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**MOUNT RUSHMORE NATIONAL MEMORIAL  
INDEPENDENCE DAY HOLIDAY FIREWORKS EVENT, 2026**

**Environmental Assessment**

**March 4, 2026**

The National Park Service has considered the factors mandated by the National Environmental Policy Act (NEPA). This environmental assessment represents the NPS's good-faith effort to fulfill NEPA's requirements by prioritizing documentation of the most important relevant considerations within the statutorily mandated page limits and timeline. This prioritization reflects the NPS's expert judgment; and any considerations addressed briefly or left unaddressed are, in NPS's judgment, comparatively non-substantive and would not meaningfully inform NPS's consideration of environmental effects and the decision to be made. The environmental assessment is substantially complete, and, in the decisionmaker's judgment, contains analysis adequate to inform NPS's decision regarding the proposed action.



## **Chapter 1: Introduction**

Mount Rushmore National Memorial (the Memorial) hosted annual Independence Day holiday fireworks displays from 1998 to 2001, 2003 to 2009, and again in 2020. The 2020 event was analyzed in the Mount Rushmore Independence Day Fireworks Event Environmental Assessment (NPS, 2020), referred to herein as the “2020 EA.” The 2020 EA and finding of no significant impact (FONSI) noted that future fireworks displays could occur under the agency-preferred (and selected) alternative. The State of South Dakota has submitted a request for a special use permit for a fireworks display at the Memorial in July 2026, which would be the 250<sup>th</sup> anniversary of the signing of the Declaration of Independence. The National Park Service (NPS) has prepared a new EA (2026 EA) to evaluate environmental impacts associated with new information that has emerged since completion of the 2020 EA. Because the 2020 FONSI stated that fireworks displays could occur in future years, this EA is meant only to supplement portions of the 2020 EA to address the relevant new information. This EA incorporates by reference the information in the 2020 EA and FONSI. The 2020 and 2026 materials are publicly available at: [https://parkplanning.nps.gov/MORU\\_Independence\\_250](https://parkplanning.nps.gov/MORU_Independence_250)

### **1.1 Purpose and Need for Action**

The need for taking action is to evaluate whether to grant the State of South Dakota’s request for a special use permit (SUP) to conduct a fireworks event at the Memorial. The purpose of the proposed action is to provide an opportunity for the public to celebrate the spirit of Independence Day in a manner that promotes enjoyment while ensuring public safety and resource protection.

### **1.2 Issues Analyzed in this Environmental Assessment**

The 2020 EA examined three impact topics in detail: wildfire, environmental contaminants, and cultural resources. This EA incorporates by reference and summarizes these impact topics, affected environment, and environmental consequences from Chapter 3 of the 2020 EA, supplemented with updated information below. It also includes an analysis of impacts to threatened and endangered species from the no action and preferred alternatives. This impact topic was dismissed in the 2020 EA.

### **1.3 Issues Dismissed from Detailed Analysis**

This EA incorporates by reference the impact topics dismissed in the 2020 EA, including socioeconomics, visitor experience, safety and event operations, percussive impacts, night skies, wilderness character, air quality, vegetation, and threatened and endangered species. However, due to changes in species listings and the results of consultation with the United States Fish and Wildlife Service (USFWS), the threatened and endangered species impact topic has been advanced for full analysis in this EA. For dismissals of other impact topics, which are incorporated by reference and summarized below, please refer to Appendix A, pages 50-54, of the 2020 EA.

## **Chapter 2. Alternatives**

This EA incorporates by reference and summarizes the alternatives and alternatives considered but dismissed in the 2020 EA, and adds one additional alternative considered but dismissed as relates to drones. Under Alternative 1 (the preferred alternative), the Memorial would permit and host an Independence Day celebration, including a fireworks display and other performances, on the evening of July 3, 2026, similar to the event hosted in 2020, and could permit similar events in subsequent years. Under Alternative 2 (the no action alternative), a fireworks event would not be permitted, and activities similar to those the Memorial hosted from 2010 to 2019 and 2021 to 2025 would occur again in 2026.

### **2.1 Alternative 1: Issue a Special Use Permit to Host an Independence Day Fireworks Event**

Similar to the 2020 event, the SUP would authorize the setup of equipment and structures during the approximately 10 days prior to the July 3 fireworks event and their dismantling over the 3–4 days following the event. This includes accommodations for visitor seating, viewing screens, bathrooms, parking, and other measures to support the event, provide for visitor safety, and protect the natural and cultural resources in the Memorial. The SUP would also include stipulations similar to those specified in the SUP issued in 2020, as described in the EA.

The event would be conditioned on appropriate weather and wildland fire conditions prior to the event. The NPS and partners would develop an incident management team for this event and create a Go/No-Go checklist to ensure conditions in and surrounding the Memorial are acceptable for the event to proceed.

Similar to the 2020 event, the launch location would be primarily in the area of the Hall of Records. For additional information about the permitted activities and management of the event, refer to the 2020 EA, Chapter 2, pages 5-9.

### **2.2 Alternative 2 (No Action Alternative)**

Under the no action alternative, no fireworks event would be scheduled in 2026, and the non-ticketed performances and activities the Memorial has hosted from 2010 to 2019 and 2021 to 2025 would occur in 2026 instead. These celebrations have included military bands, presidential reenactments, and a lighting ceremony of the sculpture for an amphitheater audience. (No event was held in 2019 due to a significant construction project underway at the time.) The Memorial would be open to visitors during regular hours.

### **2.3 Alternatives Considered but Eliminated from Detailed Study**

The 2020 EA considered but dismissed four alternative launch locations, the option of holding the event on July 4<sup>th</sup> (as opposed to July 3<sup>rd</sup>), and the alternative of hosting a laser light show (which had been conducted in 2012 due to unusually adverse fire conditions). Alternative launch locations were analyzed by a consultant and found to be impractical for technical or safety reasons. Hosting the event on July 4<sup>th</sup> was found to unreasonably conflict with other long-running regional special events, including other fireworks shows, which limit the availability of

already-committed emergency personnel on the 4<sup>th</sup>. The laser show was found to be unreasonable due to power limitations experienced in 2012. The use of drones as an alternative to fireworks was also considered but dismissed from further analysis. Drone technology has advanced considerably since 2020, and large-scale drone displays are becoming commonplace. However, drone use is generally prohibited by visitors at the Memorial due to security concerns and is prohibited by park compendium. Additionally, drone use can introduce security concerns for VIPs, and it is anticipated that this Independence Day celebration will include VIPs with heightened security requirements. Therefore, this alternative was dismissed from detailed analysis. The dismissed alternatives would also not meet the intent of the 2025 Memorandum of Agreement between the U.S. Department of the Interior and the State of South Dakota to explore ways to return fireworks to the Memorial for a 250<sup>th</sup> anniversary celebration.

For additional information about the analysis and dismissal of other launch locations and other alternatives considered but dismissed, refer to the 2020 EA, Chapter 2, pages 9-11.

## **Chapter 3. Affected Environment and Environmental Consequences**

### **3.1 Introduction**

This EA incorporates by reference and summarizes the impact topics, affected environment, and environmental consequences from Chapter 3 of the 2020 EA, supplemented with updated information below. It also includes an analysis of impacts to threatened and endangered species for the no action and preferred alternative. This impact topic was dismissed in the 2020 EA.

### **3.2 Wildfire**

#### **Current General Conditions**

The fire impacts analysis in the 2020 EA used the Wildland Fire Decision Support System (WFDSS), (a computer model) to assess the potential impacts and outcomes that could occur in various weather conditions. The model was used to simulate fires resulting from the fireworks discharge in two representative years: a dry year in 2012 and a normal precipitation year in 2013. The model predicted that there was a high probability of a low consequence event (an extinguished spot fire) and a very low probability of a high consequence event (requiring aggressive suppression activity).

Since 2020 there have been two important fire events that have reduced fuel conditions in the area of the proposed fireworks show. The naturally-ignited “244 Fire” in 2021 burned 136 acres east of the sculpture, substantially reducing fuel loads in that area (M. Davis, personal communication, 1/26/26). In addition, a 95-acre prescribed fire took place in Starling Basin on October 23, 2025 (NPS, 2025).

#### **Impacts of Wildfire from Alternative 1 (Preferred Alternative)**

These two fire events mitigate the potential for high consequence ignitions from the proposed July 3<sup>rd</sup> fireworks display, reducing the overall risk of a high consequence fire event relative to conditions that prevailed in 2020, and the same Go/No-Go approach using fire weather modeling that was successfully applied to the 2020 event would be applied to the proposed 2026 celebration. Therefore, the predicted impacts of a 2026 fireworks event are consistent with the prediction in the 2020 EA: there is a high probability of a low consequence event (an extinguished spot fire) and a very low probability of a high consequence event (requiring aggressive suppression activity). Any suppression activities would be consistent with the Memorial’s Fire Management Plan (NPS, 2024). Suppression activities would seek to control the spread of wildfires through either direct or indirect attack, relying preferentially on the use of natural barriers, backfire/burnout techniques, and water or foam firelines to reduce damage from suppression actions; aerial retardants could be used if necessary, with a buffer to protect the sculpture, streams, or wetlands.

For additional details about the analytical methods used to assess wildfire risk and the potential effects of wildfire on vegetation, fish and wildlife, soils, and cultural resources, refer to Section 3.3, pages 13-25 of the 2020 EA.

## **Impacts of Wildfire from Alternative 2 (No Action Alternative)**

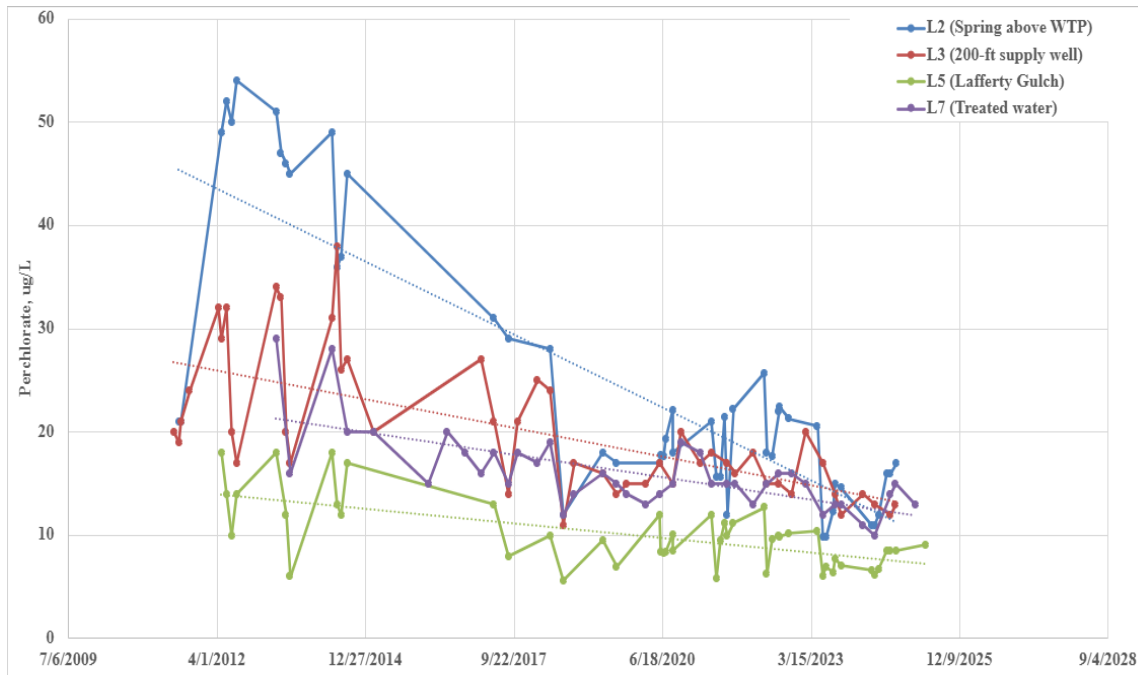
Under the no action alternative, there would be no potential for wildfires ignited from an Independence Day celebration fireworks event. Wildfire risks from normal operations at the Memorial are part of ongoing fire planning for the Northern Great Plains Interagency Dispatch Center and normal Memorial operations. As stated in the 2020 EA, the overall risk of a severe wildfire would range from low to high within the Memorial, depending on the weather conditions in the region and the effectiveness of prescribed burning activities, and is generally in a lower risk condition than during the 2020 event.

### **3.3 Environmental Contaminants**

#### **Current General Conditions**

The 2020 EA acknowledged that past fireworks events conducted from 1998 to 2009 were the most probable source of perchlorate contamination present in soil, surface water, and groundwater at the Memorial (measured by United States Geological Survey (USGS) and reported in 2016), and that the hydrogeologic conditions in the Memorial make the groundwater highly susceptible to contamination. The 2020 EA concluded that the 2020 event would result in contaminant releases comparable to previous years' annual releases, and that contamination levels would gradually increase each year that fireworks events occur but also attenuate in years in which fireworks use was suspended. Measurements taken after the 2020 event are consistent with this analysis: perchlorate levels increased modestly in 2021 measurements, then attenuated (see Figure 1). To alleviate the risk of perchlorate exposure, point-of-use water treatment systems (reverse osmosis membrane filters) were installed at several Memorial facility locations between 2013 and 2016 to reduce contaminant concentrations for those who use the water supply as their primary source.

**Figure 1: Combined NPS and USGS perchlorate groundwater samples (updated from the 2020 EA).**



On January 2, 2026, the U.S. Environmental Protection Agency (EPA) signed a proposed National Primary Drinking Water Regulation (NPDWR) and Maximum Contaminant Level Goal (MCLG) (EPA, 2026) for the purpose of limiting contaminants in drinking water to levels that safeguard human health. The EPA is proposing a health-based Maximum Contaminant Level Goal (MCLG) of 20  $\mu\text{g/L}$  and co-proposing an enforceable Maximum Contaminant Levels (MCLs) for perchlorate of 20  $\mu\text{g/L}$ , 40  $\mu\text{g/L}$ , or 80  $\mu\text{g/L}$ . MCLG represents a non-enforceable health goal where no adverse health effects are expected, and MCLs set an enforceable limit on the concentration of a contaminant legally allowed in drinking water from public water systems.

### **Impacts of Environmental Contaminants from Alternative 1 (Preferred Alternative)**

A fireworks event conducted in 2026 has the same potential perchlorate contamination as the 2020 event: perchlorate levels would rise following this event (and any other subsequent fireworks events) and would attenuate in years when events do not occur. While EPA has yet to complete rulemaking to regulate perchlorate in drinking water, the three potential enforceable MCLs provide some useful context: a single fireworks event could cause measured perchlorate levels to reach their most conservative potential standard (20  $\mu\text{g/L}$ ) but would be unlikely to reach their second proposed MCL (40  $\mu\text{g/L}$ ). Likewise, events occurring over multiple years (similar to the events held from 1998 to 2009) may eventually result in accumulated perchlorate levels exceeding 40  $\mu\text{g/L}$  but would probably not exceed the most permissive standard (80  $\mu\text{g/L}$ ). Given that these exposure levels are relevant for Memorial residents using Memorial water sources as a primary drinking and bathing water source (as opposed to incidental use by visitors), and drinking water exposure to residents can be mitigated by avoidance and use of point-of-use water treatment systems, the analysis in the 2020 EA remains valid. For additional details about the nature of environmental contaminants and the analysis methods, refer to Section 3.4, pages 25-35, of the 2020 EA.

## **Impacts of Environmental Contaminants from Alternative 2 (No Action Alternative)**

Under the no action alternative, no new contaminants would be released to the environment from an Independence Day celebration fireworks display. Existing contaminants from previously conducted fireworks events would continue to persist for an unknown length of time. Unexploded ordnance within the fallout zone not previously collected likely has already degraded and released its load of contaminants into the environment. Existing monitoring programs at the Memorial would continue. No new impacts on human health and safety or natural resources would be expected, and natural attenuation of contaminants from past fireworks displays would continue.

### **3.4 Cultural Resources**

#### **Current General Conditions**

Mount Rushmore was established as a national memorial to preserve, protect, and interpret the unique mountain sculpture of four presidents: George Washington, Thomas Jefferson, Theodore Roosevelt, and Abraham Lincoln. The entire Memorial (1,278 acres) is listed in the National Register of Historic Places as a Historic District (District), and several unique cultural features are considered contributing resources of the District. These include the sculpture itself, the Hall of Records, the talus slope beneath the sculpture, and several historic structures in the developed area of the Memorial.

The analysis of the preferred alternative in the 2020 EA acknowledged that the fireworks event had the potential to cause both direct and indirect impacts on contributing resources to the District and cultural landscape, and to the traditional values of Associated Tribes. All consulting Tribes objected to the event and regarded it as an adverse effect (NPS, 2020). As a mitigation, NPS committed to an additional Tribal cultural sites survey to document both tangible and intangible resources, and to develop measures through consultation to protect any newly documented sites. In May 2021, this traditional cultural survey was conducted in the Memorial by representatives of traditionally associated Tribes. This survey recorded approximately 90 previously undocumented cultural sites within the boundary of the Memorial (Rhodd, Ben. 2021).

The Starling Basin prescribed burn – conducted in advance of the proposed 2026 fireworks event on October 23, 2025, presented an opportunity to develop mitigation measures through consultation specific to the 95-acre burn unit. In September 2025, ten Traditional Cultural Specialists (TCSs) representing eight associated Tribes participated in surveys in and immediately surrounding the Starling Basin burn unit. As sites were identified and recorded with GPS, mitigations appropriate to the type of cultural resource were developed. A single TCS was also present during burn implementation.

Because the identified sites were organized in mitigation categories, it is anticipated that the same type of mitigation measures could be applied to new sites as they are identified in the Starling Basin and in other park areas. For example, a post-burn survey with TCSs is planned for Starling Basin, as the removal of vegetation is expected to reveal additional sites. A prescribed burn in the Grizzly burn unit is planned for Fall or Winter 2026. For this prescribed burn, TCSs

will follow the same approach taken for the Starling Basin burn, involving pre-burn surveys and mitigation prescriptions, one or more onsite TCSs for burn implementation, and post-burn surveys to identify additional sites and mitigations (R. Sprague, personal communication, 1/28/26).

### **Impacts on Cultural Resources from Alternative 1 (Preferred Alternative)**

As discussed in the 2020 EA, effects on cultural resources, including archeological resources and historic properties, are primarily associated with wildfire and wildfire response activities. Impacts to historic properties could occur as a result of a large, escaped wildfire, but such an event is highly unlikely (see Wildfire, page 4). Tangible archeological resources are unlikely to be affected by wildfire directly but could be impacted by large scale fire suppression. Again, such suppression activities are highly unlikely, and the post-burn mitigations developed for Starling Basin could be applied to a new burn setting.

For additional details about potential effects on Cultural Resources, see Section 3.5, pages 36-39, of the 2020 EA. For additional details on Tribal consultation, please see page 13, Consultation and Coordination, of this document.

### **Impacts on Cultural Resources from Alternative 2 (No Action Alternative)**

Under the no action alternative, the Independence Day celebration at the Memorial would not include a fireworks display and would be similar to recent years with various performances and activities in the amphitheater. There would be no additional impacts on cultural resources from unexploded ordnance or fireworks debris, or additional wildlife risk from a fireworks display. Impacts from previous displays would persist, including burn marks on the top of the sculpture.

## **3.5 Threatened and Endangered Species**

NPS prepared a Biological Assessment (BA) in accordance with Section 7 of the Endangered Species Act (ESA) of 1973, as amended (16 U.S.C. 1531 *et seq.*), and submitted the BA to USFWS in November 2025. This BA evaluated the potential impacts of the proposed Independence Day Holiday Fireworks Event 2026 on seven federally-listed threatened, endangered, or proposed species within the project's action area finding no effect to three species (Leedy's roseroot, rufa red knot, and Suckley's cuckoo bumble bee), no jeopardy regarding two species (monarch butterfly, and western regal fritillary), and potential adverse effects on two species (northern long-eared bat (NLEB), tricolored bat (TCB)). In March 2026, USFWS produced a BO (Appendix A) accepting NPS's determinations on Leedy's roseroot, rufa red knot, Suckley's cuckoo bumble bee, monarch, and western regal fritillary without a requirement for concurrence or additional analysis. In the BO, USFWS concurred with NPS's finding of potential adverse effects on two species (NLEB, TCB). USFWS also concurred with NPS's no jeopardy finding and issued an incidental take permit contingent on mitigation measures focused on monitoring bat activity, noise, and environmental contaminants. A summary of the analysis from the BA and BO regarding NLEB on TCB is provided below, as well as a summary of effects on monarch butterfly and western regal fritillary from the BA; unaffected species are dismissed from additional analysis.

Peregrine falcons are a South Dakota state-threatened species. There are currently no known nesting sites in the Memorial; however, if a nesting site is discovered within 0.25 miles of the launch site, additional consultation with South Dakota Department of Game, Fish, and Parks would occur.

For additional details on threatened and endangered species consultation, please see page 13, Consultation and Coordination, of this document.

### Current General Conditions (Potentially Affected Species)

Based on the USFWS Information for Planning and Consultation (IPaC) tool, the following federally listed and proposed species may occur within the action area (Table 1). Table 1 identifies each species from the official USFWS species list, including federally proposed species whose ranges fall within the geographic scope of the proposed action. The table identifies the current federal status of each species, whether each species is known or expected to occur within the action area, and the presence or absence of suitable habitat in the action area. There are no designated or proposed Critical Habitats for any listed or proposed species within the action area.

**Table 1: Threatened, endangered, candidate/proposed species with the potential to occur within the action/analysis area (USFWS, 2025).**

Species Name	Status	Occurrence in Action Area	Habitat in Action Area	Habitat Description and Geographic Range Notes
<b>MAMMALS</b>				
Northern long-eared bat ( <i>Myotis septentrionalis</i> )	Endangered	Yes	Yes	This species roosts in trees during summer and hibernates in caves or mines during winter. This species was last confirmed at the Memorial in 2019, and suitable habitat is present throughout the action area.
Tricolored bat ( <i>Perimyotis subflavus</i> )	Proposed Endangered	Yes	Yes	Found in forested habitats during spring to autumn; roosts in foliage of deciduous and evergreen trees. Hibernates in caves and abandoned mines. Confirmed within the action area and suitable habitat is present at the Memorial.
<b>INSECTS</b>				
Monarch butterfly ( <i>Danaus plexippus</i> )	Proposed Threatened	Yes	Yes	Habitat includes open areas, roadsides, and wet areas with milkweed and nectar plants. This species is confirmed at the Memorial and suitable habitat is present in the action area.
Western regal fritillary ( <i>Argynnis idalia occidentalis</i> )	Proposed Threatened	Yes	Yes	Habitat includes prairies and open areas such as damp meadows, marshes, and wet fields. This subspecies is confirmed at the Memorial and suitable habitat is present in the action area.

## Northern Long-Eared Bat

The Northern Long-eared Bat (NLEB; *Myotis septentrionalis*) is a medium-sized bat in the genus *Myotis*, strongly associated with forested landscapes. NLEB are nocturnal foragers that catch insects in flight and on surfaces in conjunction with passive acoustic cues (Ratcliffe and Dawson, 2003). It roosts almost exclusively in live or dead trees, typically under peeling bark or within cavities and crevices, and hibernates in caves and mines during winter. Forested areas in the Memorial provide suitable summer roosting habitat for the species. Much of the Memorial's forest occurs below Mount Rushmore's granite and talus slopes and exhibits old-growth ponderosa pine characteristics (Symstad and Bynum, 2007), which are known to support bat roosting. In the Black Hills of South Dakota, NLEB summer occupancy (i.e., the timeframe when bats are present on their summer home range and/or roosting in colonies) occurs between May 1 and August 31 each year. The pup season (when newborn bats are present) occurs between June 15–August 31 and includes the period of late female pregnancy and the time when most young are born until they can fly and forage independently (USFWS, 2024a).

The NLEB was listed as Threatened under the ESA on April 2, 2015, primarily due to the impacts of White-Nose Syndrome (WNS), a fungal disease that affects many bat species. Evidence that NLEB populations were declining rapidly from WNS led to a reclassification as Endangered in November 2022, with the new listing taking effect on March 23, 2023.

The NLEB is known to occur at the Memorial, though most detections occurred prior to the confirmed spread of WNS to the region. The species was confirmed in the Memorial in the early 2000s when captured in a mist net in Starling Basin (Schmidt *et al.*, 2004). More recently, two females were captured (one in each year) in 2018 and 2019 during mist-netting efforts as part of the NPS Northern Great Plains Inventory and Monitoring Network (NGPN) bat assessment efforts (Abernethy, 2018, 2019). NLEB have not been captured in the Memorial during more recent capture efforts by University of Wyoming in 2022 to 2024 [personal communication with Wyoming Natural Diversity Database (WYNDD), October 24, 2025]. However, these sampling efforts at the Memorial were designed to detect WNS, rather than to estimate bat populations or establish probable absence with robust levels of confidence. In addition to confirmed mist-net captures, acoustic monitoring conducted from 2015 to 2022 by the NPS NGPN may have detected NLEB in 2017 at multiple sites, including Lafferty Gulch and a forested ridge south of the visitor parking garages. Therefore, for purposes of the BO, NLEB was assumed to be present in the project area.

## Tricolored Bat

The Tricolored bat (TCB; *Perimyotis subflavus*) was proposed for listing as Endangered on September 14, 2022. During the spring, summer, and fall (i.e., non-hibernating seasons), TCB primarily roost among live and dead leaf clusters of live or recently dead deciduous hardwood and pine trees. Female TCB exhibit high site fidelity, returning year after year to the same summer roosting locations (Allen, 1921; Veilleux and Veilleux, 2004). TCB exhibit slow, erratic, fluttery flight while foraging (Fujita and Kunz, 1984). Similar to the NLEB, the TCB has experienced severe population declines due to WNS. Since its

emergence in 2006, WNS has spread rapidly across the bat's range, resulting in 90–100% declines in winter colony abundance at affected sites (Cheng *et al.*, 2021).

There have been no confirmed physical captures of TCB at the Memorial, but the species has been documented nearby in Hill City, South Dakota (Geluso *et al.*, 2005). There have been no other observations of TCB reported within the action area based on a search of public records [GBIF.org(b) 2025]. The mixed coniferous forest, leaf litter, and rocky outcrops of the area provide suitable roosting and foraging habitat during the active season. Acoustic monitoring conducted from 2015 to 2022 by the NPS NGPN detected probable presence of TCB within the Memorial. Therefore, for the purposes of the BO, TCB was assumed to be present in the project area.

### **Monarch Butterfly**

The monarch butterfly (*Danaus plexippus*) was proposed for listing as Threatened under the ESA on December 12, 2024. Its habitat includes roadside areas, open areas, and wet areas where milkweed and other flowering plants are present. Adult monarch butterflies feed on the nectar of many flowers during breeding and migration, but they only deposit eggs on milkweeds. An adult monarch butterfly was observed by park staff in a roadside area at the Memorial on July 14, 2025. The sighting was confirmed by University of Wyoming pollinator researchers (*personal communication* with Nina Crawford, University of Wyoming, August 25, 2025). There are three additional verified observations of monarch butterfly reported within the action area between 2021 to 2025 [GBIF.org(a) 2025]. The population of monarch butterflies in South Dakota is part of the eastern migratory population, as designated by the USFWS (USFWS, 2020).

### **Western Regal Fritillary**

The western regal fritillary (*Argynnis idalia occidentalis*) was proposed for listing as Threatened under the ESA on August 5, 2024. The species is typically associated with open, native prairie and grassland habitats, but may also be found in forest openings and edges where suitable host plants are present (USmonarchFWS, 2023). Regal Fritillary larvae feed primarily on native violet species. Native violets, including the rare *Viola selkirkii* are present within the action area and the predicted fireworks fallout zone (Mayer, 2023). At least 7 other *Viola* species have been confirmed from the action area (iNaturalist, 2025). Adult Regal Fritillary butterflies are first observed in June and become more common in July as more adults emerge and numbers of both sexes peak (USFWS, 2023). Adults rely on nectar sources for food and may also require moisture and nutrients from soils. Regal fritillaries are non-migratory. They typically move short distances between habitat patches (USFWS, 2023) and have been documented in some instances to move longer distances from breeding colonies (Selby, 2007).

The species was documented at the Memorial in 2024 by pollinator researchers (*personal communication* with Nina Crawford, University of Wyoming, September 25, 2025). Although the park is not a typical prairie ecosystem, wet meadows and native flowering plant communities provide suitable habitat for foraging and larval development. There have been no other observations of Regal Fritillary reported within the action area based on a search of public records [GBIF.org(a) 2025].

## Impacts on Threatened and Endangered Species under Alternative 1 (Preferred Alternative)

The BA and BO evaluated the potential effects of the proposed 2026 Independence Day Fireworks Event on federally listed and proposed species. Effects were assessed based on species ecology, timing of the event, and the nature of the activities (e.g., fireworks, aircraft flyovers, amplified sound, and lighting).

### Northern Long-eared Bat

NLEB may be exposed to several stressors associated with the proposed action at the Memorial. Several life stages and activities may be affected, with the greatest potential for adverse effects affecting pups. The BA and BO found the most important effects to be associated with fireworks noise and to a lesser extent artificial light, wildfire, and environmental contaminants. Other effects, such as impacts from military flyover noise, helicopter use, spot fires, and fireworks debris were considered discountable.

Anthropogenic Noise. Little is known about impacts of anthropogenic noise and light specifically caused by fireworks on bats, but anthropogenic noises are generally known to influence bat behavior, including NLEB specifically (Luo *et al.*, 2014, 2015). From the scientific literature available relating to impacts of fireworks on wildlife, most accounts document the impacts of fireworks on birds. Hoekstra *et al.* (2024) found that birds at least up to 6.2 mi (10 kilometers (km)) from a fireworks display flushed, although that response was most pronounced within 3.1 mi (5 km). While bats are also sensitive to a higher range of sound frequencies than birds in the Hoekstra *et al.* (2024) study, the frequencies produced by a wide variety of fireworks (at least up to 2.5 kiloHertz (kHz); Tanaka *et al.*, 2016) are known to enter the frequency range of bat hearing sensitivities (>10 kHz; Luo *et al.*, 2014) and to affect bat behavior. Noise can mask bat calls or prey-generated sounds, reducing their ability to detect prey (Allen *et al.*, 2021). Noise is also known to act as an aversive stimulus, causing bats to avoid areas affected by noise (Luo *et al.*, 2015; Schaub *et al.*, 2008). In some cases, bats may be able to overcome noise by altering their calling structure (Allen *et al.*, 2021), but that comes with additional energy expenditure.

We anticipate adult NLEB to potentially use the entirety of the outdoor space within the 162 mi<sup>2</sup> (420 km<sup>2</sup>) action area during the period of the proposed action, when considering all bat activities. Aside from commuting flights, we expect NLEB activities (e.g., foraging, drinking, roosting, pup-rearing) to occur primarily within relatively larger, contiguous tracts of woodland within the action area rather than the forest edges or open areas that characterize the developed areas of the Memorial. Roosts (including maternity roosts) and foraging activities are more likely to occur in the contiguous forest tracts farther from the fireworks display within the action area.

While NLEB in the action area are subjected to a baseline level of typical background noise from anthropogenic sources (NPS Natural Sounds and Night Skies; NSNS, preliminary data), the proposed event is expected to subject NLEB to additional noise sources from fireworks, higher expected volumes of amplified sound associated with music/entertainment, and military aircraft flyovers. NLEB occurred within the action area during prior fireworks displays (1998 to 2009 except for 2002; NPS, 2020) and the species appears to have persisted during that time (although

this is based on limited data). Like most bats, NLEB emerge at dusk to feed, but as with other insectivorous bats, foraging activity is presumed to peak typically within 5 hours after sunset (Kunz, 1973). We presume that some percentage of NLEB may still be roosting at the time fireworks are actively being launched. During inclement weather NLEB may not leave roosts (Geipel *et al.*, 2019), and do not appear to be adversely impacted by these natural events. Bats that remain in their roosts and do not flush during the proposed action, delaying emergence due to noise disturbance, are expected to experience insignificant impacts, as any potential delay in foraging will be minimal given the relatively short duration of the fireworks display.

It is anticipated that the noise associated with fireworks may cause some volant (capable of flight) pups bats to flush from roosts unexpectedly, especially if roosts are located closer to the source of the fireworks. For adult bats, flushing is not typically expected to have adverse long-term effects. Conversely, there is a higher potential for detrimental impacts of flushing on already-volant. This may result in effects ranging from temporary stress to separation from their mothers (upon which they may still be dependent by the date of this event), to mortality. Newly-volant pups flushing from roosts for the first time as a result of disturbance from fireworks would likely be subject to even higher stress responses, increased chance of becoming separated from their mother (Luo *et al.*, 2015), increased risk of falls or flight injuries, and increased risk of predation. The severity of this potential impact is uncertain but not insignificant or discountable if there is active maternity roosting activity with pup presence within the action area at the time of the event. It would not have a population level effect or jeopardize the continued existence of the species.

Due to this potential for adverse impacts to NLEB pups caused by high levels of noise associated with the fireworks event, the USFWS found that the proposal is Likely to Adversely Affect the NLEB. USFWS proposed mitigation measures for species that would be likely to be adversely affected, focusing on monitoring bat activity, noise, and environmental contaminants. Assuming application of these mitigation measures, USFWS issued an incidental take permit using a habitat acreage estimate.

Artificial Light. Many bats are sensitive to artificial light at night near their roosts, which may delay or cease evening emergence and slow juvenile growth relative to roosts without artificial light (Voight *et al.*, 2021). Adult NLEB are expected to avoid foraging areas with exposure to artificial lights (USFWS, 2024b), particularly in the more open, developed areas where the majority of the lighting is anticipated to occur. In addition to actively avoiding illuminated areas,—NLEB primarily forage in more contiguous woodlands rather than forest edges or open areas, and are therefore— less likely to occur in those areas with artificial lighting. Many of the areas with artificial lighting during the event are similarly illuminated every night during the summer season at the Memorial, and thus the potential impacts are unlikely to be greater than under baseline evening conditions at the Memorial.

Environmental Contaminants. The impact of chemical contamination of water (or impacts to insect prey) to NLEB, from fireworks debris, is unknown. Fireworks may introduce contaminants such as perchlorate, nitrates, and various metals into the environment (PB Energy, 2011; Bateman *et al.*, 2023). However, it is important to note that thresholds for biological effects specific to NLEB are not well established, and potentially ongoing sublethal impacts

remain poorly understood. Nevertheless, the short-term, temporary nature of the fireworks events, combined with the expected dilution of contaminants in aquatic systems, supports the conclusion that exposure would be short-term and unlikely to result in significant biological response.

Wildfire. Wildfires have the potential to consume larger tracts of woodland habitat, reducing both the amount of suitable roosting/foraging habitat available and associated arthropod prey. Wildfire may generate extensive smoke that could impact all age-classes of bats at some distance from a burn. If a wildfire were to occur, it could affect this species, with the severity of impact dependent on the location and extent of overlap with species occurrences and suitable habitat. The risk of wildfire occurring as a result of the action is highly unlikely. These risks are discussed in the Wildfire section of this document and Chapter 3 of the 2020 EA.

### **Tricolored Bat**

TCB display some differences in natural history and behavior relative to NLEB (USFWS, 2021). However, because the TCB shares many characteristics with the NLEB that are particularly relevant to the proposed activities, the effects of the action on TCB are expected to be equivalent to those described above for the NLEB.

As with NLEB, most of the impacts to TCB are temporary, localized and not expected to result in significant individual, or population level impacts. Adverse effects from fireworks noise may possibly impact pup growth and/or survival; however, this would not be expected to impact more than a small portion of the total individuals in the action area and thus would not be expected to influence the broader TCB population or species persistence. Therefore, the NPS has determined that the proposed action is Not Likely to Jeopardize the continued existence of the Tricolored Bat. If the TCB is listed prior to initiation of the proposed action, the identified impacts affecting individual bats lead the NPS to determine that the proposed action is Likely to Adversely Affect the Tricolored Bat. USFWS concurred with this determination, and as with NLEB, issued an incidental take permit contingent on mitigation measures to monitor bat activity, noise, and environmental contaminants.

### **Monarch Butterfly**

Monarch butterflies may be exposed to several stressors associated with the proposed action at the Memorial. These include anthropogenic noise, artificial lighting at night, vehicle traffic, helicopter rotor wash, injury or chemical contamination from fireworks fallout, spot fires or wildfire, and trampling from fence construction or post-event debris cleanup. Larval stages of monarch butterflies, including eggs and caterpillars, may experience physiological stress from intense noise, as studies have shown elevated heart rates and potential developmental impacts in response to similar stimuli (Davis *et al.*, 2018; Kirkpatrick and Harein, 1965). Artificial lighting at night may induce premature flight in resting adults and disrupt circadian rhythms, potentially interfering with migratory orientation (Parlin *et al.*, 2022). While vehicle traffic could pose a risk of direct mortality to butterflies crossing roads, traffic will be controlled and limited to low speeds (i.e., reducing the potential for injurious vehicle strikes), and a road closure will be in effect (i.e., potential for reduced traffic within the Memorial relative

to ‘typical’ summer conditions). During brief periods when helicopters operate at low altitude, rotor wash may physically displace monarchs, potentially throwing them to the ground and causing injury or disorientation.

Fireworks debris may introduce contaminants such as perchlorate, nitrates, and metals into the environment (PB Energy, 2011; Bateman *et al.*, 2023), but it is unclear what degree of exposure risk there may be to monarch butterflies. Existing data leads us to suggest that these levels remain below regulatory thresholds (Hoogestraat and Rowe, 2016; EPA, 2025a; EPA, 2025b; EPA, 2025c) and are unlikely to result in significant harm. However, it is important to note that thresholds for biological effects specific to monarch butterflies are not well established, and sublethal or cumulative impacts remain poorly understood. Prescribed burns prior to the event are expected to reduce the risk of spot fires and wildfire, although any monarch butterflies and/or small patches of suitable habitat present in areas that catch fire during the event could be lost. Fence construction and post-event debris cleanup may result in the loss of larvae located directly on host plants due to trampling. Despite these potential effects, the impacts are expected to be localized, temporary, and not likely to result in population-level consequences.

The action area does not include designated critical habitat for the monarch butterflies, and the temporary nature of the stressors, combined with conservation measures such as prescribed burns to reduce wildfire risk, traffic controls, and post-event debris cleanup, further limits the potential for adverse effects. Importantly, the project does not entail the conversion of native prairie or grassland habitat, which is a key threat identified in the monarch butterfly Species Status Assessment (USFWS, 2020). While some uncertainty remains regarding the full range of sublethal effects from noise, light, and chemical exposure, the best available scientific information suggests that these impacts are unlikely to result in long-term or widespread harm to the species.

### **Western Regal Fritillary**

The western regal fritillary may be exposed to similar stressors as the monarch butterfly under the proposed action, including anthropogenic noise, artificial lighting at night, vehicle traffic, helicopter rotor wash, injury or chemical contamination from fireworks fallout, spot fires or wildfire, and trampling from fence construction or post-event debris cleanup. These stressors could affect both adult and larval stages of the species.

While the overall types of effects are expected to be similar, two key differences in life history distinguish the monarch butterfly from the western regal fritillary: (1) western regal fritillary larvae rely on *Viola* species as host plants, rather than milkweed, and (2) the species is non-migratory, so potential impacts related to migratory disruption (e.g., from artificial light) are less relevant. Multiple *Viola* species are known to occur in the general area of the proposed action, providing potential habitat for larval development. If these host plants are located within or adjacent to disturbed areas, larvae may be at risk from trampling, fire, or other ground-level impacts.

As with the monarch, the effects on the western regal fritillary are expected to be localized, temporary, and not likely to result in population-level consequences. The action area does not include designated critical habitat for the western regal fritillary, and the temporary nature of the stressors, combined with conservation measures such as prescribed burns, traffic controls, and post-event cleanup, further limits the potential for adverse effects. Importantly, the project does not entail the conversion of native prairie or grassland habitat, which is a key threat identified in the Species Status Assessment for the Regal Fritillary (USFWS, 2023). While uncertainty remains regarding sublethal effects from noise, light, and chemical exposure, the best available information suggests these impacts are unlikely to result in long-term or widespread harm to the species.

### **Impacts on Threatened and Endangered Species in Alternative 2**

Under the no action alternative, the Independence Day celebration at the Memorial would not include a fireworks display and would be similar to recent years with various performances and activities in the amphitheater. There would be no additional impacts on threatened and endangered species from noise, fireworks debris, or wildfire.

## **Chapter 4. Consultation and Coordination**

### **4.1 Tribal Consultation**

On April 25<sup>th</sup>, 2025, NPS sent the following Associated Tribes an invitation to engage in formal Government-to-Government consultation and to initiate the NHPA Section 106 process regarding the request from the State of South Dakota to host a 2026 Independence Day Fireworks Celebration:

- Arapaho Tribe of the Wind River Reservation, Wyoming
- Assiniboine and Sioux Tribes of the Fort Peck Indian Reservation
- Cheyenne River Sioux Tribe of the Cheyenne River Reservation
- Crow Creek Sioux Tribe of the Crow Creek Reservation
- Flandreau Santee Sioux Tribe of South Dakota
- Lower Brule Sioux Tribe of the Lower Brule Reservation
- Northern Cheyenne Tribe of the Northern Cheyenne Indian Reservation
- Oglala Sioux Tribe
- Rosebud Sioux Tribe of the Rosebud Indian Reservation
- Sisseton-Wahpeton Oyate of the Lake Traverse Reservation
- Spirit Lake Tribe
- Standing Rock Sioux Tribe
- Yankton Sioux Tribe
- Crow Tribe of Montana
- Cheyenne and Arapaho Tribes of Oklahoma
- Three Affiliated Tribes of the Fort Berthold Reservation, North Dakota
- Kiowa Indian Tribe of Oklahoma
- Santee Sioux Nation, Nebraska
- Shoshone Tribe of the Wind River Reservation, Wyoming
- Fort Belknap Indian Community of the Fort Belknap Reservation
- Upper Sioux Community

This consultation letter included invitation to participate in a virtual meeting, which was held on May 28<sup>th</sup>, 2025. In July, a second virtual meeting invitation was sent to Tribes; this meeting was held August 26<sup>th</sup>, 2025. An additional tribal consultation meeting was held on January 28<sup>th</sup>, 2026, and another is currently planned for May 2026.

### **4.2 National Historic Preservation (NHPA) Act Consultation**

On July 16<sup>th</sup>, 2025, NPS sent a letter to the South Dakota State Historic Preservation Office to initiate Section 106 Consultation regarding the request from the State of South Dakota to host a 2026 Independence Day Fireworks Celebration. This letter described potential concerns with the fireworks event, summarized efforts to involve Associated Tribes, and requested concurrence with a determination of No Adverse Effect (NAE) from the proposed fireworks event. On September 10<sup>th</sup>, 2025, NPS received a letter from the State Historic Preservation Officer concurring with the NAE determination. (See Appendix B).

### **4.3 Endangered Species Act (ESA) and South Dakota Endangered Species Act (SDESA) Consultation**

NPS prepared and submitted a BA to USFWS in November 2025. In March 2026, USFWS produced a BO (Appendix A) accepting NPS's determinations regarding Leedy's Roseroot, rufa red knot, Suckley's Cuckoo Bumble Bee, monarch butterfly, and western regal fritillary, and potential adverse effects on two species (Northern Long-eared Bat, Tricolored Bat). USFWS also proposed mitigation measures for species that would be likely to be adversely affected, focusing on monitoring bat activity, noise, and environmental contaminants. Assuming application of these mitigation measures, USFWS issued an incidental take permit using a habitat acreage estimate (See Chapter 3, Threatened and Endangered Species).

NPS also consulted with South Dakota Department of Game, Fish, and Parks, and received a response letter on July 28<sup>th</sup>, 2025.

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## **Appendix A – U.S. Fish and Wildlife Service Biological Opinion**



# United States Department of the Interior



## FISH AND WILDLIFE SERVICE

Ecological Services

South Dakota Field Office

420 South Garfield Avenue, Suite 400

Pierre, South Dakota 57501

In Reply Refer to:  
FWS/R6/  
2025-0115200

February 27, 2026  
*Sent Electronically*

### OPENING STATEMENT

To: Jennifer Carpenter, Superintendent, Mount Rushmore National Memorial

From: Acting Project Leader, South Dakota Field Office Office, Pierre, SD

Subject: Formal Consultation on Independence Day Holiday Fireworks Event 2026

Dear Jennifer Carpenter:

This letter is in response to the National Park Service's (NPS) request to initiate formal consultation with the U.S. Fish and Wildlife Service (Service or USFWS) on the proposed Independence Day Holiday Fireworks Event 2026 America 250 (Proposed Action) in Pennington County, South Dakota (SD). The request was received by the Service on November 7, 2025. The NPS has determined that the Proposed Action's would have adverse effects on the federally endangered Northern long-eared bat (*Myotis septentrionalis*; NLEB) and the proposed endangered tricolored bat (*Perimyotis subflavus* TCB). This response is provided under the authority of the Endangered Species Act of 1973, as amended (16 U.S.C. 1531 *et seq.*) (Act), and in accordance with the implementing regulations pertaining to interagency cooperation (50 CFR 402).

The Proposed Action is defined as the NPS issuance of a special use permit (SUP) to the State of South Dakota for the event and associated activities, as well as the NPS activities in association with the event at Mount Rushmore National Memorial (MORU) in the Black Hills, southwest of Keystone, South Dakota. The purpose of the event is to "celebrate the spirit of Independence Day on the 250th anniversary of the signing of the Declaration of Independence and to provide public enjoyment in a manner that ensures safety and resource protection in accordance with the signed 2025 Memorandum of Agreement (MOA) between the Secretary of the Interior and the Governor of South Dakota."

Pursuant to 50 CFR 402.12(j), NPS submitted a biological assessment (BA) for Service review and requested concurrence with the findings presented therein. These findings conclude that the Proposed Action may affect and is likely to adversely affect the endangered NLEB and proposed endangered TCB. The enclosed Biological Opinion/Conference Opinion (BO/CO) addresses effects of the Proposed Action on the NLEB and TCB, which NPS has determined is likely to

adversely affect these species. Adverse effects are mainly a result of timing; the Proposed Action occurs during the pup season, a sensitive and critical time for both the NLEB and TCB, when the young of the species are flightless and vulnerable. After reviewing the status and environmental baseline of these species and conducting an analysis of the potential effects of the Proposed Action to the species, the Service concludes that project activities would not jeopardize the continued existence of these species. The BO/CO provides a statement of anticipated incidental take resulting from the Proposed Action. The incidental take statement for the TCB does not become effective unless the species is listed, and the CO is adopted as the BO issued through formal consultation.

The NPS has determined that the project would have no effect on the threatened rufa red knot (*Calidris canutus rufa*) and Leedy's Roseroot (*Rhodiola integrifolia* ssp. leedyi). There is no requirement under the implementing regulations of ESA (50 CFR Part 402) for federal agencies to receive concurrence from the Service for a "no effect" determination; therefore, responsibility for "no effect" determinations remain with your agency. Accordingly, we recommend you retain the documentation for the listed resources in the decisional record for this federal action.

The NPS has also determined that the Proposed Action would not jeopardize the continued existence of the proposed species in the Action Area, including the monarch butterfly (*Danaus plexippus*), western regal fritillary (*Speyeria idalia*), and Suckley's cuckoo bumble bee (*Bombus suckleyi*). There is no requirement for the Service to concur with not likely to jeopardize determinations for proposed species. However, we acknowledge the analysis provided by NPS and have determined it is consistent with our understanding of the habitat needs and threats to the species. If these species are listed following the rulemaking period, please reinstate consultation within 30 days to finalize consultation for these species if effects to these species are anticipated because of the Proposed Action. The Proposed Action is not within designated or proposed critical habitat for federally listed species.

In considering your request, we based our evaluation on details provided in the 7 November 2025 request for formal consultation, additional and clarifying information the Service, and other knowledge available to the Service. We provided notification of a complete Biological Assessment package on 27 November 2026.

### **Consultation History**

**2025-06-27:** NPS submitted a request for informal consultation for the 2026 Mount Rushmore Independence Day Event to the Service's SD Ecological Services Field Office (ES FO). The Service requested additional information from NPS before consultation could be initiated.

**2025-08-08:** The Service met with the NPS to discuss contents of a Biological Evaluation and formal vs informal consultation on the project.

**2025-08-11:** A verbal conversation between NPS MORU and SD ES FO was held to discuss the Proposed Action. During this discussion, SD ES FO requested that NPS prepare a BA to evaluate potential effects on federally listed species.

**2025-08-11:** The Service sent a follow-up e-mail to NPS MORU offering guidelines and other resources for preparation of consultation documents.

**2025-08-21:** NPS requested additional clarification from the Service on prescribed fire activities, and if they could be conducted outside of the consultation on fireworks. The Service indicated that prescribed fire activities were consistent with a separate programmatic consultation with NPS and could proceed separately.

**2025-09-08:** NPS Midwest Regional Office (MWRO) and SD ES FO staff discussed preliminary project overview and the compliance process.

**2025-09-16:** NPS Team composed of MORU, MWRO staff, and WASO (Washington Support Office) staff met with SD ES FO staff for an informal consultation meeting. The Service provided general guidance for consultation of the Proposed Action.

**2025-09-22:** NPS Team and SD ES FO staff met for an informal consultation meeting. The Service provided guidance to help define the Action Area.

**2025-09-30:** NPS Team and SD ES FO staff met for an informal consultation meeting. The Service provided guidance related to potential impacts of the Proposed Action on listed species, in particular for the NLEB and TCB.

**2025-10-25:** NPS requested and obtained an Official Species List from the Service's Information for Planning and Consultation (IPaC) system for the Proposed Action (Project Code 2025-0115200).

**2025-10-27:** NPS Team and SD ES FO staff met for an informal consultation meeting to review and discuss the draft version of the NPS BA document.

**2025-10-27:** NPS MWRO and SD ES FO staff had a follow-up call to review the BA draft to ensure all necessary information for the USFWS was included. They also discussed the most efficient path forward for communicating during consultation. A discussion on the approach for proposed species, and proposed determinations for other listed species was included in this discussion.

**2025-10-28:** NPS MWRO and SD ES FO staff discussed details related to potential effects of the Proposed Action on NLEB.

**2025-10-28:** Draft Biological Assessment was submitted to the Service by NPS for courtesy review.

**2025-10-29:** NPS MWRO, NPS MORU, and SD ES FO staff communicated regarding NLEB and TCB natural history, Leedy's Roseroot distribution, and the consultation process.

**2025-10-30:** Meeting between NPS and the Service to continue the discussion on the approach for listed species, specifically the NLEB and TCB.

**2025-10-30:** NPS MWRO, NPS WASO, and SD ES FO staff communicated regarding NLEB and TCB biology/behavior related to the NPS effects analysis.

**2025-10-31:** NPS MWRO staff confirmed details of NLEB and TCB occurrence records within the Action Area with SD ES FO staff.

**2025-11-7:** Final Biological Assessment submitted by NPS to initiate formal consultation.

**2025-11-25:** SD ES FO requested confirmation of a bat sampling location and availability of a final report that summarized bat acoustic efforts across the NPS Northern Great Plains.

**2025-11-26:** The Service confirms, via email, the BA has been accepted as complete and timeline for formal consultation begins.

**2025-12-19 through 2026-01-08:** E-mail and phone discussions between the Service and NPS to discuss options to expedite issuance of the BO to accommodate NEPA review timelines. Draft Reasonable and Prudent Measure (RPM) was provided for discussion.

**2026-01-09:** NPS and SD ES FO staff and MORU superintendent met to discuss characteristics of Action Area and provide update on progress.

**2026-01-21:** Meeting between NPS and the Service to discuss monitoring plan and sound attenuation.

**2026-02-02:** Meeting between NPS and the Service to discuss assistance with monitoring.

**2026-02-12 and 13:** Communication between NPS and the Service regarding normal operation of MORU in the summer,

**2026-02-18:** Draft Biological Opinion submitted to NPS for courtesy review.

**2026-02-27:** Final Biological Opinion submitted to NPS, concluding formal consultation.

Transmission of this BO concludes formal consultation on the Proposed Action. This also concludes conferencing on the tricolored bat for Proposed Action. The NPS may ask the Service to confirm the conference opinion as a biological opinion issued through formal consultation if the tricolored bat is listed or critical habitat is designated. The request must be in writing. The incidental take statement provided in this conference opinion for the tricolored bat does not become effective until the species is listed and the conference opinion is adopted as the biological opinion issued through formal consultation. At that time, the project will be reviewed to determine whether any take of the tricolored bat or adverse modification of designated critical habitat has occurred. Modifications of the opinion and incidental take statement may be appropriate to reflect that take. No take of the tricolored bat or adverse modification of designated critical habitat may occur between the listing of the bat and the adoption of the conference opinion through formal consultation, or the completion of a subsequent formal

consultation. If the Service reviews the proposed action and finds that there have been no significant changes in the action as planned or in the information used during the conference, the Service will confirm the conference opinion as the biological opinion on the project and no further section 7(a)(2) consultation will be necessary.

As provided in 50 CFR §402.16(a), reinitiation of consultation is required and shall be requested by the federal agency where discretionary federal involvement or control over the action has been retained or is authorized by law, and:

- 1) If the amount or extent of taking specified in the incidental take statement is exceeded;
- 2) If new information reveals effects of the action that may affect listed species or critical habitat in a manner or to an extent not previously considered;
- 3) If the identified action is subsequently modified in a manner that causes an effect to the listed species or critical habitat that was not considered in the biological opinion or written concurrence; or
- 4) If a new species is listed or critical habitat designated that may be affected by the identified action.

If you have any questions regarding this biological opinion, please contact Silka Kempema, Fish and Wildlife Biologist ([Silka\\_Kempema@fws.gov](mailto:Silka_Kempema@fws.gov), 605-220-3709) or Luke Toso, Acting Field Supervisor ([Luke\\_Toso@fws.gov](mailto:Luke_Toso@fws.gov), 701-793-6797) at the letterhead address.

Sincerely,

Luke Toso  
Acting Field Supervisor

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**LIST OF ACRONYMS**

AGL	Above Ground Level
BA	Biological Assessment
BHNF	The Black Hills National Forest
BO/CO	Biological Opinion/Conference Opinion
CSP	Custer State Park
DOD	Department of Defense
DOT	U.S Department of Transportation
ES FO	SD Ecological Services Field Office
ESA	Endangered Species Act
IPaC	Information for Planning and Consultation
MOA	Memorandum of Agreement
MORU	Mount Rushmore National Memorial
MWRO	Midwest Regional Office
NGPN	Northern Great Plains Inventory and Monitoring Network
NLEB	Northern long-eared bat
NPS	U.S. National Park Service
NSNSD	Natural Sounds and Night Skies Division
Pd	<i>Pseudogymnoascus destructans</i>
PHMSA	Pipeline and Hazardous Materials Safety Administration
SD	South Dakota
SDGFP	South Dakota Game, Fish and Parks
SUP	Special Use Permit
TCB	Tricolored bat
UN	United Nations
USFS	U.S. Forest Service
USFWS	U.S. Fish and Wildlife Service
USGS	U.S. Geological Survey
WASO	Washington Supervisor's Office
WASO	NPS Washington Support Office
WNS	White-nose Syndrome
WYNDD	Wyoming Natural Diversity Database

## BIOLOGICAL OPINION

### Introduction

Section 7(a)(2) of the Endangered Species Act (Act) of 1973, as amended (16 U.S.C. 1531 *et seq.*) requires that federal agencies shall insure that any action authorized, funded, or carried out by such agency is not likely to jeopardize the continued existence of any threatened or endangered species, or result in the destruction or adverse modification of critical habitat. When the actions of a federal agency may adversely affect a protected species, that agency (i.e., the action agency) is required to consult with the Service.

### Proposed Action

#### *Overview*

The Proposed Action analyzed in this BA is the issuance of an SUP by the NPS authorizing a fireworks and entertainment event sponsored by the State of South Dakota, and the associated activities the NPS would conduct to facilitate and support the event at MORU. The event would include fireworks and proximate pyrotechnics displays, music/entertainment performances, the installation and removal of temporary infrastructure, lighting, sound systems, helicopter transport and landings, site preparation and cleanup, and coordination with emergency services. The event is expected to attract up to 4,700 visitors. Additionally, the NPS has coordinated with the Department of Defense (DOD) to organize military flyovers that may take place as part of the entertainment. Additional details of each component of the Proposed Action are described below.

#### *Fireworks*

The Proposed Action would include up to approximately 30 minutes of fireworks and proximate pyrotechnics displays designed to illuminate the surrounding landscape and the Memorial's carved faces of presidents George Washington, Thomas Jefferson, Theodore Roosevelt, and Abraham Lincoln. The fireworks display is planned for the evening of July 3, 2026, to begin around sunset (between 8:30 p.m. and 9:30 p.m.; all times herein reported in Mountain Daylight Time). Fireworks would be launched from the natural, uncarved elevated bedrock immediately behind the sculpture, which includes the Hall of Records canyon area. The use of the discharge area would comply with the identified safety limitations and a comprehensive fireworks plan prepared by a licensed fireworks operator in accordance with 36 CFR 2.38. Operational planning and oversight would be conducted jointly by the NPS and event partners to ensure visitor safety, resource protection, and compliance with applicable regulations and permits.

Fireworks of Class 1.3G would be used for the event, which are classified as "Display Fireworks" (formerly "Class B special fireworks") under the United Nations (UN) hazard labeling system (UN0335). These fireworks are intended for professional use only and require special training, permits, and safety measures because of their higher explosive content (e.g., increased safety distances and storage restrictions). Their use is regulated by the U.S. Department of Transportation (DOT) Pipeline and Hazardous Materials Safety Administration (PHMSA) under 49 CFR §173 and the 2018 American Pyrotechnics Association (APA) Standard

87-1B (U.S. DOT 2022). Class 1.3G fireworks are typically launched from mortars or racks and can reach hundreds of feet in the air, producing large bursts of colors, shapes, movement, and sound. The display would feature both aerial and ground-level fireworks/effects, that may include:

- Ground-level: Illuminations, “Niagara Falls” effects, Line rockets, and other similar visual effects.
- Aerial: Pyrotechnic shells, comets, fountains, mines, Roman candles, and mortars (4–5 inches diameter).

Mortars would be launched from a portable platform immediately behind the sculpture and stabilized using a metal grid/frame to ensure vertical launch. The display would include approximately 180 different firework types and around 1,000 individual mortar launches. The entire display would be designed and executed by licensed and permitted pyrotechnicians in accordance with 36 CFR 2.38 and in adherence with MORU Fireworks & Pyrotechnics Code & Best Practices Evaluation (Weeth 2019).

### *Entertainment & Performances*

Music, historic re-enactments, speeches, and other general festivities would occur throughout the day on July 3, 2026, prior to the fireworks event. These daytime activities would require the use of sound amplifiers in several locations within MORU’s developed area. The daytime entertainment and evening fireworks display may be filmed for viewing audiences and distributed through live and/or delayed broadcasts. Evening activities are expected to be similar in duration and format to typical summer programs which occur nightly at MORU, including the use of sound amplifiers and large video screens for a 30-minute evening program, followed by illumination of the sculpture until approximately 11 p.m. The NPS anticipates a greater number of amplified speakers relative to typical nightly events at MORU, and thus there may be an increase in noise levels associated with this event (specific frequency ranges and volume levels are unknown).

### *Helicopter Transport & Landings*

There would be up to eight total one-way helicopter flights from unknown locations outside of the Action Area into MORU. Two helicopter flights (one flight into MORU and one flight out of MORU) may occur prior to the event (anticipated July 2, 2026) during daylight hours to transport safety equipment and other supplies. Four flights—two helicopter flights into MORU during waning daylight hours and two flights out of MORU during dark—may occur to transport guests on July 3, 2026. After the event, two helicopter flights (one flight into MORU and one flight out of MORU) may occur during daylight hours to retrieve safety equipment and supplies. Helicopters would land and take-off from an established helipad or a large concrete parking lot within MORU that can accommodate helicopter landings (i.e., helipad/lot #6 and/or parking lot #7).

### *Temporary Installations, Staging, & Site Preparation*

Staging and preparation for the fireworks event would occur one to two weeks prior to July 3, 2026, and would occur during daylight hours. A rope line would be constructed to haul fireworks and mortar rounds from developed areas (e.g., concrete pad) to the top of MORU just behind (i.e., northwest of) the Memorial. A free-standing rack or platform system would be temporarily constructed using handheld tools to store fireworks, incendiary materials, protective blankets and/or similar fire-retardant material, and other supplies, close to fireworks launch sites until the day of the event. All launch locations would be closed to public access for a predetermined time before the event as fireworks are staged.

Temporary security fencing consisting of approximately 18,000 linear feet of rebar (and/or t-posts) and snow fencing would be installed, encompassing an area up to 1 mi<sup>2</sup> (640 acres), including developed areas and portions of the adjacent mountain and forest areas within MORU.

Other preparations include transportation and construction/installation of temporary infrastructure and associated event needs such as portable stage(s), bathrooms, seating, viewing screens, lighting, sound systems, and security equipment. A temporary command center would be established to assist with helicopter and military flights for the event; this self-supporting control structure is likely to be mounted onto existing infrastructure.

### *Visitor Use*

MORU would be closed to the general public on July 3<sup>rd</sup>, and only ticketed public would be allowed into MORU for the event. Additional restrictions are expected to include SD Highway 244 West between Horsethief Lake near the western boundary of MORU to Iron Mountain Road near the eastern boundary of MORU. This highway restriction may be lifted as checkpoints begin to allow ticketholders into the park. For this event, ticketed visitor access to MORU would begin around mid-afternoon on July 3, 2026. The event is expected to attract up to 4,700 attendees, which is fewer than the number of visitors typically entering MORU on most days in July.

The primary seating area for the event is the amphitheater, which can accommodate about 1,950 visitors. Additional seating may include the Grand View Terrace, the Sculptor's Studio, or other viewing plazas in the primary developed area of MORU. Ticketed attendees would be seated only within the developed area of the memorial. There will be no public seating in parking lot #7.

MORU's parking garage, which accommodates about 1,000 vehicles, would be used for the event. In addition, a shuttle system will be provided for additional ticketed attendees between Rapid City and the park.

Attendees and crowds would depart in the evening after the fireworks via personal vehicles and shuttle buses. Shuttles would drop off and pick up attendees in the drop off zone in front of the developed area of the memorial.

### *Site Deconstruction & Cleanup*

Cleanup and deconstruction of all temporary features installed for the event is expected to take place within two weeks following the event on July 3, 2026. This would include deconstruction and removal of fireworks storage racks, radio command center, stage(s), portable bathrooms, temporary visitor seating, light and sound systems, and security equipment. The approximately 18,000 linear feet of security fencing would also be removed from all MORU grounds.

### *Military Aircraft Exhibition Flyovers*

One or more military flyovers consisting of multiple aircraft, depending on aircraft availability, may occur on July 3, 2026, prior to the fireworks show. Other flights (approximately one or two instances) may occur before July 3 as needed for safety or practice purposes. Exhibition flights are anticipated to occur at altitudes ranging from approximately 1,000–3,000 ft above ground level (AGL). Prior similar aircraft displays have included approximately 18–20 aircraft consisting of combinations of Blue Angels (F-18), military helicopters, F-16 aircraft, and B-1 aircraft; all originating from Ellsworth Air Force Base 41 km (25.5 miles) northeast of MORU. Flights are expected to occur during daylight hours and/or at dusk.

### *Proposed Conservation Measures*

The NPS would incorporate several measures as part of the Proposed Action's that would reduce impacts to federally listed and proposed species.

#### 1) Fire Risk Abatement

In the months leading up to July 3, 2026, the NPS would carry out scheduled prescribed fire activities as part of its broader Fire Management Plan (NPS 2024). The prescribed fire efforts would greatly reduce the risk of wildfire that may otherwise result from fireworks. On October 23, 2025, the NPS conducted a prescribed fire in the Starling Basin unit, situated on the western boundary of MORU between the USFS-managed Black Elk Wilderness and Highway 244.

The NPS has developed a “Go/No-Go” decision framework (detailed in Appendix A of Biological Assessment) as a requirement for hosting the State of South Dakota's permitted fireworks event. Fireworks contractors must determine that wind speeds are at an acceptable level prior to launching fireworks, with preferred wind speeds under 10 mph. In addition, the fireworks contractor would monitor the area during the event for any unexploded shells, spot fires, and similar concerns. The NPS and fire officials would have a quick-response wildland fire team on site during the event to respond to any unplanned ignitions.

The maximum firework shell diameter permitted for the event is 5-inches, as described by Weeth (2019). Compared to larger shells, this should reduce fire risk.

#### 2) Removal of Fireworks Debris

Fireworks displays can generate debris containing chemical residues, including heavy metals and perchlorates, which are known to pose ecological risks (Bateman et al. 2023). These substances

can be toxic to invertebrates and potentially harmful to water sources that support other wildlife. To mitigate these risks, exploded and unexploded shells and mortar rounds within a specified radius of the fireworks lighting areas would be collected by contractors as part of a clean-up effort; the radius would be defined based on factors related to weather conditions that influence debris drift. As in past events, NPS staff anticipate performing additional clean-up for debris undiscovered by contractors. This cleanup effort is expected to reduce the likelihood of chemical contamination thereby minimizing potential adverse effects on local biological communities.

### 3) Traffic & Visitor Use Limits

This event would have several restrictions in place that would reduce the potential effects related to vehicle and human traffic in MORU. There would be a temporary road closure of SD Highway 244 west and east of MORU, reducing the area in which vehicle traffic would occur during the Proposed Action. At the July 3 event attendance would be limited, with an anticipated maximum of 4,700 attendees. As a result, the number of visitors (and thus vehicles) to the park are anticipated to be lower than a typical day in July which ranged from 20,000 to 35,000 visitors/day in both 2019 and 2020.

#### *Action Area*

##### Action Area Delineation

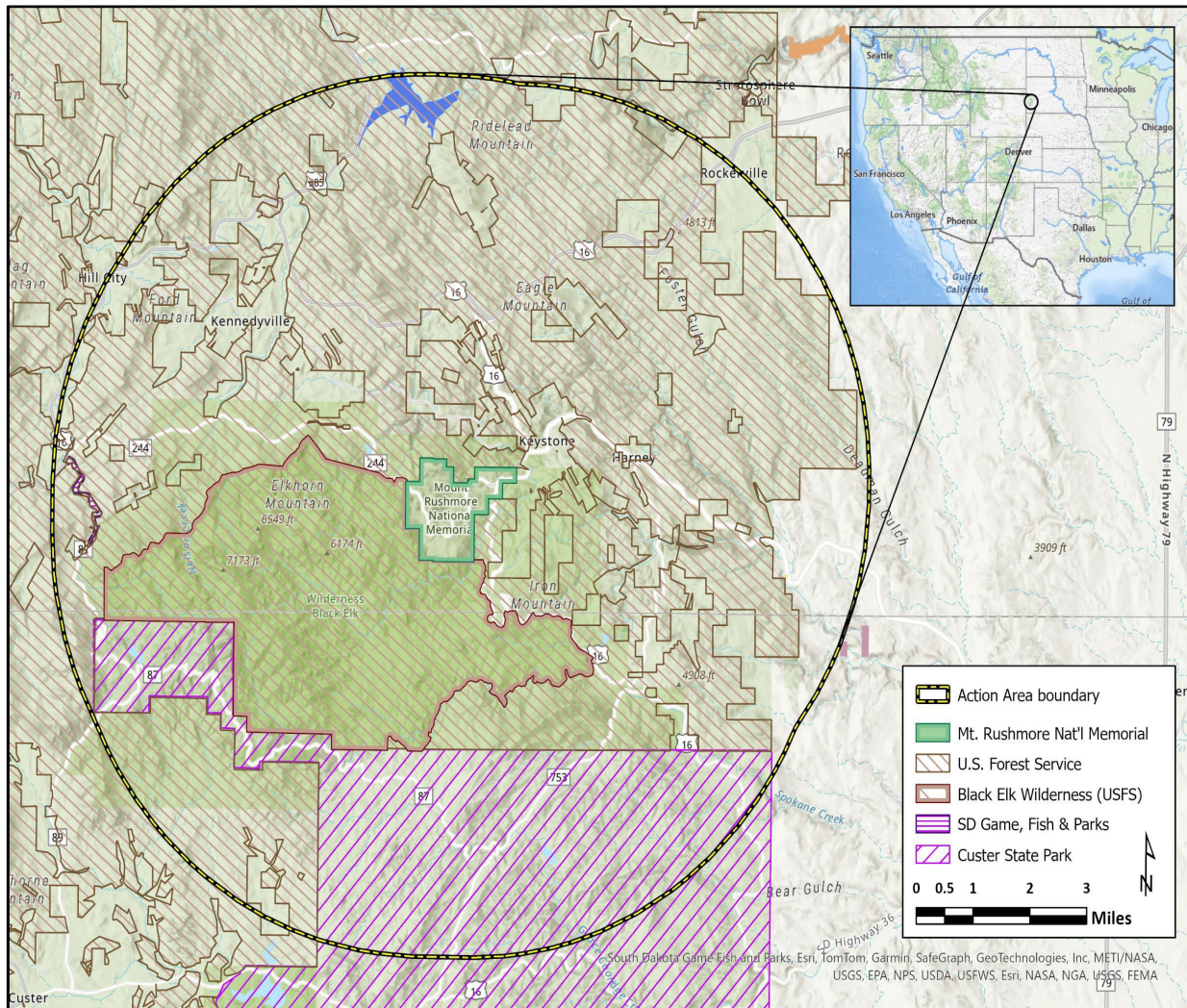
Action Area is defined in 50 CFR § 402.02, as “all areas to be affected directly or indirectly by the federal action and not merely the immediate area involved in the action.” This is not limited to the immediate footprint of the Proposed Action, nor is it limited by the federal agency’s jurisdictional authority; rather, it is determined by the geographic reach of the Proposed Action’s stressors.

The Service has determined the Action Area for the Proposed Action to be a 10 km (6.2 mile) radius, encompassing roughly 103,680 acres, that includes the entirety of MORU and surrounding areas. This is the same area as proposed by NPS in their BA. Absent published literature that evaluates the effects of fireworks on bats in a forested landscape, the Action Area was calculated based on Hoekstra et al. (2024). This is a recent study that evaluated a distance-dependence relationship with flight response in bird communities to ubiquitous fireworks displays that occur across the Netherlands on New Year’s Eve. The authors found that although flight activity continued to decrease up to 10 km, especially for large-bodied birds, the strongest decrease in effects occurred within 5 km. Although adverse effects decline beyond 5 km, documented impacts extend to 10 km, supporting the use of 10 km as the full Action Area.

Further support of a defined 10 km Action Area was done using an Attenuation Calculator developed by the NPS National Sounds and Night Skie’s Division. Using this calculator to simulate sound level propagation (Appendix A), available published information on the effects of sounds on bats and other mammals, with estimates of the amplitude a 5-inch diameter firework mortar makes at detonation, we determined that sound would attenuate to a median value of 61 dB (76.1-54.8 dB) and that take would not occur past a 10-km radius. This amplitude is at a level at which noise effects on wildlife are limited and discountable (Manci 1988, Schaub

et al. 2008, West 2016, Everson 2020), providing further support for use of a 10 km radius to define the Action Area.

The Action Area radius provided a landscape context from which an opinion on the effects of the Proposed Action to listed species was better informed. We used available and historical information on habitat and bat use at the landscape level to analyze the environmental baseline, effects of the Proposed Action and amount of incidental take. Additional details will be explained and discussed in the 'Effects of the Proposed Action' section of this consultation.



**Figure 1.** Overview map depicting the Action Area and Land Ownership

### Action Area Description

The Action Area lies within the South Dakota portion of the Black Hills ecoregion in Pennington and Custer counties. This area is geologically old, ecologically diverse, and geographically isolated. Although the Rocky Mountain coniferous forest complex predominates in the Hills, a southern and isolated extension of the Northern coniferous forest complex is found at higher elevations, and a deciduous forest complex is dispersed along drainages in the lower elevations. The central core of the Black Hills is characterized by high elevation granite outcrops including Black Elk Peak (2,207 meters) and Mount Rushmore (1,745 meters). The surrounding Great Plains grasslands isolate the region, and its mid-continent location is often the eastern or western edge of a species range.

Much of the Action Area (85%) is publicly owned and managed in various ways for its natural resources. The Park comprises approximately 2% of the Action Area. The geologic features and habitat within the 1,278-acres (2 mi<sup>2</sup>) MORU are managed for historical integrity and natural setting (Narumalani et al. 2009). Limited timber harvest and fire suppression have allowed for the growth of the second largest contiguous patch (344 ha; 850 acres) of old growth forest in the Black Hills (Symstad and Bynum 2007). Limited fires have also increased the number of small-diameter pine trees. Mechanical thinning of these trees to reduce wildfire severity and manage pine beetle outbreaks occurred throughout MORU in the early 2000s. Current land management at MORU includes selective forest thinning practices and prescribed fires.

The Black Hills National Forest (BHNF) makes up 69% of the Action Area. These lands have a multiple-use mandate carried out by the U.S. Forest Service (USFS). Management actions include timber harvest, prescribed fire, cattle grazing, and mineral extraction. Custer State Park (CSP) is located to the south and west of MORU and makes up almost 15% of the Action Area. Management of the park focuses on natural resource stewardship, high-quality visitor experiences, and maintaining a large bison herd.

Norbeck Wildlife Preserve is a special designation area found within the Action Area. This preserve is under multiple ownership including USFS, State of South Dakota and private landowner. Norbeck Wildlife Preserve is to be managed for wildlife using timber harvest and prescribed fire. Human activities are limited. The USFS, South Dakota Game, Fish and Parks (SDGFP), and private individuals provide habitat for game animals and birds. Some human activities are allowed that remain consistent with management objectives.

The 13,543 acres of Black Elk Peak Wilderness lie completely within the preserve. Natural processes are the primary management tool with timber harvest specifically excluded. Hiking, grazing, and mineral development are allowed. Many granite peaks and outcrops occur in the Wilderness, including Black Elk Peak, which is the highest point in South Dakota.

The Black Hills once contained larger expanses of old-growth forest with more deciduous forest than exists today. Timber harvest, focused on ponderosa pine, has significantly reduced the availability of mature trees and snags with dense canopy cover (>40%), which are preferred roosting features for bat species. Research indicates a 60% reduction in old-growth forest suitable for bat roosting (Whittle et al. 2022). Within the Action Area, summer roosting habitat occurs across lands managed by MORU, BHNF, CSP, and private landowners. Norbeck Wildlife

Preserve is actively managed for wildlife, with a portion that allows natural process to maintain the ecosystem (Black Elk Wilderness). Variation in timber management and fire frequency among these ownerships creates mosaic of habitat conditions. Old-growth forest within MORU, combined with remaining patches of large, mature trees across the Black Hills, supports the highest likelihood of NLEB presence.

Keystone is a small, nearby community located approximately 3.2 km (2 miles) to the northeast of MORU. This community is a notable concentrated human settlement in the Action Area.

#### Additional Habitat Information

We identified potential suitable bat maternity roost habitat in the Action Area by using available data from the USFS, CSP, and MORU. We did not have data from land under private ownership, although this was a relatively small portion of the Action Area.

Created and managed by the USFS to guide management on the BHNF, the FS Veg Database is a forest vegetation layer and associated geodatabase that is comprised of 30-acre polygons and is characterized by numerous forest stand attributes. While helping with land management decisions, this is also the main tool the BHNF uses to evaluate wildlife habitat at a landscape scale. Although representative of a classification, stands are often not homogeneous, a known limitation of this model. Habitat structural stage (HSS) classifies forest stands based on tree diameter at breast height (DBH) and percent canopy cover.

To identify suitable maternity roost habitat for NLEBs in the Black Hills, the USFS applied their FS Veg database to 77 known NLEB maternity roosts identified in the Black Hills in Wyoming (Abernethy et al. 2019, Whittle 2022). Maternity roost distribution across Habitat Structural Stages (HSS) was analyzed, along with the availability of each HSS across the Black Hills landscape. This information helped identify potential HSS preferences and availability across the Black Hills landscape, including in the Action Area.

Note that a similar analysis of TCB bat maternity roosting habitat is not yet possible in the Black Hills due to lack of maternity roost data. Tricolored bats are smaller and roost in vegetative clumps primarily in deciduous trees, but also in pine and hanging lichen. Presumably, maternity roost trees suitable for NLEBs would also be suitable for TCB bats. Potential selection by maternity roosting bats was highest for tree stands that are characterized by at least 9" DBH trees with  $\geq 40\%$  canopy closure. Although no late succession trees (DBH  $\geq 16$ " ) were available on the BHNF, it is assumed that bats would also use this HSS class if it was present.

Using the results from this analysis, we requested spatial data on trees that were  $\geq 9$ " DBH with canopy cover of  $\geq 40\%$  from SDGFP to identify NLEB maternity roosting habitat in CSP. These specific types of data were not available from MORU in comparable spatial data formats. To identify potential maternity roost data, we assumed that most forest at MORU could be suitable maternity roosting habitat given the history of limited timber harvest, the occurrence of old growth forest at MORU, and available DBH data. We conducted a GIS analysis using spatial data from a historical vegetation mapping effort on MORU (Salas and Pucherelli 1998) to identify and remove areas that were not habitat used during the pup season (rocky outcroppings, roads, and developed areas; approximately 10% of MORU). The forested areas and wetlands

that remained were considered potential maternity roosting and foraging habitat. This resulted in a total of 31,064.73 acres of suitable maternity roost habitat in the Action Area (**Table 1**).

**Table 1.** Suitable Maternity Roost Habitat in the Action Area Based On Land Ownership.

<b>Ownership</b>	<b>Acres</b>	<b>Source</b>
Mount Rushmore National Monument	1,097.3	Salas and Pucherelli 1998
Black Hills National Forest, US Forest Service	27,228.6	USDA USFS FSVeg data
Custer State Park, SD Game Fish & Parks	2,738.8	Custer State Park data
	<b>31,064.7</b>	

## Status of the Species

### *Northern Long-eared Bat*

#### Legal Status

The Northern long-eared bat (*Myotis septentrionalis*; NLEB) was proposed for federal listing as endangered on October 2, 2013. On April 2, 2015, the species was given a proposed listing of threatened with an interim 4(d) rule, which was finalized on January 14, 2016 (81 Federal Register [FR] 1900). On November 30, 2022, the Service published a final rule reclassifying the NLEB as endangered under the Act (87 FR 73488). The 4(d) rule was rendered obsolete on March 31, 2023, which was the effective date of the final rule (88 FR 4908, January 26, 2023), as 4(d) rules only apply to threatened species. No critical habitat has been designated for the species.

Parts of the following section are extracted from the *Species Status Assessment Report for the Northern long-eared bat (Myotis septentrionalis) Version 1.2 (SSA)* (Service 2022). Additional habitat and behavior information specific to the Black Hills is included, if known, especially when it differs from other parts of the species' range. For the most recent comprehensive assessment of the species' range wide status, please refer to Service 2022.

#### Species Description

The NLEB is a temperate insectivorous, migratory bat that typically hibernates in mines and caves in the winter and spends summers in wooded areas. As indicated by its common name, the species is distinguished from other *Myotis* species by its relatively long ears (average 17 mm (0.7 in); (Whitaker and Mumford 2009). Fur colors include medium to dark brown on its back; dark brown, but not black, ears and wing membranes; and tawny to pale- brown fur on the ventral side (Nagorsen and Brigham 1993, Whitaker and Mumford 2009). The maximum NLEB life span is estimated to be up to 18 and a half years, as noted by J.S. Hall and others in 1968.

#### Range and distribution

The NLEB is found in 37 states and 8 provinces in North America including much of the eastern and north-central U.S., and all Canadian provinces west to the southern Yukon Territory and eastern British Columbia. South Dakota is located on the western edge of the species' range in the U.S. The NLEB may occur in various forested habitats across the state and in badlands

features. Within the Black Hills, NLEB select moderately dense forest conditions with tall, large-diameter trees and abundant snags (Cryan et al. 2001, Abernethy et al. 2019a, Whittle 2022b). Occupied hibernacula have been documented only in the Black Hills. However, hibernacula are suspected to exist in other areas such as limestone cliffs along the Missouri River (White et al. 2020).

### Life History and Habitat Use

NLEB life history can be divided into active and inactive season in South Dakota. During the inactive season, NLEB enters a state of torpor which is an extended period of inactivity with reduced metabolic, heart, and respiratory rates that allow the bats to survive the winter without feeding). This occurs from 1 October through 30 April in the Black Hills.

The active season is estimated to extend from 1 May to 30 September (USFWS 2024a). It encompasses additional stages: spring staging, pup season, and fall swarming. Spring staging describes the period when bats emerge from hibernacula, feed, and eventually search out and return to summer habitat. Fall swarming occurs from 16 August to 30 September when bats travel to select hibernacula, breed and eventually enter torpor.

### Pup Season

The pup season is the most important period relevant to determining the effects of the Proposed Action on the NLEB. It occurs during late pregnancy when most young are born and extends until they can fly and forage independently. It is one of the most important time periods to ensure recruitment of young into the population. It is also the time when young are the most vulnerable to disturbance, since they cannot forage or fly and rely on their mother for care.

Black Hills bat reproductive phenology can be highly variable (J. Tigner (retired), Batworks, Rapid City, South Dakota, pers. comm., April 27, 2023). Phenology is likely delayed compared to lower elevations in South Dakota and surrounding states. While lactating females have been observed in the Black Hills as early as June 28, some may still be pregnant as late as July 23 (Abernethy et al. 2019b). Juvenile volancy (flight) is obtained between 18 and 21 days after birth (Kunz 1971, Krochmal and Sparks 2007, U.S. Fish and Wildlife Service 2022). Based on these data, the pup season in the Black Hills is determined to occur between 15 June and 31 August.

NLEB females typically roost singly or in maternity colonies underneath bark or more often in cavities or crevices of both live trees and snags. Colonies in the Black Hills are known to have as many as 75 individuals (Tigner and Stukel 2003, Whittle 2022a, b). These colonies may be composed of small groups where individuals may come and go or move between groups, switching tree roosts as often as every 2-3 days (fission-fusion behavior;(Service 2022)). In the Wyoming portion of the BHNF, females switched roosts within their local maternity colony an average of every 1.5 days ( $\pm 0.48$  SD) (Whittle 2022a, Whittle et al. 2025). Roosts switching likely occurs for a variety of reasons, including temperature, precipitation, predation, parasitism, sociality, and ephemeral nature of roost sites (Carter and Feldhamer 2005, Barclay and Kurta 2007). Adult females give birth to a single pup (Barbour and Davis 1969). Birthing within the colony tends to be synchronous (Krochmal and Sparks 2007). Radio-marked females moved an average of 818 meters (SD = 472) between capture location to roost on Black Hills National

Forest in Wyoming (Abernethy et al. 2019a). Whittle (2022a) reported movement of 164-1,940 meters for radio-marked females between capture site and maternity roost.

NLEB generally select roost trees based on the presence of features such as sloughing bark or cavities in which to hide, not tree species. However, reproductive females in BBNF appear to prefer aspen. They also used smaller aspen trees (e.g., ~ 6 inches DBH) compared to pines, although larger pine trees over 17.5 inches DBH and snags over 12 inches DBH offered more suitable roosting sites, as do forest stands with relatively high canopy closure (Whittle 2022a). Males have shown less specificity and would choose a variety of snag sizes, cavities in live trees and in down dead trees (Abernethy et al. 2019).

Recent research on NLEBs in the Black Hills (Abernethy et al. 2019, Whittle 2022a) has provided valuable insight to habitat use by females during the maternity/pup season. Between 2017 and 2021, the authors captured NLEBs, determined their reproductive status, fitted females with radio-transmitters, and tracked them to roosting sites where characteristics of the roost trees and roost patches were documented. Abernethy et al. (2019) found that NLEB roosts were often located on the upper portions of slopes (i.e., near the summit, shoulder, or upper portions of the backslope). The bats selected roost trees that had larger diameters and heights than random trees on the landscape. Primary roost type varied by year and reproductive status. During 2017 and 2018, roosts were generally located in large ponderosa pines with pregnant females occupying live trees while lactating females were detected in ponderosa pine snags. In 2019, the majority of roosts were in quaking aspen followed by ponderosa pine and Burr oak (while non-reproductive NLEBs used a variety of quaking aspen). They hypothesized that aspen trees may have afforded more suitable roosting conditions during colder/wetter weather conditions in 2019.

Characteristics of the surrounding roosting area included areas with larger diameter ponderosa pine snags, more less decayed snags less than 3 meters tall, and areas with higher densities of snags. Their modeling suggests that forest stands comprised of large diameter trees and higher densities of dead trees are more likely to be used as roosts by NLEBs. A variety of potential roost structures would be beneficial to bats by accommodating variation between reproductive status and climatic conditions (Abernethy et al. 2019).

Whittle (Whittle 2022a) built on this information and found that bats prefer quaking aspens and snags over ponderosa pines and live trees in stands with relatively higher canopy closures and higher number of trees. Additionally, differential selection of roost type was associated with reproductive status, supporting similar observations in Abernethy et al. (2019).

Whittle et al. (2022a) also noted that, historically, the Black Hills harbored larger old growth forest stands with a greater deciduous component than exists today due to a focus on timber production, particularly ponderosa pine, that has likely decreased the roost types most preferred by bats (mature trees, snags, with high canopy cover and greater tree density). Conserving the bats' most preferred habitats is important, but they also noted that a variety of roost types, in multi-aged, multi-species forests with a mosaic of canopy cover would likely be beneficial to the bats (Whittle 2022a).

Land management history and objectives vary from preservation to production within the Action Area. The juxtaposition of old growth in MORU with a variety of other structural stages in the area may provide the roosting habitats needed by NLEB. It increases the conservation value of MORU substantially due to the lack of old growth in the surrounding Action Area and broader area.

### Foraging

NLEBs prefer intact mature forests with small openings (i.e., forest trails, small roads, or forest-covered creeks) for forage and travel rather than fragmented habitat (80 FR 17974). Most foraging occurs above the understory, 1 to 3 m (3 to 10 ft) above the ground, but under the canopy (Nagorsen and Brigham 1993, p. 88). NLEBs use gleaning (picking insects from surfaces), hawking (catching insects in flight) behaviors in conjunction with passive acoustic cues (Ratcliffe and Dawson 2003).

NLEB are slow-flying, late night foragers adapted to low light in cluttered forests. Emergence of *Myotis* spp is late, when it is darker, probably to avoid diurnal birds of prey (Jones and Rydell 1994). In the Black Hills, NLEB begin to emerge from roosts 15-20 minutes after sunset (Whittle 2022a and Amy Hammesfahr personal communication 30 January 2026). Sunset would occur at 8:41 on 3 July near Keystone, SD. First emergence should occur at 9:00 pm under acceptable weather conditions. The moon would be 90% illuminated. The first peak in foraging for NLEB is generally 1-2 hours after dark (Van Zyll de Jong 1985). First foraging peak for NLEB would occur between 10 and 11 pm. Peak mist net capture rates from 2022-2024 for all bats at MORU occurred between 9 and 10 pm at MORU (Bernard, R. F. personal communication, 29 October 2025).

### Population Information

#### Status and Trends

Prior to 2006 (i.e., before white-nose syndrome was first documented, see Reasons for Listing section below), the NLEB was considered abundant and widespread throughout much of its range (despite having low winter detectability) and was not a focus of detailed demographic studies. Although numbers varied temporally and spatially, abundance and occurrence on the landscape were considered stable at that time (Cheng et al. 2021, Straw et al. 2022, Wiens et al. 2023). Catastrophic population declines continue across the species' range since the emergence of white-nose syndrome (Service 2022).

#### Population size

The Service estimated the U.S. population of NLEBs in 2016 to be 6,500,000 individuals (adults and juveniles, Service 2015). This estimate was updated in 2023 by using total acres of habitat for each state as per the Service's own range model. The Service estimated 610,547 acres of forested habitat available for use by NLEBs in South Dakota; 37,091 of those acres may be occupied by the species (6.10% occupancy rate, Service 2024). An estimated 1,360 adults and 680 pups in 34 colonies of 20 individuals each occurred in South Dakota (Service 2024).

### Reason for listing

There are numerous threats affecting NLEBs, but the primary factor influencing the viability of the species is White Nose Syndrome (WNS), a disease of hibernating bats caused by an invasive

cold-loving fungal pathogen, *Pseudogymnoascus destructans* (Pd). As Pd invades the skin of bats, the subsequent infection leads to increases in the frequency/duration of arousals during hibernation and the eventual depletion of fat reserves needed to survive winter, often resulting in mortality. The fungus typically arrives on a few bats and is transmitted through the colony because of swarming and roosting interactions until most individuals are exposed to the pathogen and develop WNS, so named because of the white fuzzy appearance often observed on the bats' muzzle. White-nose syndrome has caused estimated NLEB population declines of 97–100% across 79% of the species' range. As elsewhere in the range, WNS is, and would continue to be, the most significant threat to the NLEB; these species would likely not be imperiled were it not for this disease (87 FR 56381; 87 FR 73488). Other factors currently influencing the species' viability include wind energy mortality, effects from climate change, and habitat loss.

While WNS continues to spread westward across North America, to date no project has proposed a level of effects for which the Service has issued a biological opinion of jeopardy for the species. The next 5-year status review is scheduled to occur in 2027.

### *Tricolored Bat*

#### Legal Status

The tricolored bat (*Perimyotis subflavus*; TCB) was proposed for federal listing as endangered, without critical habitat, on September 14, 2022 (87 FR 56381). While conferencing is not required for this species (only activities that may jeopardize the continued existence of proposed species require a conference; see Conclusion section herein), the NPS has opted to conference at this time. Should the TCB be federally listed, the NPS must request this CO be converted to a BO pursuant to section 7 of the Act, at which time the Service would reevaluate the analysis to ensure consistency with the final rule.

Parts of the following section are extracted from the *Species Status Assessment Report for the Tricolored Bat (Perimyotis subflavus), Version 1.1* (U.S. Fish and Wildlife Service 2021). Additional habitat and behavior information specific to the Black Hills is included, if known. For the most recent comprehensive assessment of the species' range wide status, please refer to the *Species Status Assessment Report for the Tricolored Bat, Version 1.1*.

#### Species Description

The TCB bat is one of the smallest bats in eastern North America and is distinguished by its unique tricolored fur that appears dark at the base, lighter in the middle, and dark at the tip (Barbour and Davis 1969). Tricolored bats often appear yellowish (varying from pale yellow to nearly orange), but may also appear silvery-gray, chocolate brown, or black (Barbour and Davis 1969). Tricolored bats may live for more than a decade; the oldest individual on record is a male captured in Illinois 14.8 years after it was originally banded (Walley and Jarvis 1972).

#### Range and Distribution

The TCB bat is a wide-ranging bat species found in 39 States, the District of Columbia, four Canadian provinces, Belize, Guatemala, Honduras, Nicaragua, and Mexico. The species' current distribution in New Mexico, Colorado, Wyoming, South Dakota, and Texas is the result of westward range expansion in recent decades (Geluso et al. 2005, Adams et al. 2018, Hanttula

and Valdez 2021) as well as into the Great Lakes basin (Slider and Kurta 2011(Kurta et al. 2007). This expansion is largely attributed to increases in trees along rivers and increases in suitable winter roosting sites, such as abandoned mines and other human-made structures (Benedict et al. 2000).

### Life History and Habitat Use

The TCB bat's life history includes two primary timeframes; the inactive and active seasons. During the inactive season, TCB enters a state of torpor which is an extended period of inactivity with reduced metabolic, heart, and respiratory rates that allow the bats to survive the winter without feeding). The active season encompasses additional stages: spring staging, pup season, and fall swarming. The species is not well-studied in South Dakota and the specific dates of these timeframes and stages are not known, however they are considered similar to the NLEB. For the purposes of this BO/CO and lacking information to the contrary, the dates that apply to the NLEB in the Black Hills would be used for TCB.

It is suspected that TCB bats occur year-round in South Dakota, particularly in areas with nearby hibernacula (Geluso et al. 2005). On June 17, 2016, a TCB bat was observed in Wind Cave National Park (National Park Service 2017), but additional, summer records for the species in South Dakota are lacking (Ian Abernethy, University of Wyoming, pers. comm., May 9, 2023; J. Tigner (retired), Bat Works, Rapid City South Dakota, pers. comm., April 27, 2023).

In the summer, TCB bats primarily roost in live and dead foliage of live or recently dead deciduous trees but would also use beard lichen (*Usnea* spp.), pine needles, eastern red cedar (*Juniperus virginiana*), artificial roosts (e.g., barns, beneath porch roofs, bridges, concrete bunkers) and rarely caves (Service 2021). Females congregate into maternity colonies to reproduce communally (Perry and Thill 2007, Poissant et al. 2010). Like the NLEB, TCB bat maternity colonies consist of multiple roosts near one another, and females change roosts frequently, perhaps every 1.2 - 7 days (Veilleux and Veilleux 2004a). Males would roost in forested habitat occupied by maternity colonies, but males are solitary (Poissant et al. 2010). Tricolored bat maternity colonies are small compared to other cooperative breeding bat species. The largest colony on record consisted of 19 adult females and 37 pups in the Eastern RPU (Hoying and Kunz 1998), but smaller colonies consisting of 1 to 8 (mean = 4.4) females and pups (Veilleux and Veilleux 2004b) and an average of 6.9 adult females and pups per colony and range of 3 to 13 individuals per colony have been reported in other parts of the range (Perry and Thill 2007).

Limited information exists regarding the acreage occupied by maternity colonies during the summer, but the minimum summer roost area (not including forage area) for individual adult females can range between 0.1 and 2.2 hectares (0.25 and 5.4 acres) (Veilleux and Veilleux 2004a, p. 197). Female tricolored bats exhibit high site fidelity, returning year after year to the same summer roosting locations (Allen 1921, Veilleux and Veilleux 2004a). Generally, females typically give birth to two young, rarely one or three, between May and July (Allen 1921, Barbour and Davis 1969, Cope and Humphrey 1972). Tricolored bat pups have yet to be observed in the Black Hills; at this point the pup season is presumed to align with the NLEB timeframe of June 15 - August 31. Young grow rapidly and begin to fly at 3 weeks of age and achieve adult-like flight and foraging ability at 4 weeks (Lane 1946, Whitaker 1998). Adults

often abandon maternity roosts soon after weaning, but young remain longer (Whitaker 1998). Since TCB roost in vegetation and are not reliant on snags or other features with cracks and crevices, they likely are presumably less restricted by and able to occupy more sites than the NLEB.

Fraser et al. (2012) concluded that at least some TCB bats engage in latitudinal migration that is more typically associated with tree-roosting bats (e.g., hoary bats (*Lasiurus cinereus*), eastern red bats (*Lasiurus borealis*), and silver-haired bats (*Lasionycteris noctivagans*). The maximum migration distance for a female TCB bat was a straight-line distance of 151 mi (243 km) from her winter hibernaculum to summer roost (Samoray et al. 2019). Other migration records between winter hibernacula and summer habitat include less than 50 mi (80 km; (Barbour and Davis 1969)), 27 mi (44 km; (Samoray et al. 2019)), and 85 mi (137 km; (Griffin 1940)).

### Pup Season

The pup season is the most important period relevant to determining the effects of the Proposed Action on TCB. It occurs during late pregnancy when most young are born and extends until they can fly and forage independently. It is one of the most important time periods to ensure recruitment of young into the population. It is also the time when young are the most vulnerable to disturbance, since they cannot forage or fly and rely on their mother for care.

### Foraging

Tricolored bats are opportunistic feeders and consume small insects including caddisflies (*Trichoptera*), flying moths (*Lepidoptera*), small beetles (*Coleoptera*), small wasps and flying ants (*Hymenoptera*), true bugs (*Homoptera*), and flies (*Diptera*). Tricolored bats emerge early in the evening and forage at treetop level or above but may forage closer to ground later in the evening. The bats forage most commonly over waterways and forest edges. Data is limited but maximal distance traveled from roost areas to foraging grounds is known to be 4.3 kilometers (km; 2.7 miles) for reproductive (pregnant or lactating) adult females in Indiana (Veilleux et al. 2003) and 24.4 km (15.2 miles) (mean=11.4 km; 7.1 miles) for male TCB bats in Tennessee (Thames 2020) (See U.S. Fish and Wildlife Service 2021 for additional literature cited).

### Population Information

#### Status and Trends

Winter hibernacula counts provide the most consistent, long-term, reliable trend data. Prior to the arrival of white-nose syndrome, hibernating TCB bat colonies varied between 1 and 5,300 individuals; however, 40% of hibernacula had between just 1 and 10 individuals. The largest TCB bat hibernating colony (n = 5,300) was observed in Georgia in 2010 (Service 2021). At least 34 states and 1 Canadian Province were known to have winter occurrences of the TCB bat with extent of occurrence at an estimated be 1.1 billion acres with 1,951 known hibernacula and estimated abundance of 140,547 winter sites (maximum) (Service 2021).

However, available evidence, including both winter and summer data, indicates TCB bat abundance has and would continue to decline substantially under current demographic and stressor conditions, primarily driven by the effects of white-nose syndrome. This disease has caused estimated TCB bat population declines of 90-100 percent across 59 percent of the species' range (Service 2021).

### Population Size

Before white-nose syndrome was documented (in 2006), the TCB bat was considered highly abundant and widespread, with over 140,000 bats observed hibernating in 1,951 known hibernacula spread across >1 billion acres in 34 states and 1 Canadian province (USFWS 2021).

However, since the first detection of white-nose syndrome in 2006, TCB bat abundance has declined, leaving many individual colonies with small numbers of individuals. Population estimates and habitat acreages available for the NLEB are not available for the TCB bat at this time. Regarding habitat alone, both species use forested habitats, and the TCB bat may have greater suitable summer habitat available to it since it can occupy foliage and is not reliant on snags or cracks/crevices of live trees. The ranges of these two species are large and overlap. Based on this information, the habitat acreage estimated for the NLEB is likely similar, if not less than, the amount of habitat available to the TCB bat.

### Reason for listing

The primary factor influencing TCB viability for over a decade has been WNS. The same mechanisms of transmittal and effect response from WNS, as seen with NLEBs, are acting on TCBS: WNS initiates a cascade of physiological and behavioral processes that often lead to mortality. Bats that do not succumb to starvation in hibernacula often seek riskier roosting locations near entrances to roosts or emerge from roosts altogether, where they face exposure to winter conditions and scarce prey resources on the landscape (Langwig et al. 2012). As elsewhere in the range, WNS is, and would continue to be, the most significant threat to the TCB; these species would likely not be imperiled were it not for this disease (87 FR 56381; 87 FR 73488). Other factors currently influencing the species' viability include wind energy mortality, effects from climate change, and habitat loss.

While WNS continues to spread westward across North America, to date no project has proposed a level of effects for which the Service has issued a biological opinion of jeopardy for the species.

### **Environmental Baseline**

*Environmental Baseline – the condition of the listed species or its designated critical habitat in the action area, without the consequences to the listed species or designated critical habitat caused by the proposed action. The environmental baseline includes the past and present impacts of all Federal, State, or private actions and other human activities in the action area, the anticipated impacts of all proposed Federal projects in the action area that have already undergone formal or early section 7 consultation, and the impact of State or private actions which are contemporaneous with the consultation in process. The consequences to listed species or designated critical habitat from ongoing agency activities or existing agency facilities that are not within the agency's discretion to modify are part of the environmental baseline (50 CFR§ 402.02).*

*Status of the Species within the Action Area*Northern Long-eared Bat

The Action Area lies entirely within the range of the NLEB. This species occupies the Black Hills Region year-round, using caves and mines for winter hibernation and trees for summer roosting. Although no active maternity roost trees have been documented within the Action Area, multiple surveys (including hibernacula inspections, acoustic monitoring, and summer mist-netting) conducted since 2000 confirm consistent use of both winter and summer habitats. NLEB typically migrate short distances (56–89 km; ~35-55 miles) between seasonal habitats (Griffin 1940, Caire et al. 1979, Nagorsen and Brigham 1993, U.S. Fish and Wildlife Service 2022). Nine documented winter hibernacula occur within 10 km of MORU. The species is known to stage and swarm within 8.1 km (5 miles) of hibernacula. Movement of radio-marked females from capture site -to-maternity has been documented up to 1.9km in the Black Hills (Whittle 2022a) This information strongly indicates suitable habitat is present for year-round use of the Action Area and supports the NPS’s assumption of presence in the Action Area.

Confirmed presence of NLEB in the Action Area includes a 2004 mist-net capture of four lactating females and two juveniles near Starling Basin (Schmidt et al. 2004), demonstrating reproduction within MORU. More recent mist-netting efforts captured two females in 2018 and 2019 as part of the NPS Northern Great Plains Inventory & Monitoring Network’s bat assessment (Abernethy 2018, 2019). Acoustic monitoring conducted from 2017 to 2022 detected probable NLEB presence in 2017 at multiple sites, including Lafferty Gulch and a forested ridge south of the visitor parking garages. This species was also detected near hibernacula north of MORU in 2018. Although no captures occurred during surveys from 2022–2024 (University of Wyoming, WYNDD, pers. comm.), acoustic detections and the proximity of 9 known hibernacula within the Action Area suggest continued presence.

Available data are insufficient to estimate local population size. No documented maternity roosts occur within the Action Area. However, given previous documentation of the species and presence of suitable maternity roosting habitat, and NLEB’s strong fidelity to maternity roosts (Foster and Kurta 1999, Patriquin et al. 2010, Broders et al. 2013), presence within the Action Area is assumed.

In 2024, the Service estimated 245,157,764 acres of forested habitat were available as potential for the 30 states within the range of the NLEB. The Service also estimated a maximum of 8,394,086 acres may be occupied by NLEBs in those 30 states. If all the predicted suitable habitat in the Action Area is fully occupied by NLEBs, it represents 0.01% of the estimated available forest habitat ( $[31,065 \div 245,157,764] \times 100$ ) and 0.37% of the estimated occupied forest habitat ( $[103,680 \div 8,394,086] \times 100$ ) across the 30-states evaluated.

South Dakota is one of 30 states included in the Service’s evaluation of potential available habitat. The Service estimated 610,547 acres of forested habitat available for use by NLEBs in South Dakota and, of which 37,091 acres may be occupied by the species. If all the predicted suitable habitat in the Action Area is fully occupied by NLEBs, it represents 5.1% ( $[31,065 \div 610,547] \times 100$ ) of South Dakota’s forested acres and 83.8% of the estimated occupied acres of forest habitat in the state.

The Service's occupancy rate for South Dakota was estimated in the state's fifth year post-Pd detection. It is now eight years since the fungus was first documented in the state. It is expected that the number of forested acres occupied by NLEB in SD has decreased. This expected decrease is reflected in recent capture rates from the Black Hills ecoregion (Bernard, R. F. personal communication, 29 October 2025).

### Site Specific Habitat Information

As discussed in the Status of the Species Section, water resources are a significant resource for foraging for the NLEB. Surface water for drinking is limited in MORU, with only a small section of Grizzly Creek flowing through the southeast corner of the park. A former beaver pond in Starling Basin, once important to bats (Schmidt et al. 2004), has transitioned into a marshy clearing, and has diminished value for foraging since it is no longer open water.

The visitor center and administrative complex create a forest clearing with artificial lighting that may attract nocturnal insects, potentially enhancing foraging opportunities for bats, although some *Myotis* species are known to avoid artificial lighting (particularly in the white light spectrum; (Rydell 1992, Voigt et al. 2021). Foraging activities are more likely to occur in the contiguous forest tracts further from the fireworks display within the Action Area.

### Tricolored Bat

The Action Area is entirely within the range of the TCB. Like NLEB, TCB is found year-round in the Black Hills region (Geluso et al. 2005) in winter hibernacula and summer roosting habitats. The first record of TCB in the Black Hills was documented in 2003 when an individual was found hibernating in a mine near Hill City, South Dakota, followed by additional hibernacula discoveries in 2004 (Geluso et al. 2005). Since then, the number of documented hibernacula has increased, though detections remain limited—likely due to restricted survey efforts and the absence of a systematic approach to confirm presence across the region. Population estimates for TCB are not currently available, the Service lacks data on habitat quantification, occupancy rates, and occupied acreage. Female TCB exhibit strong site fidelity, returning to the same summer roosting locations year after year (Allen 1921, (Veilleux and Veilleux 2004a).

Although there have been no confirmed physical captures of TCB within MORU, the species has been documented nearby in Hill City (Geluso et al. 2005). The mixed coniferous forest, leaf litter, and rocky outcrops in the Action Area provide suitable roosting and foraging habitat during the active season. Acoustic monitoring conducted by the NPS Northern Great Plains Network from 2015 to 2022 detected probable TCB presence within MORU.

### *Factors affecting the species within the Action Area*

#### White-nose syndrome (WNS)

On May 31, 2018, the Service and others announced the fungus that causes WNS (*Pseudogymnoascus destructans* [or Pd]) had been detected in western South Dakota. Pd was first detected in South Dakota in May of 2018 (National Park Service 2018). The first detection occurred at Badlands National Park, followed by detections at Jewel Cave National Monument in 2018 and Wind Cave National Park in 2019 (NPS 2024a). The effects of this disease are being

realized. Reduced capture/detections have been reported by researchers in the region (Whittle 2021). Alston and Abernethy (2022) did not capture any NLEB or little brown bat (*Myotis lucifugus*) in the area surrounding Jewel Cave National Monument in 2022, compared to 2017-2019 surveys where 12% of all bats captured were NLEBs and 12% were little brown bat. A recent winter survey at Jewel Cave (the largest known bat hibernaculum in the Black Hills) revealed significantly lower numbers of all bat species (Alston and Abernethy 2022). Captures of *Myotis* were markedly reduced over a 6-year period at National Parks as the disease became established in the Black Hills (Bernard, personal communication, 29 October 2025).

### Mining

Production of gold, silver, uranium, feldspar and mica occurs on the BHNF in accordance with the 1872 Mining Act (U. S. Forest Service 2006). While these activities may increase overall hibernacula habitat for both TCB and NLEB, these activities also have the potential to increase human use and disturbance.

### Timber harvest

A substantial amount of ponderosa pine harvest occurs on the BHNF. It is the highest timber producing forest within the Rocky Mountain Region of the USFS. Sawtimber demand is high and expected to exceed supply (U. S. Forest Service 2006).

The USFS has an active vegetation management program to manage forest stand conditions and wildlife habitat to reduce hazardous fuels and wildlife severity, to decrease the risk of insect and disease outbreaks, and contribute to the economy of the timber industry. The type of treatment is based on tree size, topographical considerations, and acceptable levels of residual fuels within tree stands. Merchantable timber in the Black Hills is ponderosa pine. To the best of our knowledge, projects that have occurred within the Action Area that have contributed to the modification of available suitable habitat in the last 10 years include the Black Hills Resilient Landscape Project (July 2018) and Triple R Vegetative Management Project (July 2024).

In addition to timber harvest, the USFS conducts a variety of land management activities in the Black Hills that influence bat habitat. These activities include hazard tree removal, firewood collection, and other vegetation management practices. Firewood gathering typically occurs in designated areas near roads, trails, and campgrounds, but is prohibited in areas such as Black Elk Wilderness, the Norbeck Wildlife Preserve, and other administrative sites. While removing standing snags that serve as potential roost sites can negatively affect bats, reducing heavy fuel loads and smaller snags (< 21 cm) help lower the risk of severe wildfire. Research indicates that NLEB show tolerance and adaptability to timber harvest (Cryan 2003, Menzel et al. 2002).

### Tourism and Recreation

Many types of recreation occur in the Action Area on federal and state lands. Mount Rushmore National Memorial is the site most visited by the over 4 million tourists that visit the Black Hills (Narumalani et al. 2009). Recreation on BHNF includes developed and dispersed recreation. Developed recreation includes all recreation activities that take place at a maintained recreation spelunking and exploring, recreational firearm shooting, hunting, fishing, hiking, backpacking, and horseback riding. Dispersed recreation is that portion of outdoor recreation that occurs on all areas of the BHNF outside developed areas. Managed capacity for the BHNF is 750,000

Recreation Visitor Days (RVDs). Predicted demand during the next 10 years is 594,200 RVDs (U.S. Forest Service 2006). Commercial air tours (helicopter flights) occur to provide viewing opportunities of the Memorial, but no air tours are allowed directly over MORU. Private helipads are located the broader Action Area.

Roads are abundant in the project area from past mining, timber harvest, and recreation. Yearlong and seasonal road and trail restrictions are managed through the Motorized Vehicle Use Map for the BHNF. All-terrain vehicles and off-highway vehicles are used in portions of the Action Area year-round. The USFS maintains Forest Development Roads at least every 5 years.

Private Lands. Some private land inholdings exist within the Action Area. Development of these lands into subdivisions may occur. Once open meadows or forested acres are being replaced with developments. Utility companies are expanding their networks to connect to these properties, especially with broadband internet capabilities.

### Fire

Fire is a natural, reoccurring ecological process in the Black Hills. Historically, low-intensity fires occur every 10-15 to 30-40 years depending on elevation. Fewer extensive, high-intensity stand replacing fires also occurred in the past, but at a much larger frequency interval. The USFS conducts broadcast prescribed burns on about 2,000 acres annually. These burns occur in late fall through early spring, pending good burning conditions. Slash piles created from timber harvest are also burned when there is snow on the ground; approximately 2,000 (piles or acres)/year. Wildfires are a regular occurrence in the Black Hills. From 1970 through 2020, eleven of the 5,672 wildfires documented by USFS burned 80% of the 243,375 acres impacted by wildfire on BHNF. Wildfires are suppressed within 24 hours, if possible. The average size of wildfires that occurred during this period is small (<1 acre) (U.S. Forest Service 2006).

### Mountain pine beetle

The mountain pine beetle is an insect native to the coniferous forests of North America. Outbreaks are a natural occurrence in the Black Hills (Graham et al. 2021). Beetle outbreaks and associated tree mortality is a natural process at endemic levels. However, epidemics occur in the Black Hills about every 20 years. Tree mortality can be high with infestation. High-density stands are more susceptible to outbreaks. The BHNF recently endured a nearly 20-year-long epidemic that ended in 2016. It caused extensive tree mortality, created heavy surface fuel loadings, increased grass production, and created the opportunity for prolific regeneration of ponderosa pine (USFS 2023 BHNF forest assessment fire and fuels).

### Livestock grazing.

Livestock grazing is a permitted use on BHNF. Forage allocations and management direction follows the Forest Plan (U.S. Forest Service 2006). Each permittee follows an annual operating plan for their pastures in their allotments. This includes monitoring of livestock forage availability and use. Permitted livestock use is typically between June 1 to October 31.

## Effects of the Action

*Effects of the action - all consequences to listed species or critical habitat that are caused by the proposed action, including the consequences of other activities that are caused by the proposed action but are not part of the action. A consequence is caused by the proposed action if it would not occur but for the proposed action and it is reasonably certain to occur. Effects of the action may occur later in time and may include consequences occurring outside the immediate area involved in the action (50 CFR § 402.02).*

### *Factors to be Considered*

Our effects analysis considers the following factors: proximity, timing, duration, frequency, intensity, and severity of the action.

#### Proximity of the Action:

The full extent of NLEB and TCB bat occurrence throughout the Action Area has been developed using acoustic and capture data collected sporadically over the last 22 years. The recent steep decline in the species' population due to WNS makes the presence of suitable habitat on its own an unreliable predictor of presence; recent observations post-WNS detection are needed to provide a more reliable estimate of bat presence. For our analysis, presence has been detected in the vicinity of MORU after WNS was detected in SD (refer to Environmental Baseline for additional details). The species may move across the landscape as habitat conditions change due to both natural processes (e.g. succession, storm damage) and ongoing management practices. Since presence has been documented post-WNS detection and given the mobility of the species across the landscape, all suitable habitat within the Action Area is presumed occupied for the purposes of this analysis.

Aside from commuting flights, we expect most bat activity (e.g., foraging, drinking, roosting, pup-rearing) would occur primarily within the larger contiguous forest tracts further from the open and developed areas within MORU, specifically the sculpture, visitor's center, and parking lots. Some acoustic records indicate that foraging may occur in edge habitats near developed areas. Forested areas throughout the Action Area, including MORU, provide suitable summer roosting habitat for the species. Much of MORU's forest occurs below MORU's granite and talus slopes and exhibits old-growth ponderosa pine characteristics (Symstad and Bynum 2007), which are known to support bat roosting.

#### Timing:

The Proposed Action would span several weeks, with the fireworks display and associated festivities starting mid-afternoon on 3 July 2026 and may extend through the early morning hours of 4 July 2026. Activities associated with the Proposed Action have the potential to affect NLEB and TCB bats during the day and nighttime hours of their summer occupancy and pup season if activities exceed the baseline disturbances already present in MORU. This specifically relates to the fireworks display, which has both visual and auditory impacts that exceed baseline conditions. Activities associated with site preparation, demobilization, and activities that normally occur within the vicinity of MORU (e.g. helicopter flights), all fall within or

incrementally exceed the baseline disturbance regime. Therefore, the focus of the following analysis reviews the timing of activities that exceed the current disturbance regime.

#### Duration:

Activities covered under this analysis may have short-term and long-term effects to NLEB and TCB bats. Most adverse effects are expected to be short-term and associated with the fireworks display. If similar fireworks displays are planned in the future, environmental contamination from perchlorates and heavy metals may accumulate over time in surface water, ground water, or soils, but this analysis focuses on the current activities planned in 2026.

#### Disturbance Frequency and Intensity:

The disturbance associated with the Proposed Action would occur primarily during the fireworks display on 3 July 2026. The highest intensity disturbance would occur for 30 minutes between 8:30pm and 9:30pm when firework detonation occurs. The other associated activities that occur before and after the event would be within the bounds of the disturbance regime already present at MORU.

#### Disturbance Severity:

We anticipate the number and severity of the stressors to be greatest (and the likelihood of incidental take) near the launch site and decrease with distance. The most intense noise would be created from the detonating fireworks launched near the sculpture. The most severe impact may be to reproductive females with non-volant pups and the colonies to which they belong. Females would be more concentrated during the summer occupancy period, particularly during the pup season when females are birthing and caring for non-volant pups. Individual adult males and nonreproductive females that roost singly in the warm summer months may be of lowest overall risk of mortality or injury due to the ability to fly and escape.

#### *Effects of Action on Individuals:*

Identified stressors and applicable science relevant to the effects of these stressors on the NLEB and TCB are described below.

Stressors resulting from the Proposed Action include anthropogenic noise from fireworks, music, presentations, crowd noise, vehicles, and aircraft; unnatural lighting at night produced from fireworks displays, lighting of both the sculpture and event location, and concentrated traffic at night. Fires may be caused by fireworks and affect habitat and individuals. Contaminants may be introduced into the environment because of fireworks. Physical injury may be possible from falling fireworks debris, vehicle or aircraft strikes. Aircraft also have the potential to cause behavioral changes.

#### Anthropogenic Noise

##### Stressor

Three general sources of anthropogenic noise include fireworks, crowds, and aircraft. The largest stressor is expected to be the sound produced by discharged fireworks, since crowds and aircraft already occur in the vicinity of MORU as part of the existing disturbance regime and would incrementally increase because of the Proposed Action. Crowd noises include multiple

conversations, amplified music and presentations. Aircraft transporting people and equipment and performing aerial displays would also generate noise.

Increased noise would begin late in the afternoon of 3 July 2026 and extend to approximately 11 pm that night. Anthropogenic noise would be consistent, beginning in the afternoon and increasing in magnitude into the evening. Four of the one-way helicopter flights would occur during dusk and again at about 9:30 pm or 10 pm using one of two available helipads. Military aircraft flyovers would occur during daylight and possibly early dusk hours. Fireworks would be launched from the elevated bedrock behind the sculpture of MORU which is at an approximate elevation of 6,000 feet beginning at 8:30 pm. Five-inch mortar fireworks would explode from 152-183 meters (500-600 feet) in the air. These sounds would be intense and repetitive for approximately 30 minutes. Noise is expected to return to normal night-time background levels after many of the visitors have left, likely between 10:30 pm to 11 pm.

Fireworks can produce extremely loud sounds measuring upwards of 150-175 dB and cover a wide range of frequencies (0.02 to 20 kHz; (Tanaka et al. 2016). For context, a human whispering is about 25 dB, an operating chainsaw is 90 dB, and the threshold for pain in humans is 120 dB. Humans hear sound frequencies between 0.02 and 20 kHz. *Myotis spp.* hear sounds from about 1 to 120 kHz and can tolerate loud sounds (~120 dB) within these frequencies. The loudest sound produced by the Proposed Action would be from detonation of the 5"- diameter mortar.

Anthropogenic noise is a stressor that may disrupt normal breeding, feeding, movement, and sheltering activities of NLEB and TCB adults and pups during the pup season. Noise may cause roosting adult bats to either stay at the roost longer, leave roost early, or leave as normal, but travel to another roost or another location to forage. Little to no information is available on the impacts of fireworks noise on bats. Much of the literature evaluates the effects of noise from transportation, mineral extraction, or military action on bats.

Increased noise appears to pose the greatest risk to reproductive females with non-volant pups, primarily because these disturbances may trigger pup abandonment (Fenton 1997, Ferrara and Leberg 2005, West 2016). Startled females may drop pups as they flee the roost. Noise disturbance may force pups to fledge prematurely. Any grounded pups may face high mortality from falls, starvation, or predation. Communication between a female and her pup can also be disrupted, as pup isolation calls (10–30 kHz) overlap with high frequencies generated by fireworks (Mehdizadeh et al. 2021, West 2016). Bats have two areas of heightened hearing sensitivity; one of which falls within this range (Harper 2024). If females are forced to relocate, carrying pups increases energetic costs and predation risk, especially for individuals already stressed by WNS (Lacki et al. 2007). Because females produce only one pup per year, loss of a single pup represents the complete loss of that year's reproductive output (Service 2022).

Noise is also known to act as an aversive stimulus, causing bats to avoid areas affected by noise (Schaub et al. 2008, Luo et al. 2015). Bats displaced from occupied roosts would likely experience a stress response and flee, expending energy reserves. Most are expected to quickly identify suitable alternate roosts nearby with adequate local food and water resources. They may also experience higher predation rates. Passive listening species show a tendency to avoid

especially noisy areas, like that heard near highways (Schaub et al. 2008, Siemers and Schaub 2010). Known distances from noise at which high-frequency, gleaning bat species have negatively responded extends from 10-100 meters from the source (Schaub et al. 2008, Siemers and Schaub 2010, Berthinussen and Altringham 2012, Finch et al. 2020).

Bats that have left the roost to forage may avoid traditional foraging areas and seek out new ones. Avoidance requires both additional energy and increased exposure to predators. These species are characteristically slow flyers, which makes them vulnerable to higher predation rates (U. S. Fish and Wildlife Service 2024).

Anthropogenic noise may degrade foraging habitat. Those that do emerge normally to forage may have reduced foraging efficiency and need to increase the amount of time, number of capture attempts and capture fewer prey items (Schaub et al. 2008, Shannon et al. 2016). Noise that alters female foraging at a time of peak energetic demand, may lead to reduced or missed pup feedings. In response to traffic noise, *Myotis myotis*, also a passive listening bat, required more time to search for prey and was less successful in capturing prey (Siemers and Schaub 2010).

The potential noise effects from military flyovers and helicopter flights are expected to be brief, with noise levels elevated above baseline conditions for several minutes during each pass. High frequency sounds produced by jet engines (20 kHz) reach into the hearing range of *Myotis* spp. However, while the altitudes are lower than normal, these high frequency sounds are absorbed readily in air, attenuate faster, and may be deflected upward under normal atmospheric temperature gradients (Manci 1988). While uncertainty exists regarding the impact of rapidly travelling aircraft at low altitudes on bats, the impact would occur during daylight and early dusk hours when bat activity on the landscape is limited.

Given the overlap in time between the fireworks display and emergence of foraging NLEB, we presume that some percentage of NLEB may still be roosting at the time fireworks are actively being launched. For bats that do not flush from roost sites but remain within roosts due to the noise disturbance, it is anticipated the relatively short duration of the fireworks display would have an insignificant level of effect due to delays in foraging. During inclement weather NLEB may not leave roosts (Geipel et al. 2019), and do not appear to be adversely impacted by these natural events.

Effects of crowd noise are anticipated to be minimal, as human use and presence of MORU already occurs as part of the existing disturbance regime in the area. Limits on attendance will reduce the effects of crowd noise. While noise may extend beyond normal operating hours, these effects are anticipated to be localized to the visitor's area and parking lot MORU.

### Conservation Measures

Limiting maximum fireworks mortar diameter to 5 inches would result in lower amplitude sounds. Restricting the number of visitors (and associated vehicles) to 4,700 attendees would result in quieter crowds with fewer people and would reduce adverse effects.

## Effects Conclusion

Effects of anthropogenic noise caused by the Proposed Action may result in possible mortality of pups, increase energy demands searching for new roosts and foraging areas, degraded foraging areas, less efficient foraging efforts, and increased exposure to predation. Changes in roosting habits, altered foraging and feeding behaviors, increased energy expenditures, and increased exposure to predation may result in take in either the form of harm or harassment.

## Artificial Light

### Stressor

Artificial lighting at night would be from illumination of the visitor's area, parking lots, and sculpture, traffic exiting MORU, and the fireworks display. Artificial lighting would begin at dusk (about 8:15 pm) and slowly increase until dark (about 30 minutes after sunset) and continue until 11 pm on 3 July 2026. From this point on, the amount of artificial light beyond background levels would be concentrated and consistent at the visitor's area, parking lot, and the sculpture. However, many of the areas with artificial lighting during the event are illuminated the same way every night during the summer season at MORU. Hours of operation during the summer months are 5am – 11pm. A thirty-minute program (including presentation and a movie) occurs nightly starting at 9 pm. When this program ends, the Memorial is lit until 11 pm each night. The fireworks display would begin as early as 8:30 pm. This would increase the magnitude and diversify the colors of artificial light, especially in the visitor center area and occur as repeated and irregular flashes of light. Explosions of colors would occur from behind the sculpture up to 600 feet in the air. This would end in approximately 30 minutes. The number of visitors (and vehicles) allowed for this event has been reduced, the amount of traffic on SD Hwy 244 might experience a small pulse of activity and associated headlights.

### Exposure and Response

Artificial lighting may alter normal sheltering, feeding, movement, and breeding behaviors of NLEB and TCB. Bats that travel from roost to foraging areas at this time may remain at the roost and delay or forego foraging.

Established travel corridors that are now illuminated may be avoided or traveled less frequently or faster. Bat activity was reduced dramatically, and the onset of commuting behavior was delayed in the presence of lighting, with no evidence of habituation demonstrating that light pollution may have significant negative impacts upon the selection of flight routes by bats (Stone et al. 2009).

Foraging areas may be avoided or foraging activity reduced in lit areas, effectively degrading foraging habitat. Clutter-adapted, gleaning species such as NLEB are likely a "late night flying" species. Adult NLEB are expected to avoid foraging areas with exposure to artificial lights (U. S. Fish and Wildlife Service 2024a), particularly in the more open, developed areas where the majority of the lighting is anticipated to occur. These types of species have reduced activity in artificially lit areas and delay onset of nightly activities in "late" species. *Myotis* species have been documented to display greater foraging activity in sites away from streetlights (Rydell 1992, Stone et al. 2012). Exposure to artificial light decreased feeding of *Myotis dascycneme* in Europe by 60% (Kuijper 2008). Many bats are sensitive to artificial light at night near their roost

and may delay or cease evening emergence and display slower juvenile growth relative to roosts without artificial light (Voigt et al. 2021).

Prey availability may be reduced in those areas that are not illuminated as invertebrate prey may be lured to brighter areas. Travel to new foraging areas may be required. Increased exposure whether in a lit area or in search of new areas may increase predation rates. Additional or faster travel requires more energy, may decrease fitness and survival of already disease-stressed individuals, and allows less time to care for young, effectively reducing reproductive output.

NLEB primarily forage in more contiguous woodlands and may be less likely to occur in those areas with artificial lighting, such as the visitor center as well as showing avoidance of artificially lit foraging areas. Tree cover may play a role in blocking artificial light from fireworks. Straka et al. (2019) found that dense tree cover damped the negative effects of street lighting on some species, but amplified existing negative or positive effects on others, including some *Myotis* spp. As an understory forager, NLEB may be less affected.

There is potential for vehicle traffic at night to cause light pollution, albeit restricted to a short distance from roadways. The amount of light disturbance is expected to be similar or less extreme than typical (i.e., baseline) vehicle traffic in MORU in July and is expected to be insignificant. As understory foragers, foraging behavior of NLEB may negate the effects of headlights. Azam et al. (2018) recommended separating streetlights from corridors by at least 50 m. NLEB prefer interior or more contiguous forest for foraging, this species would likely not be exposed to vehicle lighting to reach the level of harassment.

### Conservation Measures

The size of mortar has been limited to 5" diameter which would reduce the amount of light emitted from fireworks. The number of attendees would be limited to 4,700. This reduces the number of vehicles, and additional light than might normally be produced by vehicles.

### Effects Conclusion

The effect of lighting is limited based on the short duration of the fireworks show, understory foraging behavior of NLE, previous exposure to similar lighting at the visitor's center and sculpture and limited traffic in and out of the park for the event. Also, given the rarity of NLEB and evidence that *Myotis* species avoid artificially lit areas, the likelihood of NLEB being present is low. If present in the visitor's center areas, the amount of light produced is not appreciably above baseline levels for this time or year and location making effects of artificial lighting insignificant and discountable.

### Fire (heat and smoke)

#### Stressor

Fires ignited by debris may occur at any time during the fireworks show or within the following hours, days and weeks. The location of any fire hinges on fuel levels, wind direction and speed, and moisture levels. Much of the debris is predicted to fall within 671 meters (2, 200 feet) of the launch location. The base of the sculpture is mostly granite and absent of fuel. Embers can be carried by the wind into surrounding forested areas that may have suitable fuel loads. The likelihood of a fire happening depends on adherence to the Go, No-go policy and effectiveness of

the protocol to find debris that may cause a fire. The duration, frequency and magnitude of a fire also depend on the availability and ability of staff to find and respond to any fire as well as weather and fuel conditions at the time of ignition. Fires ignited by debris may occur for several weeks after the event (Weeth 2019).

### Exposure Response

Fire may affect the sheltering, movement, breeding and feeding behavior of NLEB and TCB. Fire may cause direct harm or injury if an individual cannot flee oncoming flames, heat or smoke. Indirect effects include removal or modification of habitat and changes in prey availability.

Volant individuals would be disturbed (Boyles and Aubrey 2006) and nonvolant individuals harmed (Carter et al. 2002) if a roost tree is burned. However, it is most likely that volant individuals would flee advancing fire (Dickinson et al. 2009). This may require additional energy use and increase exposure to predation (although predators would also likely flee). Non-volant pups may also attempt to flush prematurely.

Fire has the potential to damage small to large tracts of suitable roosting/foraging habitat. The area affected is variable. Fire may destroy existing roosts, but burning other trees may create new suitable roosts through disease or rot, and physical injury. Regrowth of recently burned areas may attract prey and increase use of an area by foraging bats. Any effects to occupied roost trees or patches of habitat may be concentrated due to the colonial nature of breeding NLEB.

Carbon monoxide levels reach toxic levels only at the hottest flames, making poisoning a possibility, but unlikely. Fires may generate extensive smoke that could impact all age-classes of bats depending on distance from a fire, and wind speed and direction. Non-volant pups may not be able to escape and may be negatively affected by carbon monoxide poisoning, or smoke inhalation.

### Conservation Measures

In the months leading up to the 3 July 2026, the NPS would carry out scheduled prescribed fire activities as part of its broader Fire Management Plan (NPS 2024b). On October 23, 2025, the NPS conducted a prescribed fire in the Starling Basin unit, situated on the western boundary of MORU between the USFS-managed Black Elk Wilderness and Highway 244. The next priority burn is for Grizzly Creek area.

The NPS has developed a decision framework that requires that the fireworks contractor determine wind speeds to be acceptable (with preferred wind speeds under 10 mph) prior to launch. The contractor would also monitor the area during the event for any unexploded shells and spot fires. A quick response, wildland fire team would respond to any unplanned ignitions.

### Effects Conclusion

The fire prescriptions, previous timber thinning efforts, and limited fuel loads nearest the launch, and Go/No-go protocol, fire response time, and multiple plans for cleanup would greatly reduce the risk and limit the scope of fire. Based upon this analysis and the incorporation of conservation measures, the risk of fire is insignificant and possibly beneficial.

### Physical Injury (Vehicles, Helicopter flights, Military Flyovers, and Fireworks debris)

#### Stressor

Collision with vehicles, aircraft or being struck by falling fireworks debris is a stressor that may injure or kill NLEB or TCB. Vehicle traffic exiting the park and the Action Area would be greatest immediately after the fireworks display lasting for approximately 15-30 minutes. Four of the eight, 1-way helicopter flights would occur during dusk and about 9:30 or 10 and last only minutes. Military aircraft flyovers would occur as daylight begins to fade and into dusk for several minutes and at elevations as low as 1,000 feet AGL. Both vehicle and helicopter traffic would be into and out of the park from various directions. Military aircraft would originate at Ellsworth Air Force Base northeast of the park.

#### Exposure and Response

Vehicle and helicopter traffic in and out of the Action Area would occur during emergence and the peak foraging times for the NLEB. Vehicle strike is a documented source of mortality for bats in both in the US and Europe (Lesiński 2007, Russell et al. 2008). The chance of collision depends on vehicle speed, road volume, number of lanes, and location (Lesiński 2007, Russell et al. 2008, Bennett et al. 2011). Roads located between foraging and roosting areas are more likely to be sources of mortality. Age and life history also influences the chance of vehicle collision mortality, with documented higher mortality rates for young bats vs. adults (Lesiński 2007). The foraging behavior of forest-dwelling gleaners such as NLEB may decrease the change of vehicle collision (Kerth and Melber 2009). *Myotis* sp. tend to avoid artificially lighted areas when foraging. Bats have also been shown to avoid roads if cars were present (Zurcher et al. 2010).

As an understory forager, it is unlikely that NLEB would encounter either helicopters or experience the downdraft that may force them from roosts. However, at low elevation (500 AGL), hovering won't be over a forested area, and two one-way flights would occur after dark. This is likely to be extremely brief (perhaps minutes), and it is anticipated bats would avoid helicopters. Also, the locations of the helipads are in a lit area and may be avoided by NLEB (Service 2024).

In the unlikely event that an individual bat is unable to avoid a helicopter, it is more likely to be pushed off its flight trajectory by rotor wash rather than collide with the helicopter. While uncertainty exists regarding the impact of military aircraft exhibition flights, exposure would be limited to daylight and early dusk hours when bat activity in the landscape is minimal.

The foraging behavior and habitat preferences of NLEB decrease the likelihood that an individual would be traveling through or foraging near the roads within and out of the park because of lighting, sound and possibly presence of vehicles.

#### Conservation Measures

Conservation measures would include limiting the number of visitors to MORU and reduce speed of traffic entering and exiting MORU

#### Effects Conclusion

A limited number of vehicles at slower speeds reduces the likelihood of a vehicle strike. Given the limited number and short duration of helicopter flights and strong rotor wash of the propeller

blades, the risk of physical trauma to bats from direct helicopter collision or rotor wash impacts is also unlikely. The risk of physical injury from vehicles and helicopters associated with this event is insignificant.

Because military flights would occur at an elevation and at a time when bats are less active, the risk of collision is unlikely. Injuries or instances of trauma from charges or falling debris are also unlikely given that bats would probably not be present in the area directly impacted by falling debris and the short duration of the fireworks display. The risk of physical injury to bats is discountable.

### Environmental contaminants

#### Stressor

Exposure and accumulation of contaminants from exploded fireworks (chemicals and debris) is a stressor that may impair water quality, degrade foraging habitat, and possibly reduce the number and quality of insect prey available to foraging bats. Long-term accumulation of contaminants may reduce survival and reproductive rates.

Both debris and chemicals would enter the environment during the fireworks display which would begin at 8:30pm and last for approximately 30 minutes on 3 July 2020. The number of debris and chemicals are unknown. Clean-up efforts conducted by MORU staff after an initial clean up by fireworks contractors in 2020 resulted in an additional 14 pounds of debris from about 25 acres of wooded area north of the sculpture. Cardboard, tape, and other packaging were also collected. Debris fallout is expected to occur within 671 meters (2,200 feet) of the launch site based on information from 2020 and dependent on wind speed and direction the night of the event. Exposure to and accumulation of contaminants may be long-term.

#### Exposure and Response

Chemical contamination may affect individual bats adversely by reducing the quality of water used for drinking and forage in areas with the potential to each insects exposed to contaminates.

Fireworks displays can generate debris containing chemical residues, such as perchlorate, nitrates, and various heavy metals, which are known to pose ecological risks (Bateman et al. 2023) (PB Energy 2011). These substances can be toxic to invertebrates and potentially harmful to water sources that support other wildlife. The amount of environmental contaminants released is difficult to quantify given a number of factors including: number of fireworks launched, the size and type of the fireworks used, the efficiency of combustion, and the composition and quality of the fireworks used and the amount of debris that falls and accumulates. Existing environmental monitoring data suggest that concentrations of these contaminants typically remain below regulatory thresholds (EPA 2025a; EPA 2025b; EPA 2025c; (Hoogestraat and Rowe 2016). However, it is important to note that thresholds for biological effects specific to NLEB are not well established, and sublethal/cumulative or indirect impacts remain poorly understood. Accumulation of contaminants in water and body tissue over time may increase exposure and result in significant effects.

### Conservation Measures

To reduce the amount of debris and contaminants released into the environment, exploded and unexploded shells and mortar rounds within a specified radius of the fireworks launch area would be collected by contractors as part of a clean-up effort. NPS staff anticipate performing additional clean-up for debris undiscovered by contractors. This cleanup effort is expected to reduce the level of chemical contamination thereby minimizing potential adverse effects on local biological communities.

### Effects Conclusion

The transient nature of the fireworks event, combined with the expected dilution of contaminants in aquatic systems supports the conclusion that exposure would be short-term and unlikely to result in significant biological response.

### Summary of effects

The primary activities of the Proposed Action including gather of crowds, fireworks display, use of helicopters and military aircraft and vehicles and associated stressors are summarized in **Table 3**.

**Table 2.** Proposed Action Stressors Summary to NLEB and TCB.

Activity	Stressor				
	Noise	Light	Fire	Contaminants	Physical Injury
crowds	x	x			
fireworks	x	x	x	x	x
aircraft	x				x
vehicle	x	x			x

### Beneficial Effects

The above stressors may incur potential detrimental effects to the NLEB and TCB bats. However, prescribed fire (and even wildfire) has a potential beneficial effect since depending on the prescription and control, fire can maintain or increase suitable roosting and foraging habitat over time. It also reduces the potential for future and/or high severity wildfire. Application of fire in a way that is spatially and temporally variable, results in a heterogeneous forest landscape that appears to benefit North American tree roosting bats (Silvis et al. 2016).

### Species' Response to the Proposed Action

With numbers of individuals and populations of bats likely reaching low levels in the Black Hills due to WNS, the Proposed Action could impact local bat populations that may survive/remain in the area, particularly if reproductive females with non-volant young are impacted.

### Numbers of individuals/populations in the action area affected

The Action Area, and the broader ecosystem of the Black Hills, has not been systematically surveyed to determine the potential number of individual bats or bat populations that may be impacted. However, recent surveys in some areas of the Black Hills are revealing few bats in areas where they had previously been relatively easy to detect. Once among the most common species detected in the Black Hills, the NLEB may now be rare on the landscape, due to WNS. Compared to information available on NLEB presence in the Black Hills, even less information is known about TCB bats in this region. Albeit likely less common than the NLEB, this species is also impacted by WNS. Any surviving females of either species in the Action Area are likely to be concentrated in maternity colonies during the active season. The size of these colonies is likely to be relatively small, but exact number of individuals or populations is currently unknown.

In addition to the lack of systematic surveys, determining numbers of individuals or populations affected by the project is further complicated by other factors. Both the TCB bat and NLEB are small, cryptic, and difficult to identify without having a specimen in hand. Even in hand, the NLEB can be confused with similar species (e.g., little brown bat). Bats occupying roosts that are destroyed may not flee in time, or may be unable to flee (i.e., non-volant pups). Bat mortality or injuries would likely go undetected. Individuals that are observed fleeing the project area are unlikely to be identified to species while in flight. Bats are known to change roosts frequently; the roosts themselves can change, decline, or become unsuitable over time; and new suitable roosts would also develop over time. Given the diverse nature of suitable active season habitats for these bats and the bats' high mobility (with exception of non-volant pups), combined with recent records post-WNS detection, these species presence is likely within the Action Area and they are presumed present.

Given these factors, a surrogate for assessing impacts to NLEB and TCB populations is needed. The best available quantitative surrogate is the number of acres of suitable forest habitat affected. This represents the area of impact where effects may occur to individuals present within the area. Maternity roosting habitat is essential for these species to persist and for population recruitment. Therefore, impacts to these habitats during the pup season would be the primary focus of the species response.

### Sensitivity to change

Both the NLEB and TCB bat exhibit high site fidelity to both maternity roosts and hibernacula; loss of established occupied areas likely is detrimental to individuals that use them. Since the arrival of WNS, significant declines in abundance of both bat species have likely occurred. Given low population sizes, colonies may be more vulnerable to stochastic events.

### Resilience

The resilience of local bat populations is low considering the last documentation of the species was in 2020. Also, WNS has been affecting bat populations for the last eight years. Therefore, the remaining individuals that survive the disease become increasingly important to maintaining local presence of the bats.

### Recovery rate

Although both the NLEB and TCB bat are relatively long-lived (up to 18 and 14 years, respectively), recovery rates are likely low, given their low reproductive output (one and two pups per year, respectively) and reduced population sizes currently assumed due to WNS.

### **Cumulative Effects**

*Cumulative effects include the effects of future non-federal actions that are reasonably certain to occur in the Action Area considered in this biological opinion (50 CFR §402.02).*

Cumulative effects to NLEB and TCB bat could occur because of state or private actions within the Action Area. Portions of CSP occur within the Action Area adjacent to MORU. Routine management is expected to consist of timber and fire management that would affect bat habitat. Additionally, current construction projects in CSP are ongoing (2025-2026). The NPS is also aware of plans for private mineral exploration for lithium (SDPB 2025). Commercial air tours (helicopter flights) occur to provide viewing opportunities of the sculpture, and private helipads are located the area. These tours occur during daylight hours, outside of the bat active period. Forestry treatments such as thinning, fuels reduction, snag and downed dead removal to reduce wildfire potential on private land are likely to occur. Fuelwood gathering is likely to occur on non-federal land. Development and improvements to private property such as access roads and utilities are likely to occur.

### **Analytical Framework for the Jeopardy Determination**

Section 7(a)(2) of the Act requires that federal agencies ensure that any action they authorize, fund, or carry out is not likely to jeopardize the continued existence of listed species. “Jeopardize the continued existence of” means to engage in an action that reasonably would be expected, directly or indirectly, to reduce appreciably the likelihood of both the survival and recovery of a listed species in the wild by reducing the reproduction, numbers, or distribution of that species (50 CFR § 402.02).

The jeopardy analysis in this biological opinion considers the effects of the proposed federal action, and any cumulative effects, on the rangewide survival and recovery of the listed species. It relies on four components: (1) the *Status of the Species*, which describes the rangewide condition of the species, the factors responsible for that condition, and its survival and recovery needs; (2) the *Environmental Baseline*, which analyzes the condition of the species in the Action Area without the consequences to the listed species caused by the Proposed Action, the factors responsible for that condition, and the relationship of the Action Area to the survival and recovery of the species; (3) the *Effects of the Action*, which determines all consequences to listed species that are caused by the proposed federal action; and (4) the *Cumulative Effects*, which evaluates the effects of future non-federal activities in the Action Area on the species. The *Effects of the Action* and *Cumulative Effects* are added to the *Environmental Baseline* and considering the status of the species, the Service formulates its opinion as to whether the Proposed Action is likely to jeopardize the continued existence of the listed species.

## Conclusion

### *Northern Long-eared Bat*

After reviewing the current status of the NLEB, environmental baseline for the Action Area, effects of the proposed Independence Day Holiday Fireworks Event 2026 and cumulative effects, it is the Service's biological opinion that the Proposed Action is not likely to jeopardize the continued existence of the NLEB. The Service reached this conclusion because the project-related effects to the species, when added to the environmental baseline and analyzed in consideration of all potential cumulative effects, would not rise to the level of precluding recovery or reducing the likelihood of survival of the species.

Specific habitat and range factors we considered support this conclusion. The NLEB range covers 30 states, including a broad habitat extent beyond South Dakota. Within South Dakota, the Black Hills is one of several known locations for this species; the 103,680-acre Action Area encompasses about 16% of the species range in South Dakota, and 0.25% of the total species range of 245,157,764 acres (USFWS 2024b). The relatively small portion of the species range, combined with the sparse distribution of this species in the Black Hills, contributes to the conclusion that the Proposed Action would not appreciably diminish recovery of the species.

The nature of effects resulting from the Proposed Action were also considered as part of this conclusion. Fireworks displays have occurred intermittently at MORU in the past, and bat presence has still been detected in the area, indicating that effects from these activities have not eliminated the species. This is likely due to the relatively short duration of effects, and habitat is not removed or destroyed. While habitat degradation would occur during the event, resulting in potential reduced foraging success and displacement, these effects are short term, and there is abundant habitat in the surrounding area for the species to flee. The most adverse effects would be due to the time of year coinciding with the pup season, and the potential for mortality due to abandonment.

As noted above, the number of individuals/populations affected by the project is highly difficult to determine, thus the acreage of impacted suitable roosting and foraging habitat serves as the best surrogate to quantify and evaluate effects on the species. This surrogate applies to all life stages—adult males and females, nonvolant pups, and young-of-year—and focuses on habitats required by species during the pup season: maternity roost trees foraging. Disturbance and likelihood of injury may rise to the level that causes take of young and adults. The unpredictable and novel sounds that would be generated by fireworks during the pup season in suitable habitat may cause bats to startle, flee, or hide (Shannon et al. 2016). Context is important, such as being a reproductive female bat with a non-volant pup during the breeding season (Shannon et al. 2016). The sound doesn't have to be loud to be impactful (Shannon et al. 2016).

Conservation measures are expected to reduce impacts. Limiting the firework mortar size reduces the amount of noise, light, risk of fire, and potential contaminants. Limiting the number of visitors reduces the amount of noise and traffic. A Go, No-go decision framework, prescribed burns, a fire response team, and clean-up of fireworks debris would reduce the risk of wildfire.

*Tricolored Bat*

After reviewing the current status of TCB, the environmental baseline for the Action Area, the effects of the Proposed Action, and the cumulative effects, it is the Service's biological opinion that the Proposed Action is not likely to jeopardize the continued existence of the TCB. The Service reached this conclusion because the project-related effects to the species, when added to the environmental baseline and analyzed in consideration of all potential cumulative effects, would not rise to the level of precluding recovery or reducing the likelihood of survival of the species.

Like the conclusion for NLEB, this conclusion was reached primarily because the impacts of the proposed project are relatively small in the context of the tricolored bat's range. As noted previously, the number of individuals/populations affected by the Proposed Action is highly difficult to determine, thus the acreage of suitable habitat is the best surrogate to quantify and evaluate effects to the species. Suitable habitat for the tricolored bat is not currently known to be limiting in the BHNF and because the species makes use of forest vegetation rather than being reliant on snags or cracks and crevices in live trees, the tricolored bat likely has relatively more suitable habitat available to it than the NLEB. The 103,680 acre Action Area of is rather small in the context of the 1.2 million acres of the Black Hills, and while we do not currently have an estimated acreage of the tricolored bat's overall range, given the overlap and similarity in size of the tricolored bat's range to the NLEB, the proportion of habitat impacted by the current project represents a very small fraction of what is available for the continued persistence of the species.

White-nose syndrome has been present in the Black Hills since at least 2018, likely affecting the tricolored bat and resulting in fewer tricolored bats present on the landscape. Like the NLEB, TCB may be displaced or disturbed. However, while the project is anticipated to take some of those individual bats, especially pups displaced from mothers, not all bats impacted by the project would die or incur injury that would affect their survival. Some may be displaced to adjacent habitat and incur relatively little effects. Although survival (and reproduction) of individuals has become increasingly important considering white-nose syndrome losses, this project is not anticipated to rise to the level of eliminating local tricolored bat populations or affecting the species' persistence.

Conservation measures are expected to reduce impacts. Limiting the firework mortar size reduces the amount of noise, light, risk of fire, and potential contaminants. Limiting the number of visitors reduces the amount of noise and traffic. A Go, No-go decision framework, prescribed burns, a fire response team, and clean-up of fireworks debris would reduce the risk of wildfire.

### **INCIDENTAL TAKE STATEMENT**

Section 9 of the Act and Federal regulation pursuant to section 4(d) of the Act prohibit the take of endangered and threatened species, respectively, without special exemption. Take is defined as to harass, harm, pursue, hunt, shoot, wound, kill, trap, capture or collect, or to attempt to engage in any such conduct. Harass is defined by Service regulations at 50 CFR § 17.3 as an intentional or negligent act or omission which creates the likelihood of injury to wildlife by

annoying it to such an extent as to significantly disrupt normal behavior patterns which include, but are not limited to, breeding, feeding, or sheltering. Harm is defined by the same regulations as an act which kills or injures wildlife. Harm is further defined to include significant habitat modification or degradation that results in death or injury to listed species by significantly impairing essential behavior patterns, including breeding, feeding, or sheltering. Incidental take is defined as take that is incidental to, and not the purpose of, the carrying out of an otherwise lawful activity. Under the terms of section 7(b)(4) and section 7(o)(2), taking that is incidental to and not intended as part of the agency action is not considered to be prohibited taking under the Act if such taking is in compliance with the terms and conditions of this Incidental Take Statement (ITS).

The measures described below are non-discretionary and must be undertaken by the NPS so that they become binding conditions of any grant or permit issued to the applicant, as appropriate, for the exemption in section 7(o)(2) to apply. The NPS has a continuing duty to regulate the activity covered by this incidental take statement. If the NPS (1) fails to assume and implement the terms and conditions or (2) fails to require the applicant to adhere to the terms and conditions of the incidental take statement through enforceable terms that are added to the permit or grant document, the protective coverage of section 7(o)(2) may lapse. To monitor the impact of incidental take, the NPS must report the progress of the action and its impact on the species to the Service as specified in the incidental take statement (50 CFR §402.14(i)(3)).

### **Amount or Extent of Take Anticipated**

#### **Effect of the Take**

In the accompanying biological opinion, the Service determined that this level of anticipated take is not likely to appreciably reduce the survival of the NLEB and TCB. Therefore, the Service concludes the Proposed Action is not likely to result in jeopardy to the species.

#### *Northern Long-eared and Tricolor Bat*

As described in the Effects of the Action, incidental take of NLEB and TCB in the form of both harassment and harm would occur from the Proposed Action. Due to the difficulty in surveying and detecting this species, acres of suitable summer roosting habitat (as described in the *Additional Habitat Information* section) within the 10 km Action Area were used to represent potential effects to this species.

The Service anticipates that incidental take for both these species would be difficult to detect due to its life history and ecology. Bats are difficult to survey because of their nocturnal habits, making direct observation difficult, and species identification is challenging while bats are in flight. Assessing the level of harassment would require documenting altered adult behavior, foraging effort and success rates and amount of energy expended. When documenting effects to roosting bats, locating roosts is both unlikely and difficult as females need to be either observed or captured. Since maternity roosts locations unknown, documenting effects to pups, specifically the amount of food received, increase stress levels, or roost abandonment, increased mortality rate, and/or ability to be heard by the female, are also difficult to accurately measure. In the case

of mortality, documenting such an event would be difficult because of their cryptic appearance and small size. The severe impact of WNS on bats in the Black Hills has caused both populations of NLEB and TCB to decline to the point that individuals of these species are rare, making it a low probability to observe a single individual responding to a stressor.

Given the inconspicuous nature of both the NLEB and TCB, it is impractical for the Service to attempt to quantify the number of individual bats that may be injured, killed, or have a response that significantly disrupts normal behavior from the Proposed Action. However, take of these species can be approximated by quantifying the spatial extent (acres) of the habitat that would be used or degraded as a surrogate indicator of the amount or extent of take that would occur.

The Service expects the incidental take of up to 31,065 acres of suitable summer roosting habitat would occur because of the Proposed Action. This acreage is the total amount of suitable summer roosting habitat in the Action Area across publicly available datasets (Table 1 in the *Additional Habitat Information* section). Incidental take is most likely to occur near the epicenter of the fireworks launch site, and diminish as sound attenuates from the source. However, given the uncertainty surrounding bat presence in the Action Area, combined with the cryptic nature of this species, all suitable habitat is considered as part of the incidental take for the Proposed Action.

Upon implementation of the following reasonable and prudent measures, incidental take of NLEB and TCB will become exempt from the prohibitions described in section 9 of the Act. No other forms of take are exempted under this opinion.

### **Reasonable and Prudent Measures**

Measures to avoid or minimize effects on the NLEB and TCBs resulting from implementation of this Proposed Action have been incorporated into the Project's proposed conservation measures. In addition to these conservation measures, the Service believes the following reasonable and prudent measures are necessary and appropriate to minimize incidental take of the NLEB and TCBs within the Action Area:

- 1) By 15 May 2026, the NPS, in cooperation with the Service, will develop a monitoring plan that will measure the impact of the Proposed Action on NLEB and TCBs as specified in (50 CFR §402.14(i)(4)). The plan will describe specific actions to measure sound, light, and bat activity levels at and around Mount Rushmore National Monument (MORU) before, during, and after the July 2026 fireworks event. Monitoring would be done at MORU and a nearby control location. The resulting data and analysis will provide the best available information to quantify how firework displays affect reproducing bats. The mutually agreed plan will be developed by working with sound, light and bat experts including but not limited to NPS and Service staff.
- 2) NPS, in cooperation with the Service, will assess the impact of the Proposed Action on NLEB and TCBs by monitoring sound, light, and bat activity levels within the Action Area and a control site before, during, and after the July fireworks event. This provides site-specific and contemporary information to better understand how firework displays

affect reproducing bats. Results of the monitoring plan will be submitted to the Service at a mutually agreed upon date identified during the development of the monitoring plan.

### **Terms and Conditions**

To be exempt from the prohibitions of section 9 of the Act, the NPS must ensure compliance with the following terms and conditions, which implement the reasonable and prudent measure described above. These terms and conditions are nondiscretionary. The NPS shall include full implementation and adherence to the conservation measures as a condition of any permit or contract issued for the Proposed Action.

- **TC 1:** Document sound (frequency and amplitude) and light levels at multiple mutually agreed upon locations in and around MORU before, during, and after 3 July 2026 fireworks displays that will provide an adequate representation of the temporal and spatial variation in sound and light conditions that may be relevant to bats. Document and record wind, temperature and humidity levels at appropriate locations and intervals that will help interpret changes in bat activity and sound levels.
- **TC 2:** Monitor bat activity levels and document species present in and around MORU before, during and after the July 2026 fireworks event to provide a reasonable representation of variation in the area. Monitoring should be conducted in 2026 to show conditions before, during, and after fireworks displays. Bat monitoring should occur at or nearby locations where NLEB have been previously documented and include locations from which sound and light are being measured. Final methods would be mutually determined between the NPS and Service.
- **TC 3:** A progress report or meeting update will be provided or conducted by 30 October 2026. Data and a final report will be provided by 31 March 2027 or another mutually agreed upon date.

### **CONSERVATION RECOMMENDATIONS**

Section 7(a)(1) of the Act directs federal agencies to utilize their authorities to further the purposes of the Act by carrying out conservation programs for the benefit of endangered and threatened species. Conservation recommendations are discretionary agency activities to minimize or avoid adverse effects of a Proposed Action on listed species or critical habitat, to help implement recovery plans, or to develop information. The Service recommends the following actions that would further the conservation of both the NLEB and the TCB:

Water quality in Grizzly Bear Creek and Lafferty Gulch have good to excellent water quality and should be maintained. Lafferty Gulch may be particularly susceptible to decreased water quality standards from fireworks-sourced contaminants in the future due to fractures in normally non-porous rocks (Hoogestraat and Rowe 2016). The majority of firework debris collected by MORU staff after 2020 were collected from this watershed (Kencht (2020). Based on monitoring

in the early 2000's Beaver Dam Creek is an impaired waterbody. This creek runs through Starling Basin which is an area known to have reproductive NLEB (Schmidt 2004).

- 1) Continue contaminants monitoring of potassium perchlorate, and possibly other chemicals (such as nitrate) or metals in soils and surface water and groundwater, which are typically present in fireworks. The groundwater system in MORU National Memorial is highly susceptible to contamination. Monitoring before and after implementation would allow for the quantification of any changes in environmental contaminant concentrations. This information can inform adaptive management of future fireworks shows and guide any possible subsequent remediation of contaminated water or soil. The likelihood of adverse effects may increase with the long-term continuation of fireworks events. Absent specific aquatic life benchmarks or water quality criteria for perchlorate, we recommend using other existing available EPA levels for perchlorate and other contaminants.

For the Service to be kept informed of actions minimizing or avoiding adverse effects or benefiting listed species or their habitats, the Service requests notification of the implementation of any conservation recommendations.

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#### **PERSONAL COMMUNICATIONS**

- Bernard, R. F. Electronic mail communication from Dr. Riley Bernard, University of Wyoming, Department of Zoology and Physiology, to Silka Kempema, Service, South Dakota Field Office, dated 29 October 2025.
- Hammesfahr, A. Electronic mail communication from Amy Hammesfahr, U.S. Department of Agriculture, U.S. Forest Service, Black Hills National Forest, Northern Hills Ranger District, to Silka Kempema, Service, South Dakota Field Office, dated 30 January 2026.

## APPENDIX A

# Mount Rushmore National Memorial *Firework sound level modeling*

Winter 2026

### **Background Information**

In early 2026, the National Park Service (NPS) Natural Sounds and Night Skies Division (NSNSD) conducted a rapid assessment of fireworks sound level propagation to inform event plans for the Independence Day Holiday Fireworks event/America250 celebration scheduled for July 3, 2026 at Mount Rushmore National Memorial. The information below details assumptions, methods, results, and other supporting information.

### **Attenuation Calculator Tool**

The Natural Sounds and Night Skies Division (NSNSD) has created a sound mapping tool called Attenuation Calculator, which implements a standard method of calculating the attenuation of noise with distance (ISO 9613-2, 1996). Sound level inputs to Attenuation Calculator are of 1/3rd octave band resolution. The tool assumes that noise is radiated equally in all directions (an omnidirectional source). It accounts for the effects of divergence (spherical spreading loss) at a standard rate, -20 dB per 10-fold increase in distance. It also computes frequency-dependent effects of atmospheric attenuation, according to standard formulae (ISO 9613-1, 1996) and includes a simplified approximation of ground absorption along the transmission path.

The model allows the user to input several variables that affect sound propagation, including: the elevation of the source above ground level (AGL), the height of the receiver (e.g., a person or animal receiving the sound), ambient temperature, relative humidity, atmospheric pressure values, and the porous ground values.

However, the Attenuation Calculator does not account for several additional environmental factors, which require substantially more complex analyses to evaluate effects on sound propagation. The first is terrain shadowing. Topographic features such as mountains alter how sound travels, causing impedance, diffraction, and/or reflection whose effects on attenuation vary by location and frequency. But accounting for terrain shadowing requires detailed digital elevation models, very precise noise source locations, and more complicated algorithms than this

software is programmed to use. For the purposes of this analysis, the calculator assumes flat ground.

It also neglects the role of vegetation, not accounting for the ability of dense foliage to increase attenuation by a few decibels. Receiver level estimates may therefore be inflated slightly, though the effects of vegetation on sound propagation tend to be less than those of terrain shielding.

Next, the ISO 9613-2 standard used by the Calculator assumes that sounds are propagating downwind or equivalently, under a moderate temperature inversion favorable to long-range propagation. Under weather conditions that produce inversions, the Attenuation Calculator will underestimate the noise produced by the noise source.

Lastly, determining cumulative noise levels from multiple contemporaneous events is very complex, depending not only on the intensities of different sound sources and the logarithmic nature of the decibel scale, but also on the interaction between the different waves, particularly whether or not sounds are correlated or uncorrelated. Due to this complexity, the Attenuation Calculator can only model noise from individual discrete events, assuming no overlap in time.

### Model Inputs

We used the 2020 launch site near the Hall of Records Canyon as the expected 2026 launch site (Table 4), as reported in the Biological Assessment November 2025. We assumed ambient temperature of 70 °F, relative humidity of 60%, barometric pressure of 101 kPa, and an ambient sound level of 40 dB LA<sub>eq12hr</sub>.<sup>1</sup> We assumed the fireworks would be a stationary source 1000 ft above ground level. We assumed the area of interest would have a ground porosity of 50% at source, mid-range, and receiver range distances to account for the varied terrain in the area of interest.

**Table 3.** Predicted launch point

Site	Latitude	Longitude
Estimated 2020 Launch Point	43.8793100	-103.4594683
Receiver point ~10 km from MORU centroid	43.8886300	-103.3418000
Avenue of Flags Monitoring Site	43.8765800	-103.4557600

Limited evidence exists for specific source levels of fireworks. We surveyed the literature and estimated 1/3 octave sound pressure levels based on references that provided either empirical measurements, frequency analysis, or regulatory testing of fireworks noise, covering both high-

<sup>1</sup>Ambient sound level estimated from sound level studies conducted at Mount Rushmore NM [NPS Datastore - Mount Rushmore National Memorial: Baseline Ambient Sound Levels 2003](#)

intensity aerial shells and lower-intensity consumer fireworks.<sup>2,3,4,5,6</sup> Table 2 lists approximate sound pressure levels (100 m reference distance) of high and low intensity fireworks at 1/3 octave band center frequencies ranging from 20 to 5000 Hz.

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<sup>2</sup> Tanaka, Tagayasu, Ryoichi Inaba, and Atsuhito Aoyama.

“Noise and Low-Frequency Sound Levels Due to Aerial Fireworks and Prediction of the Occupational Exposure of Pyrotechnicians to Noise.” *Journal of Occupational Health*, vol. 58, no. 6, 2016, pp. 593–601. Japan Society for Occupational Health. DOI: <https://doi.org/10.1539/joh.16-0064-OA>.

<sup>3</sup> Kukulski, Bartłomiej, Tadeusz Wszolek, and Dominik Mleczko.

“The Impact of Fireworks Noise on the Acoustic Climate in Urban Areas.” *Archives of Acoustics*, vol. 43, no. 4, 2018, pp. 621–630. AGH University of Science and Technology.

<sup>4</sup> “Noise Testing of Fireworks.” *Health and Safety Executive Science Division Report HMX/21/28R*, Office for Product Safety and Standards, GOV.UK, Jan. 2023.

<https://assets.publishing.service.gov.uk/media/63da75f7d3bf7f2521335327/noise-testing-of-fireworks.pdf>.

<sup>5</sup> Hayes, Charles D., and Michael D. Lamers.

*Octave and One-Third Octave Acoustic Noise Spectrum Analysis*. NASA Technical Report 32-7052, Jet Propulsion Laboratory, California Institute of Technology, 1967.

<https://ntrs.nasa.gov/api/citations/19670006729/downloads/19670006729.pdf>.

<sup>6</sup> Reategui-Inga, Manuel, et al.

“A Systematic Review of Fireworks Noise and Its Exceedance of WHO Outdoor Limits: Global Trends and Implications.” *International Journal of Sustainable Development and Planning*, vol. 19, no. 2, 2024, pp. 663–670. DOI: <https://doi.org/10.18280/ijmdp.190223>.

**Table 4.** Estimated 1/3 octave spectral signatures for high and low intensity fireworks (100 m reference distance)

Center Frequency (Hz)	Low intensity firework sound level (dB)	High intensity firework sound level (dB)
20	100	115
25	102	118
31.5	105	120
40	108	122
50	110	125
63	112	126
80	110	124
100	108	122
125	105	120
160	100	115
200	95	110
250	90	105
315	85	100
400	80	95
500	75	90
630	70	85
800	65	80
1000	60	75
1250	55	70
1600	55	70
2000	55	70
2500	55	70
3150	55	70
4000	55	65
5000	50	65

## Results

Using previously stated environmental inputs and firework source level spectra, we estimated sound levels (at distances ranging from 50 feet to 25,000 feet) that could result from high and low intensity firework detonations (Table 3). To inform analyses examining a 10 km buffer around the Mount Rushmore National Memorial boundary, we also added a receiver location located approximately 10 km east from the centroid of the park to estimate received sound levels at that distance. Attenuation calculator outputs including contours and associated sound levels were reproduced in ArcGIS Pro layer files and conveyed to project participants.

**Table 5.** Predicted sound levels at distance contours for high and low intensity fireworks

Dist. From Source (ft)	High intensity firework	Low intensity firework
	L <sub>Amax</sub> , dB	L <sub>Amax</sub> , dB
50	100.2	88.0
200	100.0	87.8
400	99.5	87.3
630	98.7	86.5
1000	97.1	84.9
2000	93.0	80.8
4000	87.4	75.2
6300	83.3	71.2
10000	79.0	66.8
16000	74.2	62.1
25000	69.5	57.3
31127 (~10 km)	67.1	54.8

Figure 1 and Figure 2 serve as graphical representations of predicted propagation contours for high and low intensity fireworks.

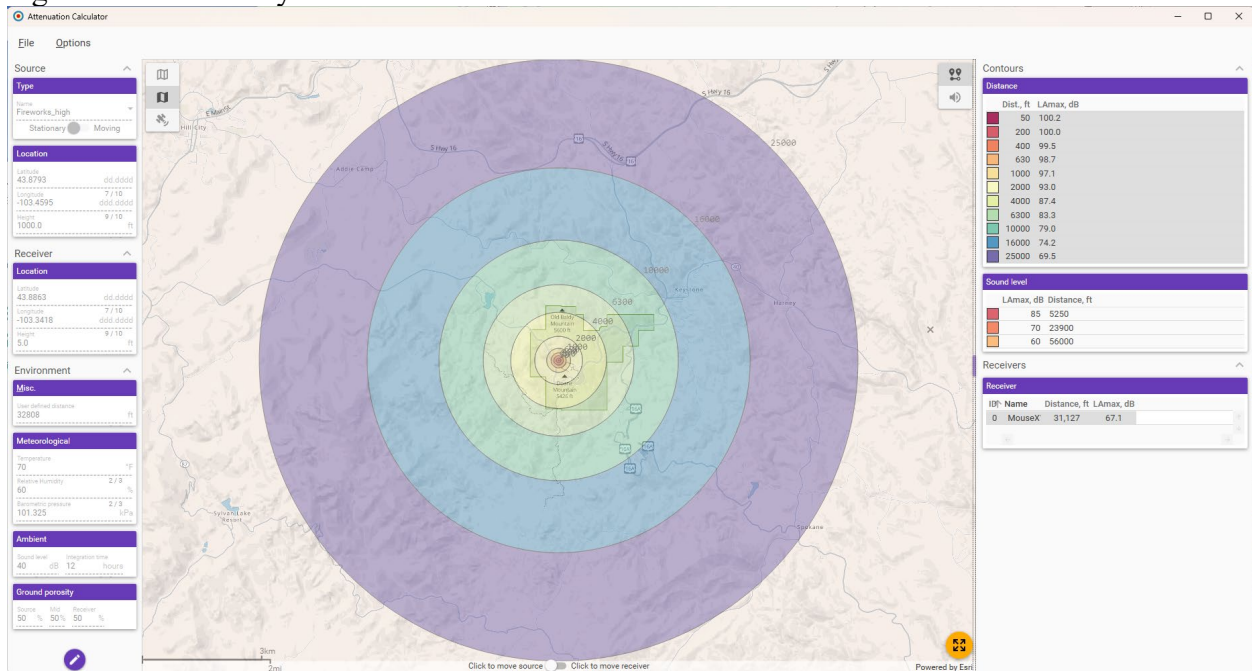


Figure 2. Screenshot of Attenuation Calculator showing input parameters and predicted sound level contours (high intensity firework)

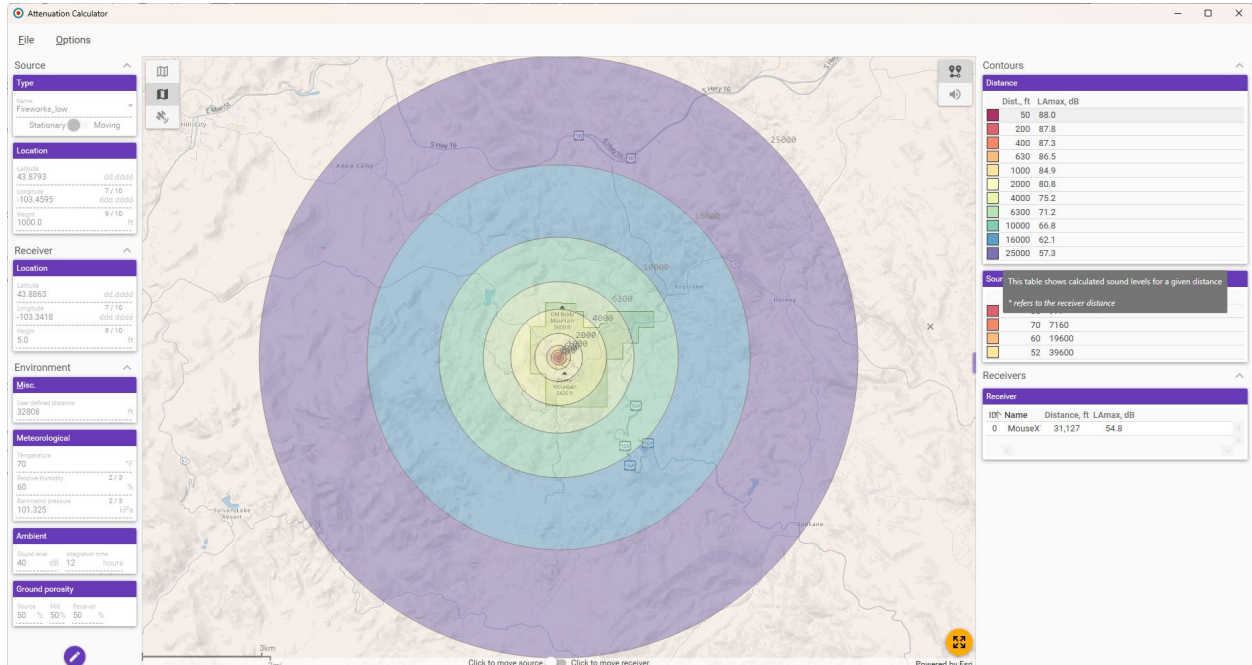


Figure 3. Screenshot of Attenuation Calculator showing input parameters and predicted sound level contours (low intensity firework)

### **Additional supporting information**

During the 2020 fireworks event, staff at Mount Rushmore National Memorial conducted calibrated sound level measurements at a site just south of the Avenue of Flags.<sup>7</sup> During this event they measured sound levels as high as 100 dB (likely  $LA_{max}$ ). Using our inputs and spectra for high/low intensity fireworks, expected levels at that same Avenue of Flags location would be 95.4 dB ( $LA_{max}$ ) under the high intensity scenario and 83.2 dB ( $LA_{max}$ ) under the low intensity scenario. Park staff also measured sound levels during B1 bomber flyovers and recorded sound levels as high as 115 dB.

#### **Natural Resource Stewardship and Science Directorate**

Natural Sounds and Night Skies Division

1201 Oakridge Drive, Suite 200

Fort Collins, CO 80525

(970)556-5632

<http://www.nps.gov/nsnsd>

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<sup>7</sup> Knecht, Philip. 2020 Mount Rushmore Seasonal Report

## **Appendix B: National Historic Preservation Act, Section 106 consultation**



September 10, 2025

Peter Swisher  
National Park Service  
Mount Rushmore National Memorial, 13000 Highway 244, Building 31, Suite 1  
Keystone, SD 57751

## **SECTION 106 PROJECT CONSULTATION**

Project: 250716010F – July 2026 Independence Day Event

Location: Pennington

NPS - National Park Service

Dear Mr. Swisher,

Thank you for the opportunity to comment on the above referenced project pursuant to 54 U.S.C. 306108, also known as Section 106 of the National Historic Preservation Act of 1966 (as amended). The South Dakota Office of the State Historic Preservation Officer (SHPO) concurs with your determination regarding the effect of the proposed undertaking on the non-renewable cultural resources of South Dakota.

On July 16, 2025, SHPO received an Electronic Review & Compliance (ERC) submission, which included your letter dated July 16, 2025, and the form titled, "Assessments of Actions Having An Effect on Historic Properties". On August 13, 2025, SHPO received additional information regarding the development of protection measures for Traditional Cultural Properties (TCPs) and a map indicating the expected location for the proposed firework display and the general area where patriotic entertainment activities will likely occur. The proposed undertaking is for a permit request from the State of South Dakota to hold an Independence Day event at the Mount Rushmore National Memorial, which will include a firework display and potentially other patriotic entertainment.

Based upon the information provided, SHPO concurs with your determination of "No Adverse Effect" for the proposed undertaking provided the prevent measures outlined on page 2 of the provided letter and the mitigation measures outlined on page 7 of the provided form are adhered to. If any relevant information concerning the identification of historic properties or effects on historic properties is submitted by other consulting parties, SHPO would like the opportunity to consider this information. Specifically, we would like the opportunity to take into account any additional information submitted by American Indian tribes who responded with interest in the project.

Changes in the location and/or nature of activities, such as the addition of activities within the Area of Potential Effect (APE) or the development of additional protective measures, from those identified in your request will require the submission of additional documentation pertaining to the identification of historic properties, as described in 36 C.F.R. § 800.4, and/or the undertaking's effects on historic properties, as described in 36 C.F.R. § 800.11.

Concurrence of the SHPO does not relieve the federal agency official from consulting with other appropriate parties, as described in 36 C.F.R. § 800.2(c).





If historic properties are discovered or unanticipated effects on historic properties are found after the agency official has completed the Section 106 process, the agency official shall avoid, minimize or mitigate the adverse effects to such properties and notify the SHPO and Indian tribes that might attach religious and cultural significance to the affected property within 48 hours of the discovery, pursuant to 36 C.F.R. § 800.13.

Should you require any additional information, please contact Katie Wasley at [Katie.Wasley@state.sd.us](mailto:Katie.Wasley@state.sd.us) or at 605-773-2906. Your concern for the non-renewable cultural heritage of our state is appreciated.

Sincerely,  
Garry Guan  
State Historic Preservation Officer

A handwritten signature in cursive script that reads "Katie Wasley".

Katie Wasley  
Review & Compliance Coordinator

CC: Molly Davis - National Park Service  
Ryan Sprague - National Park Service

