NORTHERN LONG-EARED BAT ACOUSTIC SURVEY REPORT FOR PROJECT FEASIBILITY AND LOCATION

Prevailing Winds Study Area in Bon Homme and Charles Mix Counties, South Dakota

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REPORT REFERENCE

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INTRODUCTION

Prevailing Winds, LLC (Prevailing Winds), is considering the development of the Prevailing Winds Wind Farm (Project), located in Bon Homme and Charles Mix Counties, South Dakota. To help in siting the eventual Project, Prevailing Winds evaluated a large Study Area (see Figure 1 for depiction of the Study Area as defined for 2015 studies). Prevailing Winds requested that Western Ecosystems Technology, Inc. (WEST) evaluate the potential for the federally threatened northern long-eared bat (*Myotis septentrionalis*; [NLEB]) to occur within the 2015 Study Area during the summer months. This report describes the results of the NLEB presence or probable absence acoustical assessment completed for the Study Area by WEST. These surveys were conducted following the survey recommendations found in the U.S. Fish and Wildlife Service (USFWS) *Northern Long-eared Bat Interim Conference and Planning Guidance* (USFWS 2014a) and *2015 Range-Wide Indiana Bat Summer Survey Guidelines* (USFWS 2015).

NORTHERN LONG-EARED BAT SUMMER HABITAT REQUIREMENTS

NLEB are forest dependent species, generally relying on forest features for both foraging and roosting during the summer months (USFWS 2013; USFWS 2007). In particular, NLEB appear to be a forest interior species that require adequate canopy closure for both roost and foraging habitat (Lausen 2009). Additionally, riparian areas are considered critical resource areas for many species of bats because they support higher concentrations of prey, provide drinking areas, and act as unobstructed commuting corridors (Grindal et al. 1999). While NLEB are associated with forest habitats, they also occur in agricultural settings where forest habitats have been highly fragmented.

Wing morphology of the NLEB makes them ideally suited for the high maneuverability required for gleaning-type foraging within a cluttered forest interior (Henderson and Broders 2008). Abundance of NLEB prey items, particularly beetles and moths, are typically higher in more closed forest stands than in openings, which supports studies which have found that NLEB tend to avoid open habitats (Owen et al. 2003).

During the summer, NLEB roost singly or in colonies underneath bark, in cavities, or in crevices of both live and dead trees (USFWS 2007; USFWS 2013). Males and non-reproductive females may also roost in cooler places, like caves and mines. NLEB seem opportunistic in selecting roosts, using tree species based on suitability to retain bark or provide cavities or crevices. NLEB have also been found roosting in structures like barns and sheds.

During the summer months, NLEBs are unlikely to cross over large open lands (i.e., land lacking suitable habitat) to search for foraging and roosting habitats, but rather to use tree-lined linear features as travel corridors to and from roosting and foraging habitats (USFWS 2014a). These tree-lined corridors may be important for bats as navigational aids in agricultural landscapes, as protection from predators and wind, and may act to concentrate insect prey (Verboom and Huitema 1997). The NLEB is expected to be particularly tied to intact forested habitats; for example, Henderson and Broders (2008) found that NLEB did not travel more than 255 feet (78 meters) from the edge of intact forest structure. A study of nine female NLEBs using an
intensively managed forest in West Virginia found this species forages in areas with forest patch sizes between 114 and 161 acres (46 and 65 hectares; Owen et al. 2003); however, studies in landscapes dominated by agricultural activities found NLEB can use woodlots and riparian zones with as little as 15 to 49 acres (6 to 20 hectares) of forest cover (Henderson and Broders 2008; Foster and Kurta 1999).

**METHODS**

Acoustic surveys followed the USFWS 2015 Range-Wide Indiana Bat Summer Survey Guidelines (USFWS 2015), per the Northern Long-Eared Bat Interim Conference and Planning Guidance (USFWS 2014a). The USFWS guidelines require one survey site for every 123 acres of suitable habitat for a minimum of four detector nights (USFWS 2014a). Two sampling locations at each survey site should then be surveyed for a minimum of two detector/nights each.

Initial desktop assessment of potential habitat conducted by WEST, identified approximately 1,180 acres of forested habitat; as such, this equates to 20 survey locations (two detectors per site). Although the USFWS protocol calls for 20 survey locations (10 sites with two detectors per site) for two detector/nights (for a total of 40 detector/nights), WEST surveyed 20 locations/stations for a minimum of two nights each for a total of 104 detector nights. WEST biologists deployed up to eight detectors at suitable sites throughout the Study Area for a minimum of four detector nights.

Acoustic surveys were conducted from July 21 – August 10, 2015 following USFWS guidelines (USFWS 2015). Bats were surveyed using SD1 or SD2 AnaBat™ ultrasonic detectors (Titley Electronics Pty Ltd., NSW, Australia), or SM2 Song Meter detectors (Wildlife Acoustics, Inc., Concord, Maine). Acoustic monitoring began before sunset and continued for the entire night. Survey duration at each site was for a minimum of two nights. If weather conditions such as persistent rain (> 30 minutes), strong winds (> 9 mph for > 30 minutes), or persistent cold temperatures (below 10°C [50°F] for > 30 minutes) occurred during the first five hours of a survey night, then that site was surveyed for an additional night (USFWS 2014). To maximize the quality of recorded echolocation calls, detectors were positioned at least 1.5 meters off the ground, at ≥ 45° angle, and with PVC tube weatherproofing (Britzke et al. 2010, USFWS 2014a). Sensitivity was set to “6” on AnaBat detectors, and the amplifier gain was set to 36 decibels for the SM2 units.

Bat calls were identified to species using Bat Call Identification (BCID; Allen 2012). If the identification program identified calls as NLEB at a site with a high degree of probability (P < 0.05), then qualitative analysis was conducted to determine if NLEB were present or absent at the site. Qualitative echolocation call analysis was conducted by a biologist experienced with acoustic identification and who met required USFWS qualifications (Dr. Kevin Murray of WEST; USFWS 2014a). If probable NLEB echolocation call sequences identified by BCID were not characteristic of NLEB, contained distinct calls produced by species other than NLEB, or were of insufficient quality, they were reclassified. Per USFWS guidelines, NLEB were considered present at sites with probable calls verified by qualitative analysis. NLEB were considered
absent from sites with no probable NLEB calls or from sites with probable NLEB calls that were not verified by qualitative analysis. The Study Area lies well outside of the accepted range of Indiana bats; therefore Indiana bats were not included in the BCID model.

RESULTS

AnaBat and SM2 detectors were used to survey 20 acoustic survey locations, consisting of two detector stations per site, from July 21 – August 10, 2015. UTM coordinates and brief site descriptions for each site are listed in Table 1. Pictures and datasheets with site descriptions are found in Appendices A and B. WEST checked weather at the Hajek Farms, Tyndall, SD (KSDTYNDA2) weather station, which can be found on Weather Underground’s Wundermap (http://www.wunderground.com/wundermap/). Weather conditions at sites 1, 2, 3, 4, 5, 6a, and 8 did not meet the standards for acoustic monitoring set by USFWS (2014a) on July 25 and at sites 6, 9, 10, and 11 on July 27 due to wind speeds sustaining greater than 9 miles per hour during the first five hours of survey on both nights. However, data on these nights were still included in the analysis because, while not ideal, conditions could still be suitable during a portion of the night and NLEB and other bats might still be detected. Weather conditions at all 20 locations for all other survey nights met the criteria established by the USFWS (2014a), and each detector location had at least two detector nights with good weather conditions (Table 2).

Acoustic surveys were completed at 20 locations (two detector stations per site) for a total of 104 detector nights (Tables 1 and 2). BCID identified a total of 6,478 bat call files and identified 6,323 files (98%) to species, with an average of 62.3 bat calls per detector night (Table 2). Table 2 summarizes the number of detector nights, number of bat call files, and number of bat calls identified to species at each site. Table 3 provides information on species identifications for each site.

Based on the BCID analysis, nine stations (locations), recorded potential NLEB calls with a p-value less than 0.05 for the maximum-likelihood estimation (Table 4); therefore data from the nine stations were included in qualitative analysis (USFWS 2014a). Six stations (PW1, PW6a, PW8a, PW11, PW14, and PW16) recorded probable (i.e., p-value <0.05) NLEB calls on a single night only; stations PW9a and PW17 recorded probable NLEB calls on two and three nights, respectively; and station PW13 recorded probable NLEB calls on six nights (Table 4). Qualitative identification verified the presence of NLEB at stations PW9a (on a single night only) and PW13 (on six nights); however, qualitative analysis did not verify the presence of NLEB at the remaining seven stations with probable NLEB calls (Table 4).

DISCUSSIONS/CONCLUSIONS

Limited information is available on NLEB migratory pathways and behaviors. While there is some information suggesting this species tends to follow forested areas and avoid open areas if possible, these bats may occasional move through non-forested areas.

The habitat assessment conducted by WEST at the Study Area provides information on potential NLEB habitat that might be found within the Study Area and nearby areas. If these bats occur in the area during the summer months, they will likely occur within or near (within
1,000 feet) of these habitat patches. Given its association with forest habitat (Henderson and Broders 2008; Foster and Kurta 1999), WEST anticipates that the larger and more contiguous blocks of forested areas would be more likely to be used by these species compared to the smaller forested blocks and/or tree lines and shelterbelts.

The NLEB was qualitatively verified as occurring at two acoustical stations surveyed within the Study Area (stations PW9a and PW13). Though not documented during this survey effort, there is potential for NLEB to be present within other suitable habitat within the Study Area during the summer months, particularly in the west/southwest portions of the Study Area, given the density and distribution of potential NLEB habitat; and the connectivity to larger forested and/or forested riparian habitats just outside of the Study Area boundary (i.e., forested/semi-forested corridors of Choteau Creek and Dry Choteau Creek and tributaries thereof).

Surveys are considered complete for all 20 stations at the Study Area and no further action is recommended to confirm NLEB presence within the current boundary (Table 5); however, acoustic data is probabilistic and presence determinations can be error prone. For a more detailed assessment of NLEB occurrence in the area, the USFWS guidelines (USFWS 2014a, 2015) recommend mist-netting in combination with radio-telemetry and emergence counts to confirm roost tree locations and roost size (Phase 3 and 4). Though the possibility exists for mist-netting results to contradict the acoustic results, it is unlikely for the USFWS to overturn acoustic evidence with mist-net evidence.
LITERATURE CITED


Table 1. Location and site description of the 20 acoustic survey stations at the Prevailing Winds Study Area.

<table>
<thead>
<tr>
<th>Station ID</th>
<th>Zone</th>
<th>Easting†</th>
<th>Northing†</th>
<th>Site Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>PW1</td>
<td>14</td>
<td>0569563</td>
<td>4776786</td>
<td>Edge of shelterbelts, adjacent to agricultural fields</td>
</tr>
<tr>
<td>PW2</td>
<td>14</td>
<td>0568133</td>
<td>4774899</td>
<td>Open woodlot adjacent to pasture</td>
</tr>
<tr>
<td>PW3</td>
<td>14</td>
<td>0568878</td>
<td>4775146</td>
<td>Edge of shrubby grove, adjacent to pond and pasture</td>
</tr>
<tr>
<td>PW4</td>
<td>14</td>
<td>0572800</td>
<td>4773535</td>
<td>Edge of shelterbelt and creek bed, adjacent to hay fields</td>
</tr>
<tr>
<td>PW5</td>
<td>14</td>
<td>0570321</td>
<td>4772303</td>
<td>Edge of small forest patch, adjacent to pasture</td>
</tr>
<tr>
<td>PW6</td>
<td>14</td>
<td>0579638</td>
<td>4770270</td>
<td>Edge of shelterbelt and grassy area, adjacent to pasture</td>
</tr>
<tr>
<td>PW6a</td>
<td>14</td>
<td>0574168</td>
<td>4770744</td>
<td>Grassy path adjacent to forest</td>
</tr>
<tr>
<td>PW7</td>
<td>14</td>
<td>0572985</td>
<td>4766554</td>
<td>Edge of forest in pasture</td>
</tr>
<tr>
<td>PW8</td>
<td>14</td>
<td>0575714</td>
<td>4766373</td>
<td>Edge of forest in grassy area, adjacent to pasture</td>
</tr>
<tr>
<td>PW8a</td>
<td>14</td>
<td>0575652</td>
<td>4768628</td>
<td>Grassy area adjacent to forest</td>
</tr>
<tr>
<td>PW9</td>
<td>14</td>
<td>0580064</td>
<td>4765600</td>
<td>Grassy path adjacent to forest edge and cornfield</td>
</tr>
<tr>
<td>PW9a</td>
<td>14</td>
<td>0569742</td>
<td>4766932</td>
<td>Pasture adjacent to forest edge</td>
</tr>
<tr>
<td>PW10</td>
<td>14</td>
<td>0578533</td>
<td>4763193</td>
<td>Grassy area adjacent to shelterbelt</td>
</tr>
<tr>
<td>PW11</td>
<td>14</td>
<td>0576700</td>
<td>4763072</td>
<td>Grassy area adjacent to forest edge and cropland</td>
</tr>
<tr>
<td>PW12</td>
<td>14</td>
<td>0575445</td>
<td>4762139</td>
<td>Grassy area adjacent to forest edge</td>
</tr>
<tr>
<td>PW13</td>
<td>14</td>
<td>0574443</td>
<td>4759581</td>
<td>Grassy/shrubby area adjacent to forest edges</td>
</tr>
<tr>
<td>PW14</td>
<td>14</td>
<td>0574925</td>
<td>4758670</td>
<td>Grassy/shrubby area adjacent to cedar/juniper</td>
</tr>
<tr>
<td>PW15</td>
<td>14</td>
<td>0575580</td>
<td>4758206</td>
<td>Grassy area adjacent to forest edge</td>
</tr>
<tr>
<td>PW16</td>
<td>14</td>
<td>0576680</td>
<td>4757714</td>
<td>Grassy area adjacent to forest edge</td>
</tr>
<tr>
<td>PW17</td>
<td>14</td>
<td>0578987</td>
<td>4756031</td>
<td>Grassy area adjacent to forest edge and cropland</td>
</tr>
</tbody>
</table>
Table 2. Number of bat calls recorded at each acoustic survey station determined by BCID for the Prevailing Winds Study Area.

<table>
<thead>
<tr>
<th>Acoustic Survey Station</th>
<th>Total Bat Calls</th>
<th>Calls Identified</th>
<th>Detector Nights</th>
<th>Bat Calls/Detector Night</th>
</tr>
</thead>
<tbody>
<tr>
<td>PW1</td>
<td>248</td>
<td>241 (97%)</td>
<td>6</td>
<td>41.3</td>
</tr>
<tr>
<td>PW2</td>
<td>406</td>
<td>390 (96%)</td>
<td>6</td>
<td>67.7</td>
</tr>
<tr>
<td>PW3</td>
<td>104</td>
<td>100 (96%)</td>
<td>6</td>
<td>17.3</td>
</tr>
<tr>
<td>PW4</td>
<td>42</td>
<td>42 (100%)</td>
<td>6</td>
<td>7</td>
</tr>
<tr>
<td>PW5</td>
<td>137</td>
<td>135 (96%)</td>
<td>6</td>
<td>22.8</td>
</tr>
<tr>
<td>PW6a</td>
<td>1,309</td>
<td>1,296 (99%)</td>
<td>5</td>
<td>261.8</td>
</tr>
<tr>
<td>PW6</td>
<td>185</td>
<td>183 (99%)</td>
<td>9</td>
<td>20.6</td>
</tr>
<tr>
<td>PW7</td>
<td>379</td>
<td>372 (98%)</td>
<td>3</td>
<td>126.3</td>
</tr>
<tr>
<td>PW8</td>
<td>279</td>
<td>271 (97%)</td>
<td>5</td>
<td>55.8</td>
</tr>
<tr>
<td>PW8a</td>
<td>530</td>
<td>520 (98%)</td>
<td>4</td>
<td>132.5</td>
</tr>
<tr>
<td>PW9</td>
<td>325</td>
<td>320 (98%)</td>
<td>5</td>
<td>65</td>
</tr>
<tr>
<td>PW9a</td>
<td>203</td>
<td>194 (96%)</td>
<td>4</td>
<td>50.8</td>
</tr>
<tr>
<td>PW10</td>
<td>209</td>
<td>207 (99%)</td>
<td>5</td>
<td>41.8</td>
</tr>
<tr>
<td>PW11</td>
<td>458</td>
<td>450 (98%)</td>
<td>5</td>
<td>91.6</td>
</tr>
<tr>
<td>PW12</td>
<td>53</td>
<td>53 (100%)</td>
<td>3</td>
<td>17.7</td>
</tr>
<tr>
<td>PW13</td>
<td>699</td>
<td>674 (96%)</td>
<td>6</td>
<td>116.5</td>
</tr>
<tr>
<td>PW14</td>
<td>36</td>
<td>36 (100%)</td>
<td>6</td>
<td>6</td>
</tr>
<tr>
<td>PW15</td>
<td>29</td>
<td>28 (97%)</td>
<td>2</td>
<td>14.5</td>
</tr>
<tr>
<td>PW16</td>
<td>192</td>
<td>188 (98%)</td>
<td>6</td>
<td>32</td>
</tr>
<tr>
<td>PW17</td>
<td>655</td>
<td>623 (95%)</td>
<td>6</td>
<td>109.2</td>
</tr>
<tr>
<td>Total</td>
<td>6,478</td>
<td>6,323 (98%)</td>
<td>104</td>
<td>62.3</td>
</tr>
</tbody>
</table>
### Table 3. Summary of BCID echolocation call identifications for the Prevailing Winds Study Area.

<table>
<thead>
<tr>
<th>Station ID</th>
<th>EPFU</th>
<th>LABO</th>
<th>LACI</th>
<th>LANO</th>
<th>MYLU</th>
<th>MYSE</th>
<th>NYHU</th>
<th>PESU</th>
<th>UNK</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>PW1</td>
<td>42</td>
<td>24</td>
<td>71</td>
<td>89</td>
<td>2</td>
<td>1</td>
<td>3</td>
<td>9</td>
<td>7</td>
<td>248</td>
</tr>
<tr>
<td>PW2</td>
<td>137</td>
<td>137</td>
<td>11</td>
<td>39</td>
<td>1</td>
<td>0</td>
<td>14</td>
<td>51</td>
<td>16</td>
<td>406</td>
</tr>
<tr>
<td>PW3</td>
<td>19</td>
<td>35</td>
<td>2</td>
<td>13</td>
<td>2</td>
<td>0</td>
<td>8</td>
<td>21</td>
<td>4</td>
<td>104</td>
</tr>
<tr>
<td>PW4</td>
<td>21</td>
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<td>1</td>
<td>19</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>1</td>
<td>0</td>
<td>42</td>
</tr>
<tr>
<td>PW5</td>
<td>72</td>
<td>4</td>
<td>9</td>
<td>48</td>
<td>0</td>
<td>0</td>
<td>1</td>
<td>1</td>
<td>2</td>
<td>137</td>
</tr>
<tr>
<td>PW6</td>
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<td>62</td>
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<td>PW6a</td>
<td>626</td>
<td>176</td>
<td>22</td>
<td>425</td>
<td>1</td>
<td>1</td>
<td>29</td>
<td>16</td>
<td>13</td>
<td>1,309</td>
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<tr>
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<td>60</td>
<td>25</td>
<td>0</td>
<td>4</td>
<td>7</td>
<td>7</td>
<td>379</td>
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<td>PW8</td>
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<td>181</td>
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<td>2</td>
<td>5</td>
<td>0</td>
<td>36</td>
<td>7</td>
<td>8</td>
<td>279</td>
</tr>
<tr>
<td>PW8a</td>
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<td>316</td>
<td>7</td>
<td>30</td>
<td>4</td>
<td>1</td>
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<td>10</td>
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<td>0</td>
<td>4</td>
<td>7</td>
<td>5</td>
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</tr>
<tr>
<td>PW9a</td>
<td>51</td>
<td>55</td>
<td>9</td>
<td>32</td>
<td>4</td>
<td>5</td>
<td>5</td>
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<td>9</td>
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<td>PW10</td>
<td>97</td>
<td>10</td>
<td>16</td>
<td>76</td>
<td>2</td>
<td>0</td>
<td>0</td>
<td>6</td>
<td>2</td>
<td>209</td>
</tr>
<tr>
<td>PW11</td>
<td>115</td>
<td>59</td>
<td>48</td>
<td>182</td>
<td>2</td>
<td>1</td>
<td>3</td>
<td>40</td>
<td>8</td>
<td>458</td>
</tr>
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<td>PW12</td>
<td>24</td>
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<td>16</td>
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<td>PW14</td>
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<td>0</td>
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</tr>
<tr>
<td>PW15</td>
<td>16</td>
<td>0</td>
<td>1</td>
<td>8</td>
<td>0</td>
<td>0</td>
<td>2</td>
<td>1</td>
<td>1</td>
<td>29</td>
</tr>
<tr>
<td>PW16</td>
<td>45</td>
<td>63</td>
<td>2</td>
<td>32</td>
<td>9</td>
<td>1</td>
<td>14</td>
<td>22</td>
<td>4</td>
<td>192</td>
</tr>
<tr>
<td>PW17</td>
<td>138</td>
<td>218</td>
<td>3</td>
<td>62</td>
<td>8</td>
<td>3</td>
<td>17</td>
<td>174</td>
<td>32</td>
<td>655</td>
</tr>
</tbody>
</table>

1 EPFU = Big Brown Bat; LABO = Eastern Red Bat; LACI = Hoary Bat; LANO = Silver-haired Bat; MYLU = Little Brown Bat; MYSE = Northern Long-eared Bat; NYHU = Evening Bat; PESU = Tri-colored bat; UNK = Unknown

### Table 4. Summary of Myotis call identifications by BCID and qualitative analysis for stations with potential Northern long-eared bat calls at the Prevailing Winds Study Area.

<table>
<thead>
<tr>
<th>Station ID</th>
<th>Date</th>
<th>Identification Method</th>
<th>MYSE (NLEB)</th>
</tr>
</thead>
<tbody>
<tr>
<td>PW1</td>
<td>July 24</td>
<td>BCID</td>
<td>1</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Qualitative</td>
<td>0</td>
</tr>
<tr>
<td>PW6a</td>
<td>July 31</td>
<td>BCID</td>
<td>1</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Qualitative</td>
<td>0</td>
</tr>
<tr>
<td>PW8a</td>
<td>July 30</td>
<td>BCID</td>
<td>1</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Qualitative</td>
<td>0</td>
</tr>
<tr>
<td>PW9a</td>
<td>August 9</td>
<td>BCID</td>
<td>1</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Qualitative</td>
<td>0</td>
</tr>
</tbody>
</table>
Table 4. Summary of Myotis call identifications by BCID and qualitative analysis\(^1\) for stations with potential Northern long-eared bat calls at the Prevailing Winds Study Area.

<table>
<thead>
<tr>
<th>Station ID</th>
<th>Date</th>
<th>Identification Method</th>
<th>MYSE (NLEB)</th>
</tr>
</thead>
<tbody>
<tr>
<td>PW9a</td>
<td>August 10</td>
<td>BCID</td>
<td>4</td>
</tr>
<tr>
<td>PW9a</td>
<td>August 10</td>
<td>Qualitative</td>
<td>1</td>
</tr>
<tr>
<td>PW11</td>
<td>July 29</td>
<td>BCID</td>
<td>1</td>
</tr>
<tr>
<td>PW11</td>
<td>July 29</td>
<td>Qualitative</td>
<td>0</td>
</tr>
<tr>
<td>PW13</td>
<td>August 1</td>
<td>BCID</td>
<td>39</td>
</tr>
<tr>
<td>PW13</td>
<td>August 1</td>
<td>Qualitative</td>
<td>25</td>
</tr>
<tr>
<td>PW13</td>
<td>August 2</td>
<td>BCID</td>
<td>41</td>
</tr>
<tr>
<td>PW13</td>
<td>August 2</td>
<td>Qualitative</td>
<td>21</td>
</tr>
<tr>
<td>PW13</td>
<td>August 3</td>
<td>BCID</td>
<td>33</td>
</tr>
<tr>
<td>PW13</td>
<td>August 3</td>
<td>Qualitative</td>
<td>23</td>
</tr>
<tr>
<td>PW13</td>
<td>August 4</td>
<td>BCID</td>
<td>29</td>
</tr>
<tr>
<td>PW13</td>
<td>August 4</td>
<td>Qualitative</td>
<td>19</td>
</tr>
<tr>
<td>PW13</td>
<td>August 5</td>
<td>BCID</td>
<td>19</td>
</tr>
<tr>
<td>PW13</td>
<td>August 5</td>
<td>Qualitative</td>
<td>9</td>
</tr>
<tr>
<td>PW13</td>
<td>August 6</td>
<td>BCID</td>
<td>34</td>
</tr>
<tr>
<td>PW13</td>
<td>August 6</td>
<td>Qualitative</td>
<td>16</td>
</tr>
<tr>
<td>PW14</td>
<td>August 1</td>
<td>BCID</td>
<td>2</td>
</tr>
<tr>
<td>PW14</td>
<td>August 1</td>
<td>Qualitative</td>
<td>0</td>
</tr>
<tr>
<td>PW16</td>
<td>August 1</td>
<td>BCID</td>
<td>1</td>
</tr>
<tr>
<td>PW16</td>
<td>August 1</td>
<td>Qualitative</td>
<td>0</td>
</tr>
<tr>
<td>PW17</td>
<td>August 1</td>
<td>BCID</td>
<td>1</td>
</tr>
<tr>
<td>PW17</td>
<td>August 1</td>
<td>Qualitative</td>
<td>0</td>
</tr>
<tr>
<td>PW17</td>
<td>August 4</td>
<td>BCID</td>
<td>1</td>
</tr>
<tr>
<td>PW17</td>
<td>August 4</td>
<td>Qualitative</td>
<td>0</td>
</tr>
<tr>
<td>PW17</td>
<td>August 5</td>
<td>BCID</td>
<td>1</td>
</tr>
<tr>
<td>PW17</td>
<td>August 5</td>
<td>Qualitative</td>
<td>0</td>
</tr>
</tbody>
</table>

\(^1\) Only calls with p-values < 0.05 for the maximum-likelihood estimation were included in qualitative analysis (USFWS 2014a).
Table 5. Summary of actions at each acoustic survey site for the Prevailing Winds Study Area.

<table>
<thead>
<tr>
<th>Station ID</th>
<th>BCID NLEB Calls</th>
<th>Probable NLEB Calls (P &lt; 0.05)</th>
<th>NLEB Qualitatively Verified</th>
<th>Presence/Absence Determination</th>
</tr>
</thead>
<tbody>
<tr>
<td>PW1</td>
<td>Yes</td>
<td>Yes</td>
<td>No</td>
<td>NLEB absent</td>
</tr>
<tr>
<td>PW2</td>
<td>No</td>
<td>No</td>
<td>No</td>
<td>NLEB absent</td>
</tr>
<tr>
<td>PW3</td>
<td>No</td>
<td>No</td>
<td>No</td>
<td>NLEB absent</td>
</tr>
<tr>
<td>PW4</td>
<td>No</td>
<td>No</td>
<td>No</td>
<td>NLEB absent</td>
</tr>
<tr>
<td>PW5</td>
<td>No</td>
<td>No</td>
<td>No</td>
<td>NLEB absent</td>
</tr>
<tr>
<td>PW6</td>
<td>No</td>
<td>No</td>
<td>No</td>
<td>NLEB absent</td>
</tr>
<tr>
<td>PW6a</td>
<td>Yes</td>
<td>Yes</td>
<td>No</td>
<td>NLEB absent</td>
</tr>
<tr>
<td>PW7</td>
<td>No</td>
<td>No</td>
<td>No</td>
<td>NLEB absent</td>
</tr>
<tr>
<td>PW8</td>
<td>No</td>
<td>No</td>
<td>No</td>
<td>NLEB absent</td>
</tr>
<tr>
<td>PW8a</td>
<td>Yes</td>
<td>Yes</td>
<td>No</td>
<td>NLEB absent</td>
</tr>
<tr>
<td>PW9</td>
<td>No</td>
<td>No</td>
<td>No</td>
<td>NLEB absent</td>
</tr>
<tr>
<td>PW9a</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>NLEB present</td>
</tr>
<tr>
<td>PW10</td>
<td>No</td>
<td>No</td>
<td>No</td>
<td>NLEB absent</td>
</tr>
<tr>
<td>PW11</td>
<td>Yes</td>
<td>Yes</td>
<td>No</td>
<td>NLEB absent</td>
</tr>
<tr>
<td>PW12</td>
<td>No</td>
<td>No</td>
<td>No</td>
<td>NLEB absent</td>
</tr>
<tr>
<td>PW13</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>NLEB present</td>
</tr>
<tr>
<td>PW14</td>
<td>Yes</td>
<td>Yes</td>
<td>No</td>
<td>NLEB absent</td>
</tr>
<tr>
<td>PW15</td>
<td>No</td>
<td>No</td>
<td>No</td>
<td>NLEB absent</td>
</tr>
<tr>
<td>PW16</td>
<td>Yes</td>
<td>Yes</td>
<td>No</td>
<td>NLEB absent</td>
</tr>
<tr>
<td>PW17</td>
<td>Yes</td>
<td>Yes</td>
<td>No</td>
<td>NLEB absent</td>
</tr>
</tbody>
</table>
Figure 1. Locations of acoustic bat detectors and those confirmed positive for NLEB at the Prevailing Winds Study Area from July 21 through August 10, 2015.
Appendix A. Pictures of Acoustic Survey Sites
Photo 1. Bat habitat surveyed by AnaBat detector at station PW1.

Photo 2. Bat habitat surveyed by AnaBat detector at site PW2.
Photo 3. Bat habitat surveyed by AnaBat detector at station PW3.

Photo 4. Bat habitat surveyed by AnaBat detector at site PW4.
Photo 5. Bat habitat surveyed by AnaBat detector at station PW5.

Photo 6. Bat habitat surveyed by AnaBat detector at site PW6.
Photo 7. Bat habitat surveyed by AnaBat detector at station PW6a.

Photo 8. Bat habitat surveyed by AnaBat detector at site PW7.
Photo 9. Bat habitat surveyed by AnaBat detector at station PW8.

Photo 10. Bat habitat surveyed by AnaBat detector at site PW8a.
Photo 11. Bat habitat surveyed by AnaBat detector at station PW9.

Photo 12. Bat habitat surveyed by AnaBat detector at site PW9a.
Photo 13. Bat habitat surveyed by AnaBat detector at station PW10.

Photo 14. Bat habitat surveyed by AnaBat detector at site PW11.
Photo 15. Bat habitat surveyed by AnaBat detector at station PW12.

Photo 16. Bat habitat surveyed by AnaBat detector at site PW13.
Photo 17. Bat habitat surveyed by AnaBat detector at station PW14.

Photo 18. Bat habitat surveyed by AnaBat detector at site PW15.

Photo 20. Bat habitat surveyed by AnaBat detector at site PW17.
Appendix B. Datasheets from Acoustic Survey Sites
Acoustic Monitoring STATION

Station Information

Datum: NAD27 or NAD83 Zone: 14
Easting: 0569503 Northing: 4776786

Detector Type: SD2 SD1 Anabat II
SM2 Pettersson B.A.T.

Placement: Ground Raised

Station Type: Fixed Temporary

Met Tower Present? Yes No

Microphone Protection: Plastic Bin Bat Hat None

Sound Reception: PVC Elbow Reflector Plate None

Microphone Ht (m): 1.5

Aspect: E

Power Supply: 12V

Habitat Information

Habitat:

<table>
<thead>
<tr>
<th>Rank by abundance</th>
<th>Shrub/Steppe</th>
<th>Deciduous Forest</th>
<th>Grassland</th>
<th>Other (describe)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Rank 1</td>
<td>Cropl/Agriculture</td>
<td>Coniferous Forest</td>
<td>Desert</td>
<td></td>
</tr>
<tr>
<td>Rank 2</td>
<td>Riparian/Wetland</td>
<td>Pinyon-Juniper</td>
<td>Water (lake, etc.)</td>
<td></td>
</tr>
</tbody>
</table>

Topography: Flat Slope High Point Low Point Other: __________

Was this station chosen to sample a bat feature? Yes No

Photos: Take photos of the area from each cardinal direction (facing away from the detector), as well as from the direction the microphone is pointing, and one of the detector set up itself. Also take photos of any bat features present and anything else of interest (e.g., sage grouse pellets, etc.). Label and mail to your bat station on your thumb drive.

General Remarks:

2011 Data Form

Date: 7-21-15 Project: Prevailing winds

Station Information

Station #: PW-1

Habitat Information

Habitat Map

Codes  Bat Features  Description

AS = anthropogenic structure
CV = cave
MN = mine
RO = rocky outcrop
CF = coniferous forest stand
DF = deciduous forest stand
WA = water

Other:

Map out bat and habitat features within 100 m radius of detector (1). Labeling codes provided, and write in any other features of interest (cliff, road, etc.). Provide descriptions for bat features in spaces provided.

2011  WEST, Inc.  Cheyenne, WY
Acoustic Monitoring STATION

Observer: __________
Date: 7-21-15
Project: Prevailing Wind

Station Information

Datum: NAD27 or NAD83 Zone: 14
Easting: 0568133 Northing: 4774899

Detector Type: SD2 SD1 Anabat II SM2 Pettersson B.A.T.
Serial Number(s): 80966 (microphone)

Placement: Ground Raised
Station Type: Fixed Temporary
Met Tower Present? Yes No
Microphone Ht (m): ______
Aspect: ______
Power Supply: 12V

Habitat Information

Habitat:

<table>
<thead>
<tr>
<th>Rank by abundance within 100 m of detector</th>
<th>Shrub/Steppe</th>
<th>Deciduous Forest</th>
<th>Grassland</th>
<th>Other (describe)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Crop/Agriculture</td>
<td>2</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Riparian/Wetland</td>
<td></td>
<td>Coniferous Forest Desert</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Pinyon-Juniper Water (lake, etc.)</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Topography: Flat Slope High Point Low Point Other: ______________

Was this station chosen to sample a bat feature? Yes No

Photos: Take photos of the area from each cardinal direction (facing away from the detector), as well as from the direction the microphone is pointing, and one of the detector set-up itself. Also take photos of any bat features present and anything else of interest (e.g., sage grouse pellets, etc.). Label and mail to your bat liaison on your thumb drive.

General Remarks: N15, S15, W15, E15, Lake

Habitat Map

Codes Bat Features Description

AS= anthropogenic structure
CV=cave
MN=mine
RO=rocky outcrop
CF=coniferous forest stand
DF=deciduous forest stand
WA=water

Other:

Map out bat and habitat features within 100 m radius of detector (x). Label using codes provided, and write in any other features of interest (cliff, road, etc.). Provide descriptions for bat features in spaces provided.

2011
WEST, Inc.
Cheyenne, WY
Acoustic Monitoring STATION

Observer: RS
Date: 7-21-15
Project: Prevailing Winds

Station Information
Datum: NAD27 or NAD83 Zone: 14
Easting: 0568878 Northing: 4778146

Detector Type: SD2 SD1 Anabat II Serial Number(s): 03697
SM2 Pettersson B.A.T.

Placement: Ground Raised
Raised System: N/A Pulley Fixed
Station Type: Fixed Temporary
Microphone Protection: Plastic Bin Bat Hat None

Met Tower Present? Yes No
Sound Reception: PVC Elbow Reflector Plate None

Microphone Ht (m): 2 (Height from ground to detector/microphone)

Aspect: NE Power Supply: 12V

Habitat Information

<table>
<thead>
<tr>
<th>Habitat</th>
<th>Code</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Shrub/Steppe</td>
<td>2</td>
<td>Deciduous Forest</td>
</tr>
<tr>
<td>Crop/Agriculture</td>
<td></td>
<td>Grassland</td>
</tr>
<tr>
<td>Riparian/Wetland</td>
<td>3</td>
<td>Pinyon-Juniper</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Water (lake, etc.)</td>
</tr>
</tbody>
</table>

Topography: Flat Slope High Point Low Point Other: 

Was this station chosen to sample a bat feature? Yes No

Photos: Take photos of the area from each cardinal direction (facing away from the detector), as well as from the direction the microphone is pointing, and one of the detector set up itself. Also take photos of any bat features present and anything else of interest (e.g., sage grouse pellets, etc.). Label and mail to your bat biokin on your thumb drive.

General Remarks:

Codes Bat Features

<table>
<thead>
<tr>
<th>Code</th>
<th>Bat Features</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>AS</td>
<td>Anthropogenic</td>
<td>Structure</td>
</tr>
<tr>
<td>CV</td>
<td>Cave</td>
<td></td>
</tr>
<tr>
<td>MN</td>
<td>Mine</td>
<td></td>
</tr>
<tr>
<td>RO</td>
<td>Rocky outcrop</td>
<td></td>
</tr>
<tr>
<td>CF</td>
<td>Coniferous forest</td>
<td>Stand</td>
</tr>
<tr>
<td>DF</td>
<td>Deciduous forest</td>
<td>Stand</td>
</tr>
<tr>
<td>WA</td>
<td>Water</td>
<td></td>
</tr>
<tr>
<td>Others</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Map out bat and habitat features within 100 m radius of detector (e). Label using codes provided, and write in any other features of interest (cliff, road, etc.). Provide descriptions for bat features in spaces provided.
Acoustic Monitoring STATION
Observer: RS

2011 Data Form
Date: 7-21-15
Project: Prevailing Winds
Station #: PW-Y

Station Information
Datum: NAD27 or NAD83 Zone: 41
Easting: 0572800 Northing: 4773535
Detector Type: SD2 Anabat II Serial Number(s): 03483 (microphone)
SM2 Pettersson B.A.T. (recorder, if applicable)

Placement: Ground Raised Raised System: N/A Pulley Fixed
Station Type: Fixed Temporary
Met Tower Present? Yes No
Microphone Ht (m): 2

Microphone Protection: Plastic Bin Bat Hat None
Sound Reception: PVC Elbow Reflector Plate None
Aspect: 
Power Supply: 12V (e.g., voltage and Amp-hours of battery, solar panel, etc.)

Habitat Information
Habitat:
Shrub/Steppe I Deciduous Forest Grassland Other (describe)
Crop/Agriculture 2 Coniferous Forest Desert
Riparian/Wetland Pinyon-Juniper Water (lake, etc.)

Topography: Flat Slope High Point Low Point Other: 

Was this station chosen to sample a bat feature? Yes No

Photos: Take photos of the area from each cardinal direction (facing away from the detector), as well as from the direction the microphone is pointing, and one of the detector set-up itself. Also take photos of any bat features present and anything else of interest (e.g., sage grouse pellets, etc.). Label and mail to your bat liaison on your thumb drive.

General Remarks:

Habitat Map

Codes Bat Features Description
AS=anthropogenic structure :
CV=cave :
MN=mines :
RO=rocky outcrop :
CF=coniferous forest stand :
DF=deciduous forest stand :
WA=water :
Others: 

Map out bat and habitat features within 100 m of detector(s). Label using codes provided, and write in any other features of interest (cliff, snout, etc.). Provide descriptions for bat features in spaces provided.
Acoustic Monitoring STATION

Observer: RS  
Date: 7-21-15  
Project: Prevailing Winds

Station Information

Datum: NAD27 or NAD83 Zone: 14  
Easting: 0570321  
Northing: 41772303

Detector Type: SD2 SD1 Anabat II  
SM2 Pettersson B.A.T.

Placement: Ground  
Raised System: N/A Pulley Fixed

Station Type: Fixed  
Temporary

Met Tower Present? Yes

Microphone Protection: Plastic Bin  
Bat Hat

Sound Reception: PVC Elbow  
Reflector Plate

Microphone Ht (m): 2

Aspect: E

Power Supply: 12V

Habitat Information

Habitat:

<table>
<thead>
<tr>
<th>Rank by abundance</th>
<th>1</th>
<th>2</th>
<th>3</th>
</tr>
</thead>
<tbody>
<tr>
<td>Shrub/Steppe</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Crop/Agriculture</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Riparian/Wetland</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Other: Posture

Topography: Flat

Was this station chosen to sample a bat feature? Yes

Photos: Take photos of the area from each cardinal direction (facing away from the detector), as well as from the direction the microphone is pointing, and one of the detector set up itself. Also take photos of any bat features present and anything else of interest (e.g., sage goose pellets, etc.). Label and mail to your bet LIKERS on your thumb drive.

General Remarks:

Codes Bat Features

<table>
<thead>
<tr>
<th>Codes</th>
<th>Bat Features</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>AS</td>
<td>Anthropogenic structure</td>
<td></td>
</tr>
<tr>
<td>CV</td>
<td>Cave</td>
<td></td>
</tr>
<tr>
<td>MN</td>
<td>Mine</td>
<td></td>
</tr>
<tr>
<td>RO</td>
<td>Rocky outcrop</td>
<td></td>
</tr>
<tr>
<td>CF</td>
<td>Coniferous forest stand</td>
<td></td>
</tr>
<tr>
<td>DF</td>
<td>Deciduous forest stand</td>
<td></td>
</tr>
<tr>
<td>WA</td>
<td>Water</td>
<td></td>
</tr>
<tr>
<td>Other</td>
<td>Other</td>
<td></td>
</tr>
</tbody>
</table>

Map out bat and habitat features within 100 m radius of detector (x). Labeling codes provided, and write in any other features of interest (cliff, road, etc.). Provide descriptions for bat features in spaces provided.
Acoustic Monitoring STATION

Observer: RS

2011 Data Form

Date: 7-21-15

Station Information

Datum: NAD27 or NAD83 Zone: 14

Easting: 0579638 Northing: 4770270

Detector Type: SD2, SD1, Anabat II, SM2, Pettersson B.A.T.

Serial Number(s): 804182

Project: Prevailing Winds

Station #: PHW-6

Microphone Ht (m): 2

Aspect: NE

Power Supply: 12V

Habitat Information

Shrub/Steppe: 1
Deciduous Forest
Grassland
Other (describe)

Coniferous Forest
Desert

Riparian/Wetland
Pinyon-Juniper
Water (lake, etc.)

Topography: Flat

Was this station chosen to sample a bat feature? Yes

Photos: Take photos of the area from each cardinal direction (facing away from the detector), as well as from the direction the microphone is pointing, and one of the detector set-up itself. Also take photos of any bat features present and anything else of interest (e.g., sage grouse pellets, etc.). Label and mail to your bat liaison on your thumb drive.

Codes Bat Features

AS= anthropogenic structure
CV=cave
MN=mine
RG=rocky outcrop

CF=coniferous forest stand
DP=deciduous forest stand
WA=water

Other=

Other=

Map out bat and habitat features within 100 m radius of detector (r). Label using codes provided, and write in any other features of interest (cliff, road, etc.). Provide descriptions for bat features in spaces provided.

General Remarks:

N, E, S, 41° 44' 40" / 106° 39' 59" 2011

WEST, Inc.
Cheyenne, WY
Acoustic Monitoring STATION

2011 Data Form

Project: Prevailing Winds

Observer: Roger McDonald

Date: 7/28/2015

Station #: PW-6A

Station Information

Datum: NAD27 or (NAD83) Zone: 1111 Easting: 574168 Northing: 4770744

Detector Type: SD2 SD1 Arnesen Anabat II

SM2 Pettersson B.A.T.

Placement: Ground Raised

Station Type: Fixed Temporary

Met Tower Present? Yes No

Serial Number(s): 80966 (microphone)

Raised System: N/A Pulley Fixed

Microphone Protection: Plastic Bin Bat Hat None

Sound Reception: PVC Elbow Reflector Plate None

Microphone Ht (m): 2

Aspect: 350° Power Supply: 12V

Habitat Information

Habitat:

Shrub/Sedge 1 Deciduous Forest 1 Grassland 2 Other (describe) 4

Crop/Agriculture 3 Coniferous Forest Desert

Riparian/Wetland Pinyon-Juniper Water (lake, etc.)

Topography: Flat Slope High Point Low Point Other:

Was this station chosen to sample a bat feature? Yes No

Photos: Take photos of the area from each cardinal direction (facing away from the detector), as well as from the direction the microphone is pointing, and one of the detector itself. Also take photos of any bat features present and anything else of interest (e.g., sage groves, peppers, etc). Label each and send to your batfisher on your thumb drive.

General Remarks: Grassy road leads directly to point

Habitat Map

Codes Bat Features

A= anthropogenic structure
C=cove
M=minimine
K=klotody outcrop
C=coniferous forest stand
D=deciduous forest stand
W=water

Other:

Map out bat and habitat features within 100 m radius of detector (e). Label using codes provided, and write in any other features of interest (hill, mound, etc.). Provide description for bat features in species provided.

2011 WEST, Inc. Cheyenne, WY
Acoustic Monitoring STATION

2011 Data Form

Observer: RS

Date: 7-21-15

Project: Prevailing Winds

Station Information

Datum: NAD27 or NAD83 Zone: 14

Easting: 0572985 Northing: 4766554

Detector Type: SD2 SD1 Anabat II

Serial Number(s): 015567 (microphone)

Placement: Ground Raised

Raised System: N/A Pulley Fixed

Microphone Protection: Plastic Bin Bat Hat None

Sound Reception: PVC Elbow Reflector Plate None

Microphone Ht (m): 2

Station Type: Fixed Temporary

Met Tower Present? Yes No

Microphone Ht (m): 2

(Habitat Map)

Habitat Information

Habitat:

Rank by abundance within 100 m of detector. 1 = most abundant, etc.

<table>
<thead>
<tr>
<th>Shrub/Steppe</th>
<th>Deciduous Forest</th>
<th>1</th>
<th>Grassland</th>
<th>Other (describe)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Crop/Agriculture</td>
<td>Coniferous Forest</td>
<td>Desert</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Riparian/Wetland</td>
<td>Pinyon-Juniper</td>
<td>Water (lake, etc.)</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Topography: Flat Slope High Point Low Point Other:

Was this station chosen to sample a bat feature? Yes No

Photos: Take photos of the area from each cardinal direction (facing away from the detector), as well as from the direction the microphone is pointing, and one of the detector set up itself. Also take photos of any bat features present and anything else of interest (e.g., sage grouse pellets, etc.). Label and mail to your bat filing on your thumb drive.

General Remarks:

Habitat Map

Codes Bat Features Description

AS=anthropogenic structure:
CV=cave:
MN=mine:
RO=rocky outcrop:
CF=coniferous forest stand:
DF=deciduous forest stand:
WA=water:

Others:

WEST, Inc.

Cheyenne, WY
Acoustic Monitoring STATION 2011 Data Form

Station Information

Datum: NAD27 or NAD83 Zone: 14
Easting: 0575714
Northing: 4765373

Detector Type: SD2 SD1 Arbat II
SM2 Pettersson B.A.T.

Placement: Ground Raised

Serial Number(s): 015653 (microphone)

Station Type: Fixed

Met Tower Present? Yes

Microphone Ht (m): 2

Microphone Protection: Plastic Bin Bat Hat None

Sound Reception: PVC Elbow Reflector Plate None

Aspect: 5

Power Supply: 6V

Habitat Information

Habitat:
Rank by abundance within 100 m of detector. 1 = most abundant, etc.

<table>
<thead>
<tr>
<th>Shrub/Steppe</th>
<th>Deciduous Forest</th>
<th>Grassland</th>
<th>Other (describe)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Crop/Agriculture</td>
<td>Coniferous Forest</td>
<td>Desert</td>
<td></td>
</tr>
<tr>
<td>Riparian/Wetland</td>
<td>Pinyon-Juniper</td>
<td>Water (lake, etc.)</td>
<td></td>
</tr>
</tbody>
</table>

Topography: Flat

Was this station chosen to sample a bat feature? Yes

Photos: Take photos of the area from each cardinal direction (facing away from the detector), as well as from the direction the microphone is pointing, and one of the detector setup itself. Also take photos of any bat features present and anything else of interest (e.g., sage grouse pellets, etc.). Label and mail to your bat folder in your thumb drive.

General Remarks:

<table>
<thead>
<tr>
<th>Codes</th>
<th>Bat Features</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>AS=anthropogenic structure</td>
<td></td>
<td></td>
</tr>
<tr>
<td>CV=cave</td>
<td></td>
<td></td>
</tr>
<tr>
<td>MN=mine</td>
<td></td>
<td></td>
</tr>
<tr>
<td>RO=rocky outcrop</td>
<td></td>
<td></td>
</tr>
<tr>
<td>CF=coniferous forest stand</td>
<td></td>
<td></td>
</tr>
<tr>
<td>DF=deciduous forest stand</td>
<td></td>
<td></td>
</tr>
<tr>
<td>WA=water</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Other:

Map out bat and habitat features within 100 m radius of detector (e.g. labeling codes provided, and write in any other features of interest (cliff, road, etc.). Provide descriptions for bat features in spaces provided.

2011
WEST, Inc.
Cheyenne, WY
Acoustic Monitoring STATION

Observer: Ryan McDonald
Date: 7/25/2015
Project: Prevailing Winds

Station Information

Datum: NAD27 or NAD83 Zone: 14T
Easting: 575652 Northing: 4768678

Detector Type: SD2, SD1, Anabat II, SM2, Pettersson BAT
Serial Number(s): 80917 (microphone)
Placement: Ground, Raised
Raised System: N/A, Pulley, Fixed
Station Type: Fixed, Temporary
Met Tower Present? Yes, No

Microphone Ht (m):

Microphone Protection:

Sound Reception:

Aspect:

Power Supply:

Habitat Information

Habitat:
- Shrub/Steppe
- Crop/Agriculture
- Riparian/Wetland
- Coniferous Forest
- Pinon-Juniper
- Grassland
- Desert
- Water (lake, etc.)

Topography:

Was this station chosen to sample a bat feature? Yes, No

Photos: Take photos of the area from each cardinal direction (facing away from the detector), as well as from the direction the microphone is pointing, and one of the detector set-up itself. Also take photos of any bat features present and any thing else of interest (e.g., sage groves, pellis, etc.). Label and mail to your bat liaison on your thumb drive.

General Remarks:

Habitat Map:

Codes: Bat Features
- AS=anthropogenic structure
- CV=cave
- MN=mine
- RO=rocky outcrop
- CF=coniferous forest stand
- DF=deciduous forest stand
- WA=water

Map out bat and habitat features within 100 m radius of detector(s). Label using codes provided, and write in any other features of interest (well, road, etc.). Provide description for bat features in spaces provided.
Acoustic Monitoring STATION

2011 Data Form

Observer: Ryan M. McDonald
Date: 7/27/2015
Project: Prevailing Winds

Station #: PN-9

Station Information

Datum: NAD27 or NAD83 Zone: UT Easting: 580064 Northing: 4765600
Detector Type: SD2 SD1 Anabat II
SM2 Pettersson B.A.T.
Placement: Ground Raised
Station Type: Fixed Temporary
Met Tower: Yes No
Microphone Height (m): 2
(Same from ground to detector/microphone)

Serial Number(s): 03483 (microphone)
Raised System: N/A Pulley Fixed
Microphone Protection: Plastic Bin Bat Hat None
Sound Reception: PVC Elbow Reflector Plate None

Habitat Information

Habitat:
Rank by abundance within 100 m of detector: 1 = most abundant, etc.

<table>
<thead>
<tr>
<th>Shrub/Shrubs</th>
<th>Deciduous Forest</th>
<th>Grassland</th>
<th>Other (describe)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>2</td>
<td>4</td>
<td></td>
</tr>
</tbody>
</table>

Crop/Agriculture
Riparian/Wetland

Topography: Flat Slope High Point Low Point Other:

Was this station chosen to sample a bat feature? Yes No

Photos: Take photos of the area from each cardinal direction (facing away from the detector), as well as from the direction the microphone is pointing, and one of the detector set-up itself. Also take photos of any bat features present and anything else of interest (e.g., sage grove poles, etc.). Label and mail to your Bat Festival on your thumb drive.

General Remarks:

Habitat Map

Codes: Bat Features

<table>
<thead>
<tr>
<th>Codes</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>AS</td>
<td>Anthropogenic structure</td>
</tr>
<tr>
<td>CV</td>
<td>Cave</td>
</tr>
<tr>
<td>MN</td>
<td>Mine</td>
</tr>
<tr>
<td>RO</td>
<td>Rocky Outcrop</td>
</tr>
<tr>
<td>CF</td>
<td>Coniferous forest stand</td>
</tr>
<tr>
<td>DF</td>
<td>Deciduous forest stand</td>
</tr>
<tr>
<td>W</td>
<td>Water</td>
</tr>
<tr>
<td>Other</td>
<td>Other</td>
</tr>
</tbody>
</table>

Map not bat and habitat features within 100 m radius of detector (i.e. Label only codes provided, and write in any other features of interest (e.g., rock, etc.). Provide descriptions for bat features in spaces provided.

2011

WEST, Inc.
Cheyenne, WY
Station Information

Datum: NAD27 or NAD83 Zone: W1
Easting: 569742 Northing: 4766932

Detector Type: SD2 SD1 Arribat II
SM2 Pettersson B.A.T.

Placement: Ground Raised

Station Type: Fixed Temporary

Met Tower Present? Yes No

Serial Number(s): 80917

Microphone Protection: Plastic Bin Bat Hat None

Sound Reception: PVC Elbow Reflector Plate None

Raised System: N/A Pulley Fixed

Microphone Protection: Plastic Bin Bat Hat None

Microphone Ht (m): 1.5

Aspect: 80°

Power Supply: 12V

Habitat Information

Habitat:
- Shrub/Shrubs
- Deciduous Forest
- Coniferous Forest
- Grassland
- Desert
- Pinyon-Juniper
- Water (lake, etc.)

Topography: Flat Slope High Point Low Point Other:

Was this station chosen to sample a bat feature? Yes No

Photos: Take photos of the area from each cardinal direction (facing away from the detector), as well as from the direction the microphone is pointing, and one of the detector set-up itself. Also take photos of any bat features present and anything else of interest (e.g., rope grove poles, etc.). Label and mail to your bat liaison as your thumbnails drive.

General Remarks:

Codes Bat Features

Description

Map

WEST, Inc.
Cheyenne, WY
Acoustic Monitoring STATION

Station Information

- Datum: NAD27 or NAD83
- Zone: HT
- Easting: 578533
- Northing: 4763193
- Detector Type: SO2, SO1, Aronat II, SM2, Pettersson, B.A.T.
- Serial Number(s): 80814 (microphone)
- Raised System: N/A; Pulley; Fixed
- Microphone Protection: Plastic Bin, Bat Hat, None
- Sound Reception: PVC Elbow, Reflector Plate, None
- Microphone Ht (m): 2
-方面: 15°
- Power Supply: 12V

Habitat Information

- Habitat: Shrub/Steppe, Deciduous Forest, Grassland, Other (describe)
- Topography: Flat, Slope, High Point, Low Point, Other:
- Was this station chosen to sample a bat feature? Yes, No

General Remarks:

Habitat Map

Descriptions

- On the map, label any bat habitat features within 100 m radius of detector h5. Label using provided codes, and write in any other features of interest (e.g., crop, grass, etc.). Provide description for bat features in species provided.
Acoustic Monitoring STATION

Station Information

Datum: NAD27 or NAD83 Zone: H4T
Easting: 576700 Northing: 4763072

Detector Type: SD2, SM2, Arbat II, B.A.T., Pettersson
Placement: Ground, Raised
Station Type: Fixed, Temporary
Met Tower Present? Yes, No
Microphone Ht (m): 2

 serial number: D3697 (microphone)
Raised System: N/A, Pulley, Fixed
Microphone Protection: Plastic Bin, Bat Hat, None
Sound Reception: PVC Elbow, Reflector Plate, None
Aspect: 5°
Power Supply: 12 V

Habitat Information

<table>
<thead>
<tr>
<th>Habitat Type</th>
<th>Ranking</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Shrub/Steppes</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>Deciduous Forest</td>
<td>1</td>
<td>Grassland</td>
</tr>
<tr>
<td>Coniferous Forest</td>
<td>2</td>
<td>Desert</td>
</tr>
<tr>
<td>Pinyon-Juniper</td>
<td>3</td>
<td>Water (lake, etc.)</td>
</tr>
</tbody>
</table>

Topography: Flat, Slope, High Point, Low Point, Other:

Was this station chosen to sample a bat feature? Yes, No

Photos: Take photos of the area from each cardinal direction facing away from the detector, as well as from the direction the microphone is pointing and one of the detector set-up itself. Also take photos of any bat features present and anything else of interest (e.g., roost groves, poles, etc.). Label and mail to your batihan on your thumb drive.

General Remarks:

Habitat Map:

Codes:

Bat Features:

Description:

WEST, Inc.
Cheyenne, WY
Station Information

Datum: NAD27 or NAD88 Zone: 1
Easting: 575445 Northing: 4762139

Detector Type: SD2 SD1 Anabat II
SM2 Pettersson B.A.T.

Placement: Ground

Station Type: Fixed

Met Tower Present? Yes No

Microphone Height (m): 2

Serial Number(s): 80482 (microphone)

Raised System: N/A Pulley Fixed

Microphone Protection: Plastic Bin Bat Hat None

Sound Reception: PVC Elbow Reflector Plate None

Detector Type: Microphone

Habitat Information

Habitat:
Shrub/Steppe Deciduous Forest SF Grassland 1 Other (describe)
Crop/Agriculture Coniferous Forest
Riparian/Wetland Pinyon-Juniper Water (lake, etc.)

Topography: Flat Slope High Point Low Point Other:

Was this station chosen to sample a bat feature? Yes No

Photos: Take photos of the area from each cardinal direction (facing away from the detector), as well as from the direction the microphone is pointing, and one of the detector set up itself. Also take photos of any bat features present and anything else of interest (e.g., sage grouse pecos, etc.) and mail to your bat liaison on your thumb drive.

General Remarks:

Habitat Map

Codes: Bat Features

AS = anthropogenic structure
C = cave
MN = mine
RO = rocky outcrop
CF = coniferous forest stand
DF = deciduous forest stand
W = water

Other:

Map out bat and habitat features within 100 m radius of detector by. Label using codes provided, and write in any other features of interest (e.g., road, etc.). Provide description for bat features in spaces provided.

2011 Data Form

Project: Prevailing Winds

Date: 7/28/2015

WEST, Inc.

Cheyenne, WY
Acoustic Monitoring STATION

Observer: Kyan McDonald
Date: 8/1/2015
Project: Prevailing Winds

Station Information

Datum: NAD27 or NAD83 Zone: JT
Easting: 574443 Northing: 4759581

Detector Type: SD2 □ SD1 □ Anabat II
SM2 □ Pettersson □ B.A.T.

Placement: Ground □ Raised

Serial Number(s): 03483
Microphone Protection: Plastic Bin □ Bat Hat □ None
Sound Reception: PVC Elbow □ Reflector Plate □ None

Met Tower Present? Yes □ No

Microphone Ht (m): 1.5
Aspect: 90°
Power Supply: 12 V

Habitat Information

Habitat: Shrub/Steppe □ Deciduous Forest □ Grassland □ Other (describe)
Crop/Agriculture □ Coniferous Forest □ Desert □
Riparian/Wetland □ Pinon-Juniper □ Water (lake, etc.)

Topography: Flat □ Slope □ High Point □ Low Point □ Other:

Was this station chosen to sample a bat feature? Yes □ No

Photos: Take photos of the area from each cardinal direction (facing away from the detector), as well as from the direction the microphone is pointing, and one of the detector setup itself. Also take photos of any bat features present and anything else of interest (e.g., shape, size, position, etc.), label and mail to your bat lab before your next trip back.

General Remarks:

Codes: Rat Features

<table>
<thead>
<tr>
<th>Code</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>AS</td>
<td>Anthropogenic structure</td>
</tr>
<tr>
<td>CV</td>
<td>Cave □ Volcanic</td>
</tr>
<tr>
<td>MN</td>
<td>Mine □ Nuclear □ Uranium □ Waste □ Water □ Other</td>
</tr>
<tr>
<td>R0</td>
<td>Rocky outcrop</td>
</tr>
<tr>
<td>C1</td>
<td>Coniferous forest □ DF</td>
</tr>
<tr>
<td>D</td>
<td>Deciduous forest □ DF</td>
</tr>
</tbody>
</table>

Other: Map out bat and habitat features within 100 m radius of detector(s). Labelling codes provided, and write in any other features of interest (FM, mast, etc.). Provide descriptions for bat features in spaces provided.

2011 WEST, Inc. Cheyenne, WY
Acoustic Monitoring STATION 2011 Data Form  
Observer: Ryan McDonald  
Date: 8/1/2013  
Project: Dreaming Words

Station Information

Datum: NAD27 or NAD83 Zone: MT  
Easting: 574925  
Northing: 4758670  
Detector Type: SO2, SD1, SM2, Petterson B.A.T.  
Serial Number(s): 03697  
Raised System: N/A, Pulley, Fixed  
Station Type: Fixed, Temporary  
Microphone Protection: Plastic Bin, Bat Hat, None  
Sound Reception: PvcElbow, Reflector Plate, None  
Microphone Ht (m): 2  
Aspect: 30  
Power Supply: 12V

Habitat Information

Habitat:  
- Shrub/Steppe 3  
- Deciduous Forest 2  
- Grassland 1  
- Other (describe)  
- Coniferous Forest  
- Pinyon-Juniper 1  
- Desert  
- Water (lake, etc.)

Topography: Flat, Slope, High Point, Low Point, Other:  

Was this station chosen to sample a bat feature? Yes  

Photos: Take photos of the area from each cardinal direction (facing away from the detector), as well as from the direction the microphone is pointing, and one of the detector setup itself. Also take photos of any bat features present and anything else of interest (e.g., sage grouse pellets, etc.). Label and mail to your bat habitat on your thumb drive.

General Remarks:

Habitat Map

Codes  Bat Features  Description

AS= anthropogenic structure
Cl= cave
MN= mine
Rt= rocky outcrop
CF= coniferous forest stand
D= deciduous forest stand
W= water
Others:

Map out all bat habitat features within 100 m radius of detector(s). Labeling codes provided, and write in any other features of interest (e.g., cliff, well, etc.). Provide descriptions for bat features in spaces provided

2011  
WEST, Inc.  
Cheyenne, WY
## Station Information

- **Datum:** NAD27 or NAD83
- **Zone:** 4T
- **Easting:** 575580
- **Northing:** 4758206
- **Detector Type:**
  - SD2
  - SD1
  - Arribat II
  - SM2
  - Petersson
  - B.A.T.
- **Serial Number(s):** 80966 (microphone)
- **Placement:**
  - Ground
  - Raised
- **Station Type:**
  - Fixed
  - Temporary
- **Met Tower Present?**
  - Yes
  - No
- **Microphone HT (m):** 1.5
- **Raised System:**
  - N/A
  - Pulley
  - Fixed
- **Microphone Protection:**
  - Plastic Bin
  - Bat Hat
  - None
- **Sound Reception:**
  - PVC Elbow
  - Reflector Plate
  - None
- **Height from ground to detector/microphone:**
- **Aspect:** 0°
- **Power Supply:** 12 V

## Habitat Information

<table>
<thead>
<tr>
<th>Habitat</th>
<th>Rank by Abundance</th>
<th>Within 100 m of Detector</th>
<th>Most Abundant, etc.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Shrub/Steppe</td>
<td>Deciduous Forest</td>
<td>Grassland</td>
<td>Other (describe)</td>
</tr>
<tr>
<td>Riparian/Wetland</td>
<td>Coniferous Forest</td>
<td>Desert</td>
<td></td>
</tr>
<tr>
<td>Crop/Agriculture</td>
<td>Pinyon-Juniper</td>
<td>Water (lake, etc.)</td>
<td></td>
</tr>
</tbody>
</table>

- **Topography:**
  - Flat
  - Slope
  - High Point
  - Low Point
  - Other:

- **Was this station chosen to sample a bat feature?**
  - Yes
  - No

- **Photos:**
  - Take photos of the area from each cardinal direction (facing away from the detector), as well as from the direction the microphone is pointing, and one of the detector set-up itself. Also take photos of any bat features present and anything else of interest (e.g., sage grove pellets, etc.). Label and mail to your bat files in on your thumb drive.

## General Remarks:

- **Habitat Map:**
  - [Habitat Map Diagram]

## Codes

- **Bat Features:**
  - AS: Anthropogenic structure
  - CV: Cave
  - MN: Mine
  - RM: Rocky outcrop
  - CF: Coniferous forest stand
  - DF: Deciduous forest stand
  - WA: Water
  - Other: Other bat and habitat features within 100 m radius of detector (e.g., Label using codes provided, and write in any other features of interest: cliff, road, etc.). Provide descriptions for bat features in agencies provided.

## Map

2011 WEST, Inc. Cheyenne, WY
Acoustic Monitoring STATION

Observer: Ryan M.  
Date: 8/1/2015

Station Information
Datum: NAD82
Easting: 576680
Serial Number(s): 80482

Detector Type: SD2
SD1
Arabat II
SM2
Pettersson
B.A.T.

Placement: Ground
Raised

Easting: 4757714

RAISED

Station Type: Ground
Temporary

Microphone Protection: Plastic Bin
Bat Hat
None

Sound Reception: PVC Elbow
Reflector Plate: None

Microphone Ht (m): 2

Aspect: 0

Power Supply: 12 V

Habitat Information

<table>
<thead>
<tr>
<th>Habitat</th>
<th>Deciduous Forest</th>
<th>Grassland</th>
<th>Other (describe)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Shrub/Steppe</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Crop/Agriculture</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Riparian/Wetland</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Topography: Flat

Was this station chosen to sample a bat feature? Yes

Photos: Take photos of the area from each cardinal direction (facing away from the detector), as well as from the direction the microphone is pointing, and one of the detector setup itself. Also take photos of any bat features present and anything else of interest (e.g., snake gourds pellet, etc.). Label and mail to your bat lab on your data sheet.

General Remarks:

Habitat Map

Codes Bat Features

<table>
<thead>
<tr>
<th>Codes</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>Anthropogenic vegetation</td>
</tr>
<tr>
<td>CV</td>
<td>Cave</td>
</tr>
<tr>
<td>MN</td>
<td>Mine</td>
</tr>
<tr>
<td>RO</td>
<td>Rocky outcrop</td>
</tr>
<tr>
<td>CF</td>
<td>Coniferous forest stand</td>
</tr>
<tr>
<td>DF</td>
<td>Deciduous forest stand</td>
</tr>
<tr>
<td>W</td>
<td>Water</td>
</tr>
<tr>
<td>Other</td>
<td>Other</td>
</tr>
</tbody>
</table>

Map out bat and habitat features within 100 m radius of detector(s). Label using codes provided, and write in any other features of interest (wet, mud, etc.). Provide description for bat features in species provided.
Acoustic Monitoring STATION

Observer: Ryan McDonald
Date: 8/1/2015
Project: Prevailing Winds
Station #: DW.17

Station Information
Datum: NAD27 or NAD83 Zone: UT Easting: 578987 Northing: 4756031
Detector Type: SD2, SD1, Anabat II, SM2, Pettersson, B.A.T.
Placement: Ground, Raised
Station Type: Fixed, Temporary
Met Tower Present? Yes

Serial Number(s): 80917
(Microphone: Recorder, if applicable)
Raised System: N/A, Pulley, Fixed
Microphone Protection: Plastic Bin, Bat Hat, None
Sound Reception: PVC Elbow, Reflector Plate, None
Microphone Ht (m): 1.5
(Height from ground to detector/microphone)
Aspect: 280°
(Polar or Cardinal Direction of site, e.g., refuge and roost sites, bat perches, etc.)
Power Supply: 12 V

Habitat Information
Habitat: Rank by abundance within 100 m of detector. 1 = most abundant, etc.
Shrub/Wetland 7 Deciduous Forest Grassland 2 Other (describe)
Crop/Agriculture Coniferous Forest
Riparian/Wetland Pleistocene Juniper

Topography: Flat, Slope, High Point, Low Point, Other:
Was this station chosen to sample a bat feature? Yes
Photos: Take photos of the area from each cardinal direction facing away from the detector, as well as from the direction the microphone is pointing, and one of the detector set-up itself. Also take photos of any bat features present and anything else of interest (e.g., snake passage, etc.). Label and mail to your bat facility on your thumb drive.

General Remarks:

Habitat Map

Codes Bat Features Description
A: Anthropogenic structure
C: Cave
M: Mine
R: Rocky outcrop
N: Coniferous forest stand
D: Deciduous forest stand
W: Water

Map out bat and habitat features within 1200 m radius of detector(s). Label using codes provided, and write in any other features of interest (bush, tree, etc.). Provide descriptions for key features in species provided.

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WEST, Inc.
Cheyenne, WY