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# memorandum

date August 31, 2017  
to Debbie Bent, City of Kenmore  
from Jim Keany, Director of Biological Resources, ESA Northwest Region  
subject Review of St. Edward State Park Bat Study

The City of Kenmore (City) requested Environmental Science Associates (ESA) to review a study recently completed for Washington State Parks (Parks) on the presence of bats at St. Edward State Park, with an emphasis on the existing ballfield east of the seminary building. The City has proposed to renovate the existing ballfield and install lights to facilitate recreational use. Parks has expressed some concern about the potential effect of ballfield lights on bats that use the area. The following narrative provides a summary of ESA's process for reviewing the information and our conclusions regarding potential effects to bats from the proposed ballfield lighting.

ESA staff visited the site at dusk to observe the current conditions and reviewed the following information:

- Site plans for the proposed ballfield renovation (Pertect, 2016).
- Lighting plan grid analysis (Musco Lighting, 2006).
- Lighting time schedule (City of Kenmore, undated).
- LED lighting specifications letter report (Stantec, 2017).
- 2017 Bat Survey Report for St. Edward State Park (Owl Ridge Natural Resource Consultants, Inc., 2017).
- Protecting Washington State Parks' Natural Resources, A Comprehensive Natural Resources Management Policy (Washington State Parks, 2011).
- State of Washington Bat Conservation Plan (Washington Department of Fish and Wildlife [WDFW], 2013).
- A number of relevant articles in the scientific literature, as cited.

## Proposed Lighting at Ballfield

The site is an existing grassy ballfield adjacent to a parking lot that is on the east side of the seminary building in St. Edward State Park. The park entrance road traverses along the north side of the ballfield, a parking area lies on the west side, and forests border the east and south sides of the field. An emergent wetland is present along the eastern forest boundary, which flows south into a large forested wetland. Large security lights on the seminary building illuminate the adjacent parking lot and most of the existing ballfield. At dark, a person standing in the center of the ballfield casts a shadow toward the eastern forest edge. Only the extreme reaches of the eastern and southern edge of the ballfield, along the forest margin, approach darkness. We understand that these security lights stay on throughout the night year-round.

The proposed ballfield lighting plan includes the use of LED sports lights that are designed as “cutoff” floodlights that approach full cutoff performance – meaning that very little light would spill outside the area of intended illumination – just outside of the ballfield area of play. The shielding proposed for the lights meets recommendations by the International Dark Sky Association (2016) and The Nature Conservancy (2015) guidelines for outdoor LED lighting. Because the lights are so constrained, for safety (fly ball visibility), one light is angled upward so balls are visible.

The proposed lighting schedule is to illuminate the ballfield for play until 9 pm each night. The lighting schedule for the summer months, when the vast majority of bat activity occurs in the Puget Sound region (Christy and West, 1983), calls for either no lighting or extremely limited lighting because the length of the summer days makes lighting unnecessary. Table 1 below shows the lighting schedule for the primary months of when bats are active in the area.

**Table 1. St. Edward State Park Ballfield Proposed Lighting Schedule.**

Month	Average Sunset Time	Time Lights are Turned On	Average Hours of Lights Per Day*
May	8:32 pm	8:45 pm	0.25
June	9:04 pm	-----	0
July	9:06 pm	-----	0
August	8:31 pm	8:45 pm	0.25

\*Lights would be turned off at 9:00 pm, at the latest, year-round.

**2017 Bat Study at St. Edward State Park**

Washington State Parks recently commissioned a bat study in St. Edward State Park. Owl Ridge Natural Resource Consultants performed this study through the spring and summer of 2017. Two methods were used to collect bat acoustic data at the park – passive collection methods and active collection methods. In passive data collection, acoustical monitors were set up at fixed locations for 1.5 hours following dusk at the ballfield and at the edge of a separate field, referred to as the Grotto, west of the seminary building. Active collection was used by walking with a backpack acoustical collection system along the South Canyon Trail, North Canyon Trail, and along Lake Washington. In addition, searches were conducted in the Seminary and adjacent buildings by visual and acoustical collection methods (Owl Ridge Natural Resource Consultants, Inc. 2017).

The bat species confirmed by the acoustical survey are common species to the Puget Sound area, and none have any special federal or state management designation (Christy and West, 1993; WDFW, 2013). The highest numbers of bats and numbers of species (eight species) were observed along the shore of Lake Washington. All of these common bat species tend to favor riparian and open water shorelines for foraging where insect prey is found at high densities (Christy and West, 1993; WDFW 2013). Similarly, six species were recorded at the detention pond north of the seminary building, with high numbers of bat acoustic detection.

Because passive techniques were used for collecting acoustical data at the Lake Washington shoreline and at the detention pond, rather than placing a device here for the full 1.5-hour survey time as was done for the ballfield site, it is highly likely that the survey results underrepresent the relative use by bats of the lakeshore site and the detention pond given the high numbers of bats and number of species recorded by the limited active data

collection methods. The results do, however, provide a valuable snapshot of relative use of the areas by foraging bats.

In contrast to the high diversity of bats and high numbers of bat detections near the watered sites, 91% of the detections at the ballfield consisted of one common species - the silver-haired bat (*Lasiorycteris noctivagans*), which is known to forage along forest clearings, above ponds, along riparian areas, and above trees. The only other species recorded here were nine detections of the hoary bat (*Lasiurus cinereus*), two of the Yuma myotis (*Myotis yumanensis*), and one of the long-legged myotis (*M. volans*). All of these bats are common species in western Washington.

Bat use of the ballfield appeared limited to the darker recesses adjacent to the forest and above the wetland ditch along the eastern edge. Bat use of this edge of the ballfield was highest from late June to the 2<sup>nd</sup> of July and then fell precipitously to either no detections or just two detections per evening through early August. Thus, bat use of the area appears to be limited to a small area adjacent to the forest for a short portion of the summer.

### **Bats and Artificial Light**

A number of studies have been conducted regarding how bats either avoid lights or are drawn to the insect prey around lights (Rowse et al., 2015; Rich and Longcore, 2006; Stone et al., 2015; Rydell, 1992; Stone 2013). In these studies or data summaries, bats are placed in one of two categories – light-tolerant or light-intolerant – based on field observations or application of these observations applied to related species. Those bats that emerge from roosts at or before dusk are thought to have evolved with a higher light tolerance or predator avoidance mechanisms, while those that emerge after dark are thought to be more light-intolerant.

There no available studies specific to the light tolerance of the silver-haired bat, the primary species recorded at the ballfield. Most of the literature notes that silver-haired bats emerge from roosts after dark, but there are some historic records of them emerging prior to dusk (Seton, 1907). Based on their general foraging behavior and lack of observations around streetlights, they are considered a light-intolerant species. The three other species of bats observed at very low densities at the ballfield are of the genus *Myotis*, also generally considered a light-intolerant genus.

Silver-haired bats have a bi-modal foraging schedule. They leave roosts after dark and are active up to several hours afterward and then return to a roost, and emerge several hours later to feed again. In western Washington, there have been limited observations of silver-haired bats emerging from winter roosts for short periods to feed if the weather is warm (at least 48 degrees Fahrenheit), dry, and winds are minimal (Falxa, 2007). In general, bat use of the site in winter is expected to be limited (Christy and West, 1993; WDFW, 2013).

### **Potential Effects of the Proposed Ballfield Lighting**

Because the proposed ballfield lighting plan uses guidelines of the International Dark Sky Association and The Nature Conservancy (in particular, using hardware to avoid light spillage and avoiding light schedules that cause conflicts for foraging bats), there would be negligible effects to bats from the proposed plan.

The lighting plan would have only negligible effects because of the following:

- Lights will not be used during the peak bat seasonal use months (June and July), and lighting would be used a maximum of 15 minutes per night in May and August when bat use is minimal
- Lights will be turned off by 9:00 p.m., at the latest, year-round.
- There are no special-status bats in the area.
- There are no roosting or maternal colonies nearby.

- Bats use the ballfield for a short duration during the summer that coincides with the time the ballfield lights are generally not needed.
- Surveys indicate that more productive foraging areas are present within a short distance from the ballfield.
- The proposed lighting technology adheres to conservation recommendations and does not spill out from the field of play; areas outside of the ballfield will not be affected.

Additionally, most of the ballfield is already illuminated by the bright lights at the seminary building. These lights were installed by State Parks years ago for security purposes.

Under the State Environmental Policy Act (SEPA), a significant effect is defined as “...a reasonable likelihood of more than a moderate adverse impact on environmental quality” (WAC 197-11-794). In the proposed lighting plan for the ballfield, the effects of lighting are minimized because:

- 1) Lights will be turned off by 9:00 p.m., at the latest, year-round.
- 2) Lights will not be used in June and July, and lighting would be used a maximum of 15 minutes per night in May and August.
- 3) Standard light conservation technology is used to eliminating light leaking outside of the ballfield.

No sensitive natural resource receptors (bat communal or maternal roosts, special status species) are located at or near the ballfield, so effects to bats in general have been reduced to negligible – or not measurable. Thus, in my professional opinion, the appropriate SEPA effects determination does not approach a significance threshold. The appropriate SEPA conclusion is a Determination of Non-Significance, and the use of the standard SEPA checklist is the appropriate level of environmental documentation.

Parks’ natural resource management guidelines (Washington State Parks, 2011) regarding common species and habitats note the following:

*Where native species are significantly impacted by regulations (e.g., WAC 352-32-150 opens State Parks for the harvest of fish) or Commission-sanctioned actions (developments associated with approved park master plans, treatment of problem wildlife) efforts will be made to minimize and mitigate these impacts.*

Planning for the ballfield lights includes specific hardware to minimize light spillage according to standard conservation guidelines, and a reduced lighting schedule to eliminate potential effects to bats and other night-dwelling wildlife. Thus, the effects of the proposed project have been reduced to a negligible level and have been done so in accordance with Parks’ guidelines for managing natural resources and recreation use on Parks lands.

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