Final Progress Report April 2008-April 2009
Baseline Acoustic Monitoring of Bat Populations within the Duke Energy Searchlight Wind Energy Project Site, Clark County, Nevada

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INTRODUCTION

As an alternative renewable energy source, wind energy development projects have been increasing throughout the United States and consequently receiving increased scrutiny with respect to impacts to birds and bats (Johnson, 2004; Kunz et al., 2007a). Bird mortality studies provided early indication that some bats were similarly put at risk of collision with turbines but until large numbers of bats were found dead at the Mountaineer Wind Energy Center in West Virginia, focused studies on bat mortality were not conducted (Arnett et al., 2008). Current knowledge indicates the level of mortality can be alarmingly high with potentially significant long-term ramifications to bat populations.

Prior to 1954, all records of bat occurrence were based on shooting, finding dead animals, or locating a roost site (Hall, 1946). In 1954, mist nets were introduced to North American bat work (Dalquest, 1954), resulting in the ability to conduct focused surveys. Little was known about bat occurrence and distribution in southern Nevada until M. J. O'Farrell initiated mist net studies in 1964. These studies were confined to small water holes that could be effectively netted. Thus, the sites studied were confined to the fringes of the Las Vegas Valley and beyond.

Although mist nets provide an enhanced ability to study localized bat faunas, there is considerable bias inherent in their use (Kunz and Kurta, 1988). Technological advances over the past decade have produced acoustic equipment capable of recording and displaying the time-frequency structure of echolocation calls, which then allows identification of the vocalizing species (O'Farrell, 1997; O'Farrell et al., 1999). Acoustic surveys have limitations, particularly for quiet species, such as Townsend's big-eared bat (*Corynorhinus townsendii*) and California leaf-nosed bat (*Macrotus californicus*) (O'Farrell and Gannon, 1999). However, significantly more species can be documented by acoustic means than standard capture methods (Kalko et al., 1996; Ochoa et al., 2000, and O'Farrell and Gannon, 1999).

The purpose of the present study is to provide a baseline of knowledge on temporal changes in species composition and differential habitat use within the Table Mountain area that may be affected by the proposed Searchlight Wind Generation Facility Project. This is a progress report of the first year of baseline collection for April 2008 through April 2009.

MATERIALS AND METHODS

Six stationary acoustic monitoring stations were established at select sites within the

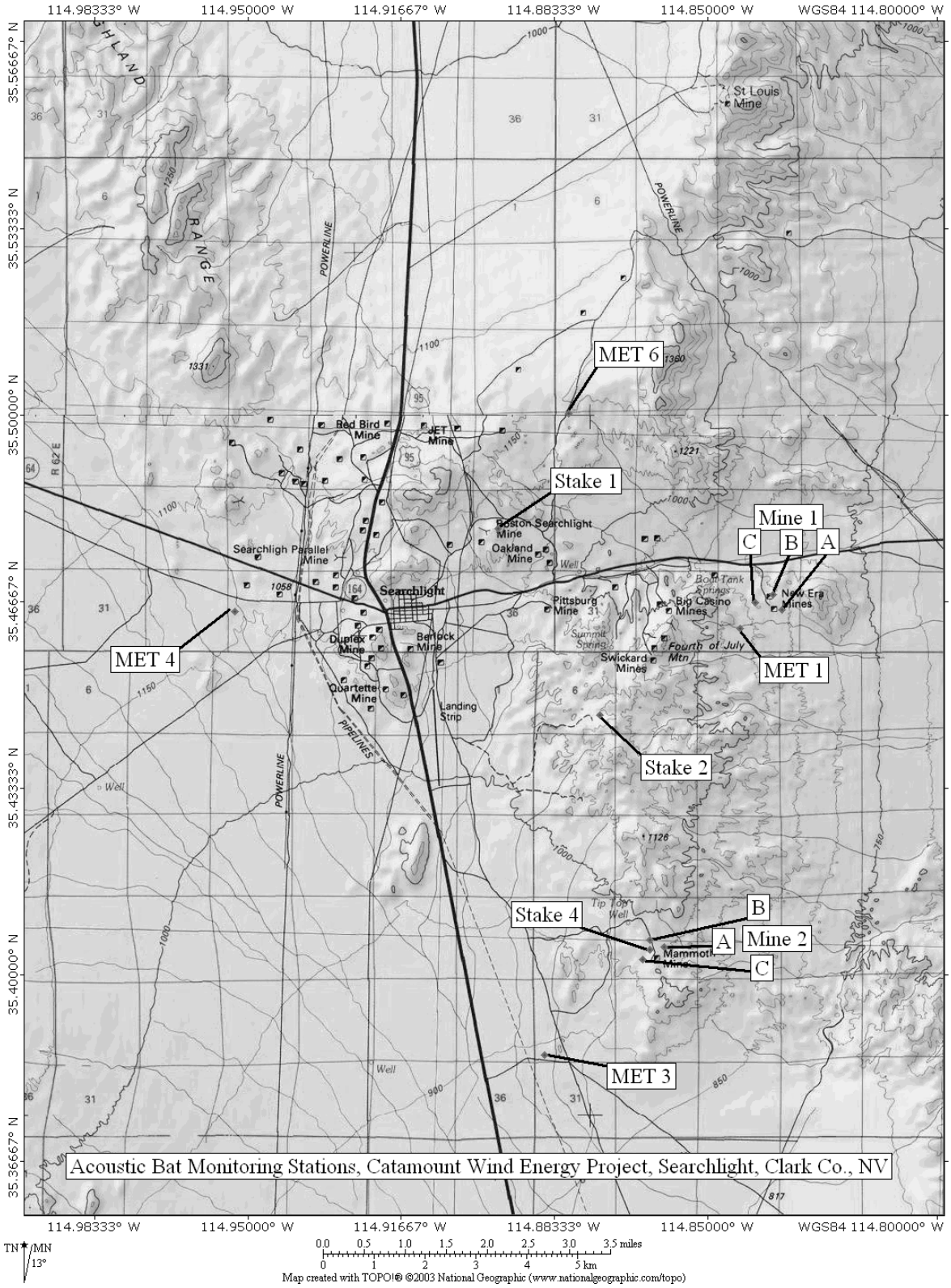

Figure 1. Location of the stationary acoustic monitoring stations for the Duke Energy Searchlight Wind Energy Project Area.

Wind Energy Project area that samples the general habitat that may be affected by the proposed activities (Figure 1). Each of the selected sites corresponds to locations proposed for wind generation turbines. The dispersion of monitoring stations provides an adequate examination of general bat usage over the entire proposed project site. All existing meteorological (MET) towers were utilized as monitoring station; two additional sites were selected to sample areas deemed as potential movement corridors. The size of the project site and redesign of turbine placement has resulted in removal of one acoustic station (MET 4) in October 2008 and will eventually result in placement of this station in the southeastern portion of the project site. In the interim, a low stake sampling point (Stake 4) was established 21 January 2009.

In consultation with the Bureau of Land Management and the Nevada Department of Wildlife, approval was granted to continue the baseline data collection for a second year. In order to address agency concerns about potential impacts of turbine placement on known maternity colonies in local abandoned mines, I designed a sampling protocol. Two mine complexes were identified from previous abandoned mine surveys conducted for the Bureau of Land Management that were within the active footprint of the proposed project and contained significant bat resources. Reconnaissance of the mines verified the presence of washes radiating out from the mine locations. Bats tend to use wash features for foraging and as movement corridors. Three locations were selected around each mine complex based on topography for the placement of ground-level acoustic units to monitor bat activity within the wash systems associated with each mine complex.

Each stationary monitoring station on MET towers contained two acoustic units, one mounted low (ca. 2 m) and one mounted high (ca. 40-50 m). Originally, two additional sampling stations utilized metal fence stakes (Stake units) allowing mounting comparable to the low position at MET towers; in January 2009, at third unit (Stake 4) was established at the proposed location for relocating MET 4. The acoustic units were designed by Tetra Tech (Portland, ME office) and consisted of a combined bat detector, and Compact Flash Zero Crossings Analysis Interface Module (Anabat SD1; Titley Electronics, Ballina, New South Wales, Australia) and a rechargeable battery enclosed in a weatherproof case. A hole was cut in the side of the case allowing a microphone opening, oriented towards the ground. Beneath the opening was a Plexiglas reflector plate oriented to provide a horizontal volume of detection. A solar panel was mounted on the flat side of the case to maintain the rechargeable battery. Units at the MET towers were hung on a pulley system suspended on a tower guy wire. As with the start of any collection effort involving an array of electronic monitoring systems, some technical problems were encountered resulting in equipment failure or malfunction at times. Each mobile acoustic unit contained a microphone encased in a protective shroud utilizing a reflector plate to collect

bat vocalizations and mounted on a ground level stand. The reflector plate was oriented to provide a 45° angle upwards for the volume of detection. The remaining equipment consisted of an Anabat II bat detector, a CF ZCAIM, and a rechargeable battery encased in a weatherproof NEMA case. Data memory cards were exchanged at approximately 2-week intervals. Sampling dates for stationary monitoring are presented in Table 1.

Identification of species used the methods of O'Farrell et al. (1999) based on frequency characteristics, call shape, and comparison with a comprehensive library of vocal signatures developed by O'Farrell and colleagues. Thus, species richness (# species verified as present) was obtained for each location. A key feature of the Anabat system is that each file saved to the computer is named with a time date code (e.g., B8012024.16#, where B = 2001, 8 = August, 01 = day of the month, 2024.16 = 8:24:16 PM). Thus, activity data was derived for each monitoring station. An Index of Activity (IA), or the magnitude of each species contribution to spatial use, was obtained using the sum of 1-minute time increments for which a species was detected as present divided by the number of nights of sampling (Miller, 2001). The IA was multiplied by a factor of 100 in order to bring the smallest numbers up to whole numbers. Further, the IA is presented as a number rounded off to the nearest whole number for ease in using the tables. Therefore, totals may not add up exactly but the magnitude of differences between species and/or locations will be accurately reflected. Reference calls for each species recorded during the present study are presented in Appendix II.

RESULTS

A total of 14 species of bats were recorded (Table 2). Six of the species are listed as Federal Species of Special Concern, three of them are State-listed Sensitive and three are State-listed Protected. Species richness varied among the sites but no site demonstrated the entire inventory of species found within the study area (Table 3). The variation among stationary acoustic stations with respect to quantity of data, number of minutes of total bat activity, Index of Activity (IA), and species richness (# species) is beginning to show distinct patterns. Except for MET 1, 60-85% of the bat activity occurred at the low rather than high units. Inexplicable at this time, 60% of bat activity at MET 1 occurred at the high unit compared to the low unit. The three stake units were comparable in quantity of activity to MET 3 and 4. MET 6 had the greatest amount of bat activity. It should be stressed that although data are presented for ground-level acoustic stations around the two abandoned mines, sampling to date has only occurred for no more than two weeks. Based on the limited sampling, no conclusions or valid comparisons among sites can be made at this time. Any reference to data from these sites is provided for basic descriptive purposes.

Table 1. Sampling dates for all acoustic locations for the Duke Energy Searchlight Wind Energy Project Site, April 2008-April 2009.

	2008									2009			
Location	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	JAN	FEB	MAR	APR
Stake 1	9-30	1-31	1-30	1-31	1-31	1-30	1-31	1-30	1-28	1-16,22-31	1-4,9-28	1-31	1-30
Stake 2	10-30	1-31	1-30	1-31	1-21,25-31	1-9,13-30	1-31	1-15	17-31	1-31	1-28	1-31	1-30
MET 1 High	10-30	1-31	1-30	1-31	1-9,29-31	1-22,25-30	1-16,18-19	14-30	9,11,13-14,16,19-23,26,29-31	2-29	4-28	1-31	1-30
MET 1 Low	10-25	10-31	1-30	1-31	1-31	1-30	1-31	1-30	1-31	1-4,6-9,15-29	4-28	1-31	1-30
MET 3 High	10-30	1-31	1-30	1-31	1-31	1-30	1-31	1-4,14-30	1-31	1-12,15-31	1-28	1-31	1-30
MET3 Low	10-30	1-31	1-30	1-31	1-29		2-31	1-15,18-24,27-29		2-31	1-27	7-31	1-24,30
MET 4 High	10-30	1-31	1-30	1-31	1-31	1-30	1-2						
MET 4 Low	10-30	1-31	1-30	1-31	1-31	1-30	1-23			21-31	1-28	1-31	1-30
MET 6 High	11-30	1-31	1-30	1-31	1-16,31	1-9,26,29-30	1-29	1-21,28-30	1-31	1-14,21-31	1-28	1-31	1-30
MET 6 Low	11-30	1-31	1-30	1-31	1-19,23-31	1-17,21-30	1-31	1-14,26-28,30	1-31	1-31	1-28	1-31	1-30
Mine 1A													17-30
Mine 1B													17-30
Mine 1C													17-30
Mine 2A													17-30
Mine 2B													17-30
Mine 2C													30

Table 2. Checklist and status of bats found to occur within the Duke Energy Searchlight Wind Energy Project Site, April 2008-April 2009. Nomenclature follows Hoofer et al. (2006), Wilson and Cole (2000), and Wilson and Reeder (1993).

FAMILY/SPECIES	COMMON NAME
Vespertilionidae	
Myotis californicus	California Myotis
Myotis ciliolabrum	Western Small-footed Myotis [++]
Myotis thysanodes	Fringed Myotis [‡,++]
Myotis yumanensis	Yuma Myotis [++]
Lasiurus blossevillii	Western Red Bat [**]
Lasiurus cinereus	Hoary Bat
Lasionycteris noctivagans	Silver-haired Bat
Parastrellus hesperus	Western Pipistrelle
Eptesicus fuscus	Big Brown Bat
Corynorhinus townsendii townsendii	Pacific Western Big-eared Bat [**,++]
Antrozous pallidus	Pallid Bat [‡]
Molossidae	
Tadarida brasiliensis	Brazilian Free-tailed Bat [‡]
Nyctinomops macrotis	Big Free-tailed Bat [++]
Eumops perotis californicus	Greater Western Mastiff Bat [**,++]

[*] State-listed Threatened

[**] State-listed Sensitive

[‡] State-listed Protected

[++] Federal Species of Special Concern (formerly Category 2 for Federal Listing)

Table 3. Summary of the number of files, number of calls, number of minutes of bat activity, Species Richness (S^*), and Index of Activity (IA) recorded at each of the acoustic sampling locations within the Duke Energy Searchlight Wind Energy Project Site, April 2008-April 2009.

Location	Files	Calls	Minutes	S^*	IA
Stake 1	1,684	13,568	1,349	10	363
Stake 2	1,731	12,809	1,606	10	460
MET 1 High	828	7,919	598	8	190
MET 1 Low	526	2,858	425	8	118
MET 3 High	467	2,973	440	9	117
MET3 Low	1,046	5,864	1,013	10	333
MET 4 High	843	6,178	805	9	457
MET 4 Low	1,392	9,779	1,353	10	687
Stake 4	543	4,648	494	7	543
MET 6 High	523	3,909	490	8	140
MET 6 Low	3,269	29,749	2,945	10	802
Mine 1A	149	667	138	6	1007
Mine 1B	124	904	113	6	836
Mine 1C	244	1,890	218	7	2486
Mine 2A	141	1,066	130	5	929
Mine 2B	81	499	79	6	564
Mine 2C	14	65	13	4	93
Total	**12,852**	**100,254**	**11,518**		

At the MET towers, one species (*Tadarida brasiliensis*) was a primary species, based on the magnitude of bat activity, at all low sites except MET 6, accounting for 26-63% of bat activity; it was a secondary species at the one low sites contributing 18% of bat activity (Tables 4-7; Appendices I-1 through I-4). At the four high locations, *T. brasiliensis* was a primary species accounting for 67-92% of bat activity. A second species (*Parastrellus hesperus*) was a primary species at two low sites MET 1 and 6 accounting for 38-57% of bat activity; it was a secondary species at the remaining low sites contributing 13-25% of bat activity. At the high sets, *P. hesperus* was a secondary species accounting for 9-25% of bat activity. A third species (*Myotis californicus*) was the primary species at MET 4 low accounting for 30% of bat activity, and of secondary importance at only one high set (MET 1; 8%) and at all low units except Stake 2 and MET 4 accounting for 14-23% of bat activity. *Myotis yumanensis* and *Eptesicus fuscus* were the other species of secondary importance at MET 3 high (7-8% of bat activity) and MET 4 low (14%) and MET 3 and 4 high 9-14%), respectively. The remaining contribution to bat activity for each species was ≤ 6%.

The three stake sites, which only sampled a low altitude volume consistent with low sets at each of the MET towers, demonstrated one primary species (*T. brasiliensis*) accounting for 52-58% of bat activity (Tables 8-9; Appendix I-5). Two secondary species (*P. hesperus* and *M. californicus*) accounted for 13-25% of the activity, respectively. *Myotis yumanensis* was secondary at Stake 4 accounting for 7.4% of bat activity. The six ground units around the abandoned mines also only sample a low altitude volume also consistent with low sets at each of the MET towers. Preliminary data from the mines are consistent with that recorded at the stake sites (Table 10; Appendix I-6). A summary of primary and secondary status by location and height is given in Table 11.

Although most were minor in contribution to the total activity recorded at each location, various species of concern were detected (Tables 4-10). *Corynorhinus townsendii*, Federal Species of Special Concern and State-listed Sensitive, was recorded at MET 1 high, MET 3 low and high, and at Stakes 1 and 2. *Eumops perotis*, Federal Species of Special Concern and State-listed Sensitive, was recorded at MET 1 high, MET 3 low, MET 4 high, and MET 6 low and high. *Myotis thysanodes*, Federal Species of Special Concern and State-listed Protected, was recorded at MET 4 and 6 low. *Antrozous pallidus*, State-listed Protected, was recorded at all MET units except for MET 1 high, at Stakes 1 and 2, and at Mine 2B. *Tadarida brasiliensis*, State-listed Protected, was found at all sites and heights. *Myotis ciliolabrum*, Federal Species of Special Concern, was recorded at all sites and heights except for the three Mine 2 locations. *Myotis yumanensis*, Federal Species of Special Concern, was recorded at all locations and all heights except at MET 6 high. *Nyctinomops macrotis*, Federal Species of

Table 4. Activity Index (number of minutes of activity/nights of recording*100) for each month at site MET 1, Duke Energy Searchlight Wind Energy Project Site, April 2008-April 2009.

	2008									2009				
Species	**APR**	**MAY**	**JUN**	**JUL**	**AUG**	**SEP**	**OCT**	**NOV**	**DEC**	**JAN**	**FEB**	**MAR**	**APR**	**TOTAL**
	HIGH SET (50 m)													
Corynorhinus townsendii	5	0	0	0	0	0	0	0	0	0	0	0	0	**0.3**
Eptesicus fuscus	0	6	0	0	8	0	0	0	0	0	0	0	0	**1**
Eumops perotis	0	0	0	0	0	0	0	0	0	0	0	0	3	**0.3**
Lasiurus cinereus	10	3	3	0	0	0	0	0	0	0	0	0	17	**3**
Myotis ciliolabrum	14	0	0	0	0	0	0	0	0	0	0	0	0	**1**
Myotis yumanensis	14	6	20	0	0	0	0	0	0	0	4	10	3	**4**
Parastrellus hesperus	38	32	37	16	0	25	0	0	0	0	0	3	20	**15**
Tadarida brasiliensis	890	106	10	158	208	89	11	0	0	0	84	332	660	**175**
Total	**971**	**155**	**70**	**174**	**217**	**114**	**11**	**0**	**0**	**0**	**88**	**345**	**703**	**190**
	LOW SET (2 m)													
Antrozous pallidus	6	0	0	0	3	0	0	0	0	0	4	0	3	**1**
Eptesicus fuscus	25	5	0	0	3	7	0	0	0	0	0	0	0	**2**
Lasiurus cinereus	0	0	0	0	0	0	0	0	0	0	0	0	3	**0.3**
Myotis californicus	25	5	3	6	39	17	0	57	0	0	12	39	60	**17**
Myotis ciliolabrum	56	0	0	0	3	0	0	0	0	0	0	3	30	**5**
Myotis yumanensis	6	14	0	0	0	17	6	3	0	0	28	35	33	**6**
Parastrellus hesperus	19	18	10	103	197	120	19	0	0	0	0	35	63	**45**
Tadarida brasiliensis	63	0	0	29	13	10	0	0	0	0	36	77	407	**41**
Total	**200**	**41**	**13**	**139**	**258**	**170**	**26**	**60**	**0**	**0**	**80**	**190**	**600**	**118**

Table 5. Activity Index (number of minutes of activity/nights of recording*100) for each month at site MET 3, Duke Energy Searchlight Wind Energy Project Site, April 2008-April 2009.

	2008									2009				
Species	**APR**	**MAY**	**JUN**	**JUL**	**AUG**	**SEP**	**OCT**	**NOV**	**DEC**	**JAN**	**FEB**	**MAR**	**APR**	**TOTAL**
	HIGH SET (50 m)													
Antrozous pallidus	5	0	0	3	3	3	0	0	0	0	0	0	0	**1**
Corynorhinus townsendii	5	0	0	0	6	0	0	0	0	0	0	0	0	**1**
Eptesicus fuscus	5	0	17	52	32	3	0	0	0	0	0	0	0	**9**
Lasiurus cinereus	24	10	0	0	3	0	0	0	0	0	0	3	10	**3**
Myotis californicus	5	0	0	3	3	0	0	0	0	0	0	0	0	**1**
Myotis ciliolabrum	0	0	0	3	0	0	0	0	0	0	0	0	0	**0.3**
Myotis yumanensis	14	10	17	3	16	10	19	5	0	0	0	3	10	**8**
Parastrellus hesperus	14	13	43	26	23	10	3	0	0	0	0	0	7	**11**
Tadarida brasiliensis	129	65	67	177	139	107	10	0	0	0	61	87	223	**83**
Total	**200**	**97**	**143**	**268**	**226**	**133**	**32**	**5**	**0**	**0**	**61**	**94**	**250**	**117**
	LOW SET (2 m)													
Antrozous pallidus	0	0	0	3	3	-	0	0	-	0	0	0	0	**1**
Corynorhinus townsendii	0	0	0	0	0	-	3	4	-	0	0	0	0	**1**
Eptesicus fuscus	0	13	7	58	72	-	0	0	-	0	0	0	0	**15**
Eumops perotis	0	0	0	0	3	-	0	0	-	0	0	0	0	**0.3**
Lasiurus cinereus	0	3	0	0	3	-	0	0	-	0	0	0	4	**1**
Myotis californicus	57	61	90	94	183	-	250	12	-	3	4	28	40	**78**
Myotis ciliolabrum	10	6	0	0	0	-	0	0	-	0	0	0	8	**2**
Myotis yumanensis	10	10	67	65	100	-	57	8	-	0	7	52	32	**38**
Parastrellus hesperus	24	29	90	235	224	-	17	0	-	0	0	0	8	**61**
Tadarida brasiliensis	224	68	117	445	228	-	27	0	-	3	52	80	260	**137**
Total	**324**	**190**	**370**	**900**	**817**	**-**	**353**	**24**	**-**	**7**	**63**	**160**	**352**	**333**

Table 6. Activity Index (number of minutes of activity/nights of recording*100) for each month at site MET 4, Duke Energy Searchlight Wind Energy Project Site, 2008.

		2008								
Species	**APR**	**MAY**	**JUN**	**JUL**	**AUG**	**SEP**	**OCT**	**NOV**	**DEC**	**TOTAL**
					HIGH SET (40 m)					
Antrozous pallidus	0	3	13	0	0	3	0			**3**
Eptesicus fuscus	5	0	43	100	77	20	0			**43**
Eumops perotis	0	0	0	0	0	3	0			**1**
Lasiurus cinereus	5	10	0	0	6	3	0			**4**
Myotis californicus	10	0	10	3	0	7	0			**5**
Myotis ciliolabrum	24	23	30	6	3	7	0			**15**
Myotis yumanensis	0	0	0	0	0	7	0			**1**
Parastrellus hesperus	14	13	113	77	77	30	0			**56**
Tadarida brasiliensis	295	135	180	568	445	363	50			**331**
Total	**352**	**184**	**390**	**755**	**610**	**443**	**50**			**457**
					LOW SET (2 m)					
Antrozous pallidus	0	3	20	13	10	3	0			**8**
Eptesicus fuscus	0	3	87	226	255	63	4			**99**
Lasionycteris noctivagans	0	3	0	0	0	0	0			**1**
Lasiurus cinereus	0	3	0	0	3	0	0			**1**
Myotis californicus	14	74	210	248	306	443	43			**205**
Myotis ciliolabrum	5	29	77	29	74	50	17			**43**
Myotis thysanodes	0	0	0	0	3	10	0			**2**
Myotis yumanensis	5	3	3	3	42	53	0			**17**
Parastrellus hesperus	5	6	183	274	323	63	4			**134**
Tadarida brasiliensis	214	71	120	374	197	217	26			**178**
Total	**243**	**197**	**700**	**1168**	**1213**	**903**	**96**			**687**

Table 7. Activity Index (number of minutes of activity/nights of recording*100) for each month at site MET 6, Duke Energy Searchlight Wind Energy Project Site, April 2008-April 2009.

	2008									2009				
Species	**APR**	**MAY**	**JUN**	**JUL**	**AUG**	**SEP**	**OCT**	**NOV**	**DEC**	**JAN**	**FEB**	**MAR**	**APR**	**TOTAL**
	HIGH SET (50 m)													
Antrozous pallidus	0	0	7	0	0	0	0	0	0	0	0	0	0	**1**
Eptesicus fuscus	5	3	23	16	0	0	0	0	0	0	0	0	0	**4**
Eumops perotis	0	0	0	0	0	7	0	0	0	0	0	6	0	**1**
Lasiurus cinereus	20	0	0	0	0	0	0	0	0	0	0	6	13	**3**
Myotis californicus	5	0	0	0	0	4	0	0	0	0	0	0	0	**1**
Myotis ciliolabrum	10	0	3	0	0	0	0	0	0	0	0	0	0	**1**
Parastrellus hesperus	10	23	213	48	29	56	3	0	0	0	0	0	40	**35**
Tadarida brasiliensis	355	29	20	26	29	56	3	6	3	6	107	219	370	**94**
Total	**405**	**55**	**267**	**90**	**57**	**122**	**6**	**6**	**3**	**6**	**107**	**232**	**423**	**140**
	LOW SET (2 m)													
Antrozous pallidus	0	3	10	19	25	4	0	0	0	0	0	10	0	**6**
Eptesicus fuscus	5	6	47	52	32	11	0	0	0	0	0	0	0	**12**
Eumops perotis	0	0	0	0	0	4	0	0	0	0	0	3	0	**1**
Lasiurus cinereus	5	3	0	0	0	0	3	0	0	0	0	0	3	**1**
Myotis californicus	130	252	547	390	543	207	26	11	0	3	0	19	90	**175**
Myotis ciliolabrum	20	3	3	0	4	0	0	0	0	0	0	0	0	**2**
Myotis thysanodes	0	0	0	0	0	4	0	0	0	0	0	0	0	**0.3**
Myotis yumanensis	0	0	10	35	36	4	0	0	0	0	0	0	13	**8**
Parastrellus hesperus	25	190	1340	1748	1239	1093	68	11	0	0	0	6	27	**459**
Tadarida brasiliensis	585	232	93	123	157	74	23	6	3	6	57	155	393	**140**
Total	**770**	**690**	**2050**	**2368**	**2036**	**1400**	**119**	**28**	**3**	**10**	**57**	**194**	**527**	**802**

Table 8. Activity Index (number of minutes of activity/nights of recording*100) for each month at sites Stake 1 and Stake 2, Duke Energy Searchlight Wind Energy Project Site, April 2008-April 2009.

	2008									2009				
Species	**APR**	**MAY**	**JUN**	**JUL**	**AUG**	**SEP**	**OCT**	**NOV**	**DEC**	**JAN**	**FEB**	**MAR**	**APR**	**TOTAL**
	STAKE 1 (2 m)													
Antrozous pallidus	0	0	0	3	0	0	0	0	0	0	0	0	0	**0.3**
Corynorhinus townsendii	0	0	0	0	0	0	0	0	0	0	0	3	0	**0.3**
Eptesicus fuscus	0	6	0	0	19	0	0	0	0	0	0	0	0	**2**
Lasionycteris noctivagans	0	0	0	0	0	0	0	0	0	0	0	3	0	**0.3**
Lasiurus cinereus	11	0	3	0	0	0	0	3	0	0	0	3	17	**3**
Myotis californicus	42	16	90	132	61	27	0	0	0	0	13	68	177	**50**
Myotis ciliolabrum	58	6	0	0	0	0	0	0	0	0	0	0	87	**10**
Myotis yumanensis	0	0	0	0	65	37	3	0	0	0	0	71	3	**15**
Parastrellus hesperus	32	68	387	258	174	150	3	0	4	0	4	16	80	**95**
Tadarida brasiliensis	1179	187	160	90	94	167	10	3	0	4	92	448	307	**187**
Total	**1321**	**284**	**640**	**484**	**413**	**380**	**16**	**7**	**4**	**4**	**108**	**613**	**670**	**363**
	STAKE 2 (2 m)													
Antrozous pallidus	0	0	3	6	7	4	0	0	0	0	0	3	0	**2**
Corynorhinus townsendii	0	3	0	0	0	0	0	0	0	0	0	0	0	**0.3**
Eptesicus fuscus	0	3	7	0	0	0	0	0	0	0	0	0	0	**1**
Lasiurus cinereus	19	16	0	0	0	0	0	0	0	0	0	3	10	**4**
Myotis californicus	48	48	67	35	71	93	16	0	0	3	0	13	10	**33**
Myotis ciliolabrum	14	68	77	0	0	0	0	0	0	0	0	0	13	**15**
Myotis yumanensis	19	26	57	26	54	37	32	7	0	0	4	16	13	**24**
Nyctinomops macrotis	0	0	0	0	0	0	3	0	0	0	0	0	0	**0.3**
Parastrellus hesperus	76	71	153	203	321	541	16	0	0	3	0	3	33	**115**
Tadarida brasiliensis	1424	223	230	177	107	122	26	0	0	0	61	181	990	**267**
Total	**1600**	**458**	**593**	**448**	**561**	**796**	**94**	**7**	**0**	**6**	**64**	**219**	**1070**	**460**

Table 9. Activity Index (number of minutes of activity/nights of recording*100) for each month at site Stake 4, Duke Energy Searchlight Wind Energy Project Site, 2009.

	2009				
Species	**JAN**	**FEB**	**MAR**	**APR**	**TOTAL**
Eptesicus fuscus	0	0	0	3	**1**
Lasiurus cinereus	0	7	0	20	**8**
Myotis californicus	0	32	87	130	**75**
Myotis ciliolabrum	0	0	0	27	**8**
Myotis yumanensis	0	18	32	83	**40**
Parastrellus hesperus	9	11	42	173	**69**
Tadarida brasiliensis	9	114	216	807	**342**
Total	**18**	**182**	**377**	**1243**	**543**

Table 10. Activity Index (number of minutes of activity/nights of recording*100) for April at site multiple sites around key mines, Duke Energy Searchlight Wind Energy Project Site, 2009.

	Mine 1			Mine 2		
Species	**A-East**	**B-North**	**C-West**	**A-East**	**B-North**	**C-South**
Antrozous pallidus	0	0	0	0	7	0
Lasiurus blossevillii	0	0	14	0	0	0
Lasiurus cinereus	14	21	21	7	7	0
Myotis californicus	264	57	293	100	86	21
Myotis ciliolabrum	129	21	36	0	0	0
Myotis yumanensis	50	36	107	214	29	36
Parastrellus hesperus	64	200	164	100	43	7
Tadarida brasiliensis	464	471	921	507	393	29
Total	**1007**	**836**	**2486**	**929**	**564**	**93**

Table 11. A summary of primary or secondary status based on the magnitude of activity demonstrated by each species for high and low sets at each of the sampling sites within the Duke Energy Searchlight Wind Energy Project Site, April 2008-April 2009.

Species	Stake 1	Stake 2	Stake 4	MET 1	MET 3	MET 4	MET 6
				HIGH			
Tadarida brasiliensis				P	P	P	P
Parastrellus hesperus					S	S	S
Myotis yumanensis					S		
Eptesicus fuscus					S	S	
				LOW			
Tadarida brasiliensis	P	P	P	P	P	P	S
Parastrellus hesperus	S	S	S	P	S	S	P
Myotis californicus	S		S	S	S	P	S
Myotis yumanensis					S		
Eptesicus fuscus						S	

Special Concern, was recorded at Stake 2. *Lasiurus blossevillii*, State-listed Sensitive, was recorded at Mine 1C. *Lasiurus cinereus* was recorded at all sites and heights, except for the three units at Mine 2. *Lasionycteris noctivagans* was recorded at MET 4 low and Stake 1.

The first year of data sampling allows a determination of resident status of bat species found on the project site based on monthly presence (see Tables 4-10). Three clearly year-round residents (*M. californicus, P. hesperus*, and *T. brasiliensis*) were found during the first year. Four species of breeding residents (*A. pallidus, C. townsendii, E. fuscus*, and *M. yumanensis*) were found. The general time span from early spring through late fall suggests that some, at least, of the breeding residents may remain locally and hibernate through the winter. The remaining six species appear to be transient in the spring and/or fall months.

All the data for MET towers was combined and analyzed for nightly patterns in activity (Figs. 2-4). Two basic patterns were revealed. First, a crepuscular pattern was exhibited by *P. hesperus* with a large peak in activity within the first hour after sunset and smaller discrete peak just before sunset. The remaining species demonstrated a later initial peak and then prolonged moderate activity through much of the night. The patterns were similar regardless of altitude of sampling.

DISCUSSION

A total of 14 species were recorded during the April 2008-April 2009 survey. A significant decline in numbers of species was observed as fall progressed into winter. Although many of these species are known to have a broad distribution within the state of Nevada, Searchlight has not been examined in detail (Bradley et al., 2006). Of the species found in the present survey, two molossids (*Eumops perotis* and *Nyctinomops macrotis*), two myotis (*M. thysanodes* and *M. yumanensis*), and two migrators (*Lasiurus cinereus* and *L. blossevillii*) have been considered uncommon or of limited distribution within the state. The present study contributes significant observations on the distribution of these species within Clark County.

Antrozous pallidus, State-listed Protected, is found throughout the state and at a variety of localities within Clark County (Hermanson and O'Shea, 1983; Bradley et al., 2006). The species has been found throughout the Spring Mountains (O'Farrell, 2002). Although seemingly common, loss of roost sites and degradation of foraging areas have resulted in population declines. In the present study, it was found at all sites but was most common at MET 4, 6, and Stake 2. Although the majority of activity was restricted to low heights, it was found at all high sets except for MET 1. The species is known to be a year-round resident in southern Nevada

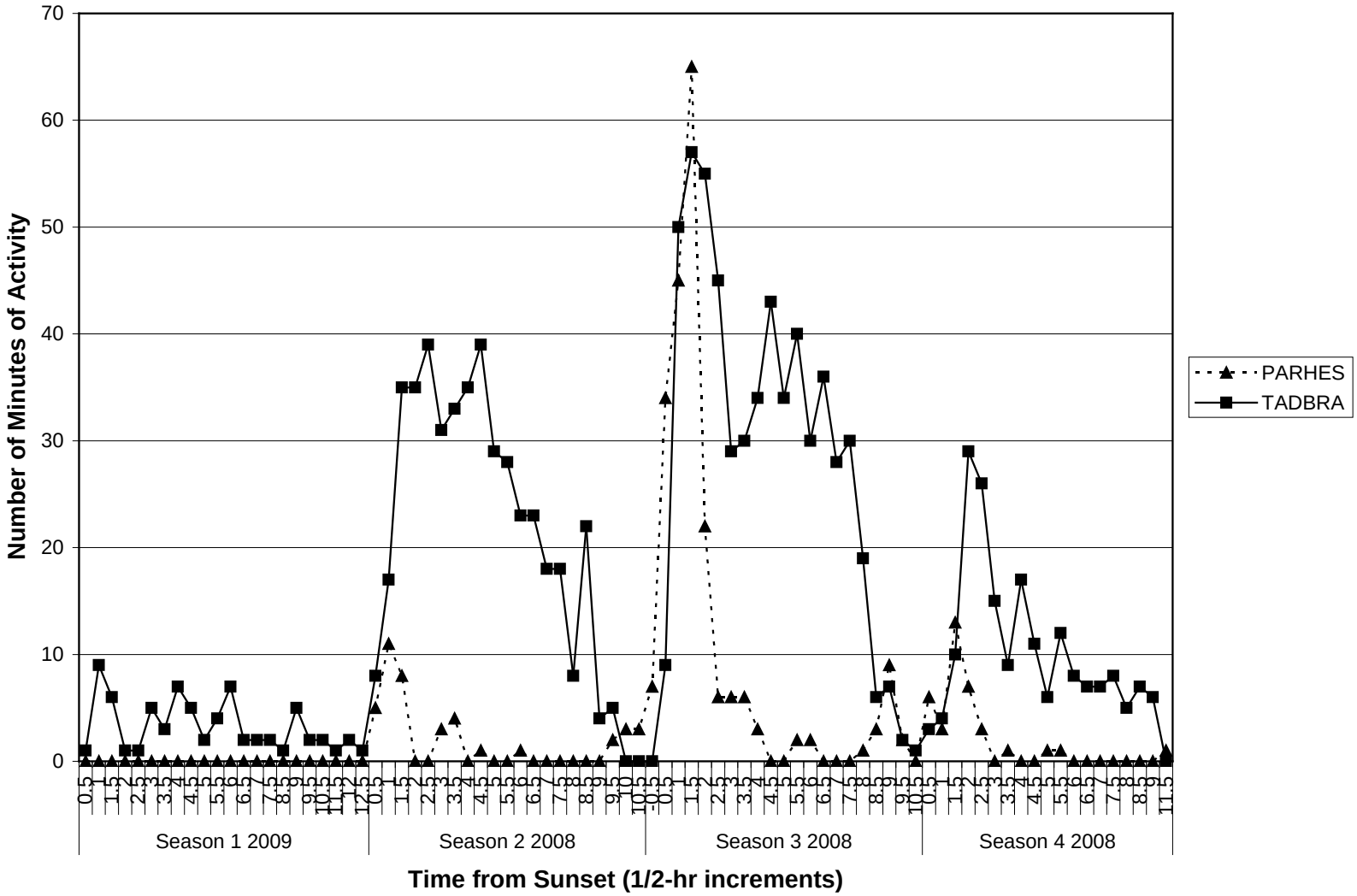

Figure 2. Activity in relation to time from sunset in ½-hr increments for *Parastrellus hesperus* and *Tadarida brasiliensis* during winter (Season 1), spring (Season 2), summer (Season 3), and winter (Season 4) 2008 for MET tower high units on the Duke Energy Searchlight Wind Energy Project, Clark Co., NV.

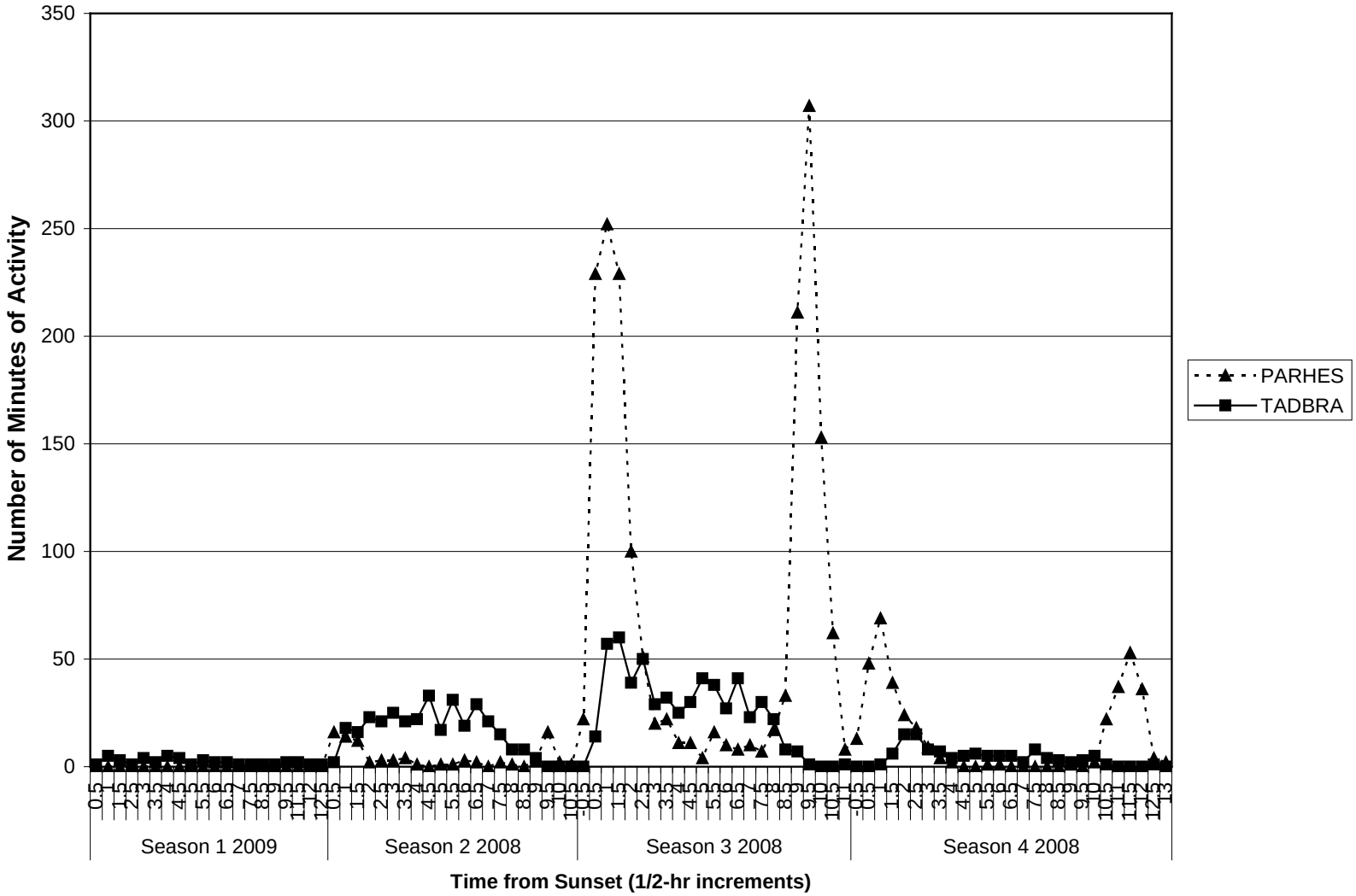

Figure 3. Activity in relation to time from sunset in ½-hr increments for *Parastrellus hesperus* and *Tadarida brasiliensis* during winter (Season 1), spring (Season 2), summer (Season 3), and winter (Season 4) 2008 for MET tower low units on the Duke Energy Searchlight Wind Energy Project, Clark Co., NV.

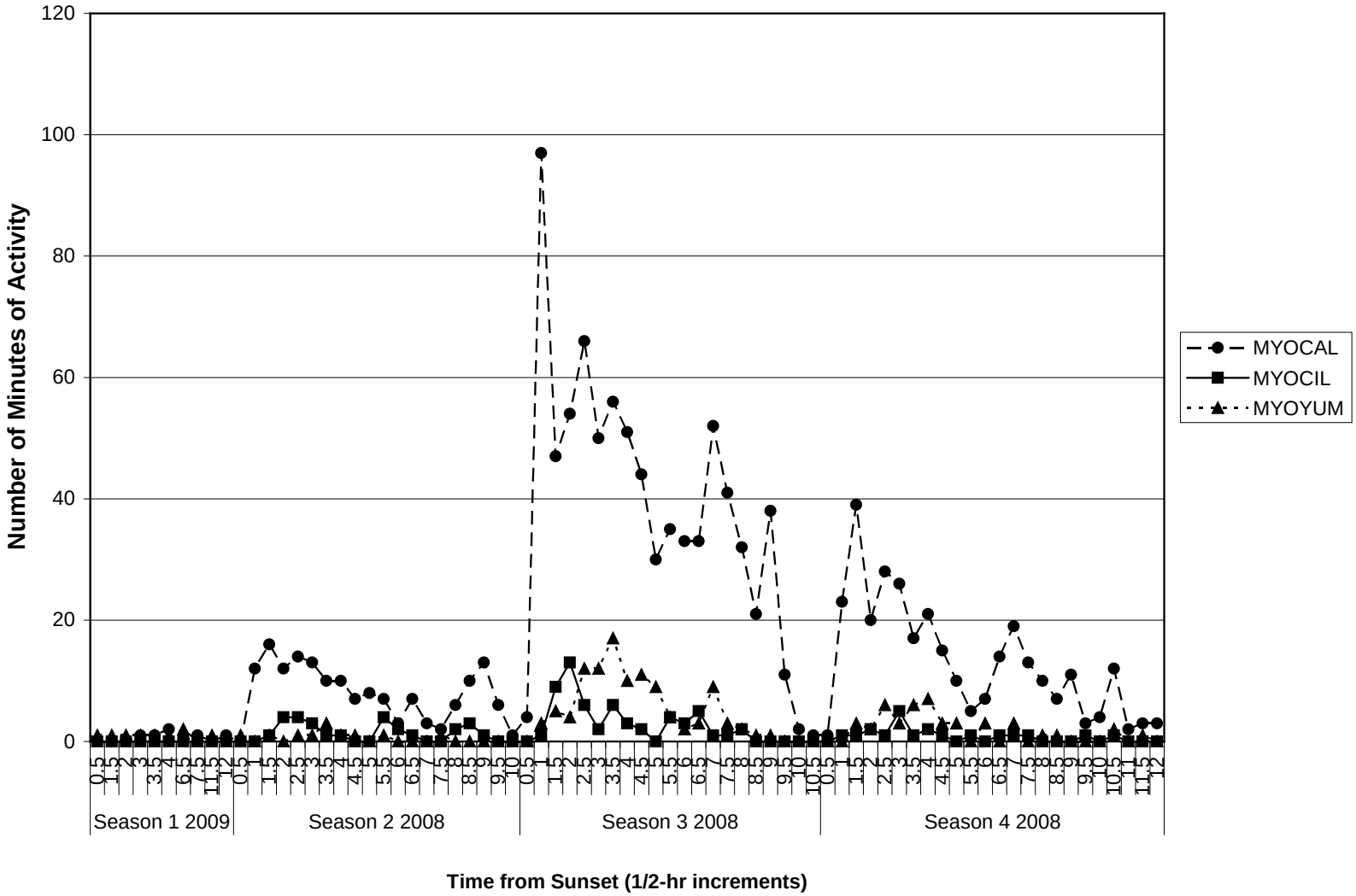

Figure 4. Activity in relation to time from sunset in ½-hr increments for *Myotis californicus*, *M. ciliolabrum*, and *M. yumanensis* during winter (Season 1), spring (Season 2), summer (Season 3), and winter (Season 4) 2008 for MET tower low units on the Duke Energy Searchlight Wind Energy Project, Clark Co., NV..

(O'Farrell et al., 1967; O'Farrell and Bradley, 1970; O'Farrell and Bradley, 1977). In the present study, *A. pallidus* was recorded from February through September, indicating breeding resident status. It may move off site to winter but it is possible that periodic activity in winter months may be confined to washes and other low topography areas not sampled during the first year.

Corynorhinus townsendii, a Federal Species of Special Concern and State-listed Sensitive, is found widely distributed through Nevada and is known from a variety of locations in Clark County primarily associated with the Spring Mountains and the Colorado River (Kunz and Martin, 1982; Bradley et al., 2006). This species relies on abandoned mines for day roosts and has suffered drastic population declines throughout its range due to degradation of foraging habitat and loss of roost sites. In the present study, it was found at MET 1, 3, and Stake 2. The species is known to be a year-round resident in southern Nevada and is active periodically throughout the winter (O'Farrell et al., 1967; O'Farrell and Bradley, 1970; O'Farrell and Bradley, 1977). Further, it is known to form maternity colonies in select abandoned mines within the project area (BLM, personal communication). In the present study, *C. townsendii* was not found in winter and most summer months reflecting sampling bias rather than presence within the project site. However, it probably moves to higher elevations off site to suitable structures for hibernation.

Eptesicus fuscus, although found throughout Nevada, is more associated with woodland and urban and more patchy and sparse in low desert habitats (Kurta and Baker, 1990; Bradley et al., 2006). It is better adapted to human habitation and will use a variety of buildings and abandoned mines. In the present study, it was found at all sites and heights but activity was more prevalent at the low sets. The species was found from April into October consistent with resident breeder status. It is not known where the species goes during the winter but may stay in the region at higher elevations with suitable cold hibernals.

Eumops perotis, a Federal Species of Special Concern and State-listed Sensitive, is one of the rarest bats in Nevada. It was known from Nevada from a single specimen found in southeast Las Vegas (Bradley and O'Farrell, 1967). Recent acoustic surveys have documented summer occurrences in Kyle Canyon (O'Farrell, 2002), Las Vegas Wash (O'Farrell, 2006b). This is a fast, high-flying species that primarily roosts in crevices in cliff faces and boulders (Best et al., 1996; Bradley et al., 2006). In the present study, it was found in late summer/early fall and through the spring at all MET towers. This species can travel over long distances to forage and the transient status on the project site may simply reflect seasonal changes in foraging movements as opposed to migratory movements. A second alternative could be that *E. perotis* is more common over the site than current data would indicate but confined to higher altitudes

above the effective sampling range of the equipment. If the latter alternative is correct, activity could be occurring within the upper limits of the rotor swept area but not be recorded.

Lasionycteris noctivagans is a well-recognized migrator that exclusively uses trees for roosting during much of the year although it has been found in caves and abandoned mines during the winter (Kunz, 1982; Bradley et al., 2006). The species is widely distributed throughout the state but is patchily common in select habitats generally associated with riparian or forested habitats. A strong spring migratory occurrence is usually followed by a lesser occurrence in the fall. Conventional wisdom suggested the species migrated to warmer climates during the winter. However, recent long-term continuous acoustic monitoring in southern and east central Nevada demonstrates movement into select middle elevation sites for wintering (O'Farrell et al., 2003; Hall et al., 2005; O'Farrell 2006a-c). In the present study, it was found as a single occurrence each in May 2008 at the MET 4 low set and March 2009 at Stake 1.

Lasiurus blossevillii, State-listed Sensitive, was known in Nevada from one animal each at Overton and Fallon (Hall, 1946). Since then, several individuals have been captured near Fallon in 1958 (J. R. Alcorn collection, Nevada State Museum of Natural History). Recently, observations verified a year round presence in the Upper Moapa Valley (Williams, 2001; O'Farrell et al., 2003) and seasonal occurrence in the Spring Mountain Range (O'Farrell, 2002a and b; 2006a). In Las Vegas Wash, spring and fall activity predominated but at least in 2005, there was significant activity through the summer (O'Farrell, 2006b). In Lincoln County, *L. blossevillii* was recorded in July in Meadow Valley Wash south of Rox and in Condor Canyon north of Ursine in August (Kenney and Tomlinson, 2005), in the Pahranagat, Delamar, Pahroc, and Dry Lake valleys from spring through early fall (O'Farrell, 2006d), and at Crystal Spring, Ash Meadows NWR in Nye County peak activity was found in mid-late summer (O'Farrell, 2009). This is an obligate tree roosting species and is generally associated with riparian habitat (Shump and Shump, 1982a; Bradley et al., 2006). In the present study, only two fragmentary occurrences were documented in late April 2009 at Mine 1C.

Lasiurus cinereus is a well-recognized migrator that exclusively uses trees for roosting and is generally associated with riparian habitats (Shump and Shump, 1982b; Bradley et al., 2006). Currently the species is considered to be sparsely distributed throughout the state. A strong spring migratory occurrence is usually followed by a lesser occurrence in the fall. There is evidence that at least small numbers, possibly males, maintain summer residence in northern latitudes and/or at high elevations. In the present survey, *L. cinereus* was found at all locations and heights except for MET 1 low. The greatest proportion of activity was found at the high sets. The species was found from February to June and August to November consistent with a

migratory pattern. Although it occurred at all locations and altitudes, the majority of activity occurred at the high sets.

Myotis californicus is common throughout southern and western Nevada (Simpson, 1993; Bradley et al., 2006). It is considered to be a lower elevation species that roosts in crevices mainly in rock faces, mines, and buildings. In the present study, it was found at all locations and heights except for MET 1 low. The vast majority of activity was restricted to the low sets. The species is known to be a year-round resident in southern Nevada active throughout the year (O'Farrell et al., 1967; O'Farrell and Bradley, 1970; O'Farrell and Bradley, 1977). This pattern was evident in the present study.

Myotis ciliolabrum, a Federal Species of Special Concern, is widespread and common throughout Nevada (Holloway and Barclay, 2001; Bradley et al., 2006). In the southern portion of the state it primarily occurs at middle and high elevations. It is known to commonly use abandoned mines for day roosting. Periodic winter activity has been found at middle elevations north of Clark County (Hall et al., 2005) indicating that *M. ciliolabrum* may be moving north to find suitable hibernals similar to the pattern found for *L. noctivagans*. It was found within the project site from March through October indicative of a breeding resident. In the present study, it was found at all locations and heights but the greatest proportion of activity was at the low sets.

Myotis thysanodes, a Federal Species of Special Concern and State-listed Protected, was known only from a single location in Nevada near the historic town of St. Thomas, which was inundated with the formation of Lake Mead (Hall, 1946). More recently, it has been documented in the Upper Moapa Valley (Williams, 2001) and in Las Vegas Wash (O'Farrell, 2006b). Further observations have been associated with mid- to high elevations within the Spring Mountain Range (O'Farrell, 2002; 2006a), Virgin River (O'Farrell, 2006c), throughout Lincoln County (Kenney and Tomlinson, 2005; O'Farrell, 2006d), and scattered locations in western Nevada (Bradley et al., 2006). This species is known to use abandoned mines and buildings as day roosts and are highly susceptible to human disturbance (O'Farrell and Studier, 1980). In the present survey, it was found only at MET 4 and 6 low sets. It was found only in August and September indicating dispersal movements from a breeding area off site to a wintering area, also off site.

Myotis yumanensis, a Federal Species of Special Concern, is abundant in proximity to large reservoirs, lakes, rivers or substantial streams primarily in southern and west-central Nevada (Bradley et al., 2006). This distribution has been extended up the White River drainage

(Kenney and Tomlinson, 2005) and Delamar, Dry Lake, and Cave Valleys (O'Farrell, 2006d). It is known to use mines, rock crevices and buildings as day roosts. In the present study, it was found at all locations and heights except for MET 6 high with the majority of activity restricted to the low sets. Currently, the onsite status may be breeding resident although the period of activity is lengthier than would be expected for a breeding resident (February to November). Either the species overwinters in the region offsite or may winter on site but expected periodic activity simply was not recorded.

Nyctinomops macrotis, a Federal Species of Special Concern, was known in Nevada from a single animal found in Henderson (Bradley et al., 1965). Recent acoustic surveys have documented autumn occurrence in the Upper Moapa Valley (Williams, 2001) and Kyle and Lee canyons (O'Farrell, 2002; 2006a), Las Vegas Wash (O'Farrell, 2006b), Virgin and Muddy River drainages (O'Farrell, 2006c), White River Valley, Dry Lake Valley, and the southern Spring Valley (O'Farrell, 2006d), and a number of locations along Meadow Valley Wash in Lincoln County (Kenney and Tomlinson, 2005). This is a fast, high-flying species that primarily roosts in crevices in cliff faces and boulders (Milner et al., 1990; Bradley et al., 2006). Recent acoustic surveys (cited above) reveal that *N. macrotis* disperse through portions of southern Nevada in the fall. In the present survey, *N. macrotis* was found at Stake 2 as a single occurrence in October.

Parastrellus hesperus is common and widely distributed through southern and western Nevada (Bradley et al., 2006). This species primarily roosts in rock outcrops and cliffs faces but disperse widely to forage. In the present study, it was found at all locations and heights with the majority of activity occurring at the low sets. The species is known to be a year-round resident in southern Nevada active throughout the year (O'Farrell et al., 1967; O'Farrell and Bradley, 1970; O'Farrell and Bradley, 1977). This pattern was evident in the present study.

Tadarida brasiliensis, State-listed Protected, are widespread and abundant throughout much of Nevada (Wilkins, 1989; Bradley et al., 2006). The species can utilize a variety of man-made structures as well as a variety of natural features. Similar to large molossids this species can fly at high altitudes and may travel long distances to foraging sites. Although historically considered an obligate migrator to southern winter areas, at least some portion of the resident population appears to remain year-round in southern Nevada. Recent long-term continuous acoustic monitoring in southern and east central Nevada has established considerable variation in temporal and spatial use by this species (O'Farrell et al., 2003; Hall et al., 2005; O'Farrell 2006a-d; Williams et al., 2006; O'Farrell, 2009). In the present study, it was the primary species at all physical locations and contributed the majority of activity at the high sets.

Large-eared bats tend to forage in closed, cluttered microhabitats and tend to have simple short duration calls of low intensity and therefore are more difficult to detect acoustically than many other species (O'Farrell and Gannon, 1999). The documentation of large-eared quiet species (*A. pallidus, C. townsendii*, and *M. thysanodes*) demonstrates significant presence of these species. Counter to the idea that *A. pallidus* and *C. townsendii* would be found at the lower altitudes consistent with foraging close to vegetation, a small significant amount of activity was found at high sets in the present study.

Wind energy projects have been determined to cause various impacts to birds and bats (Johnson, 2004; Kunz et al., 2007a). These impacts may be direct (e.g., physical impact resulting in injury or death) or indirect (e.g., disruption of foraging behavior, breeding activities, or migratory patterns). A template for assessing impacts to birds and bats has been addressed recently (Kunz et al., 2007b). A range of methods were discussed, including visual, acoustic, radar, thermal imaging, and capture with a consensus that use of multiple methods will provide the greatest ability to assess baseline conditions and the potential for significant impacts. Unfortunately, there has been little success in establishing uniform protocols that would allow valid comparisons among projects throughout the United States. This is particularly true for pre-construction studies. Regardless of methods used, a strong recommendation was made that a minimum of one year, or at least a full active season (April through October), should be completed. This is particularly true for the use of acoustic methods. Species composition and nightly activity is known to vary greatly on a temporal basis and a true reflection of site use can best be determined by continuous sampling throughout the study period (O'Farrell et al., 2003; Hall et al., 2005; O'Farrell 2006a-d). The limited time span of the present study and the gap in data acquisition due to excessive noise resulted in a database that provides a glimpse into bat activity on the project site but limits the ability to draw clear conclusions.

Wind turbines have been shown to be involved in bat mortality (for a review see Arnett et al., 2008). In general, tree-roosting migratory species are more susceptible; however, few studies have been conducted in the western United States. In general, past studies show that most mortalities occur in the late summer-early fall. However, most studies lack a full year of data. Four species found within the present survey have been found to contribute to most of known bat mortality associated with wind turbines. *Lasiurus cinereus* is the most affected of any species in North America and averages more than 44% of all documented mortalities. Within a more restricted range than *L. cinereus* and only two post-construction studies within that range, *T. brasiliensis* mortality averaged 63.5% (Arnett et al., 2008). Other species affected by wind turbine mortality include *L. borealis* (> 28 %), *L. noctivagans* (> 16%), and *E. fuscus* (2.8%) (Arnett et al., 2008).

Despite much speculation, the differential cause of bat mortality is not certain. The primary cause appears to be that bats are either struck by rotors while flying within normal travel routes or actually attracted to the rotor swept area (Horn et al., 2008). It appears that tree bats may be attracted to turbine monopoles as potential roost sites or areas of social congregation. There is also an indication that periods of higher insect abundance within the rotor-swept area may attract bats as a rich foraging ground. Other hypotheses have been suggested as well but none have been rigorously tested. However, it does not appear that mortality occurs due to random contact with turbines.

The Duke Energy Searchlight Wind Energy Project proposes a facility with a substantial footprint covering an area of low to middle elevation Mojave Desert scrub. The finished size and configuration of the facility is still in planning. The bat species inventory generated during the present study appears to be relatively high (13 species) reflecting the range of topographic diversity found on and in proximity to the project site; which includes a rich mosaic of foraging and roosting possibilities. However, the study to date is less than a yearlong; thus it is not possible to make inferences as to use of the area throughout the year, including aspects of movement and foraging patterns. The presence of four species known to be adversely affected by wind energy projects is of concern. Likewise, the presence of two other high-flying molossids and the use of the high sets by other species suggest these species be evaluated more thoroughly.

It is clear from the study to date that continuous acoustic sampling has allowed a detailed examination of bat presence, activity, and habitat use within the Duke Energy Searchlight Wind Generating Facility Project area. However, equipment malfunctions during the start up phase of the current study have created gaps in the database. Presumably these problems have been solved and the full functioning of all units is anticipated. Two years of continuous data collection at Las Vegas Wash (O'Farrell, 2006b) demonstrated significant fluctuations in quantity of bat activity between the years. The causes of these annual fluctuations and resulting magnitude of such changes remain unknown. The current study, as planned, will provide a meaningful examination of seasonal and annual changes in bat community dynamics and will allow an informed assessment of deleterious impacts to that community.

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APPENDIX I

Raw data of sampling (number of minutes of activity) at the acoustic monitoring stations within the Duke Energy Searchlight Wind Energy Project area, Clark County, Nevada from April 2008-April 2009.

Table I-1. Number of minutes of activity for each month at site MET 1, Duke Energy Searchlight Wind Energy Project Site, April 2008-April 2009.

	2008									2009				
Species	**APR**	**MAY**	**JUN**	**JUL**	**AUG**	**SEP**	**OCT**	**NOV**	**DEC**	**JAN**	**FEB**	**MAR**	**APR**	**TOTAL**
	HIGH SET (50 m)													
Corynorhinus townsendii	1	0	0	0	0	0	0	0	0	0	0	0	0	**1**
Eptesicus fuscus	0	2	0	0	1	0	0	0	0	0	0	0	0	**3**
Eumops perotis	0	0	0	0	0	0	0	0	0	0	0	0	1	**1**
Lasiurus cinereus	2	1	1	0	0	0	0	0	0	0	0	0	5	**9**
Myotis ciliolabrum	3	0	0	0	0	0	0	0	0	0	0	0	0	**3**
Myotis yumanensis	3	2	6	0	0	0	0	0	0	0	1	3	1	**12**
Parastrellus hesperus	8	10	11	5	0	7	0	0	0	0	0	1	6	**47**
Tadarida brasiliensis	187	33	3	49	25	25	2	0	0	0	21	103	198	**552**
Total	**204**	**48**	**21**	**54**	**26**	**32**	**2**	**0**	**0**	**0**	**22**	**107**	**211**	**598**
	LOW SET (2 m)													
Antrozous pallidus	1	0	0	0	1	0	0	0	0	0	1	0	1	**3**
Eptesicus fuscus	4	1	0	0	1	2	0	0	0	0	0	0	0	**8**
Lasiurus cinereus	0	0	0	0	0	0	0	0	0	0	0	0	1	**1**
Myotis californicus	4	1	1	2	12	5	0	17	0	0	3	12	18	**60**
Myotis ciliolabrum	9	0	0	0	1	0	0	0	0	0	0	1	9	**19**
Myotis yumanensis	1	3	0	0	0	5	2	1	0	0	7	11	10	**22**
Parastrellus hesperus	3	4	3	32	61	36	6	0	0	0	0	11	19	**164**
Tadarida brasiliensis	10	0	0	9	4	3	0	0	0	0	9	24	122	**148**
Total	**32**	**9**	**4**	**43**	**80**	**51**	**8**	**18**	**0**	**0**	**20**	**59**	**180**	**425**

Table I-2. Number of minutes of activity for each month at site MET 3, Duke Energy Searchlight Wind Energy Project Site, April 2008-April 2009.

	2008									2009				
Species	**APR**	**MAY**	**JUN**	**JUL**	**AUG**	**SEP**	**OCT**	**NOV**	**DEC**	**JAN**	**FEB**	**MAR**	**APR**	**TOTAL**
	HIGH SET (50 m)													
Antrozous pallidus	1	0	0	1	1	1	0	0	0	0	0	0	0	**4**
Corynorhinus townsendii	1	0	0	0	2	0	0	0	0	0	0	0	0	**3**
Eptesicus fuscus	1	0	5	16	10	1	0	0	0	0	0	0	0	**33**
Lasiurus cinereus	5	3	0	0	1	0	0	0	0	0	0	1	3	**13**
Myotis californicus	1	0	0	1	1	0	0	0	0	0	0	0	0	**3**
Myotis ciliolabrum	0	0	0	1	0	0	0	0	0	0	0	0	0	**1**
Myotis yumanensis	3	3	5	1	5	3	6	1	0	0	0	1	3	**31**
Parastrellus hesperus	3	4	13	8	7	3	1	0	0	0	0	0	2	**41**
Tadarida brasiliensis	27	20	20	55	43	32	3	0	0	0	17	27	67	**311**
Total	**42**	**30**	**43**	**83**	**70**	**40**	**10**	**1**	**0**	**0**	**17**	**29**	**75**	**440**
	LOW SET (2 m)													
Antrozous pallidus	0	0	0	1	1	-	0	0	-	0	0	0	0	**2**
Corynorhinus townsendii	0	0	0	0	0	-	1	1	-	0	0	0	0	**2**
Eptesicus fuscus	0	4	2	18	21	-	0	0	-	0	0	0	0	**45**
Eumops perotis	0	0	0	0	1	-	0	0	-	0	0	0	0	**1**
Lasiurus cinereus	0	1	0	0	1	-	0	0	-	0	0	0	1	**3**
Myotis californicus	12	19	27	29	53	-	75	3	-	1	1	7	10	**237**
Myotis ciliolabrum	2	2	0	0	0	-	0	0	-	0	0	0	2	**6**
Myotis yumanensis	2	3	20	20	29	-	17	2	-	0	2	13	8	**116**
Parastrellus hesperus	5	9	27	73	65	-	5	0	-	0	0	0	2	**186**
Tadarida brasiliensis	47	21	35	138	66	-	8	0	-	1	14	20	65	**415**
Total	**68**	**59**	**111**	**279**	**237**	**-**	**106**	**6**	**-**	**2**	**17**	**40**	**88**	**1013**

Table I-4. Number of minutes of activity for each month at site MET 6, Duke Energy Searchlight Wind Energy Project Site, April 2008-April 2009.

	2008									2009				
Species	**APR**	**MAY**	**JUN**	**JUL**	**AUG**	**SEP**	**OCT**	**NOV**	**DEC**	**JAN**	**FEB**	**MAR**	**APR**	**TOTAL**
	HIGH SET (50 m)													
Antrozous pallidus	0	0	2	0	0	0	0	0	0	0	0	0	0	**2**
Eptesicus fuscus	1	1	7	5	0	0	0	0	0	0	0	0	0	**14**
Eumops perotis	0	0	0	0	0	2	0	0	0	0	0	2	0	**4**
Lasiurus cinereus	4	0	0	0	0	0	0	0	0	0	0	2	4	**10**
Myotis californicus	1	0	0	0	0	1	0	0	0	0	0	0	0	**2**
Myotis ciliolabrum	2	0	1	0	0	0	0	0	0	0	0	0	0	**3**
Parastrellus hesperus	2	7	64	15	8	15	1	0	0	0	0	0	12	**124**
Tadarida brasiliensis	71	9	6	8	8	15	1	1	1	2	30	68	111	**331**
Total	**81**	**17**	**80**	**28**	**16**	**33**	**2**	**1**	**1**	**2**	**30**	**72**	**127**	**490**
	LOW SET (2 m)													
Antrozous pallidus	0	1	3	6	7	1	0	0	0	0	0	3	0	**21**
Eptesicus fuscus	1	2	14	16	9	3	0	0	0	0	0	0	0	**45**
Eumops perotis	0	0	0	0	0	1	0	0	0	0	0	1	0	**2**
Lasiurus cinereus	1	1	0	0	0	0	1	0	0	0	0	0	1	**4**
Myotis californicus	26	78	164	121	152	56	8	2	0	1	0	6	27	**641**
Myotis ciliolabrum	4	1	1	0	1	0	0	0	0	0	0	0	0	**7**
Myotis thysanodes	0	0	0	0	0	1	0	0	0	0	0	0	0	**1**
Myotis yumanensis	0	0	3	11	10	1	0	0	0	0	0	0	4	**29**
Parastrellus hesperus	5	59	402	542	347	295	21	2	0	0	0	2	8	**1683**
Tadarida brasiliensis	117	72	28	38	44	20	7	1	1	2	16	48	118	**512**
Total	**154**	**214**	**615**	**734**	**570**	**378**	**37**	**5**	**1**	**3**	**16**	**60**	**158**	**2945**

Table I-5. Number of minutes of activity for each month at sites Stake 1 and Stake 2, Duke Energy Searchlight Wind Energy Project Site, April 2008-April 2009.

	2008									2009				
Species	**APR**	**MAY**	**JUN**	**JUL**	**AUG**	**SEP**	**OCT**	**NOV**	**DEC**	**JAN**	**FEB**	**MAR**	**APR**	**TOTAL**
	STAKE 1 (2 m)													
Antrozous pallidus	0	0	0	1	0	0	0	0	0	0	0	0	0	**1**
Corynorhinus townsendii	0	0	0	0	0	0	0	0	0	0	0	1	0	**1**
Eptesicus fuscus	0	2	0	0	6	0	0	0	0	0	0	0	0	**8**
Lasionycteris noctivagans	0	0	0	0	0	0	0	0	0	0	0	0	0	
Lasiurus cinereus	2	0	1	0	0	0	0	1	0	0	0	1	5	**10**
Myotis californicus	0	0	0	0	0	0	0	0	0	0	0	1	0	**1**
Myotis ciliolabrum	8	5	27	41	19	8	0	0	0	0	3	21	53	**185**
Myotis yumanensis	11	2	0	0	0	0	0	0	0	0	0	0	26	**39**
Parastrellus hesperus	0	0	0	0	20	11	1	0	0	0	0	22	1	**55**
Tadarida brasiliensis	6	21	116	80	54	45	1	0	1	0	1	5	24	**354**
Total	**224**	**58**	**48**	**28**	**29**	**50**	**3**	**1**	**0**	**1**	**22**	**139**	**92**	**695**
	STAKE 2 (2 m)													
Antrozous pallidus	0	0	1	2	2	1	0	0	0	0	0	1	0	**7**
Corynorhinus townsendii	0	1	0	0	0	0	0	0	0	0	0	0	0	**1**
Eptesicus fuscus	0	1	2	0	0	0	0	0	0	0	0	0	0	**3**
Lasiurus cinereus	4	5	0	0	0	0	0	0	0	0	0	1	3	**13**
Myotis californicus	10	15	20	11	20	25	5	0	0	1	0	4	3	**114**
Myotis ciliolabrum	3	21	23	0	0	0	0	0	0	0	0	0	4	**51**
Myotis yumanensis	4	8	17	8	15	10	10	1	0	0	1	5	4	**83**
Nyctinomops macrotis	0	0	0	0	0	0	1	0	0	0	0	0	0	**1**
Parastrellus hesperus	16	22	46	63	90	146	5	0	0	1	0	1	10	**400**
Tadarida brasiliensis	299	69	69	55	30	33	8	0	0	0	17	56	297	**933**
Total	**336**	**142**	**178**	**139**	**157**	**215**	**29**	**1**	**0**	**2**	**18**	**68**	**321**	**1606**

Table I-3. Number of minutes of activity for each month at site MET 4, Duke Energy Searchlight Wind Energy Project Site, 2008.

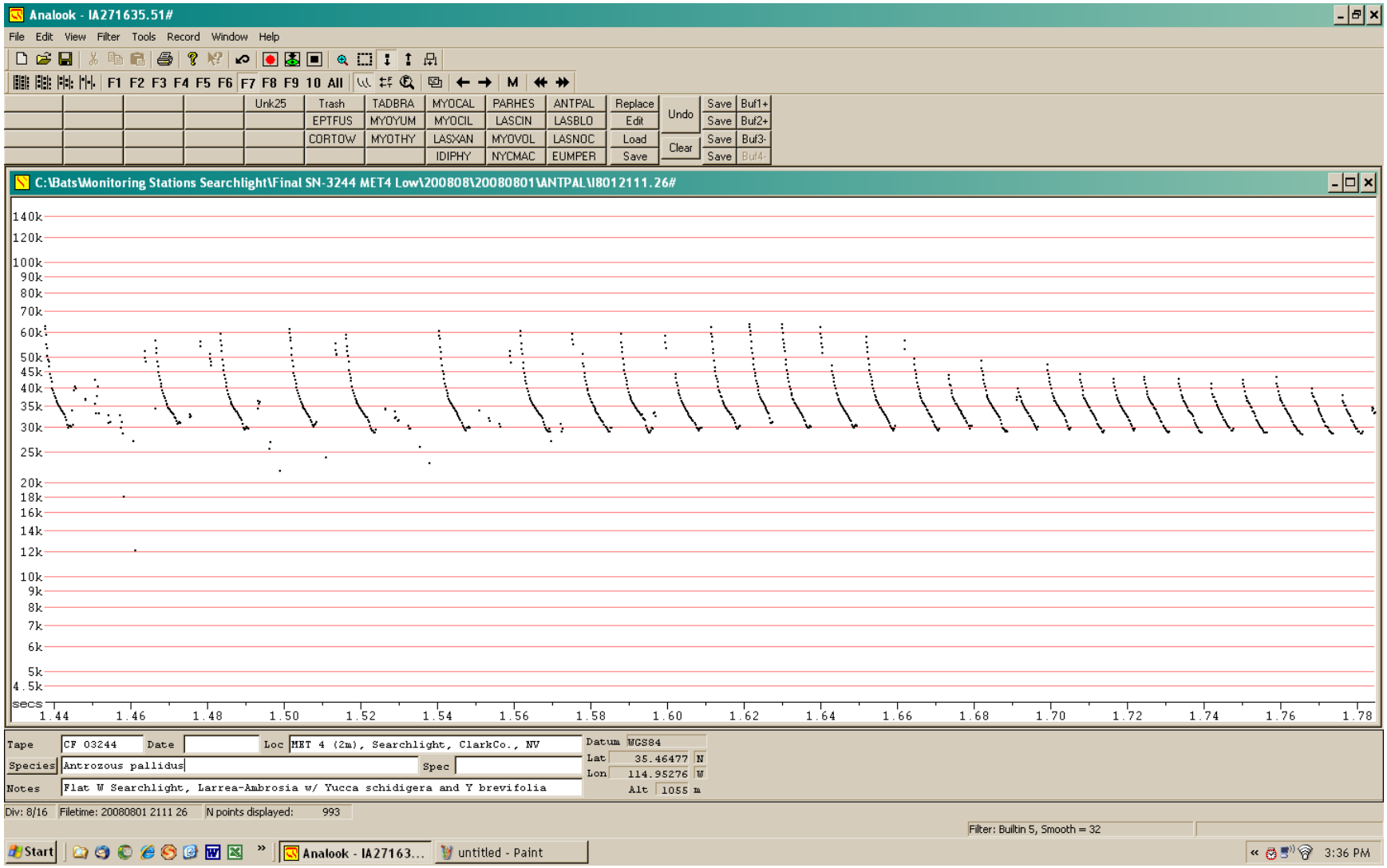
	2008									
Species	**APR**	**MAY**	**JUN**	**JUL**	**AUG**	**SEP**	**OCT**	**NOV**	**DEC**	**TOTAL**
					HIGH SET (40 m)					
Antrozous pallidus	0	1	4	0	0	1	0			**6**
Eptesicus fuscus	1	0	13	31	24	6	0			**75**
Eumops perotis	0	0	0	0	0	1	0			**1**
Lasiurus cinereus	1	3	0	0	2	1	0			**7**
Myotis californicus	2	0	3	1	0	2	0			**8**
Myotis ciliolabrum	5	7	9	2	1	2	0			**26**
Myotis yumanensis	0	0	0	0	0	2	0			**2**
Parastrellus hesperus	3	4	34	24	24	9	0			**98**
Tadarida brasiliensis	62	42	54	176	138	109	1			**582**
Total	**74**	**57**	**117**	**234**	**189**	**133**	**1**			**805**
					LOW SET (2 m)					
Antrozous pallidus	0	1	6	4	3	1	0			**15**
Eptesicus fuscus	0	1	26	70	79	19	1			**196**
Lasionycteris noctivagans	0	1	0	0	0	0	0			**1**
Lasiurus cinereus	0	1	0	0	1	0	0			**2**
Myotis californicus	3	23	63	77	95	133	10			**404**
Myotis ciliolabrum	1	9	23	9	23	15	4			**84**
Myotis thysanodes	0	0	0	0	1	3	0			**4**
Myotis yumanensis	1	1	1	1	13	16	0			**33**
Parastrellus hesperus	1	2	55	85	100	19	1			**263**
Tadarida brasiliensis	45	22	36	116	61	65	6			**351**
Total	**51**	**61**	**210**	**362**	**376**	**271**	**22**			**1353**

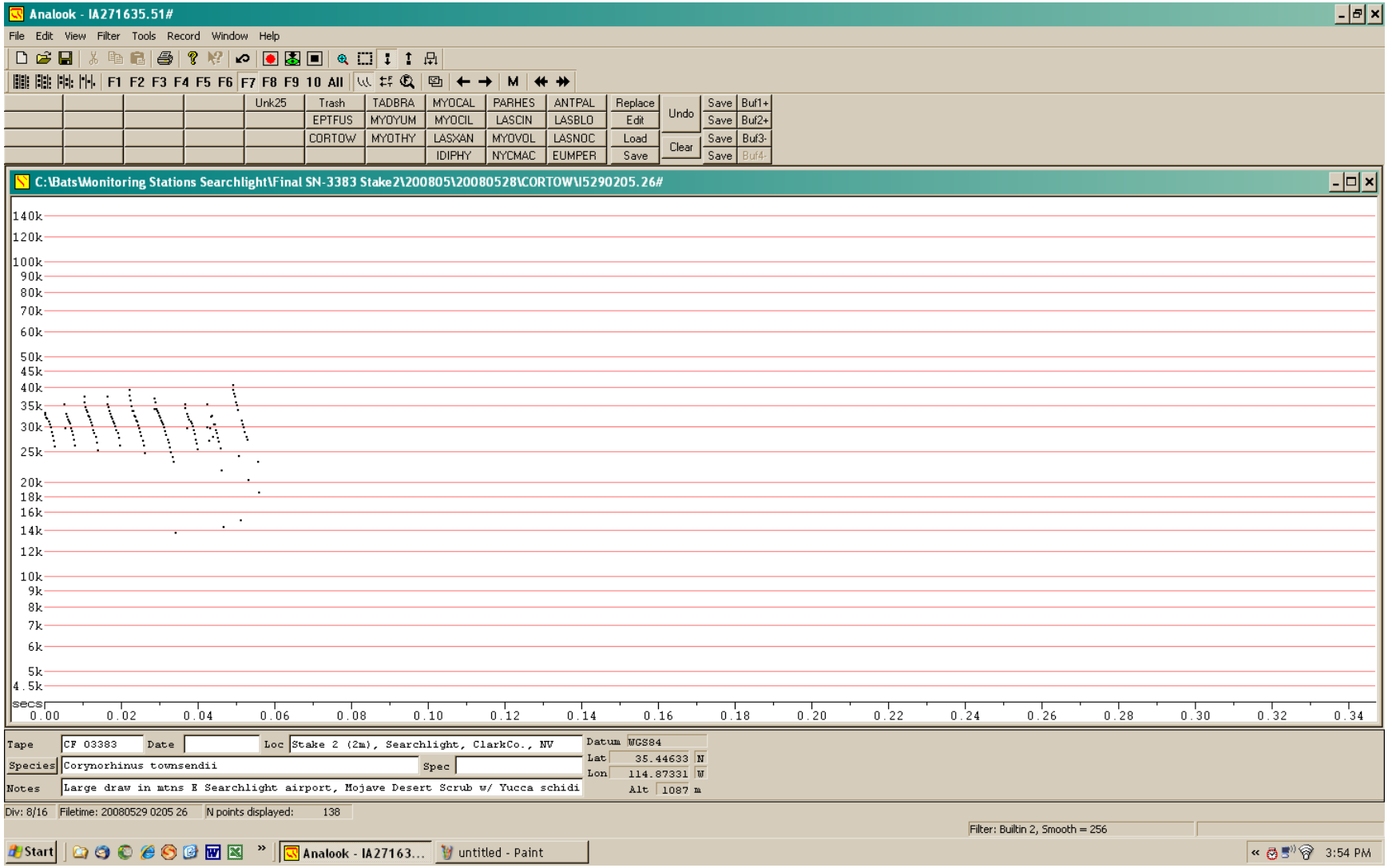
Table I-6. Number of minutes of activity for each month at site Stake 4, Duke Energy Searchlight Wind Energy Project Site, 2009.

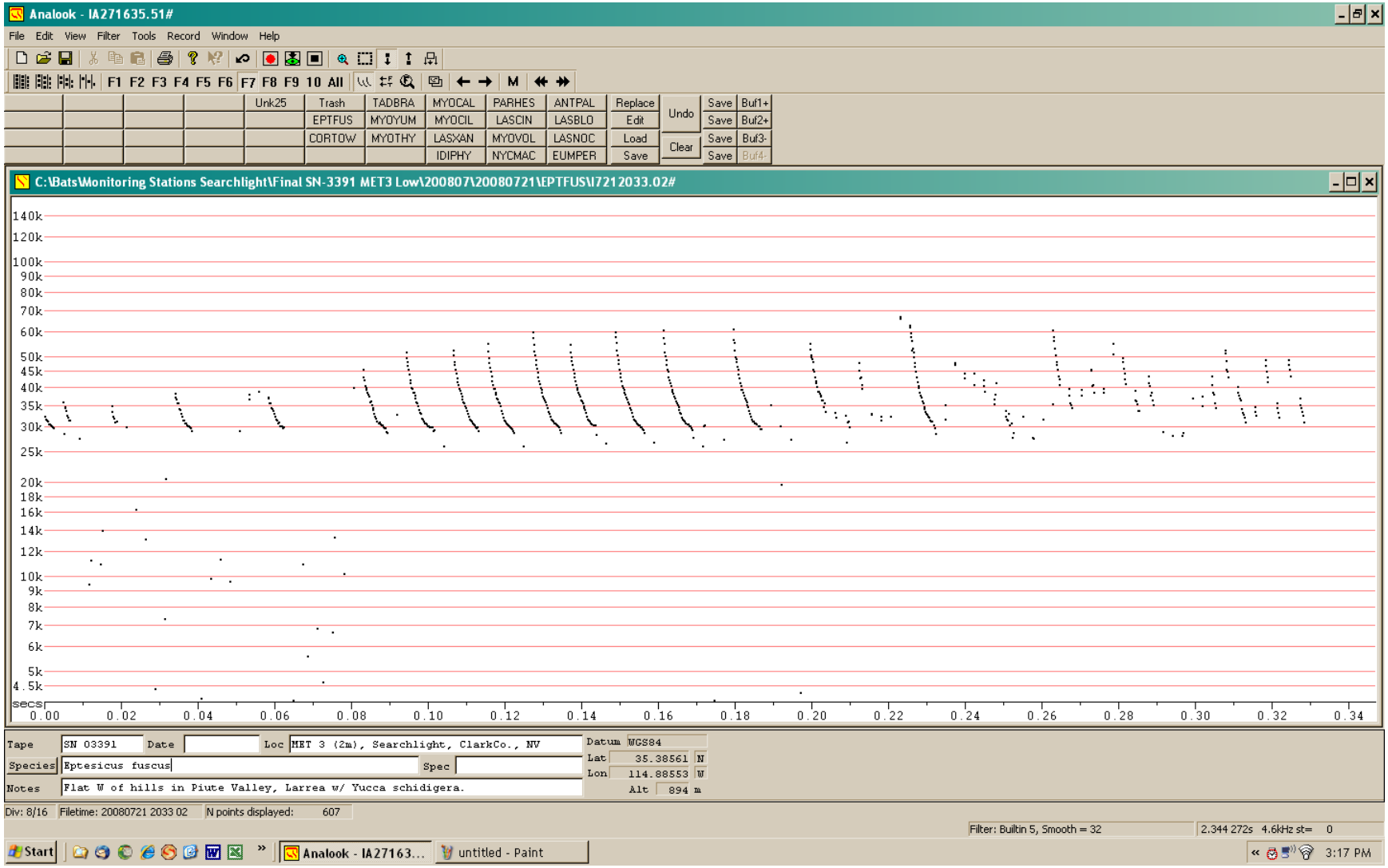
	2009				
Species	**JAN**	**FEB**	**MAR**	**APR**	**TOTAL**
Eptesicus fuscus	0	0	0	3	**1**
Lasiurus cinereus	0	7	0	20	**8**
Myotis californicus	0	32	87	130	**75**
Myotis ciliolabrum	0	0	0	27	**8**
Myotis yumanensis	0	18	32	83	**40**
Parastrellus hesperus	9	11	42	173	**69**
Tadarida brasiliensis	9	114	216	807	**342**
Total	**18**	**182**	**377**	**1243**	**543**

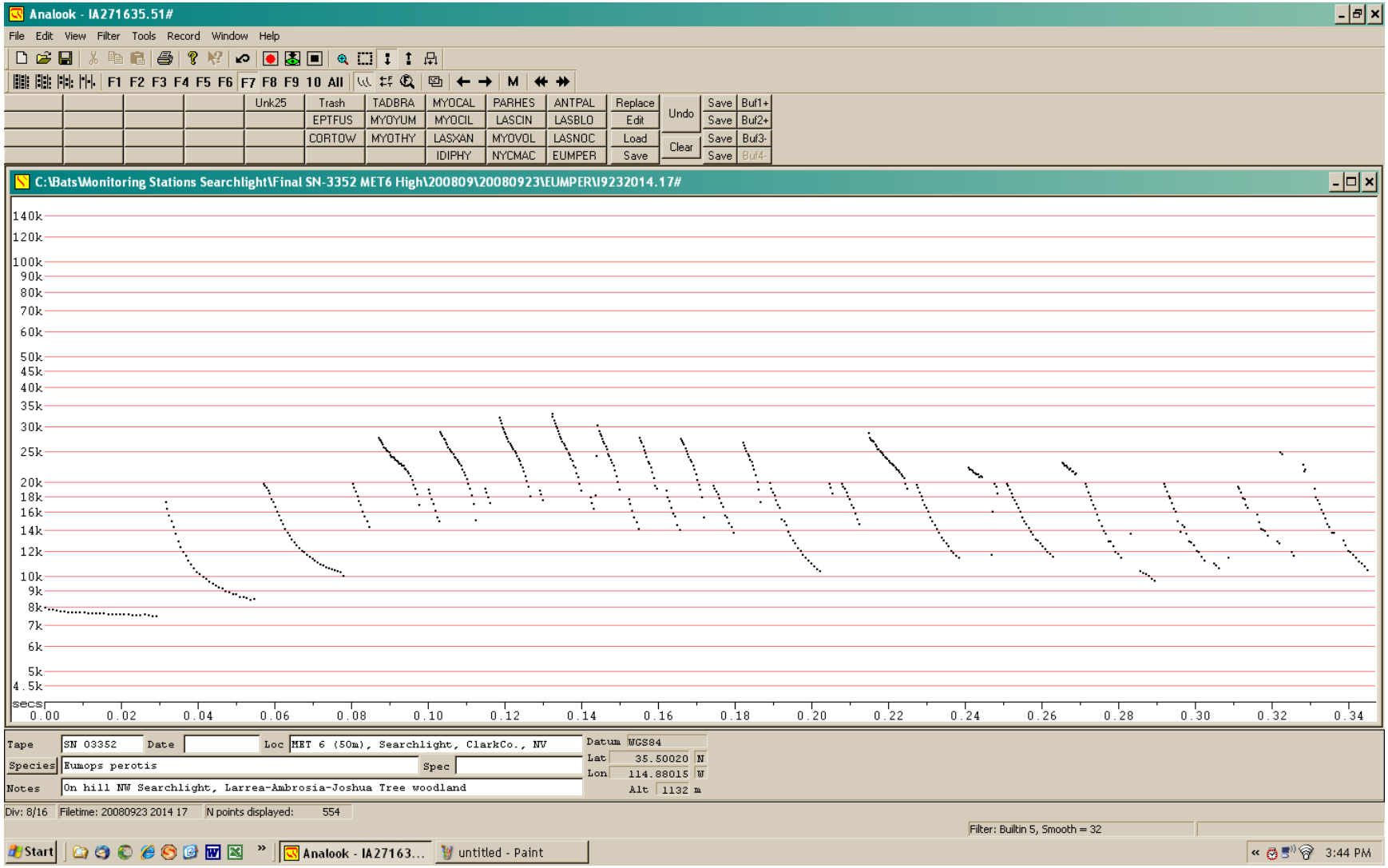
APPENDIX II

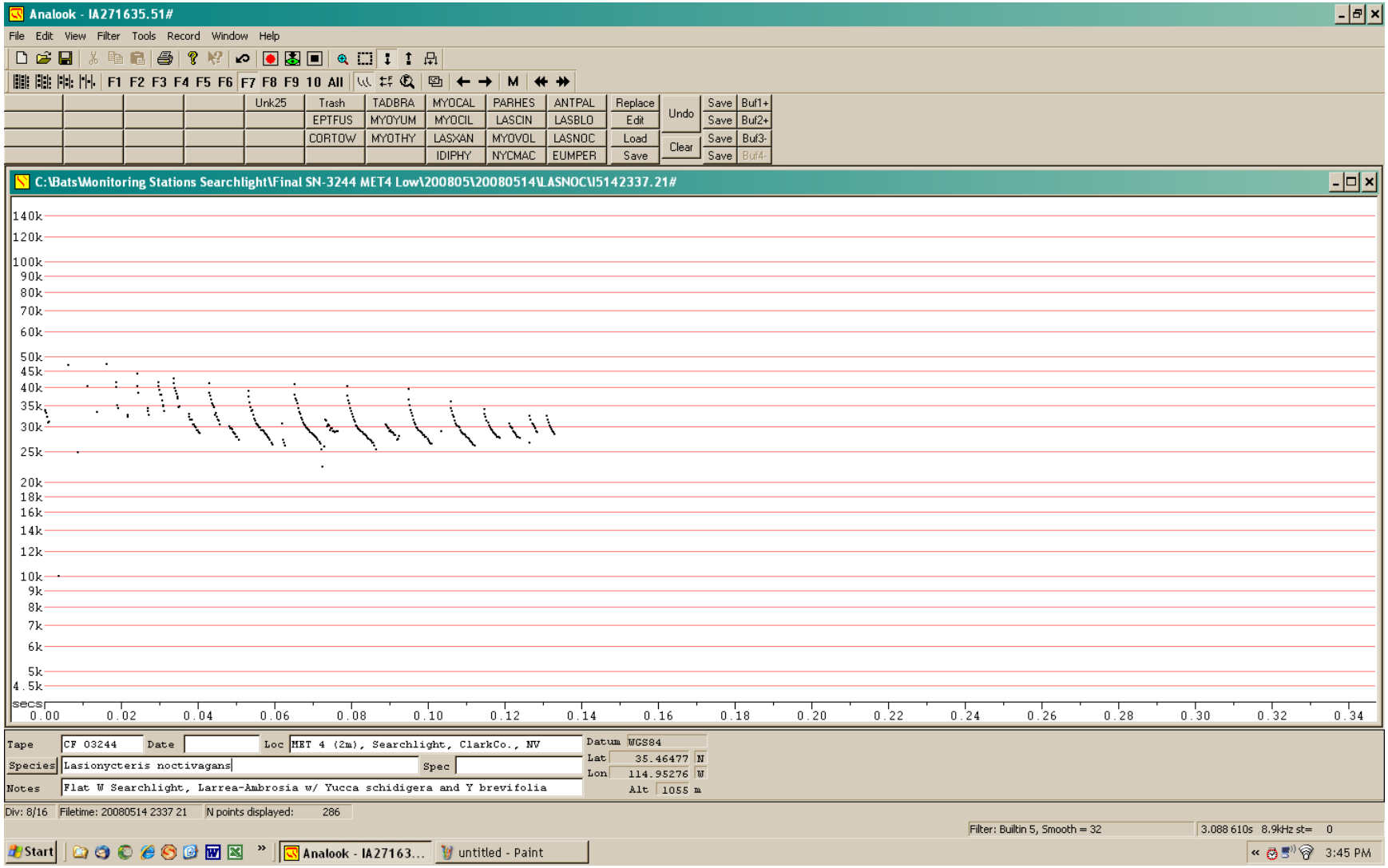
Representative vocal signatures of each species of bat detected within the Duke Energy Searchlight Wind Energy Facility Project area, Clark County, Nevada from April 2008-April 2009.

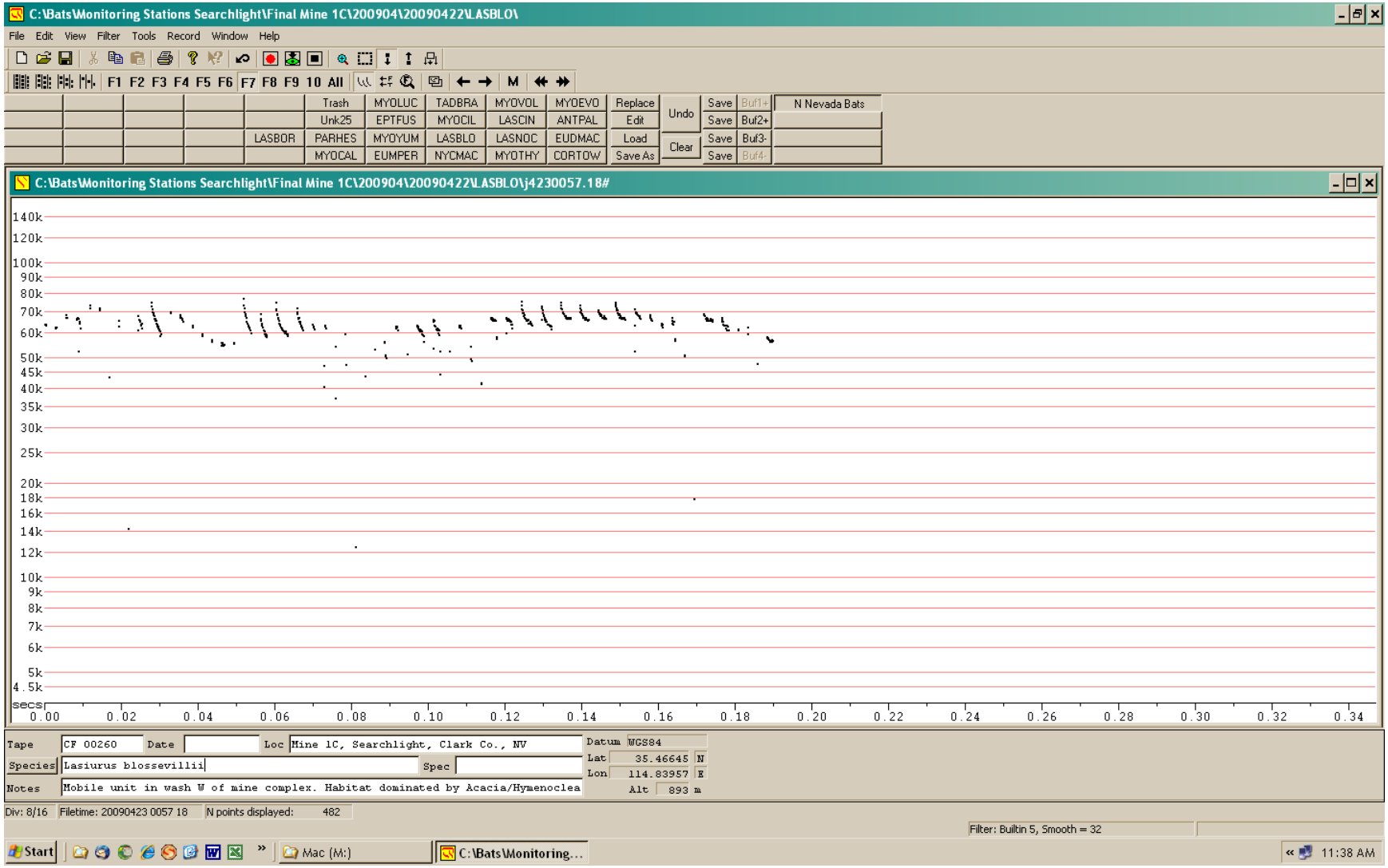

Analook - IA271635.51#
File Edit View Filter Tools Record Window Help
F1 F2 F3 F4 F5 F6 F7 F8 F9 10 All M
Unk25 Trash TADBRA MYOCAL PARHES ANTPAL Replace Undo Save Buf1+
EPTFUS MYOYUM MYOCIL LASCIN LASBLO Edit Save Buf2+
CORTOW MYOTHY LASXAN MYOVOL LASNOC Load Clear Save Buf3-
IDIPHY NYCMAC EUMPER Save Save Buf4-
C:\Bats\Monitoring Stations Searchlight\Final SN-3244 MET4 Low\200808\20080801\ANTPAL\I8012111.26#
140k
120k
100k
90k
80k
70k
60k
50k
45k
40k
35k
30k
25k
20k
18k
16k
14k
12k
10k
9k
8k
7k
6k
5k
4.5k
secs
1.44 1.46 1.48 1.50 1.52 1.54 1.56 1.58 1.60 1.62 1.64 1.66 1.68 1.70 1.72 1.74 1.76 1.78
Tape CF 03244 Date Loc MET 4 (2m), Searchlight, ClarkCo., NV
Datum WGS84
Species Antrozous pallidus Spec
Lat 35.46477 N
Lon 114.95276 W
Notes Flat W Searchlight, Larrea-Ambrosia w/ Yucca schidigera and Y brevifolia
Alt 1055 m
Div: 8/16 Filetime: 20080801 2111 26 N points displayed: 993
Filter: Builtin 5, Smooth = 32
Start
Analook - IA27163...
untitled - Paint
3:36 PM

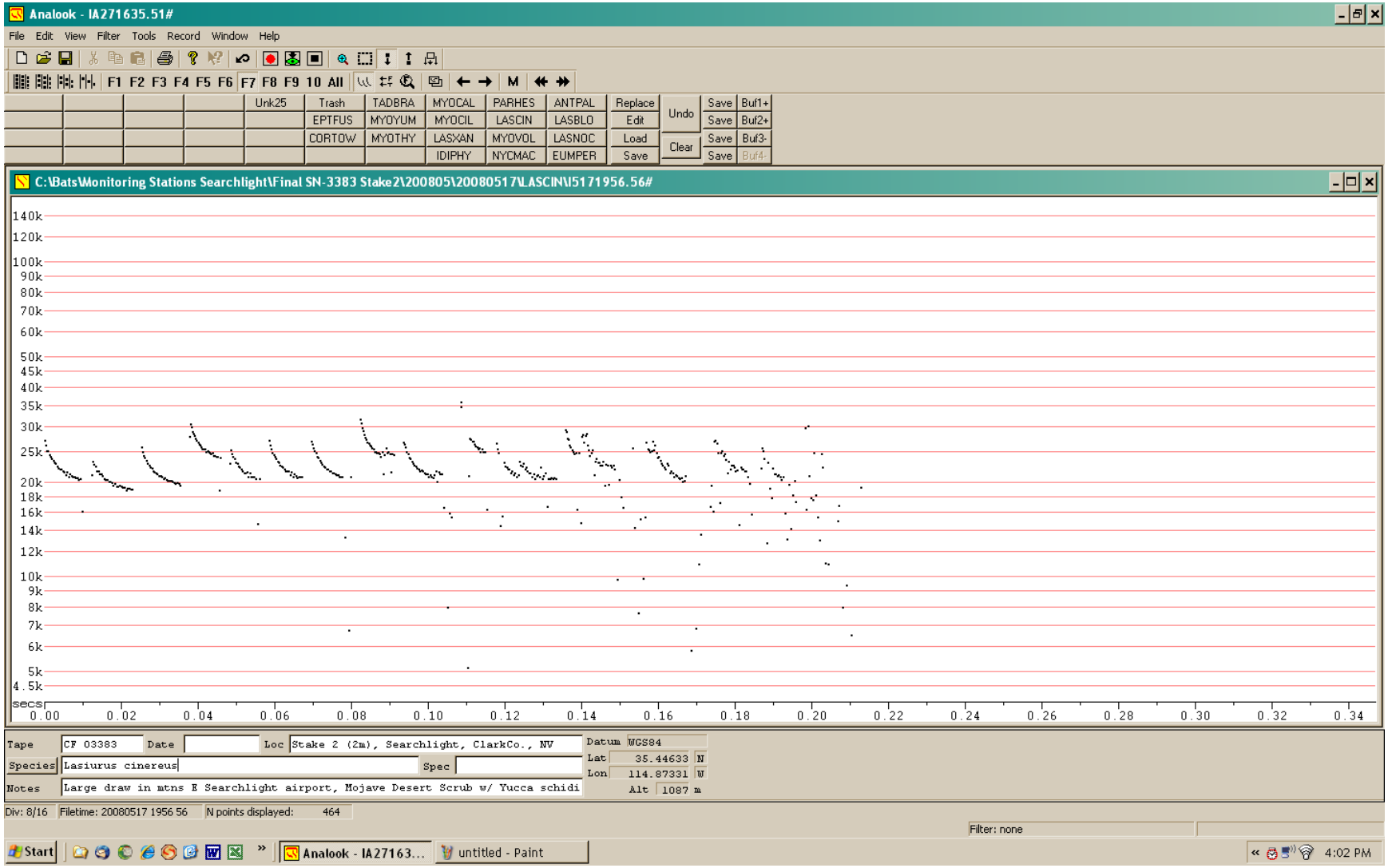

Analook - IA271635.51#
File Edit View Filter Tools Record Window Help
F1 F2 F3 F4 F5 F6 F7 F8 F9 10 All M
Unk25 Trash TADBRA MYOCAL PARHES ANTPAL Replace Undo Save Buf1+
EPTFUS MYOYUM MYOCIL LASCIN LASBLO Edit Save Buf2+
CORTOW MYOTHY LASXAN MYOVOL LASNOC Load Clear Save Buf3-
IDIPHY NYCMAC EUMPER Save Save Buf4-
C:\Bats\Monitoring Stations Searchlight\Final SN-3383 Stake2\200805\20080528\CORTOW\I5290205.26#
140k
120k
100k
90k
80k
70k
60k
50k
45k
40k
35k
30k
25k
20k
18k
16k
14k
12k
10k
9k
8k
7k
6k
5k
4.5k
secs
0.00 0.02 0.04 0.06 0.08 0.10 0.12 0.14 0.16 0.18 0.20 0.22 0.24 0.26 0.28 0.30 0.32 0.34
Tape CF 03383 Date Loc Stake 2 (2m), Searchlight, ClarkCo., NV
Datum WGS84
Species Corynorhinus townsendii Spec
Lat 35.44633 N
Lon 114.87331 W
Notes Large draw in mtns E Searchlight airport, Mojave Desert Scrub w/ Yucca schidi
Alt 1087 m
Div: 8/16 Filetime: 20080529 0205 26 N points displayed: 138
Filter: Builtin 2, Smooth = 256
Start
Analook - IA27163...
untitled - Paint
3:54 PM

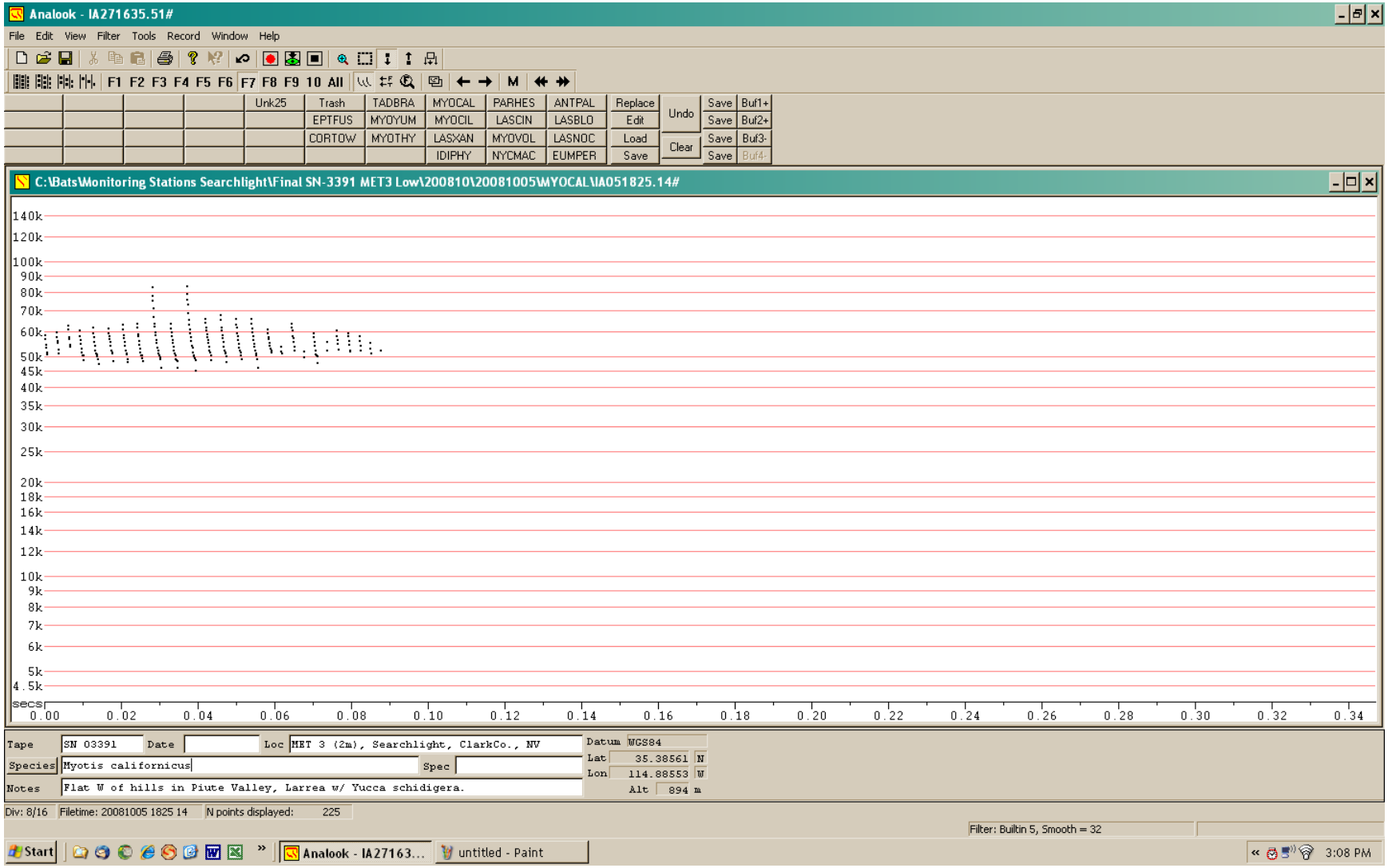

Analook - IA271635.51#
File Edit View Filter Tools Record Window Help
F1 F2 F3 F4 F5 F6 F7 F8 F9 10 All M
Unk25 Trash TADBRA MYOCAL PARHES ANTPAL Replace Undo Save Buf1+
EPTFUS MYOYUM MYOCIL LASCIN LASBLO Edit Save Buf2+
CORTOW MYOTHY LASXAN MYOVOL LASNOC Load Clear Save Buf3-
IDIPHY NYCMAC EUMPER Save Save Buf4-
C:\Bats\Monitoring Stations Searchlight\Final SN-3391 MET3 Low\200807\20080721\EPTFUS\I7212033.02#
140k 120k 100k 90k 80k 70k 60k 50k 45k 40k 35k 30k 25k 20k 18k 16k 14k 12k 10k 9k 8k 7k 6k 5k 4.5k
secs 0.00 0.02 0.04 0.06 0.08 0.10 0.12 0.14 0.16 0.18 0.20 0.22 0.24 0.26 0.28 0.30 0.32 0.34
Tape SN 03391 Date Loc MET 3 (2m), Searchlight, ClarkCo., NV Datum WGS84
Species Eptesicus fuscus Spec Lat 35.38561 N
Notes Flat W of hills in Piute Valley, Larrea w/ Yucca schidigera. Lon 114.88553 W
Alt 894 m
Div: 8/16 Filetime: 20080721 2033 02 N points displayed: 607
Filter: Builtin 5, Smooth = 32 2.344 272s 4.6kHz st= 0
Start Analook - IA27163... untitled - Paint 3:17 PM

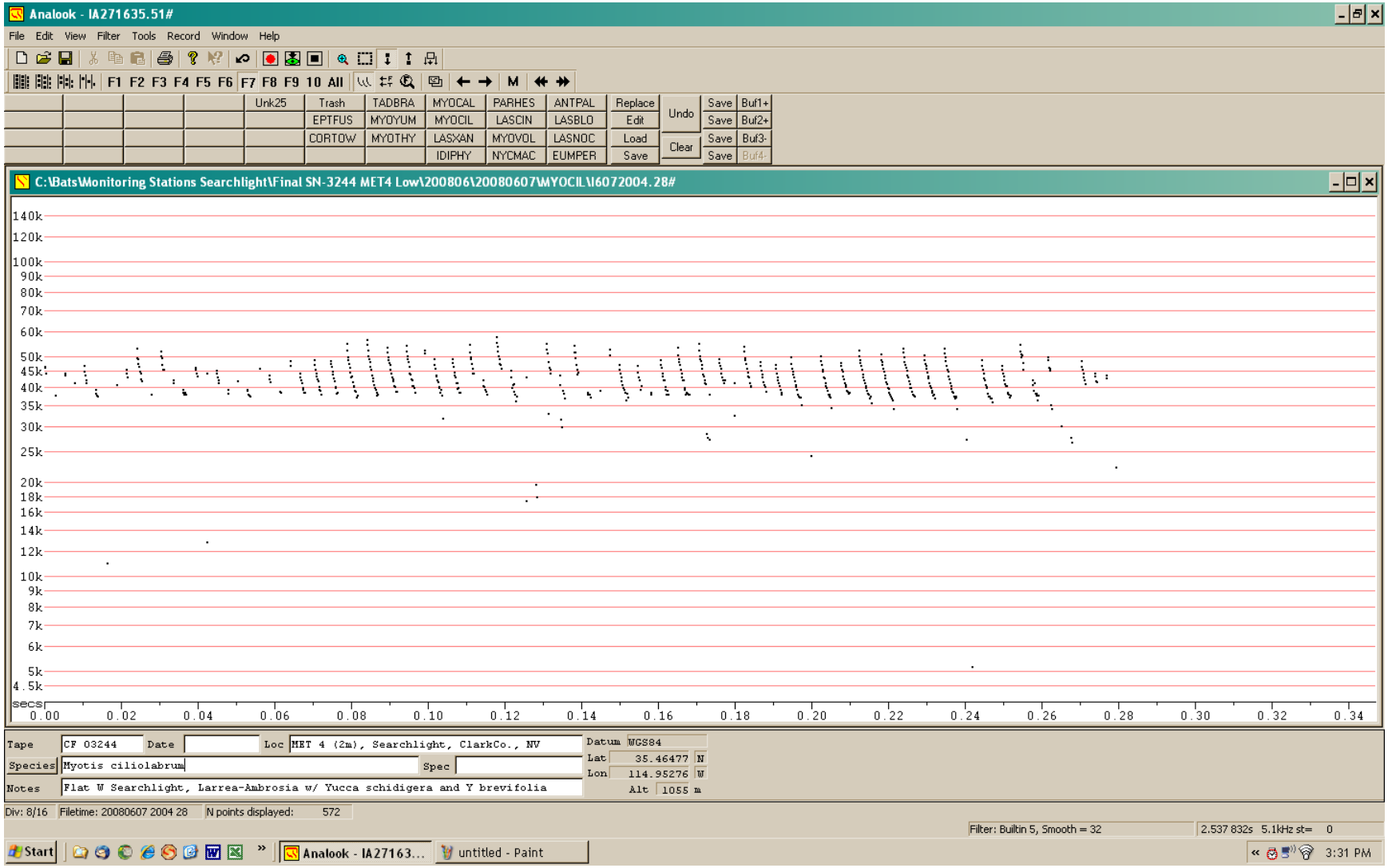

Analook - IA271635.51#
File Edit View Filter Tools Record Window Help
F1 F2 F3 F4 F5 F6 F7 F8 F9 10 All M
Unk25 Trash TADBRA MYOCAL PARHES ANTPAL Replace Undo Save Buf1+
EPTFUS MYOYUM MYOCIL LASCIN LASBLO Edit Save Buf2+
CORTOW MYOTHY LASXAN MYOVOL LASNOC Load Clear Save Buf3-
IDIPHY NYCMAC EUMPER Save Save Buf4-
C:\Bats\Monitoring Stations Searchlight\Final SN-3352 MET6 High\200809\20080923\EUMPER\I9232014.17#
140k
120k
100k
90k
80k
70k
60k
50k
45k
40k
35k
30k
25k
20k
18k
16k
14k
12k
10k
9k
8k
7k
6k
5k
4.5k
secs
0.00 0.02 0.04 0.06 0.08 0.10 0.12 0.14 0.16 0.18 0.20 0.22 0.24 0.26 0.28 0.30 0.32 0.34
Tape SN 03352 Date Loc MET 6 (50m), Searchlight, ClarkCo., NV
Datum WGS84
Species Eumops perotis Spec
Lat 35.50020 N
Lon 114.88015 W
Notes On hill NW Searchlight, Larrea-Ambrosia-Joshua Tree woodland
Alt 1132 m
Div: 8/16 Filetime: 20080923 2014 17 N points displayed: 554
Filter: Builtin 5, Smooth = 32
Start
Analook - IA27163...
untitled - Paint
3:44 PM

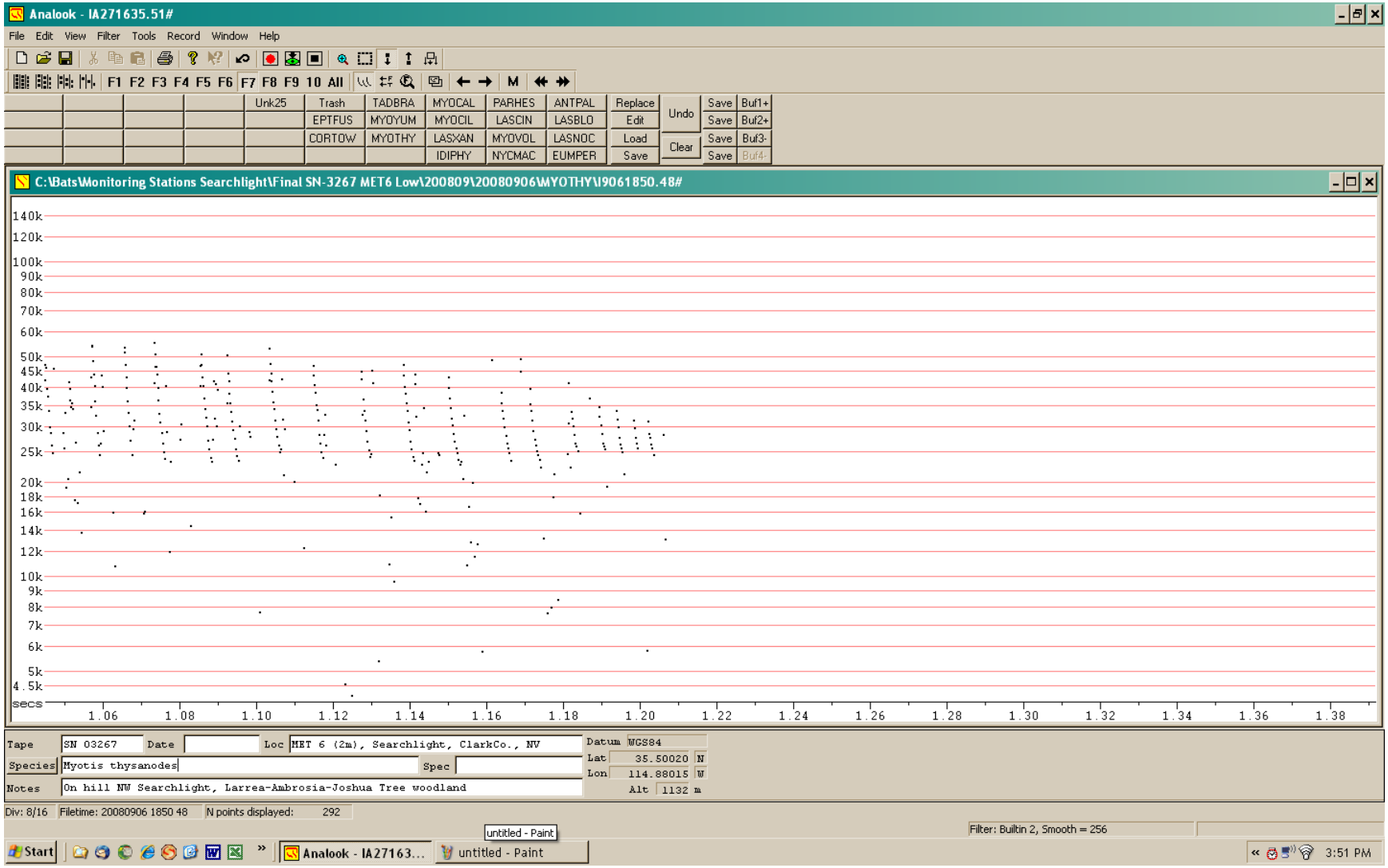

Analook - IA271635.51#
File Edit View Filter Tools Record Window Help
F1 F2 F3 F4 F5 F6 F7 F8 F9 10 All M
Unk25 Trash TADBRA MYOCAL PARHES ANTPAL Replace Undo Save Buf1+
EPTFUS MYOYUM MYOCIL LASCIN LASBLO Edit Save Buf2+
CORTOW MYOTHY LASXAN MYOVOL LASNOC Load Clear Save Buf3-
IDIPHY NYCMAC EUMPER Save Save Buf4-
C:\Bats\Monitoring Stations Searchlight\Final SN-3244 MET4 Low\200805\20080514\LASNOC\I5142337.21#
140k
120k
100k
90k
80k
70k
60k
50k
45k
40k
35k
30k
25k
20k
18k
16k
14k
12k
10k
9k
8k
7k
6k
5k
4.5k
secs
0.00 0.02 0.04 0.06 0.08 0.10 0.12 0.14 0.16 0.18 0.20 0.22 0.24 0.26 0.28 0.30 0.32 0.34
Tape CF 03244 Date Loc MET 4 (2m), Searchlight, ClarkCo., NV
Species Lasionycteris noctivagans Spec
Notes Flat W Searchlight, Larrea-Ambrosia w/ Yucca schidigera and Y brevifolia
Datum WGS84
Lat 35.46477 N
Lon 114.95276 W
Alt 1055 m
Div: 8/16 Filetime: 20080514 2337 21 N points displayed: 286
Filter: Builtin 5, Smooth = 32 3.088 610s 8.9kHz st= 0
Start Analook - IA27163... untitled - Paint 3:45 PM

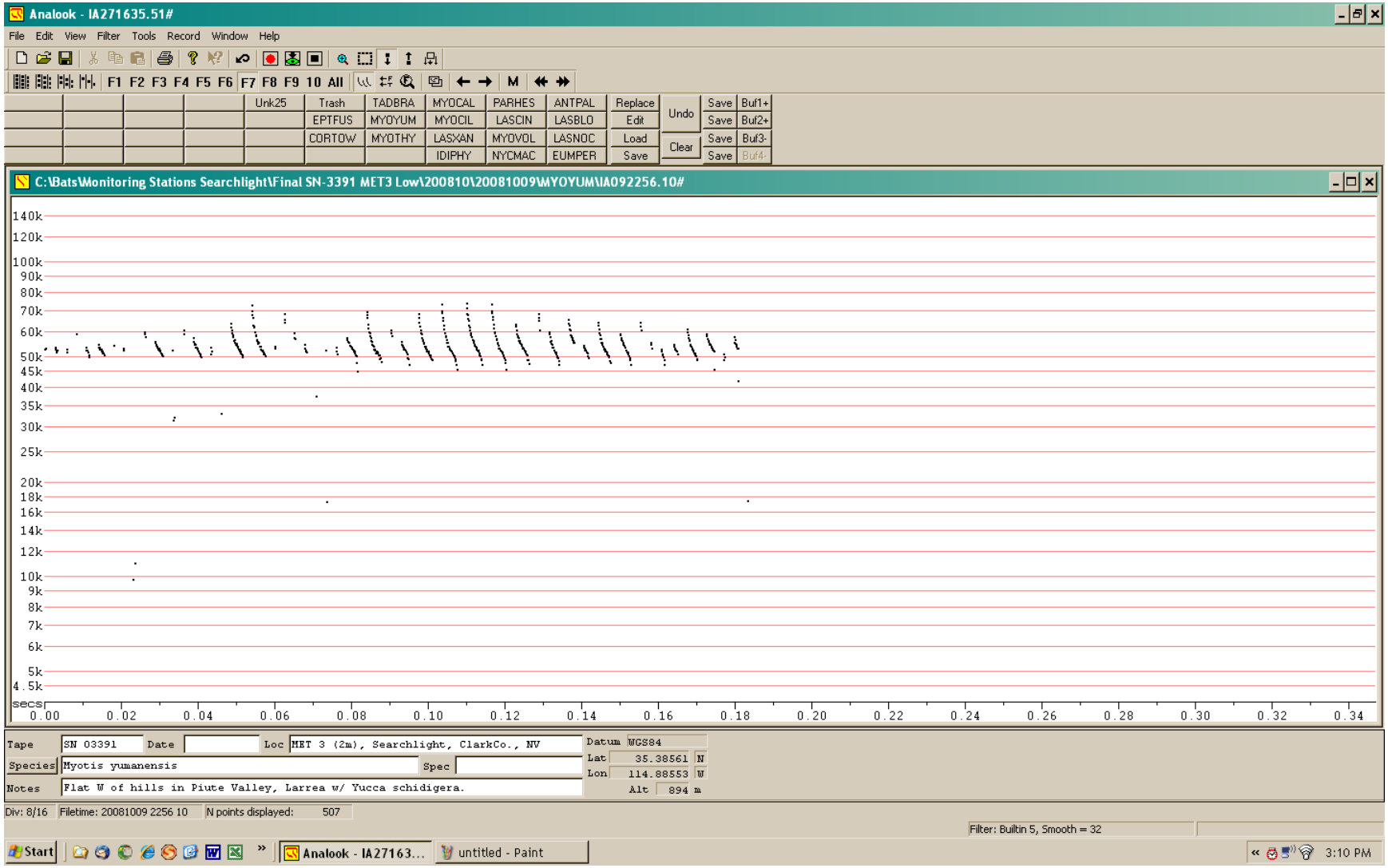

C:\Bats\Monitoring Stations Searchlight\Final Mine 1C\200904\20090422\LASBLO\
File Edit View Filter Tools Record Window Help
F1 F2 F3 F4 F5 F6 F7 F8 F9 10 All
Trash MYOLUC TADBRA MYOVOL MYOEVO Replace Undo Save Buf1+ N Nevada Bats
Unk25 EPTFUS MYOCIL LASCIN ANTPAL Edit Save Buf2+
LASBOR PARHES MYOYUM LASBLO LASNOC EUDMAC Load Clear Save Buf3-
MYOCAL EUMPER NYCMAC MYOTHY CORTOW Save As Save Buf4-
C:\Bats\Monitoring Stations Searchlight\Final Mine 1C\200904\20090422\LASBLO\j4230057.18#
140k 120k 100k 90k 80k 70k 60k 50k 45k 40k 35k 30k 25k 20k 18k 16k 14k 12k 10k 9k 8k 7k 6k 5k 4.5k
secs 0.00 0.02 0.04 0.06 0.08 0.10 0.12 0.14 0.16 0.18 0.20 0.22 0.24 0.26 0.28 0.30 0.32 0.34
Tape CF 00260 Date Loc Mine 1C, Searchlight, Clark Co., NV Datum WGS84
Species Lasiurus blossevillii Spec Lat 35.46645 N
Notes Mobile unit in wash W of mine complex. Habitat dominated by Acacia/Hymenoclea Lon 114.83957 E
Alt 893 m
Div: 8/16 Filetime: 20090423 0057 18 N points displayed: 482
Filter: Builtin 5, Smooth = 32
Start Mac (M:) C:\Bats\Monitoring... 11:38 AM

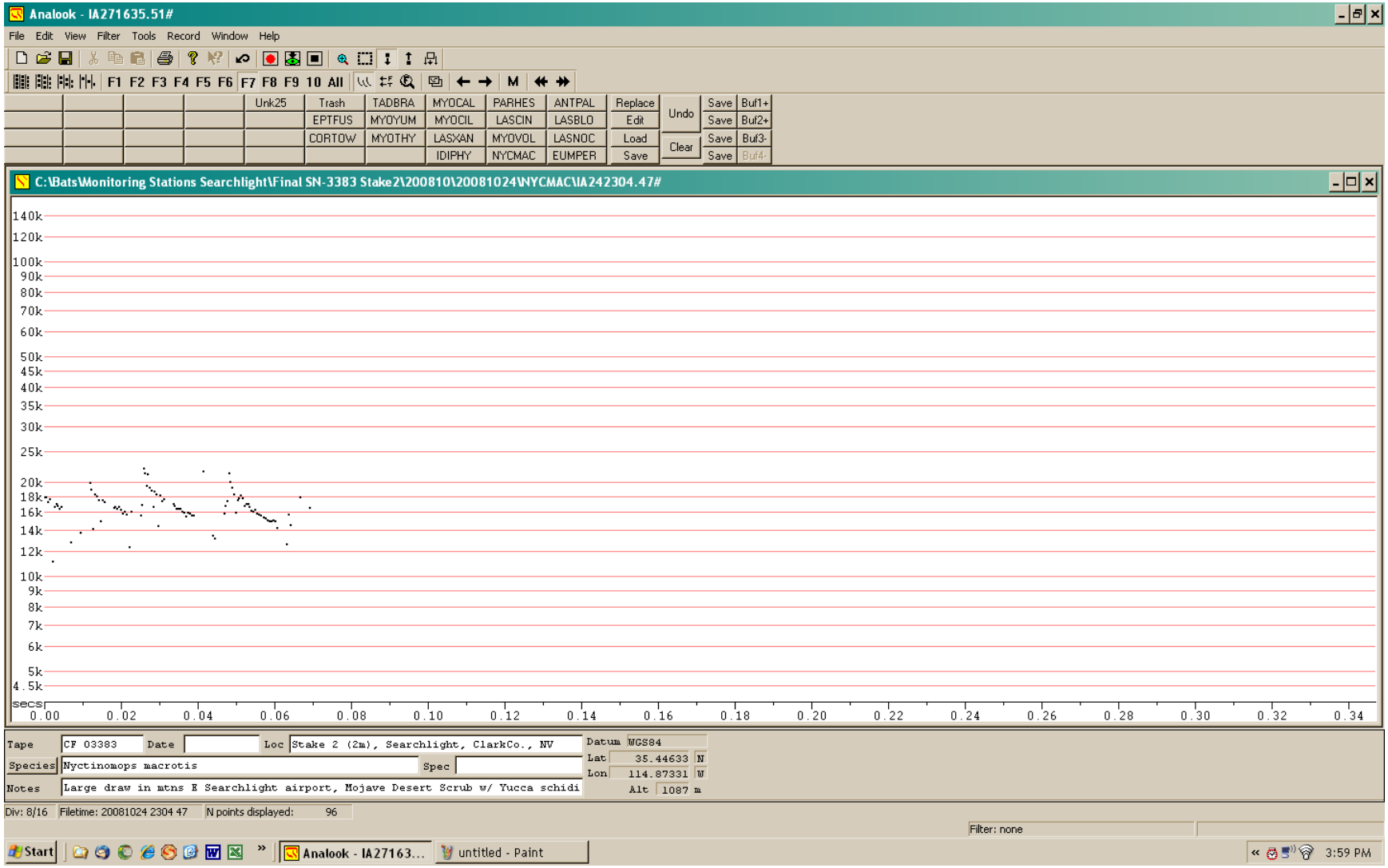

Analook - IA271635.51#
File Edit View Filter Tools Record Window Help
F1 F2 F3 F4 F5 F6 F7 F8 F9 10 All M
Unk25 Trash TADBRA MYOCAL PARHES ANTPAL Replace Undo Save Buf1+
EPTFUS MYOYUM MYOCIL LASCIN LASBLO Edit Save Buf2+
CORTOW MYOTHY LASXAN MYOVOL LASNOC Load Clear Save Buf3-
IDIPHY NYCMAC EUMPER Save Save Buf4-
C:\Bats\Monitoring Stations Searchlight\Final SN-3383 Stake2\200805\20080517\LASCIN\I5171956.56#
140k
120k
100k
90k
80k
70k
60k
50k
45k
40k
35k
30k
25k
20k
18k
16k
14k
12k
10k
9k
8k
7k
6k
5k
4.5k
secs
0.00 0.02 0.04 0.06 0.08 0.10 0.12 0.14 0.16 0.18 0.20 0.22 0.24 0.26 0.28 0.30 0.32 0.34
Tape CF 03383 Date Loc Stake 2 (2m), Searchlight, ClarkCo., NV
Datum WGS84
Species Lasiurus cinereus Spec
Lat 35.44633 N
Lon 114.87331 W
Notes Large draw in mtns E Searchlight airport, Mojave Desert Scrub w/ Yucca schidi
Alt 1087 m
Div: 8/16 Filetime: 20080517 1956 56 N points displayed: 464
Filter: none
Start
Analook - IA27163...
untitled - Paint
4:02 PM

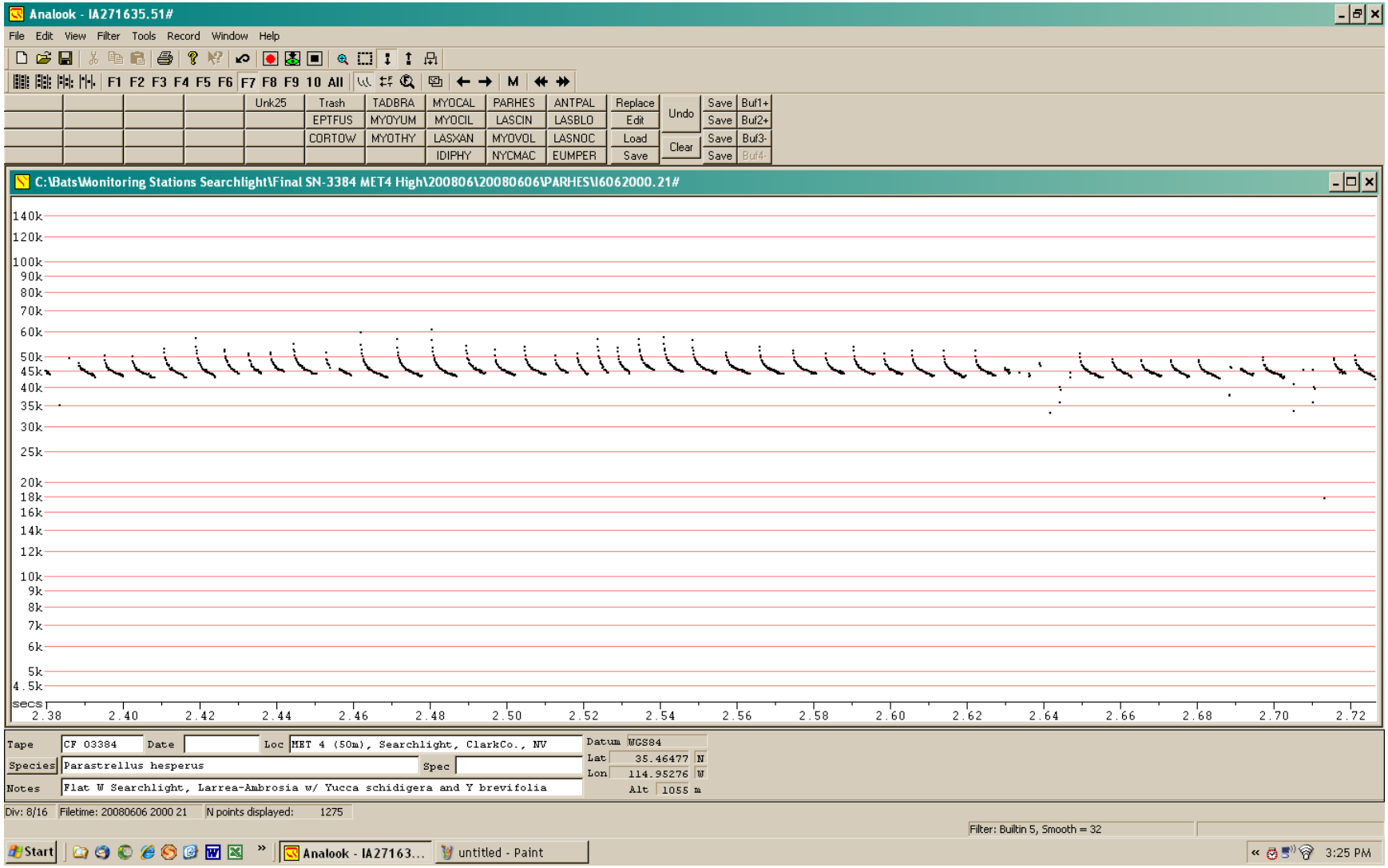

Analook - IA271635.51#
File Edit View Filter Tools Record Window Help
F1 F2 F3 F4 F5 F6 F7 F8 F9 10 All M
Unk25 Trash TADBRA MYOCAL PARHES ANTPAL Replace Undo Save Buf1+
EPTFUS MYOYUM MYOCIL LASCIN LASBLO Edit Save Buf2+
CORTOW MYOTHY LASXAN MYOVOL LASNOC Load Clear Save Buf3-
IDIPHY NYCMAC EUMPER Save Save Buf4-
C:\Bats\Monitoring Stations Searchlight\Final SN-3391 MET3 Low\200810\20081005\MYOCAL\IA051825.14#
140k
120k
100k
90k
80k
70k
60k
50k
45k
40k
35k
30k
25k
20k
18k
16k
14k
12k
10k
9k
8k
7k
6k
5k
4.5k
secs
0.00 0.02 0.04 0.06 0.08 0.10 0.12 0.14 0.16 0.18 0.20 0.22 0.24 0.26 0.28 0.30 0.32 0.34
Tape SN 03391 Date Loc MET 3 (2m), Searchlight, ClarkCo., NV
Datum WGS84
Species Myotis californicus Spec
Lat 35.38561 N
Lon 114.88553 W
Notes Flat W of hills in Piute Valley, Larrea w/ Yucca schidigera.
Alt 894 m
Div: 8/16 Filetime: 20081005 1825 14 N points displayed: 225
Filter: Builtin 5, Smooth = 32
Start
Analook - IA27163...
untitled - Paint
3:08 PM

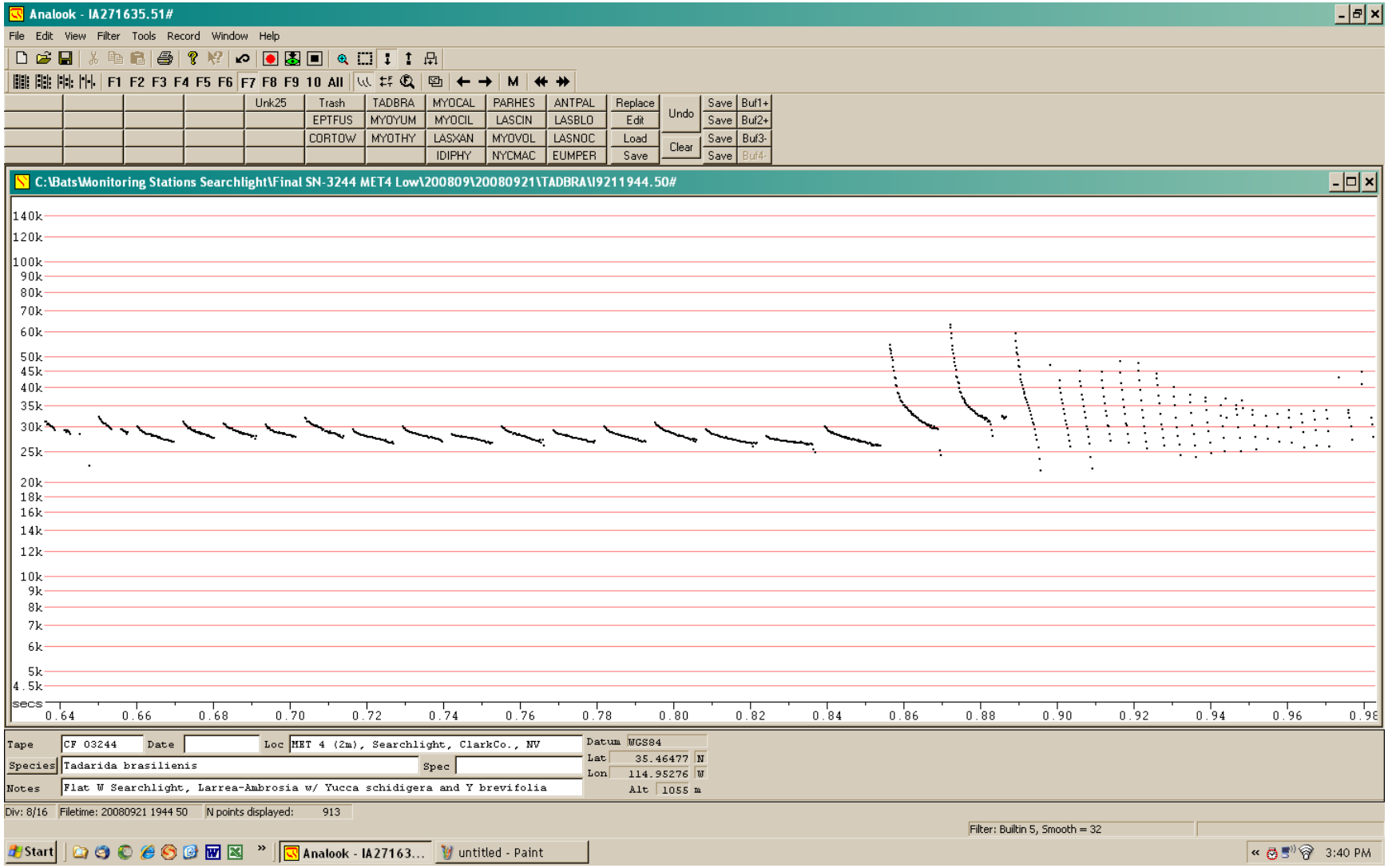

Analook - IA271635.51#
File Edit View Filter Tools Record Window Help
F1 F2 F3 F4 F5 F6 F7 F8 F9 10 All
Unk25 Trash TADBRA MYOCAL PARHES ANTPAL Replace
EPTFUS MYOYUM MYOCIL LASCIN LASBLO Edit
CORTOW MYOTHY LASXAN MYOVOL LASNOC Load
IDIPHY NYCMAC EUMPER Save
Undo Clear
Save Buf1+
Save Buf2+
Save Buf3-
Save Buf4-
C:\Bats\Monitoring Stations Searchlight\Final SN-3244 MET4 Low\200806\20080607\MYOCIL\I6072004.28#
140k
120k
100k
90k
80k
70k
60k
50k
45k
40k
35k
30k
25k
20k
18k
16k
14k
12k
10k
9k
8k
7k
6k
5k
4.5k
secs
0.00 0.02 0.04 0.06 0.08 0.10 0.12 0.14 0.16 0.18 0.20 0.22 0.24 0.26 0.28 0.30 0.32 0.34
Tape CF 03244
Date
Loc MET 4 (2m), Searchlight, ClarkCo., NV
Datum WGS84
Species Myotis ciliolabrum
Spec
Lat 35.46477 N
Lon 114.95276 W
Notes Flat W Searchlight, Larrea-Ambrosia w/ Yucca schidigera and Y brevifolia
Alt 1055 m
Div: 8/16
Filetime: 20080607 2004 28
N points displayed: 572
Filter: Builtin 5, Smooth = 32
2.537 832s 5.1kHz st= 0
Start
Analook - IA27163...
untitled - Paint
3:31 PM


Analook - IA271635.51#
File Edit View Filter Tools Record Window Help
F1 F2 F3 F4 F5 F6 F7 F8 F9 10 All M
Unk25 Trash TADBRA MYOCAL PARHES ANTPAL Replace Undo Save Buf1+
EPTFUS MYOYUM MYOCIL LASCIN LASBLO Edit Save Buf2+
CORTOW MYOTHY LASXAN MYOVOL LASNOC Load Clear Save Buf3-
IDIPHY NYCMAC EUMPER Save Save Buf4-
C:\Bats\Monitoring Stations Searchlight\Final SN-3267 MET6 Low\200809\20080906\MYOTHY\I9061850.48#
140k
120k
100k
90k
80k
70k
60k
50k
45k
40k
35k
30k
25k
20k
18k
16k
14k
12k
10k
9k
8k
7k
6k
5k
4.5k
secs
1.06 1.08 1.10 1.12 1.14 1.16 1.18 1.20 1.22 1.24 1.26 1.28 1.30 1.32 1.34 1.36 1.38
Tape SN 03267 Date Loc MET 6 (2m), Searchlight, ClarkCo., NV
Species Myotis thysanodes Spec
Notes On hill NW Searchlight, Larrea-Ambrosia-Joshua Tree woodland
Datum WGS84
Lat 35.50020 N
Lon 114.88015 W
Alt 1132 m
Div: 8/16 Filetime: 20080906 1850 48 N points displayed: 292
Filter: Builtin 2, Smooth = 256
Start
Analook - IA27163...
untitled - Paint
3:51 PM


Analook - IA271635.51#
File Edit View Filter Tools Record Window Help
F1 F2 F3 F4 F5 F6 F7 F8 F9 10 All M
Unk25 Trash TADBRA MYOCAL PARHES ANTPAL Replace Undo Save Buf1+
EPTFUS MYOYUM MYOCIL LASCIN LASBLO Edit Save Buf2+
CORTOW MYOTHY LASXAN MYOVOL LASNOC Load Clear Save Buf3-
IDIPHY NYCMAC EUMPER Save Save Buf4-
C:\Bats\Monitoring Stations Searchlight\Final SN-3391 MET3 Low\200810\20081009\MYOYUM\IA092256.10#
140k 120k 100k 90k 80k 70k 60k 50k 45k 40k 35k 30k 25k 20k 18k 16k 14k 12k 10k 9k 8k 7k 6k 5k 4.5k
secs 0.00 0.02 0.04 0.06 0.08 0.10 0.12 0.14 0.16 0.18 0.20 0.22 0.24 0.26 0.28 0.30 0.32 0.34
Tape SN 03391 Date Loc MET 3 (2m), Searchlight, ClarkCo., NV Datum WGS84
Species Myotis yumanensis Spec Lat 35.38561 N
Notes Flat W of hills in Piute Valley, Larrea w/ Yucca schidigera. Lon 114.88553 W
Alt 894 m
Div: 8/16 Filetime: 20081009 2256 10 N points displayed: 507
Filter: Builtin 5, Smooth = 32
Start Analook - IA27163... untitled - Paint 3:10 PM


Analook - IA271635.51#
File Edit View Filter Tools Record Window Help
F1 F2 F3 F4 F5 F6 F7 F8 F9 10 All
Unk25 Trash TADBRA MYOCAL PARHES ANTPAL Replace
EPTFUS MYOYUM MYOCIL LASCIN LASBLO Edit
CORTOW MYOTHY LASXAN MYOVOL LASNOC Load
IDIPHY NYCMAC EUMPER Save
Undo Clear
Save Buf1+
Save Buf2+
Save Buf3-
Save Buf4-
C:\Bats\Monitoring Stations Searchlight\Final SN-3383 Stake2\200810\20081024\NYCMAC\IA242304.47#
140k
120k
100k
90k
80k
70k
60k
50k
45k
40k
35k
30k
25k
20k
18k
16k
14k
12k
10k
9k
8k
7k
6k
5k
4.5k
secs
0.00 0.02 0.04 0.06 0.08 0.10 0.12 0.14 0.16 0.18 0.20 0.22 0.24 0.26 0.28 0.30 0.32 0.34
Tape CF 03383
Date
Loc Stake 2 (2m), Searchlight, ClarkCo., NV
Datum WGS84
Species Nyctinomops macrotis
Spec
Lat 35.44633 N
Lon 114.87331 W
Notes Large draw in mtns E Searchlight airport, Mojave Desert Scrub w/ Yucca schidi
Alt 1087 m
Div: 8/16
Filetime: 20081024 2304 47
N points displayed: 96
Filter: none
Start
Analook - IA27163...
untitled - Paint
3:59 PM


Analook - IA271635.51#
File Edit View Filter Tools Record Window Help
F1 F2 F3 F4 F5 F6 F7 F8 F9 10 All M
Unk25 Trash TADBRA MYOCAL PARHES ANTPAL Replace Undo Save Buf1+
EPTFUS MYOYUM MYOCIL LASCIN LASBLO Edit Save Buf2+
CORTOW MYOTHY LASXAN MYOVOL LASNOC Load Clear Save Buf3-
IDIPHY NYCMAC EUMPER Save Save Buf4-
C:\Bats\Monitoring Stations Searchlight\Final SN-3384 MET4 High\200806\20080606\PARHES\I6062000.21#
140k
120k
100k
90k
80k
70k
60k
50k
45k
40k
35k
30k
25k
20k
18k
16k
14k
12k
10k
9k
8k
7k
6k
5k
4.5k
secs
2.38 2.40 2.42 2.44 2.46 2.48 2.50 2.52 2.54 2.56 2.58 2.60 2.62 2.64 2.66 2.68 2.70 2.72
Tape CF 03384 Date Loc MET 4 (50m), Searchlight, ClarkCo., NV
Datum WGS84
Species Parastrellus hesperus Spec
Lat 35.46477 N
Lon 114.95276 W
Notes Flat W Searchlight, Larrea-Ambrosia w/ Yucca schidigera and Y brevifolia
Alt 1055 m
Div: 8/16 Filetime: 20080606 2000 21 N points displayed: 1275
Filter: Builtin 5, Smooth = 32
Start
Analook - IA27163...
untitled - Paint
3:25 PM


Analook - IA271635.51#
File Edit View Filter Tools Record Window Help
F1 F2 F3 F4 F5 F6 F7 F8 F9 10 All M
Unk25 Trash TADBRA MYOCAL PARHES ANTPAL Replace Undo Save Buf1+
EPTFUS MYOYUM MYOCIL LASCIN LASBLO Edit Save Buf2+
CORTOW MYOTHY LASXAN MYOVOL LASNOC Load Clear Save Buf3-
IDIPHY NYCMAC EUMPER Save Save Buf4-
C:\Bats\Monitoring Stations Searchlight\Final SN-3244 MET4 Low\200809\20080921\TADBRA\I9211944.50#
140k
120k
100k
90k
80k
70k
60k
50k
45k
40k
35k
30k
25k
20k
18k
16k
14k
12k
10k
9k
8k
7k
6k
5k
4.5k
secs
0.64 0.66 0.68 0.70 0.72 0.74 0.76 0.78 0.80 0.82 0.84 0.86 0.88 0.90 0.92 0.94 0.96 0.98
Tape CF 03244 Date Loc MET 4 (2m), Searchlight, ClarkCo., NV
Species Tadarida brasilienis Spec
Notes Flat W Searchlight, Larrea-Ambrosia w/ Yucca schidigera and Y brevifolia
Datum WGS84
Lat 35.46477 N
Lon 114.95276 W
Alt 1055 m
Div: 8/16 Filetime: 20080921 1944 50 N points displayed: 913
Filter: Builtin 5, Smooth = 32
Start
Analook - IA27163...
untitled - Paint
3:40 PM