initially compared to first year of available antelope data, and use data to determine current change in antelope numbers compared to first year of available antelope data 	10% decline in habitat availability for any year, and a cumulative 10% change in antelope numbers in any year, compared to reference area (Sublette antelope herd unit or other mutually agreeable area). 

Study Areas

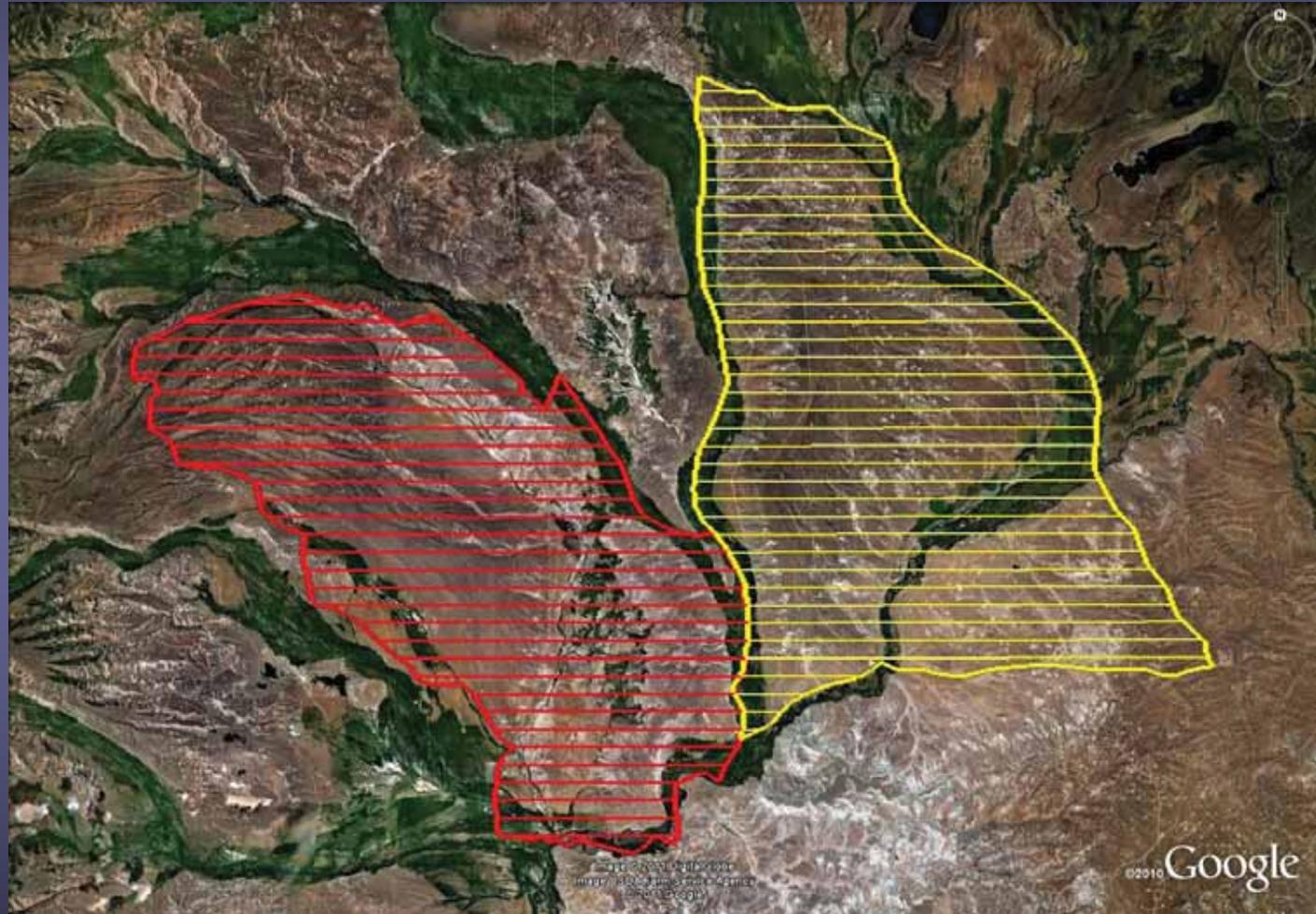


Pronghorn Monitoring

- Focus on winter months (Jan – Mar)
- 2009 – 2010 was first winter of monitoring under the WMMM
- Conducted aerial surveys (near census) to monitor abundance
- Ground surveys for age & sex ratios
- GPS collars on 30 adult females
 - Monitoring habitat use
 - Identifying migration corridors
 - Monitoring survival

Monitoring Abundance

- Fixed-wing flights (~400 ft. AGL) along transects spaced at ½-mile intervals
- GPS pronghorn groups
- Count groups
 - if >50 then film



Monitoring Abundance



Monitoring Abundance



Count = 165

Monitoring Abundance

- Each image/video was viewed by 2 independent observers
- When counts were not equal, we consulted until an agreement was reached
- 1 survey in Jan
- 1 survey in Feb
- No survey in Mar due to poor snow cover

Monitoring Abundance: Results

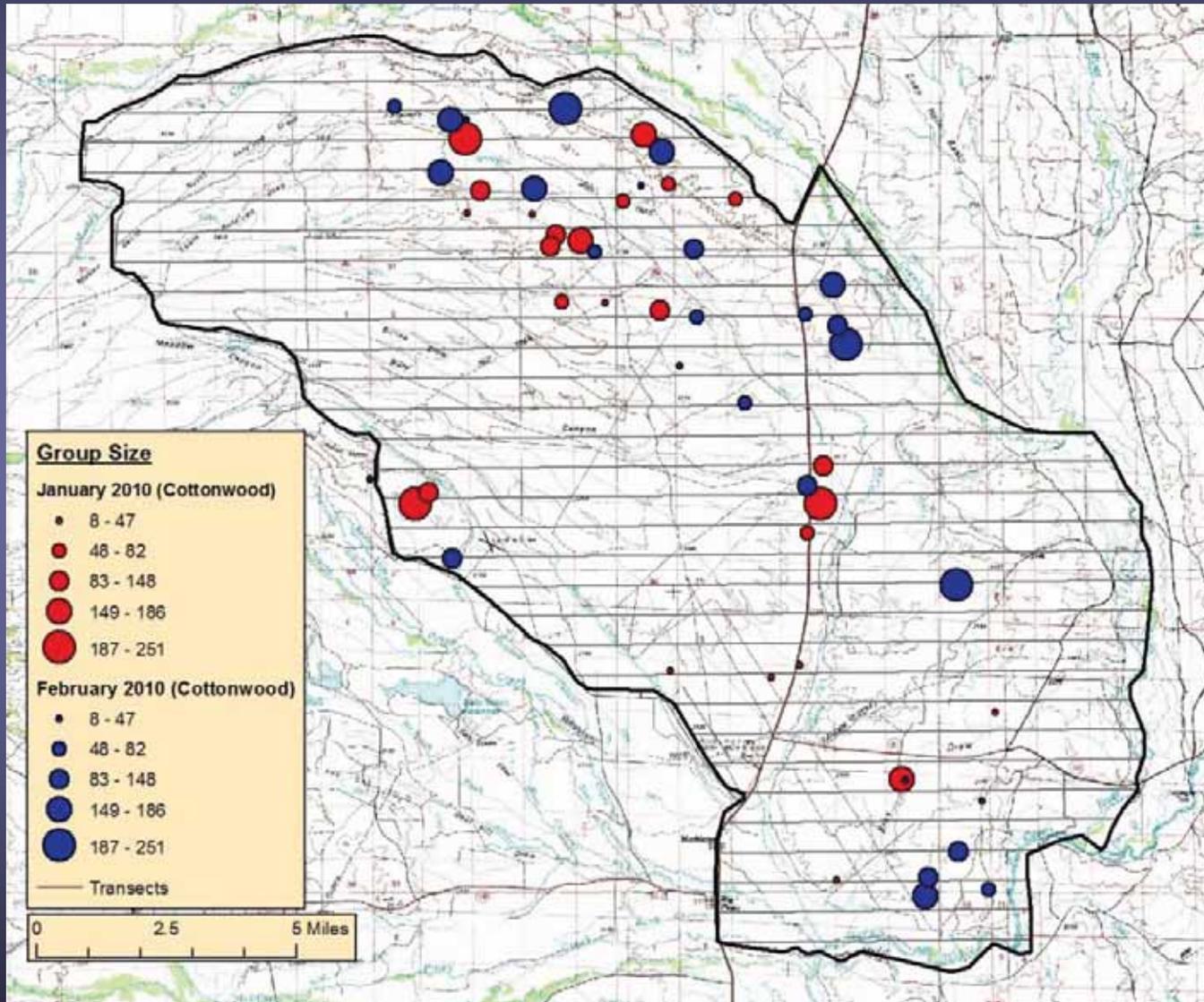
Cottonwood Creek Area

- January
 - 2,683 in 26 groups
- February
 - 2,802 in 28 groups

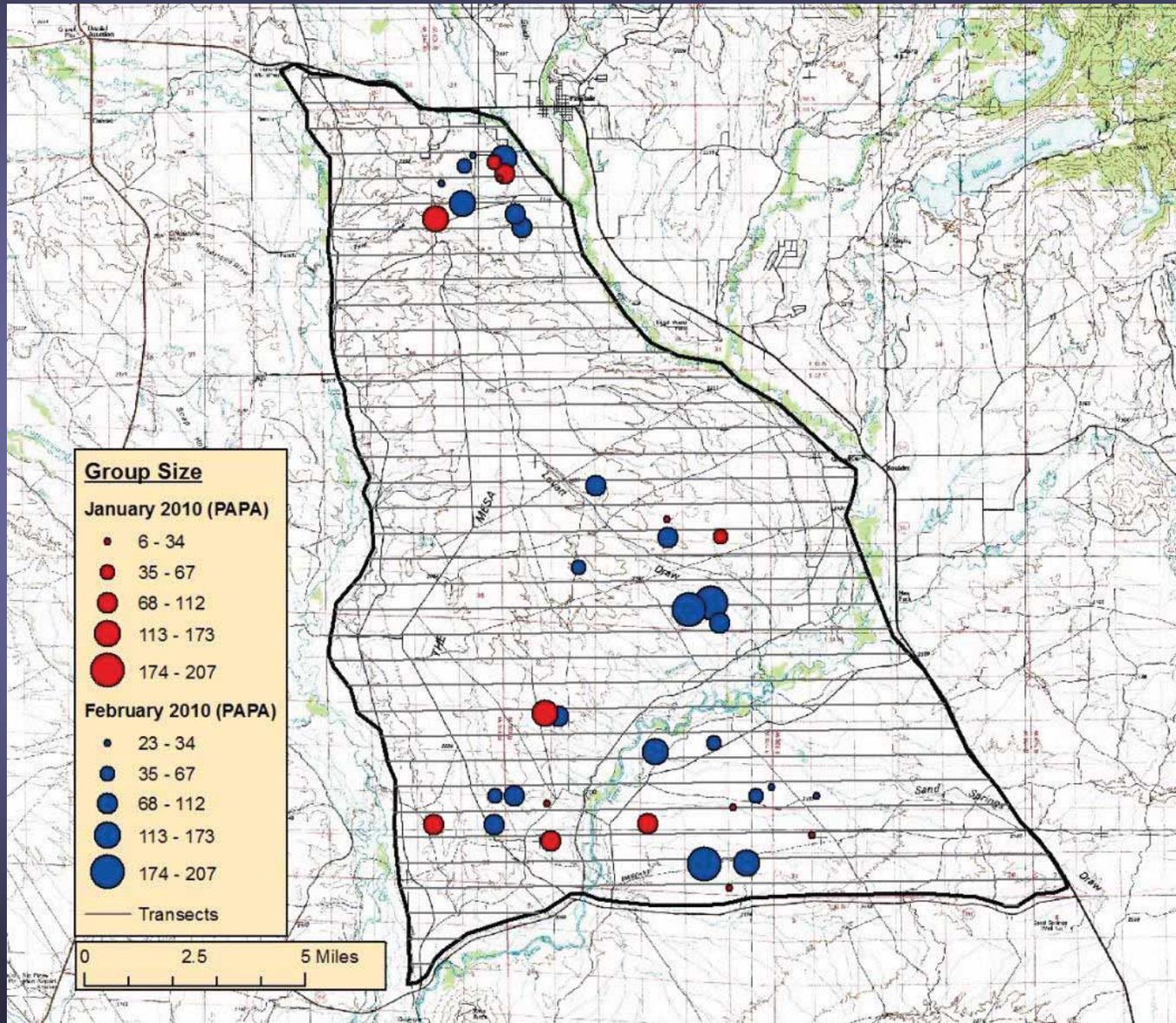
PAPA

- January
 - 775 in 14 groups
- February
 - 2,291 in 24 groups

Monitoring Abundance: Results



Monitoring Abundance: Results



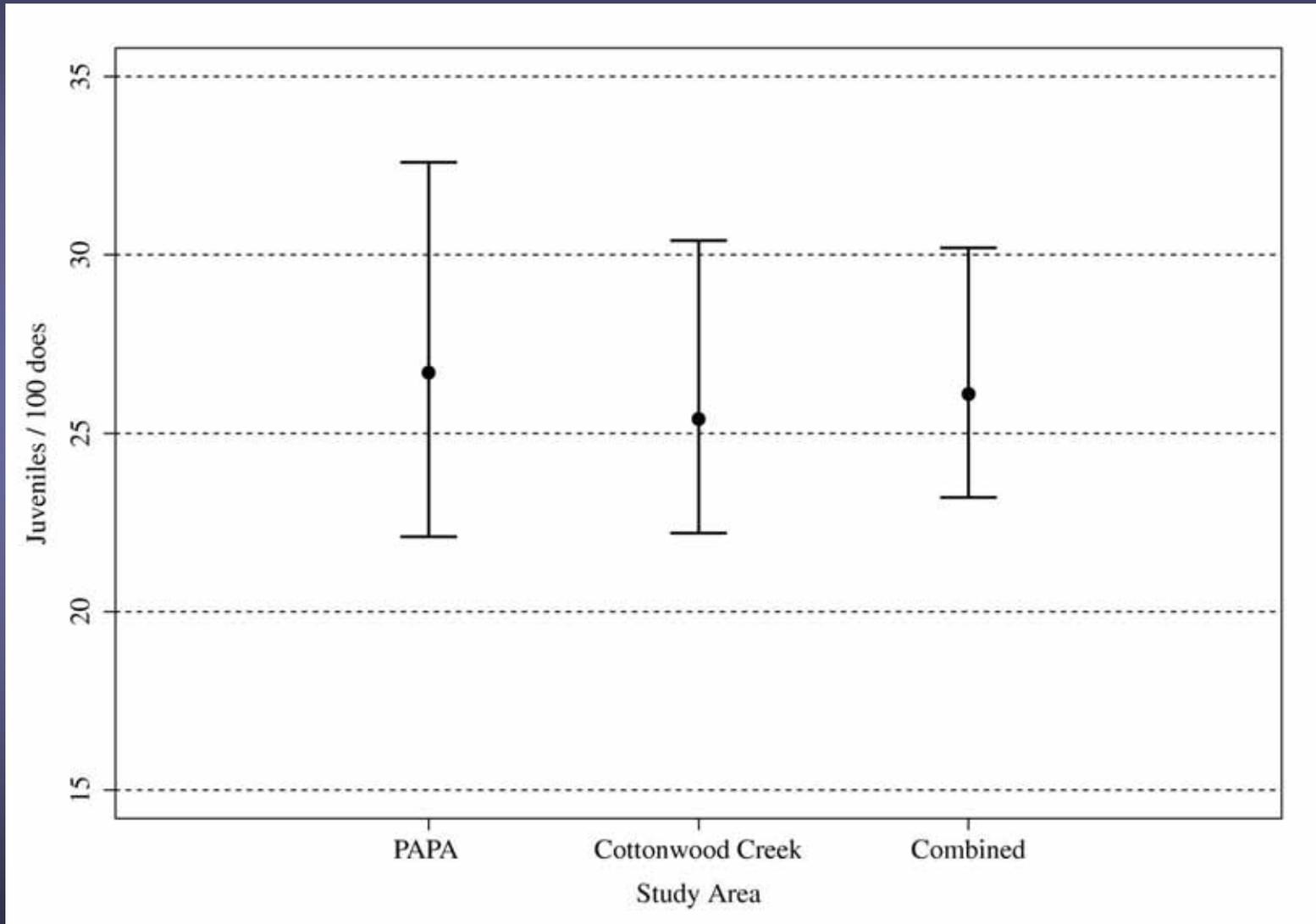
Monitoring Abundance

- Key assumptions
 - Few if any groups missed
 - No groups were double-counted
 - Group size counted accurately
- Multiple surveys each winter provide estimates of variation

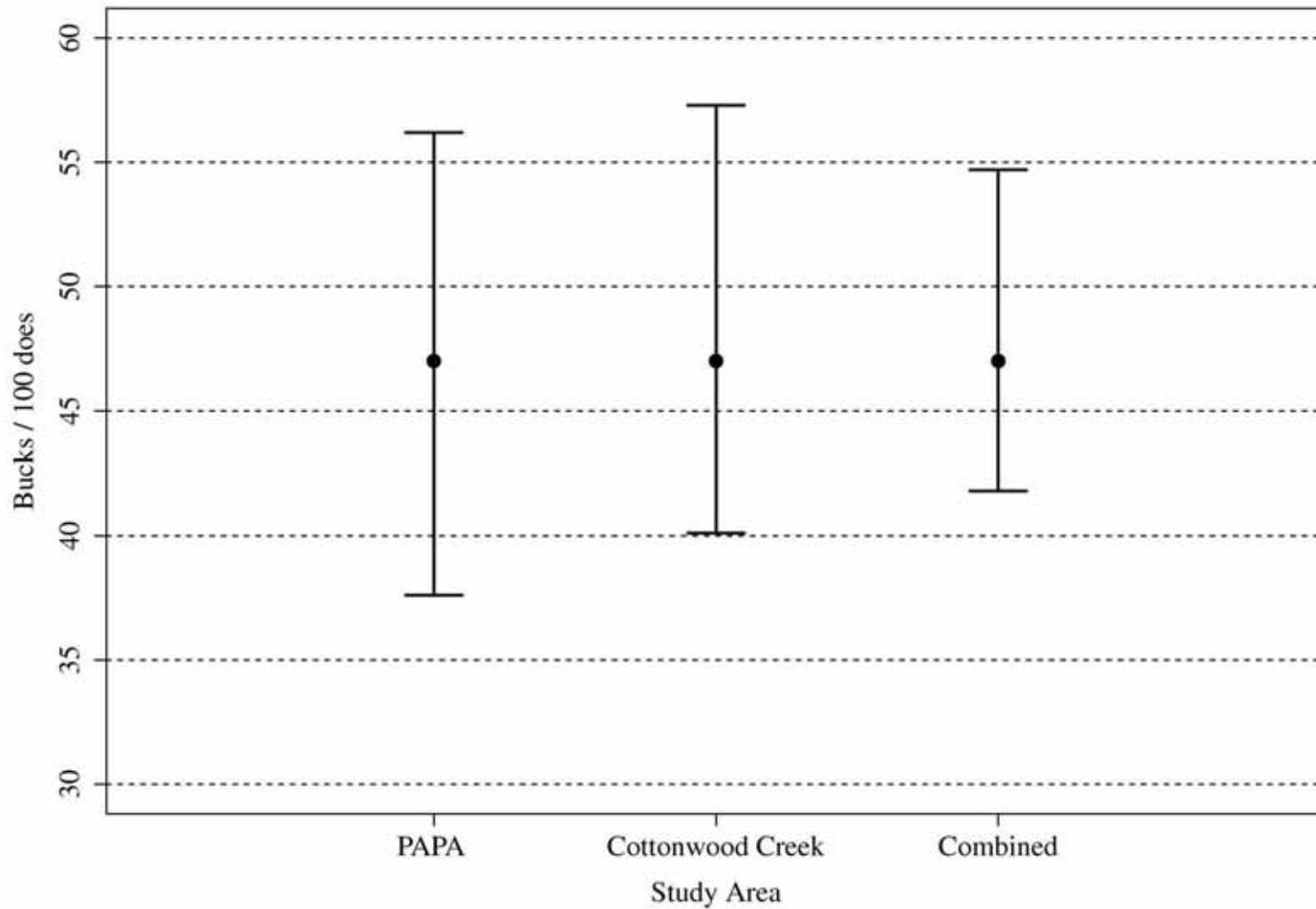
Age/Sex Ratios

- A minimum of 400 animals were classified in each area during each survey (Jan and Feb)
 - Estimates of
 - # juveniles / 100 does
 - # males / 100 does

Age/Sex Ratios



Age/Sex Ratios



GPS Collars

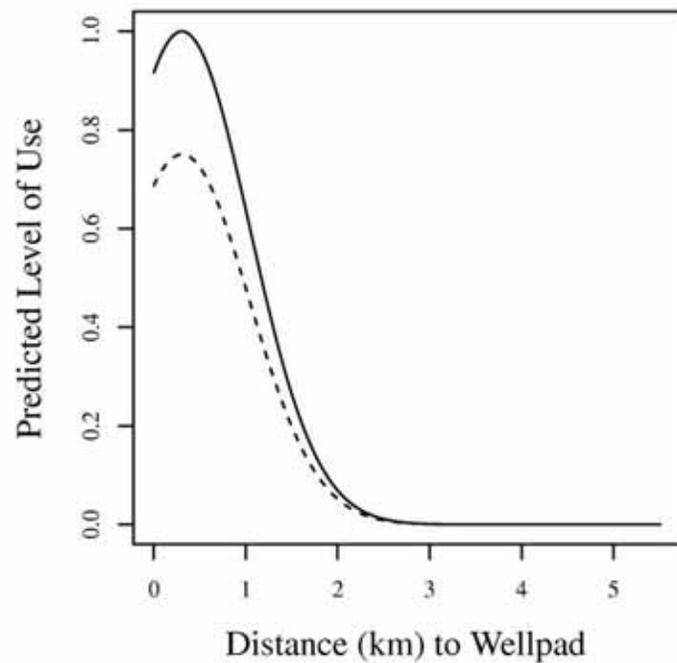
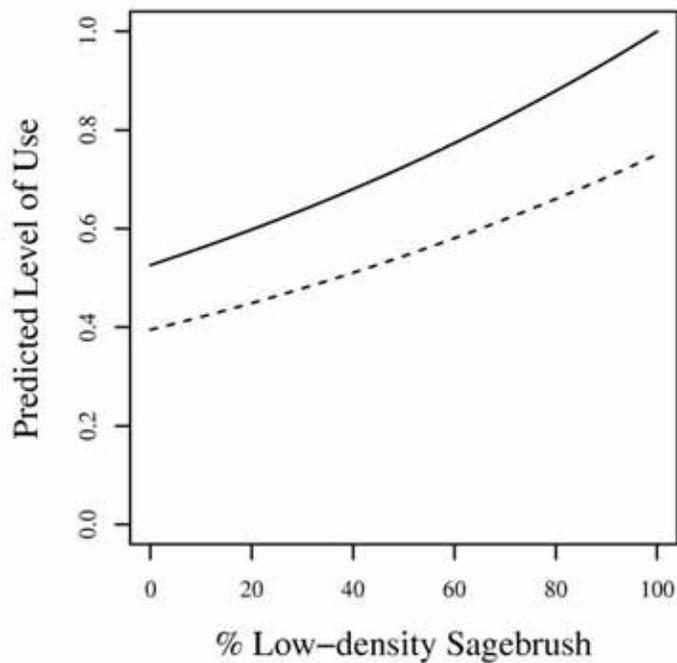
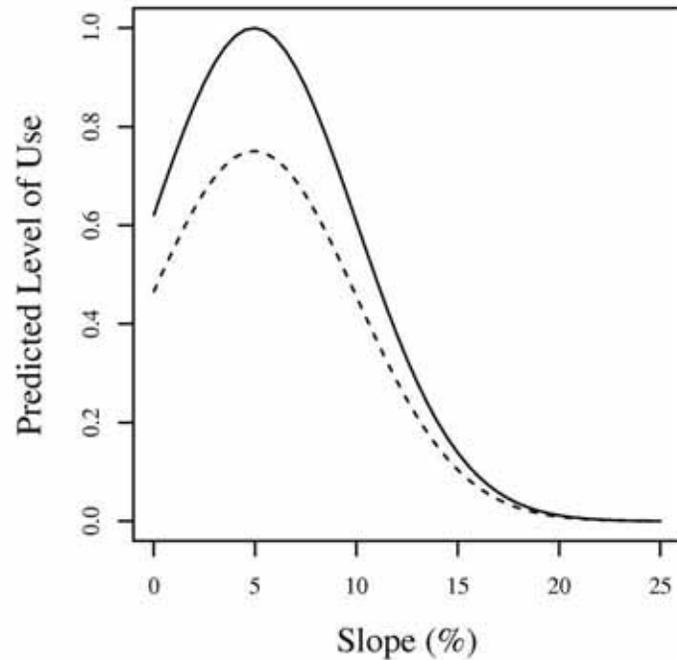
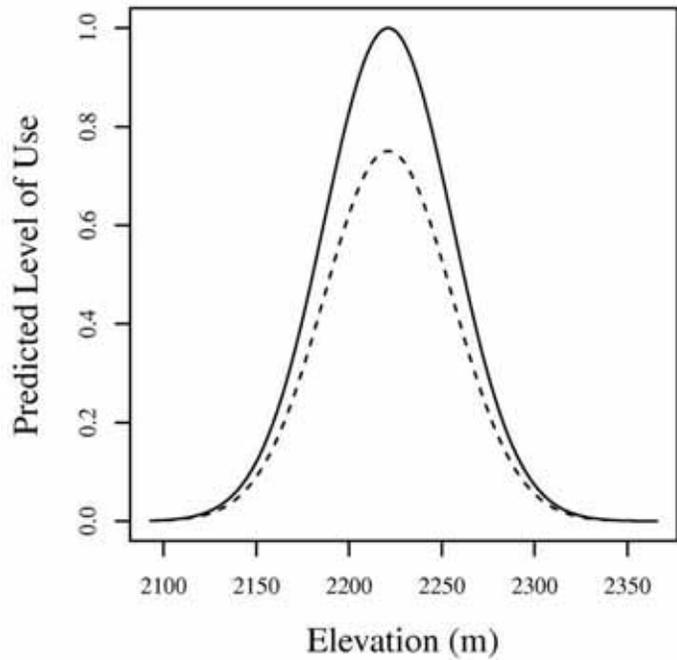
- 15 in PAPA and 15 in Cottonwood Creek Area
 - 14 recovered from PAPA and 13 recovered from Cottonwood Creek
- Recorded locations every 3.5 hours
- Highly accurate (within 20m) and consistent information on habitat use and movement
- A small sample for estimating survival rates

Habitat Use

- RSF modeling indicated that in the 2009-10 winter, pronghorn on the PAPA were selecting for areas...
 - at elevations around 2300 m,
 - with moderate slopes (4.9%),
 - higher % low-density sagebrush,
 - on south and east facing aspects, and

Habitat Use

- RSF modeling indicated that in the 2009-10 winter, pronghorn on the PAPA were not negatively affected by gas field infrastructure.
- Other studies suggest herding animals may alleviate the effects of perceived risk by aggregating into large groups

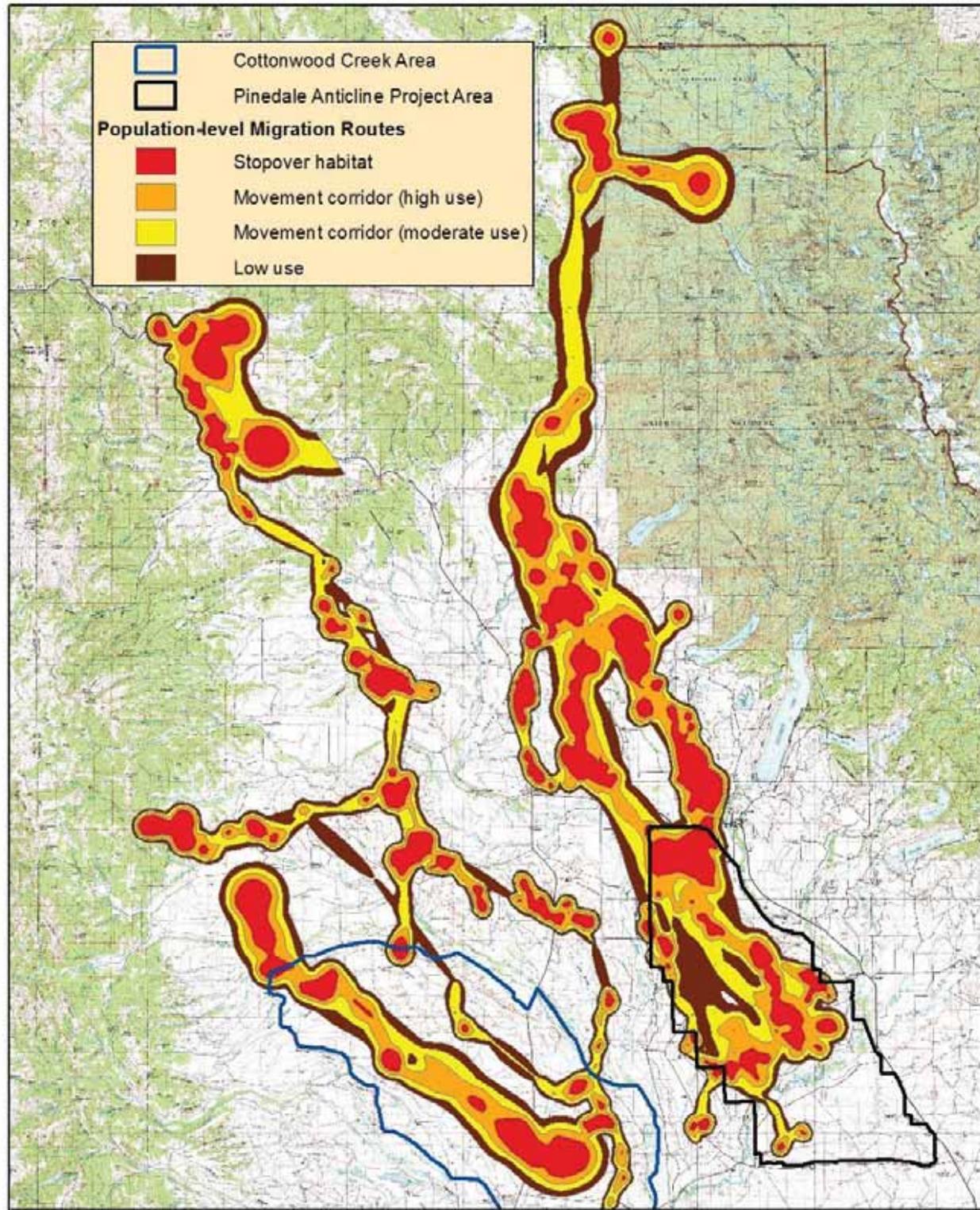


Solid lines
represent S and
E facing slopes

Dashed lines
represent N
and W facing
slopes

Migration

- Brownian bridge movement model was used to estimate migration routes
 - 9 animals from PAPA and 9 animals from Cottonwood Creek displayed clear seasonal migrations
 - Others were non-migratory/nomadic



Survival

Cottonwood Creek Area

- 13 collars recovered
- 10/13 survived Dec 2009 to Nov 2010
- 78.6% survival

PAPA

- 14 collars recovered
- 13/14 survived Dec 2009 to Nov 2010
- 92.8% survival

Survival

- Sample sizes are extremely small for estimation of survival
- If just 2 collars disappear, this can have a large effect on survival estimates

Ongoing/Future Work

- Continued with same approach in 2010-11
 - Report will be presented to the PAPO for review spring 2012
- Plan to continue in the 2011-12 winter, with one modification
 - Keep GPS collars on for 2 years rather than 1



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