Introduction

The 2008 Record of Decision for the Supplemental Environmental Impact Statement (SEIS) for the Pinedale Anticline Oil and Gas Exploration and Development Project Sublette County, Wyoming (ROD) requires monitoring of specific wildlife populations and habitat use following the Wildlife Monitoring and Mitigation Matrix (Matrix). The Pinedale Anticline Project Office (PAPO) selected qualified contractors to monitor wildlife in the Pinedale Anticline Project Area (PAPA) and adjacent reference areas. Evaluation of wildlife habitat use in the Pinedale Anticline Project Area (PAPO) was designed to include consideration for winter snow conditions and traffic volumes.

Data collected for traffic volumes and snow depth may be included in analysis for all PAPA Matrix species being monitored and also provides the PAPO with a means to measure mitigation effectiveness. Analysis of mule deer and pronghorn habitat use includes a Resource Selection Function Model following that of Sawyer et al. (2006, 2007, 2009*a*, 2009*b*), where the animal is treated as the experimental unit and probability of use is estimated as a function of habitat variables with snow being one of those variables. The analysis for pronghorn habitat use incorporates winter severity (including snow depth), and response to selected development features that may vary depending on winter conditions.

August 2009, Asset Environmental Services II L.L. C (Asset) was contracted to quantitatively monitor and report traffic volumes within the PAPA and quantitatively monitor and report snow depth within the PAPA and associated reference areas (attachment A). Asset performed monitoring from November 1, 2009 through May 31, 2010. Asset provided all monitoring data to the PAPO and Western EcoSystems Inc (contractor selected for pronghorn and mule deer monitoring in 2009) and coordinated with the PAPO in the selection of monitoring routes, specific monitoring locations and timing of data collection.

Traffic Monitoring Methods

Asset installed Trailmaster® TM 1550 active infrared sensors similar to those utilized in previous monitoring efforts (for consistency with previous years' data). These sensors were installed in early November to monitor traffic at 60 PAPO-selected locations within the PAPA. Traffic sensors remained active until May to monitor human activity levels throughout the field, recording hour and date for each event. Asset set each sensor at a sensitivity level which requires the infrared beam to be broken for approximately 0.30 seconds before a hit would be recorded, and a delay between hits of approximately 6-8 seconds (Beckman et al. 2008). These settings reduce the probability of recording multiple hits for trucks hauling trailers or hits caused by passing wildlife. Asset implemented a quality assurance/quality control (QA/QC) program to identify recorded events that may be caused by erroneous events such as snow plows, road graders, extreme weather, etc. which could cause numerous events (Nielson and Sawyer 2006). Traffic monitoring equipment was downloaded every 7 -10 days and examined for QA/QC (sensor data was compared to visual occurrences to check for hit accuracy).

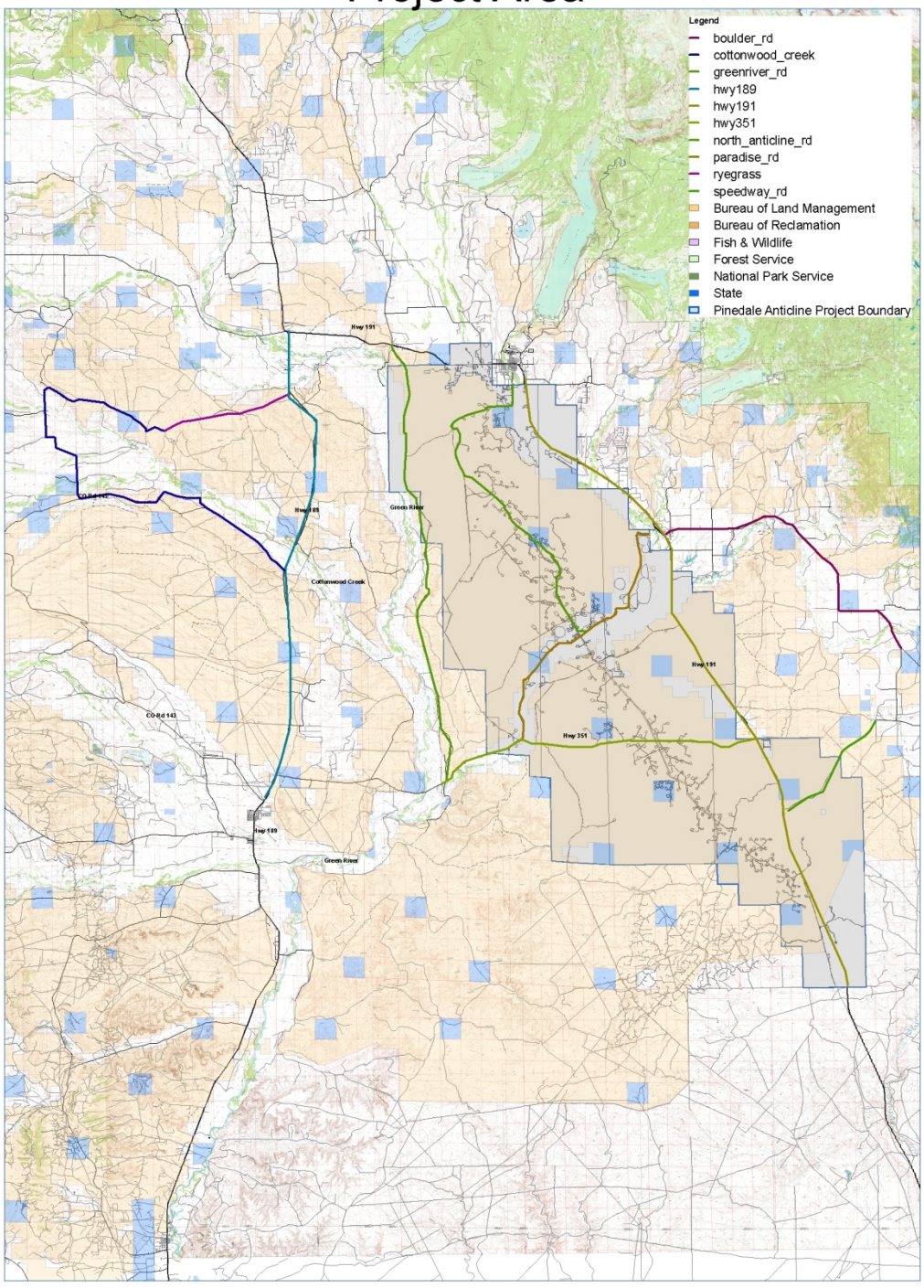
Snow Monitoring Methods

Asset personnel installed fixed snow measuring devices in early November to monitor snow depth accumulations at 60 PAPO - approved locations within the PAPA and reference areas. Asset personnel monitored these devices every two (2) weeks, concurrently while downloading traffic counter data, from November through April (or until snow melt). Snow measuring devices were installed to include representations from the following aspects: North, South, East, West, Ridge, and Drainage.

Asset personnel installed snow measurement sticks (secured via heavy anchoring devices) with large enough numbers to be read through binoculars or spotting scope from the access road. Standard measurements were taken in a prescribed consistent manner. Measurements were recorded in inches. Significant weather events and snow depth differences between visits were also recorded for each station.

Attachment A

Snow Monitoring Routes and Traffic Monitoring Project Area



2009-10 Monthly Traffic Summary

Stewart Point	Unit Number	January	February	March	April	May	season total per location
	40	25.8	4.0	4.3	6.3	22.1	62.5
	41	3.5	6.2	3.2	1.6	2.6	17.1
	50	14.4	30.3	33.1	30.1	42.0	149.8
	51	9.8	3.2	3.0	2.2	2.5	20.8
	52	2.0	1.1	1.1	3.6	1.0	8.8
	53	2.5	2.3	3.4	6.8	2.6	17.7
	54	0.3	0.2	0.3	0.0	3.6	4.4
	55	9.3	12.1	13.9	11.1	56.1	102.5
	56	1.4	1.7	2.1	2.2	3.8	11.2
	57	0.5	0.4	0.5	0.3	0.4	2.1
	58	2.0	1.5	2.3	3.1	1.5	10.6
	59	5.3	4.0	4.3	5.4	6.4	25.2
	60	10.4	12.5	16.2	13.0	39.1	91.3
		87.4	79.5	87.7	85.7	183.8	
						Season Total	524.0

Development Area 1	Unit Number	January	February	March	April	May	season total per location
	20	23.3	24.0	16.8	34.6	68.3	166.9
	21	4.0	2.9	4.8	1.8	2.4	15.9
	22	21.7	18.3	17.3	22.3	21.7	101.3
	28	84.1	83.4	93.5	97.8	156.1	515.0
	29	3.7	4.1	3.3	2.4	5.5	19.0
	30	1.7	1.6	1.6	1.9	1.1	7.9
	31	4.9	4.7	5.0	5.7	5.1	25.3
	32	49.5	37.2	57.1	65.6	126.2	335.6
	33	9.3	2.5	2.4	3.9	3.9	22.2
	34	16.5	nul	nul	nul	nul	16.5
	35	3.2	4.4	3.3	2.2	3.1	16.2
	36	9.8	13.2	2.3	1.7	3.1	30.1
	37	3.9	1.9	2.0	13.2	2.2	23.2
	38	53.8	58.3	130.4	40.9	34.6	318.1
	39	50.2	76.9	109.7	134.1	72.3	443.2
		339.7	333.5	449.5	428.1	505.7	
						Season Total per Development Area	2056.5

Development Area 2	Unit Number	January	February	March	April	May	season total per location
	1	13.7	9.8	7.7	7.4	7.2	45.8
	2	843.0	614.8	793.8	770.6	511.7	3533.9
	3	5.2	3.7	3.1	3.9	11.8	27.7
	4	72.8	55.7	111.1	70.9	39.8	350.2
	5	122.3	114.2	111.3	134.2	88.5	570.5
	6	31.9	6.4	10.5	14.1	8.6	71.4
	7	3.3	2.9	3.4	3.5	4.1	17.4
	8	5.5	3.5	5.1	3.9	15.2	33.2
	9	65.3	8.1	8.1	7.6	7.1	96.2
		1163.0	819.2	1054.1	1016.0	694.0	
						Season Total	4746.3

Development Area 3	Unit Number	January	February	March	April	May	season total per location
	10	108.0	69.3	64.5	58.1	92.3	392.2
	13	118.6	126.3	122.2	128.1	183.1	678.4
	14	73.2	94.6	95.4	90.8	118.0	472.0
	42	2.5	2.3	2.2	2.4	3.6	13.0
	43	5.2	5.9	4.4	5.1	4.9	25.4
		307.5	298.4	288.8	284.5	401.9	
						Season Total	1581.0

Development Area 4	Unit Number	January	February	March	April	May	season total per location
	11	818.0	761.8	651.5	702.4	692.7	3626.4
	15	96.9	83.8	87.4	110.7	110.5	489.3
	16	2.3	2.1	2.2	1.8	2.0	10.4
	17	4.1	3.1	2.9	3.5	2.4	15.9
	18	8.7	5.1	5.9	5.4	16.3	41.3
	44	1.3	1.0	5.1	5.2	0.9	13.4
	45	9.1	7.2	12.1	26.6	2.2	57.3
	46	192.7	246.3	100.9	233.8	254.7	1028.4
	47	2.4	1.4	1.3	2.0	2.2	9.3
	48	5.5	4.3	3.7	6.9	6.4	26.8
	49	0.6	nul	nul	nul	nul	0.6
		1141.6	1116.0	872.9	1098.3	1090.3	
						Season Total	5319.1

Development Area 5	Unit Number	January	February	March	April	May	season total per unit
	12	121.1	62.3	55.1	93.0	97.0	428.5
	19	3.0	2.4	2.2	2.8	3.0	13.4
	23	22.5	15.6	20.3	17.6	10.1	86.1
	24	5.2	0.9	1.0	3.9	3.4	14.5
	25	5.9	3.7	8.3	4.7	4.5	27.1
	26	56.7	22.5	34.3	40.8	56.4	210.6
	27	119.4	83.4	93.5	97.8	156.1	550.3
		333.7	190.8	214.6	260.6	330.6	
						Season Total	1330.4

monthly total		6745.5	5674.7	5935.1	6346.6	6412.7	31114.7

2009-10 Monthly Snow Summary

(Measurements in inches)

Route	December	January	February	March	April	May
Boulder	**2.18**	**3.00**	**4.69**	**1.05**	**0.30**	**nul**
Cottonwood Ryegrass	**1.40**	**4.23**	**6.53**	**2.40**	**0.90**	**0.00**
Mesa Rd -Industrial Rd	**3.04**	**3.94**	**5.46**	**0.34**	**0.34**	**0.00**
Greenriver Rd	**1.67**	**4.20**	**4.76**	**0.60**	**0.00**	**0.00**
Hwy 189	**1.28**	**4.24**	**6.45**	**0.90**	**0.00**	**nul**
Hwy 191	**3.06**	**4.20**	**6.73**	**0.78**	**1.02**	**0.00**
Hwy 351	**1.45**	**4.18**	**4.95**	**0.65**	**0.35**	**0.00**
Middle Crest Rd	**2.58**	**4.23**	**6.30**	**0.36**	**1.16**	**nul**
Paradise Rd	**1.97**	**3.25**	**4.75**	**0.00**	**0.40**	**0.00**
Speedway	**2.93**	**4.35**	**6.86**	**0.30**	**0.30**	**nul**
Meadow Cyn Rd	**2.85**	**4.73**	**6.41**	**1.80**	**0.25**	**nul**