

ALTAMONT WIND POWER PROJECT

DRAFT AVIAN USE SURVEY RESULTS

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Prepared for:

APWRA Monitoring Team
SRC

Prepared by:

Western EcoSystems Technology, Inc.
2003 Central Avenue
Cheyenne, Wyoming 82001



Table 1. List of avian species observed during fixed-point surveys on the Altamont Project site.

Species/Group	Scientific Name
American white pelican	<i>Pelecanus erythrorhincos</i>
California gull	<i>Larus californicus</i>
double-crested cormorant	<i>Phalacrocorax auritus</i>
great blue heron	<i>Ardea herodias</i>
great egret	<i>Ardea alba</i>
ring-billed gull	<i>Larus delawarensis</i>
bufflehead	<i>Bucephala albeola</i>
Canada goose	<i>Branta canadensis</i>
common merganser	<i>Mergus merganser</i>
mallard	<i>Anas platyrhynchos</i>
black-necked stilt	<i>Himantopus mexicanus</i>
killdeer	<i>Charadrius vociferus</i>
long-billed curlew	<i>Numenius americanus</i>
American coot	<i>Fulica americana</i>
American kestrel	<i>Falco sparverius</i>
bald eagle	<i>Haliaeetus leucocephalus</i>
burrowing owl	<i>Athene cunicularia</i>
Cooper's hawk	<i>Accipiter cooperii</i>
ferruginous hawk	<i>Buteo regalis</i>
golden eagle	<i>Aquila chrysaetos</i>
merlin	<i>Falco columbarius</i>
northern harrier	<i>Circus cyaneus</i>
osprey	<i>Pandion haliaetus</i>
prairie falcon	<i>Falco mexicanus</i>
red-tailed hawk	<i>Buteo jamaicensis</i>
Swainson's hawk	<i>Buteo swainsoni</i>
turkey vulture	<i>Cathartes aura</i>
white-tailed kite	<i>Elanus leucurus</i>
American crow	<i>Corvus brachyrhynchos</i>
Brewer's blackbird	<i>Euphagus cyanocephalus</i>
common raven	<i>Corvus corax</i>
European starling	<i>Sturnus vulgaris</i>
loggerhead shrike	<i>Lanius ludovicianus</i>
mourning dove	<i>Zenaida macroura</i>
rock pigeon	<i>Columba livia</i>
unidentified cormorant	
unidentified gull	
unidentified duck	
unidentified scaup	
unidentified goldeneye	
unidentified shrike	
unidentified raptor	

Table 2. Avian species observed while conducting fixed-point surveys (December 19, 2005 - February 16, 2006 and June 21, 2006 - January 23, 2007) on the Project Site.

Species/Group	Winter '06		Summer		Fall		Winter '07		Overall	
	# obs.	# groups	# obs.	# groups	# obs.	# groups	# obs.	# groups	# obs.	# groups
Waterbirds	8541	254	28	16	4673	176	3506	126	16748	572
American white pelican	0	0	0	0	3	1	1	1	4	2
California gull	15	1	0	0	0	0	4	1	19	2
double-crested cormorant	6	5	0	0	0	0	1	1	7	6
great blue heron	0	0	6	5	3	3	1	1	10	9
great egret	0	0	2	2	3	3	0	0	5	5
ring-billed gull	9	4	0	0	0	0	1	1	10	5
unidentified cormorant	1	1	0	0	0	0	0	0	1	1
unidentified gull	8510	243	20	9	4664	169	3498	121	16692	542
Waterfowl	27	6	60	2	44	7	46	10	177	25
Canada goose	1	1	0	0	0	0	0	0	1	1
bufflehead	0	0	0	0	0	0	36	5	36	5
common merganser	6	1	0	0	0	0	0	0	6	1
mallard	11	3	60	2	15	4	3	2	89	11
unidentified duck	9	1	0	0	29	3	2	1	40	5
unidentified goldeneye	0	0	0	0	0	0	2	1	2	1
unidentified scaup	0	0	0	0	0	0	3	1	3	1
Shorebirds	0	0	7	6	42	5	79	15	128	26
black-necked stilt	0	0	3	2	9	2	0	0	12	4
killdeer	0	0	4	4	2	1	17	9	23	14
long-billed curlew	0	0	0	0	31	2	62	6	93	8
Coots										
American coot	0	0	6	1	2	2	4	2	12	5
Raptors	657	652	575	559	1260	1180	585	574	3077	2965
<i>Kite</i>										
white-tailed kite	1	1	0	0	5	6	6	6	12	13
<i>Accipiters</i>										
Cooper's hawk	1	1	0	0	2	2	0	0	3	3

Table 2. Avian species observed while conducting fixed-point surveys (December 19, 2005 - February 16, 2006 and June 21, 2006 - January 23, 2007) on the Project Site.

Species/Group	Winter '06		Summer		Fall		Winter '07		Overall	
	# obs.	# groups	# obs.	# groups	# obs.	# groups	# obs.	# groups	# obs.	# groups
<i>Buteos</i>	475	472	375	370	927	846	404	400	2181	2088
Swainson's hawk	0	0	4	4	0	0	0	0	4	4
ferruginous hawk	27	27	0	0	15	15	18	18	60	60
red-tailed hawk	448	445	371	366	912	831	386	382	2117	2024
<i>Northern harriers</i>										
northern harrier	37	36	14	14	43	44	34	34	128	128
<i>Eagles</i>										
bald eagle	0	0	0	0	0	0	2	2	2	2
golden eagle	61	60	66	66	122	120	49	50	298	296
<i>Owls</i>										
burrowing owl	0	0	19	12	2	2	1	1	22	15
<i>Falcons</i>	81	81	92	89	151	152	86	78	410	400
American kestrel	56	56	77	74	125	126	68	60	326	316
merlin	1	1	0	0	1	1	1	1	3	3
prairie falcon	24	24	15	15	25	25	17	17	81	81
<i>Other Raptors</i>	1	1	9	8	8	8	3	3	21	20
osprey	1	1	1	1	0	0	2	2	4	4
unidentified raptor	0	0	8	7	8	8	1	1	17	16
Vultures										
turkey vulture	52	47	547	469	338	250	269	189	1206	955
Passerines	455	304	418	307	932	565	634	355	2439	1531
American crow	29	13	38	18	68	37	151	73	286	141
Brewer's blackbird	0	0	0	0	1	1	0	0	1	1
European starling	0	0	0	0	0	0	17	7	17	7
common raven	408	273	343	254	832	502	443	252	2026	1281
loggerhead shrike	18	18	37	35	24	23	23	23	102	99
unidentified shrike	0	0	0	0	7	2	0	0	7	2

Table 2. Avian species observed while conducting fixed-point surveys (December 19, 2005 - February 16, 2006 and June 21, 2006 - January 23, 2007) on the Project Site.

Species/Group	Winter '06		Summer		Fall		Winter '07		Overall	
	# obs.	# groups	# obs.	# groups	# obs.	# groups	# obs.	# groups	# obs.	# groups
Doves/Pigeons	168	47	160	58	657	71	529	61	1514	237
mourning dove	10	5	11	10	1	1	0	0	22	16
rock pigeon	158	42	149	48	656	70	529	61	1492	221
Unidentified Birds										
unidentified bird	2	2	0	0	8	8	0	0	10	10
Totals	9902	1312	1801	1418	7956	2264	5652	1332	25311	6326

Table 3. Mean use, mean # species/survey, total number of species, and total number of fixed-point surveys conducted by season and overall for the Project site. All observations in 800-m viewsheds included.

Season	Number of Visits	Mean Use ^a	Mean use by time ^b	# Species/Survey ^c	# Species	# Surveys Conducted
Winter '06	3	66.670	217.942	3.403	22	152
Summer	4	6.621	12.219	2.482	21	272
Fall	4	29.568	51.807	3.297	26	272
Winter '07	2	41.559	56.673	4.199	29	136
Overall	13	32.914	78.713	3.209	37	832

^a # observations per 30-minute survey

^b # of minutes per 30-minute survey

^c mean number of bird species observed during each 30-minute survey

Table 4a. Mean use, percent composition and percent frequency of occurrence for avian groups for the Altamont Project site.

Species/Group	Mean Use (#/30 min. survey)				Group Composition (%)				% Frequency			
	Winter '06	Summer	Fall	Winter '07	Winter '06	Summer	Fall	Winter '07	Winter '06	Summer	Fall	Winter '07
Waterbirds	58.025	0.103	17.416	25.779	87.03	1.55	58.90	62.03	27.30	5.51	18.57	27.21
Waterfowl	0.175	0.221	0.163	0.338	0.26	3.33	0.55	0.81	4.68	0.74	1.85	5.88
Shorebirds	0.000	0.026	0.157	0.581	0.00	0.39	0.53	1.40	0.00	2.21	1.49	8.09
Rails/Coots	0.000	0.022	0.007	0.029	0.00	0.33	0.02	0.07	0.00	0.37	0.37	1.47
Raptors	4.279	2.114	4.667	4.301	6.42	31.93	15.78	10.35	96.19	76.84	92.61	97.79
Kites	0.005	0.000	0.018	0.044	0.01	0.00	0.06	0.11	0.48	0.00	1.85	3.68
Accipiters	0.005	0.000	0.007	0.000	0.01	0.00	0.02	0.00	0.48	0.00	0.74	0.00
Buteos	3.021	1.379	3.434	2.971	4.53	20.82	11.61	7.15	86.83	63.24	87.78	86.76
Northern Harriers	0.222	0.051	0.160	0.250	0.33	0.78	0.54	0.60	16.51	5.15	13.73	17.65
Eagles	0.429	0.243	0.452	0.375	0.64	3.66	1.53	0.90	27.78	16.91	26.66	25.74
Falcons	0.570	0.338	0.559	0.632	0.85	5.11	1.89	1.52	42.38	20.96	37.42	42.65
Owls	0.000	0.070	0.007	0.007	0.00	1.05	0.03	0.02	0.00	2.21	0.74	0.74
Other Raptors	0.028	0.033	0.029	0.022	0.04	0.50	0.10	0.05	2.78	2.57	1.84	2.21
Vultures	0.432	2.011	1.250	1.978	0.65	30.37	4.23	4.76	20.71	56.99	33.25	46.32
Passerines	2.742	1.537	3.450	4.662	4.11	23.21	11.67	11.22	67.06	50.00	71.11	86.03
Doves/Pigeons	1.007	0.588	2.427	3.890	1.51	8.88	8.21	9.36	15.95	12.87	12.24	17.65
Unidentified Birds	0.010	0.000	0.030	0.000	0.01	0.00	0.10	0.00	0.95	0.00	2.59	0.00
Overall	66.670	6.621	29.568	41.559	100.00	100.00	100.00	100.00				

^a Same as the values in table 4b given that % frequency is not effected by # individuals or # of minutes.

Table 4b. Mean use by time, percent composition and percent frequency of occurrence for avian groups for the Altamont Project site.

Species/Group	Mean Use by time (#/30 min. survey)				Group Composition (%)				% Frequency			
	Winter '06	Summer	Fall	Winter '07	Winter '06	Summer	Fall	Winter '07	Winter '06	Summer	Fall	Winter '07
Waterbirds	192.478	0.061	27.848	19.228	88.32	0.50	53.75	33.93	27.30	5.51	18.57	27.21
Waterfowl	0.163	0.110	1.218	1.890	0.08	0.90	2.35	3.33	4.68	0.74	1.85	5.88
Shorebirds	0.000	0.013	1.548	1.853	0.00	0.11	2.99	3.27	0.00	2.21	1.49	8.09
Rails/Coots	0.000	0.221	0.110	0.335	0.00	1.81	0.21	0.59	0.00	0.37	0.37	1.47
Raptors	17.000	6.048	12.978	15.809	7.80	49.50	25.05	27.89	96.19	76.84	92.61	97.79
Kites	0.002	0.000	0.063	0.088	0.00	0.00	0.12	0.16	0.48	0.00	1.85	3.68
Accipiters	0.005	0.000	0.004	0.000	0.00	0.00	0.01	0.00	0.48	0.00	0.74	0.00
Buteos	12.844	4.037	10.223	12.581	5.89	33.04	19.73	22.20	86.83	63.24	87.78	86.76
Northern Harriers	0.325	0.037	0.128	0.228	0.15	0.30	0.25	0.40	16.51	5.15	13.73	17.65
Eagles	1.579	0.520	1.082	0.805	0.72	4.26	2.09	1.42	27.78	16.91	26.66	25.74
Falcons	1.898	0.623	1.332	1.996	0.87	5.10	2.57	3.52	42.38	20.96	37.42	42.65
Owls	0.000	0.653	0.047	0.037	0.00	5.34	0.09	0.06	0.00	2.21	0.74	0.74
Other Raptors	0.347	0.178	0.100	0.074	0.16	1.46	0.19	0.13	2.78	2.57	1.84	2.21
Vultures	0.486	2.467	1.048	2.456	0.22	20.19	2.02	4.33	20.71	56.99	33.25	46.32
Passerines	4.992	2.886	4.642	7.857	2.29	23.62	8.96	13.86	67.06	50.00	71.11	86.03
Doves/Pigeons	2.791	0.414	2.330	7.246	1.28	3.38	4.50	12.79	15.95	12.87	12.24	17.65
Unidentified Birds	0.031	0.000	0.085	0.000	0.01	0.00	0.16	0.00	0.95	0.00	2.59	0.00
Overall	217.942	12.219	51.807	56.673	100.00	100.00	100.00	100.00				

^a Same as the values in table 4a given that % frequency is not effected by # individuals or # of minutes.

Table 5a. Avian species observed within 800m of the observer and estimated mean use (#/30-minute survey) on the Project site (December 19, 2005 - February 16, 2006 and June 21, 2006 - January 23, 2007).

Winter '06		Summer		Fall		Winter '07	
Species/Group	Use	Species/Group	Use	Species/Group	Use	Species/Group	Use
unidentified gull	57.855	turkey vulture	2.011	unidentified gull	17.382	unidentified gull	25.721
red-tailed hawk	2.870	red-tailed hawk	1.364	red-tailed hawk	3.378	common raven	3.257
common raven	2.518	common raven	1.261	common raven	3.081	red-tailed hawk	2.838
rock pigeon	0.960	rock pigeon	0.548	rock pigeon	2.424	rock pigeon	2.676
turkey vulture	0.432	American kestrel	0.283	turkey vulture	1.250	turkey vulture	1.978
golden eagle	0.429	golden eagle	0.243	American kestrel	0.463	American crow	1.213
American kestrel	0.336	mallard	0.221	golden eagle	0.452	American kestrel	1.110
prairie falcon	0.229	American crow	0.140	American crow	0.251	long-billed curlew	0.500
northern harrier	0.222	loggerhead shrike	0.136	northern harrier	0.160	golden eagle	0.456
ferruginous hawk	0.152	unidentified gull	0.074	long-billed curlew	0.116	bufflehead	0.360
American crow	0.138	burrowing owl	0.070	unidentified duck	0.108	northern harrier	0.265
mallard	0.098	prairie falcon	0.055	prairie falcon	0.093	loggerhead shrike	0.250
loggerhead shrike	0.086	northern harrier	0.051	loggerhead shrike	0.089	ferruginous hawk	0.169
California gull	0.071	mourning dove	0.040	ferruginous hawk	0.056	European starling	0.132
mourning dove	0.048	unidentified raptor	0.029	mallard	0.055	killdeer	0.125
ring-billed gull	0.043	American coot	0.022	black-necked stilt	0.034	prairie falcon	0.125
unidentified duck	0.043	great blue heron	0.022	unidentified bird	0.030	white-tailed kite	0.125
common merganser	0.029	killdeer	0.015	unidentified raptor	0.029	American coot	0.044
double-crested cormorant	0.029	Swainson's hawk	0.015	unidentified shrike	0.026	California gull	0.029
osprey	0.028	black-necked stilt	0.011	white-tailed kite	0.018	mallard	0.029
unidentified cormorant	0.028	great egret	0.007	American white pelican	0.011	unidentified scaup	0.022
unidentified bird	0.010	osprey	0.004	great egret	0.011	bald eagle	0.022
Canada goose	0.005			great blue heron	0.011	osprey	0.015
Cooper's hawk	0.005			burrowing owl	0.007	unidentified duck	0.015
merlin	0.005			American coot	0.007	unidentified goldeneye	0.015
white-tailed kite	0.005			Cooper's hawk	0.007	American white pelican	0.015

Table 5a. Avian species observed within 800m of the observer and estimated mean use (#/30-minute survey) on the Project site (December 19, 2005 - February 16, 2006 and June 21, 2006 - January 23, 2007).

Winter '06		Summer		Fall		Winter '07	
Species/Group	Use	Species/Group	Use	Species/Group	Use	Species/Group	Use
				killdeer	0.007	burrowing owl	0.007
				merlin	0.004	double-crested cormorant	0.007
				mourning dove	0.004	great blue heron	0.007
				Brewer's blackbird	0.004	merlin	0.007
						ring-billed gull	0.007
						unidentified raptor	0.007

Table 5b. Avian species observed within 800m of the observer and estimated mean use by time (# of minutes/30-minute survey) on the Project site (December 19, 2005 - February 16, 2006 and June 21, 2006 - January 23, 2007).

Winter '06		Summer		Fall		Winter '07	
Species/Group	Use by Time	Species/Group	Use by Time	Species/Group	Use by Time	Species/Group	Use by Time
unidentified gull	192.350	red-tailed hawk	3.985	unidentified gull	27.676	unidentified gull	19.199
red-tailed hawk	12.296	turkey vulture	2.467	red-tailed hawk	10.151	red-tailed hawk	12.243
common raven	4.578	common raven	2.318	common raven	4.205	rock pigeon	7.246
rock pigeon	2.477	burrowing owl	0.653	rock pigeon	2.328	common raven	5.169
golden eagle	1.579	American kestrel	0.586	long-billed curlew	1.513	turkey vulture	2.456
American kestrel	0.956	golden eagle	0.520	American kestrel	1.193	American crow	1.989
prairie falcon	0.909	rock pigeon	0.325	golden eagle	1.082	American kestrel	1.665
ferruginous hawk	0.548	loggerhead shrike	0.318	turkey vulture	1.048	long-billed curlew	1.287
turkey vulture	0.486	American crow	0.250	mallard	0.612	bufflehead	1.272
osprey	0.347	American coot	0.221	unidentified duck	0.606	golden eagle	0.794
northern harrier	0.325	unidentified raptor	0.176	loggerhead shrike	0.215	killdeer	0.566
mourning dove	0.314	mallard	0.110	American crow	0.207	loggerhead shrike	0.474
American crow	0.221	mourning dove	0.088	prairie falcon	0.137	ferruginous hawk	0.338
loggerhead shrike	0.193	Swainson's hawk	0.051	northern harrier	0.128	American coot	0.335
mallard	0.125	unidentified gull	0.040	American coot	0.110	unidentified scaup	0.331
ring-billed gull	0.062	northern harrier	0.037	unidentified raptor	0.100	prairie falcon	0.257
California gull	0.036	prairie falcon	0.037	unidentified bird	0.085	northern harrier	0.228
merlin	0.033	great blue heron	0.013	American white pelican	0.073	European starling	0.224
unidentified bird	0.031	great egret	0.007	ferruginous hawk	0.073	unidentified goldeneye	0.213
unidentified duck	0.021	killdeer	0.007	great egret	0.067	white-tailed kite	0.088
double-crested cormorant	0.017	black-necked stilt	0.006	white-tailed kite	0.063	merlin	0.074
common merganser	0.014	osprey	0.002	burrowing owl	0.047	osprey	0.070
unidentified cormorant	0.014			great blue heron	0.033	mallard	0.059
Cooper's hawk	0.005			black-necked stilt	0.032	burrowing owl	0.037
Canada goose	0.002			unidentified shrike	0.013	California gull	0.015

Table 5b. Avian species observed within 800m of the observer and estimated mean use by time (# of minutes/30-minute survey) on the Project site (December 19, 2005 - February 16, 2006 and June 21, 2006 - January 23, 2007).

Winter '06		Summer		Fall		Winter '07	
Species/Group	Use by Time	Species/Group	Use by Time	Species/Group	Use by Time	Species/Group	Use by Time
white-tailed kite	0.002			Cooper's hawk	0.004	unidentified duck	0.015
				killdeer	0.004	bald eagle	0.011
				merlin	0.002	American white pelican	0.004
				mourning dove	0.002	double-crested cormorant	0.004
				Brewer's blackbird	0.002	great blue heron	0.004
						ring-billed gull	0.004
						unidentified raptor	0.004

Table 6. Avian species observed within 800m of the observer and estimated frequency of occurrence on the Project site (December 19, 2005 - February 16, 2006 and June 21, 2006 - January 23, 2007).

Winter '06		Summer		Fall		Winter '07	
Species/Group	% freq	Species/Group	% freq	Species/Group	% freq	Species/Group	% freq
red-tailed hawk	85.40	red-tailed hawk	63.24	red-tailed hawk	87.41	red-tailed hawk	84.56
common raven	65.16	turkey vulture	56.99	common raven	66.67	common raven	77.94
golden eagle	27.78	common raven	42.65	turkey vulture	33.25	turkey vulture	46.32
American kestrel	27.38	American kestrel	18.38	American kestrel	31.11	American kestrel	33.82
unidentified gull	25.87	golden eagle	16.91	golden eagle	26.66	golden eagle	25.74
turkey vulture	20.71	rock pigeon	10.29	unidentified gull	16.73	unidentified gull	25.74
prairie falcon	19.21	loggerhead shrike	8.82	northern harrier	13.73	northern harrier	17.65
northern harrier	16.51	northern harrier	5.15	rock pigeon	11.86	rock pigeon	17.65
rock pigeon	15.48	prairie falcon	4.04	prairie falcon	8.16	American crow	16.91
ferruginous hawk	11.35	American crow	3.68	loggerhead shrike	7.41	loggerhead shrike	15.44
loggerhead shrike	6.19	mourning dove	3.68	American crow	5.92	ferruginous hawk	12.50
mallard	3.73	unidentified gull	2.94	ferruginous hawk	4.84	prairie falcon	12.50
American crow	2.86	burrowing owl	2.21	unidentified bird	2.59	killdeer	5.88
osprey	2.78	unidentified raptor	2.21	white-tailed kite	1.85	bufflehead	3.68
unidentified cormorant	2.78	great blue heron	1.84	unidentified raptor	1.84	white-tailed kite	3.68
double-crested cormorant	1.43	killdeer	1.47	great egret	1.11	European starling	2.94
mourning dove	0.95	black-necked stilt	0.74	great blue heron	1.11	long-billed curlew	2.94
unidentified bird	0.95	great egret	0.74	mallard	1.10	American coot	1.47
California gull	0.48	mallard	0.74	long-billed curlew	0.75	bald eagle	1.47
Canada goose	0.48	Swainson's hawk	0.74	unidentified duck	0.75	mallard	1.47
common merganser	0.48	American coot	0.37	burrowing owl	0.74	osprey	1.47
Cooper's hawk	0.48	osprey	0.37	Cooper's hawk	0.74	American white pelican	0.74
merlin	0.48			unidentified shrike	0.74	burrowing owl	0.74
ring-billed gull	0.48			American white pelican	0.37	California gull	0.74
unidentified duck	0.48			black-necked stilt	0.37	double-crested cormorant	0.74
white-tailed kite	0.48			merlin	0.37	great blue heron	0.74

Table 6. Avian species observed within 800m of the observer and estimated frequency of occurrence on the Project site (December 19, 2005 - February 16, 2006 and June 21, 2006 - January 23, 2007).

Winter '06		Summer		Fall		Winter '07	
Species/Group	% freq	Species/Group	% freq	Species/Group	% freq	Species/Group	% freq
				mourning dove	0.37	merlin	0.74
				American coot	0.37	ring-billed gull	0.74
				Brewer's blackbird	0.37	unidentified duck	0.74
				killdeer	0.37	unidentified goldeneye	0.74
						unidentified raptor	0.74
						unidentified scaup	0.74