Wildlife Use of Future Wildlife Mitigation Structures on a Highway in South Texas

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INTRODUCTION

- Roads can have a major impact on wildlife, causing habitat fragmentation and direct mortality from vehicle collisions
- Wildlife crossing structures (WCSs) can help reduce wildlife road mortality and promote habitat connectivity
- Important to know how wildlife used locations before construction to assess how effective WCSs and other mitigation structures are
- Texas Department of Transportation began construction of WCSs and wildlife guards (WGs) on Farm-to-Market 1847 (FM 1847) in Cameron County, Texas to reduce threats of roads to ocelots (*Leopardus pardalis*) in February 2020

OBJECTIVE

- Assess baseline wildlife use of planned wildlife mitigation structures on FM 1847 in Cameron County, Texas
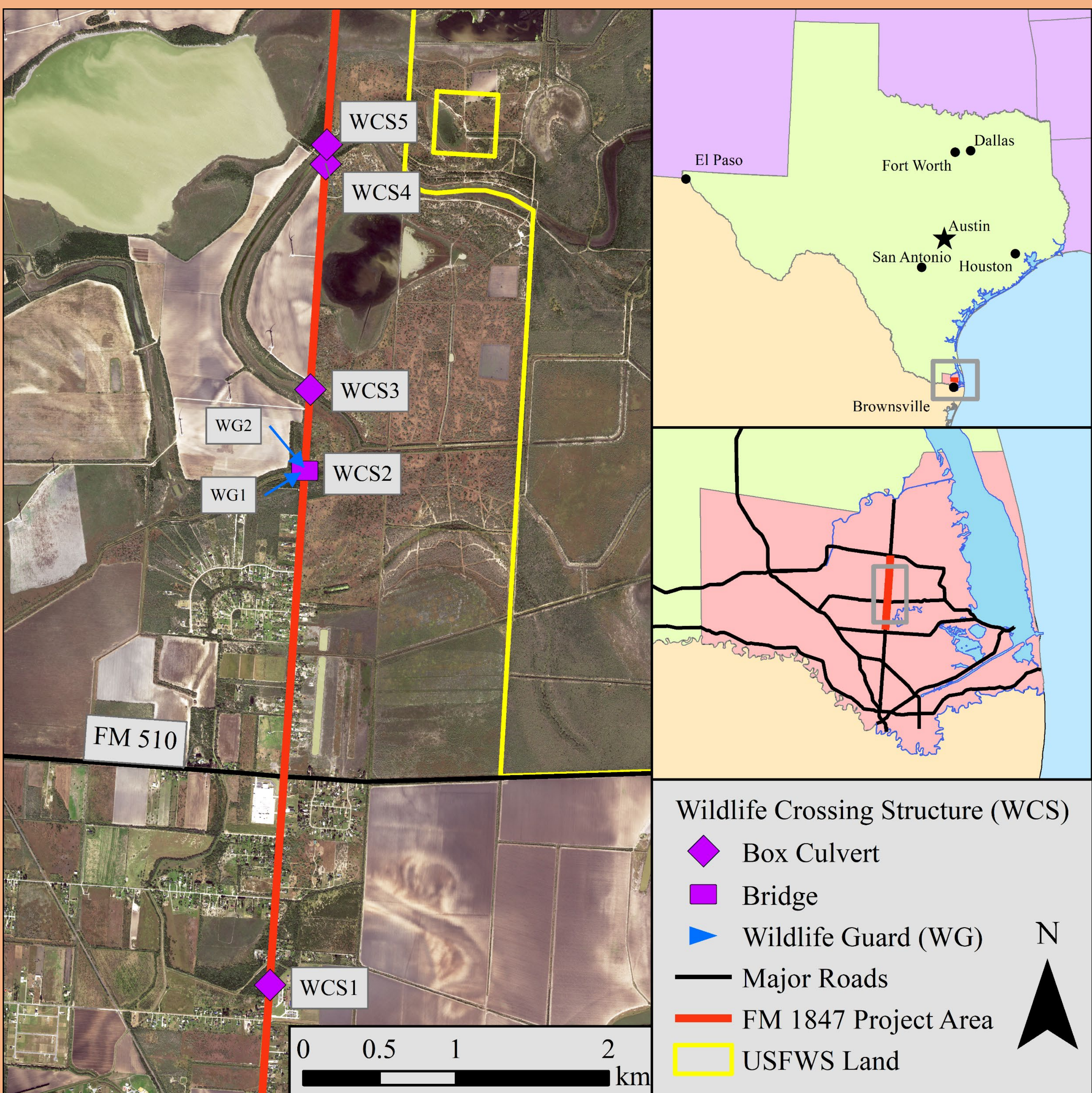

Fig. 1: Study area showing the locations of the planned wildlife mitigation structures on Farm-to-market 1847 in Cameron County, Texas

METHODS

- Camera Monitoring
  - Reconyx Hyperfire 2 camera traps were set up along FM 1847 at planned wildlife mitigation structures including WCSs and WGs (Fig. 1, Fig. 2)
  - Monitoring occurred from July 2019 to January 2020

- Statistical Analysis
  - Number of independent events determined using a 30-minute interval
  - Diel activity estimated for mammal species with > 70 independent events
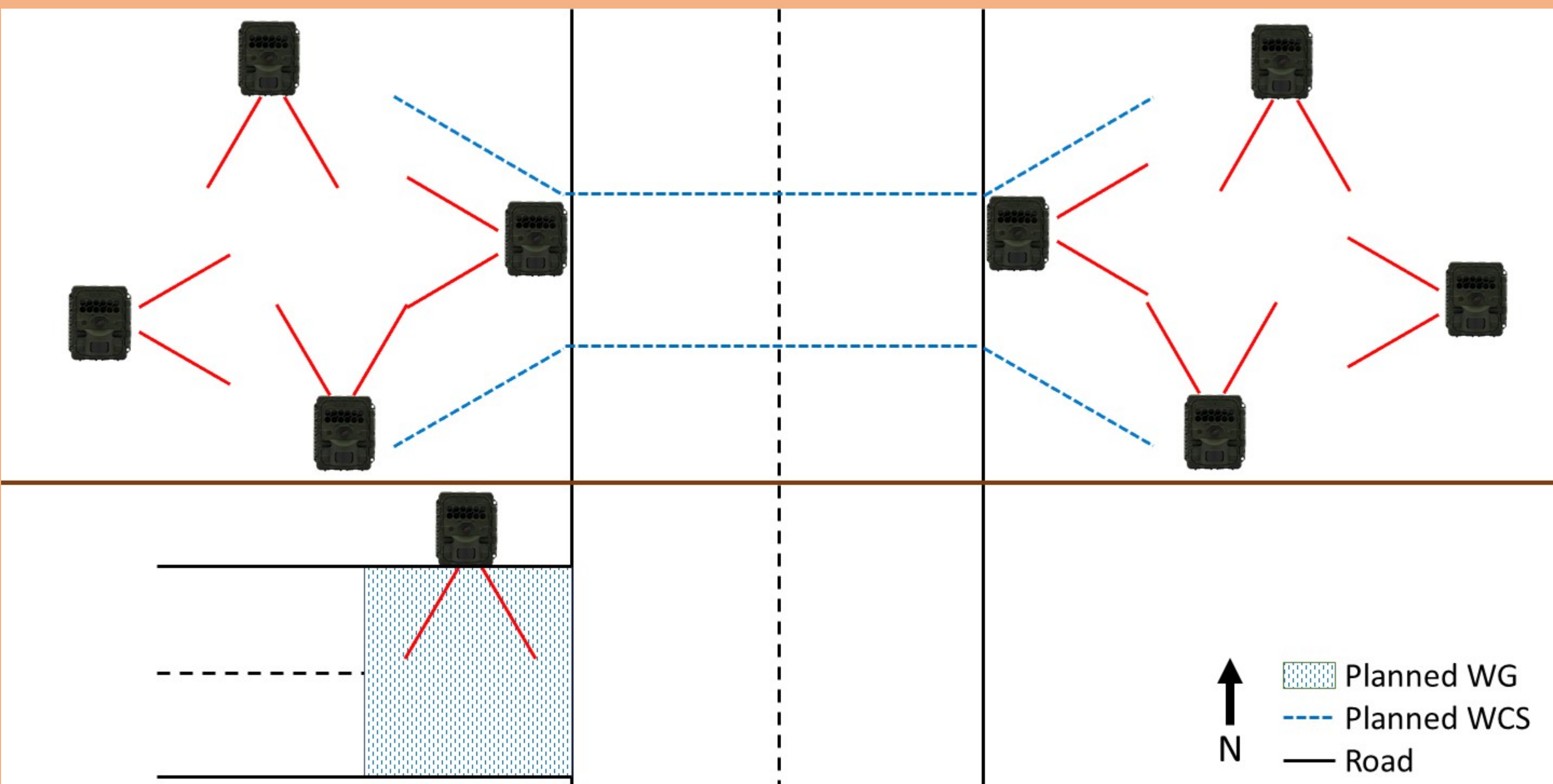   - Conducted using the *Activity* package in R

Fig. 2: Placement of camera traps at planned WCSs (top) and WGs (bottom) on FM 1847. Four cameras were placed on each side at WCSs and one camera was placed at WGs
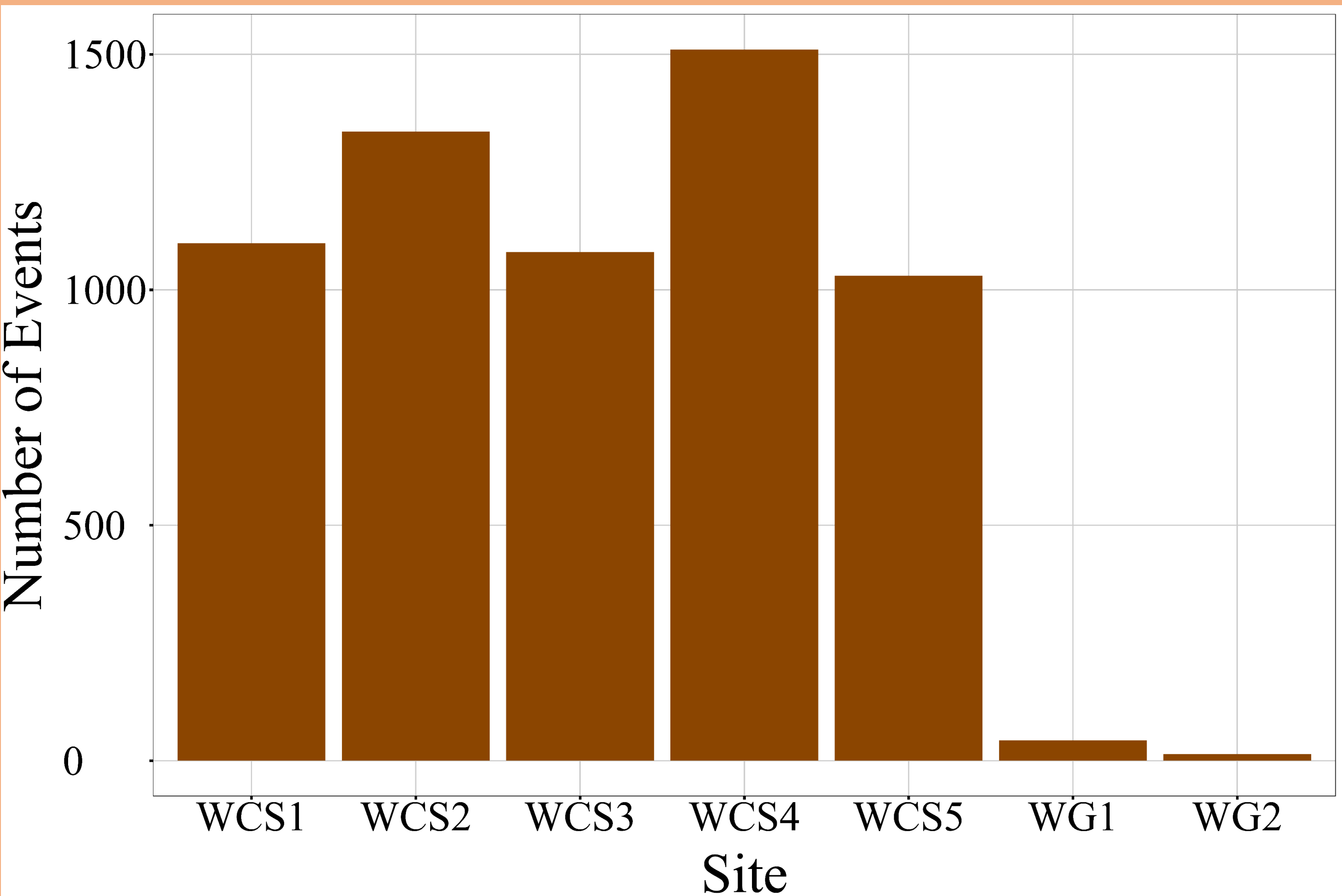

Fig. 3: Number of wildlife detections at planned WCSs and WGs on FM 1847

Table 1: Number of detections of each species at each planned WCS and WG on FM 1847

Species	WCS1	WCS2	WCS3	WCS4	WCS5	WG1	WG2	Total
Virginia opossum	448	687	250	155	197	22	3	1762
Rodent	50	165	162	649	403			1429
Eastern cottontail		71	96	414	284	7	3	875
Bird	238	31	130	105	43	1		548
Unknown	18	99	74	92	17			300
Domestic cat	274	3	2	5	2	1	1	288
Northern raccoon	27	97	124	2	20	1		271
Bobcat		116	35	11	24	3	3	192
White-tailed deer		42	111	25	2	1		181
Nine-banded armadillo	41	2	37	43	34			157
Coyote		14	21		4	7	4	50
Domestic dog	3	5	16	2				26
Nilgai			14	1				15
Mexican ground squirrel		1		4				5
Unk Snake			5					5
Javelina		2						2
Unk Frog	1	1						2
Unk Lizard			1	1				2
Feral hog			1					1
Texas tortoise				1				1
Total	1099	1336	1080	1510	1030	43	14	6112

RESULTS

- Planned WCSs were monitored for 195 trap nights and planned WGs were monitored for 135 trap nights
- 6055 events of wildlife detected at planned WCSs and 57 events at planned WGs (Fig. 3)
  - 14 species of mammal detected at WCSs & 6 mammals at WGs (Table 1)
  - Virginia Opossum, rodents, and eastern cottontails were the most common species detected at WCSs
- Bobcats detected at 4 of 5 planned WCS locations & both planned WGs
- Most species showed nocturnal or crepuscular activity (Fig. 4)
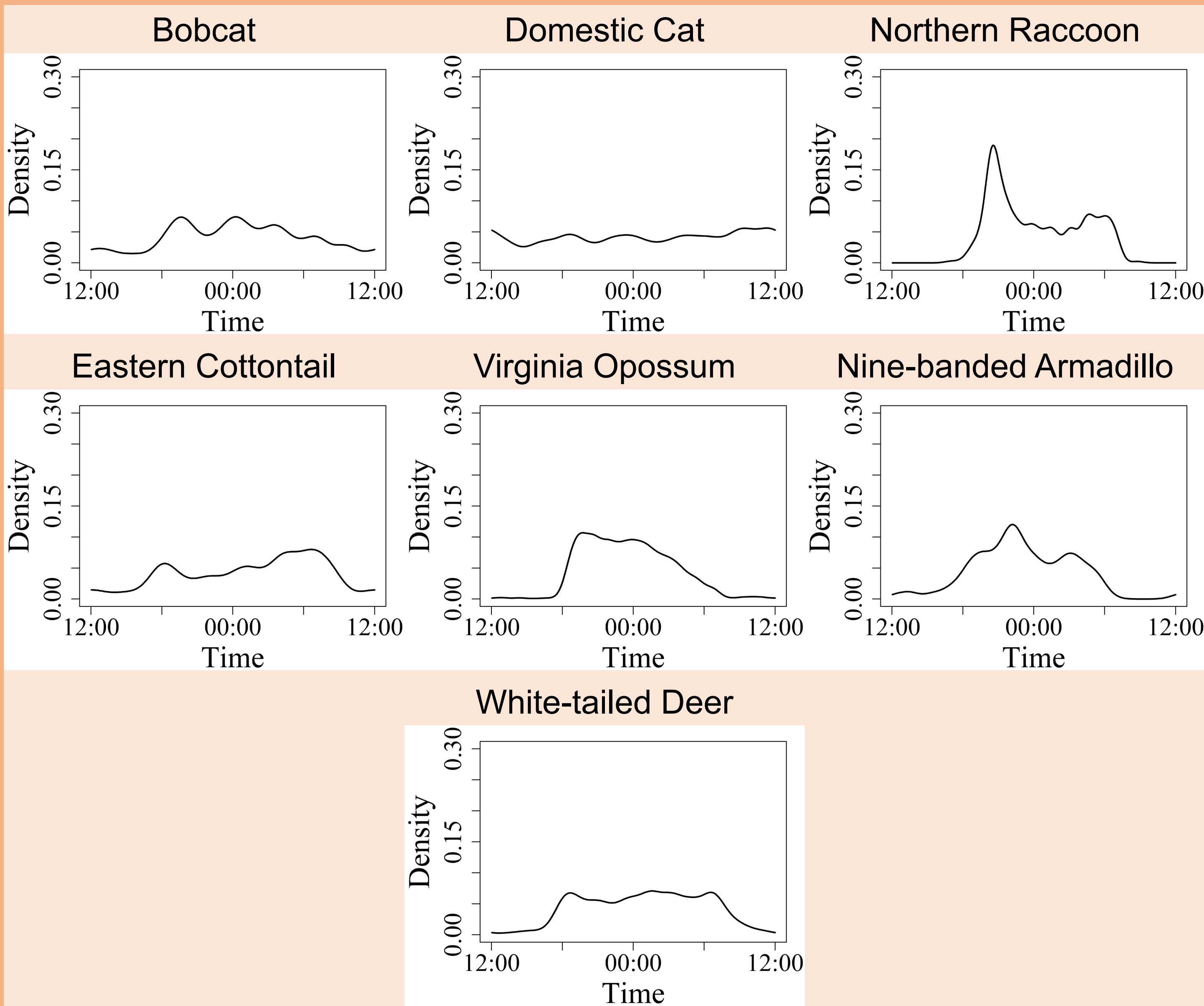

Fig. 4: Diel activity of mammal species which had >70 independent events at planned WCSs combined on FM 1847

CONCLUSIONS AND FUTURE DIRECTIONS

- Results form a baseline usage for comparison once mitigation structure construction is completed
- Part of a long-term monitoring project of wildlife mitigation structures on FM 1847
- Continue monitoring WCSs and WGs after they are constructed to assess how wildlife usage has changed
- Assess how wildlife road mortality changes with construction of mitigation structures
- Determine how vehicle traffic, noise, and nighttime light impact wildlife use of the road area and mitigation structures

ACKNOWLEDGEMENTS