

ENVIRONMENTAL BASELINE

Status of the Species in the Action Area

Indiana bat - The action area is within the Ibat Appalachian Mountain Recovery Unit (RU) (Service 2007) and encompasses 2,115 acres in VA and 4,248 acres in WV, of which 1,358.5 and 3,515.3 acres ~~is are~~ forested in VA and WV, respectively (Table ~~4x~~). The Appalachian Mountain RU covers 8,762,586 acres in VA and 15,506,210 acres in WV. The action area is within 0.024% of the Appalachian Mountain RU in VA and 0.027% in WV. The construction ROW is approximately 303.5 miles in WV and VA. The action area contains 6 categories of Ibat habitat: suitable unoccupied summer habitat in VA and WV; known use summer habitat in WV; unknown use summer habitat in VA and WV; known or presumed occupied hibernacula in VA and WV; unknown use spring staging/fall swarming habitat in VA and WV; and known use spring staging/fall swarming habitat in VA and WV.

Commented [SC1]: For now, let's leave all tables un-numbered. I will number them when we have all text finalized.

Suitable unoccupied summer habitat is defined as forested/wooded habitats in an Ibat RU in which survey results per the level of effort outlined in the Range-wide Indiana bat Summer Survey Guidelines (2017b) suggest probable absence during the summer months. ~~ESI conducted~~ Mist-net surveys surveys were conducted at 338 net sites (1,953 complete and 426 partial net nights) within the ~~action area~~ Project Area in VA and WV during the 2015 and 2016 mist-net survey season and no Ibats were captured (ESI 20xx). Approximately 258.6 acres in VA and 1,005.1 acres in WV (276.9 miles in total) proposed for clearing are classified as suitable unoccupied summer habitat (Table x4). This includes an estimated 2 miles of construction ROW in suitable unoccupied summer habitat that will be that will be cleared affected for by the Atlantic Coast Pipeline and Supply Header Pipeline ~~projects~~ in Doddridge and Harrison Counties, WV, for which a non-jeopardy biological opinion was issued by the Service on October 16, 2017. Adverse effects to Ibats in this habitat category are not expected.

Known use summer habitat is defined as areas within a 5-mile radius (home range) of a pregnant female or juvenile capture or within 2.5 miles of a known roost tree. None occurs in VA (Table x3). Approximately 10.3 miles of construction ROW and 10.3 miles of access roads, a total of 227.8 acres, will be cleared within known use summer habitat in WV (Table x4). (FERC 2017b). Potential roost tree surveys were conducted in known use summer habitat in WV and surveys documented 755 potential roost trees, of which 39 were potential primary trees and 716 were potential secondary trees (M.D. Stahl, EQT, email to T. Lennon, Service, October 23, 2017). Primary roosts are used frequently and repeatedly by large numbers of female bats and their young.

Commented [SC2]: In the ACP BO, we used this text "Primary roost trees are more likely to support a maternity colony of Ibats than secondary trees." Why are we changing it?

Unknown use summer habitat is defined as areas that contain suitable habitat where presence/probable absence surveys were not conducted and MVP-FERC has elected to assume Ibat presence. Mist-net surveys were not conducted along approximately 128.9 miles (42.4%) of the ~~proposed~~ construction ROW and 102.3 miles (50%) of access roads in WV and VA (ESI 2015a, ~~and~~ 2015b). Approximately 96.8 miles of construction ROW (19.8 in VA and in 77.0 WV) and 78.2 miles of access roads (13.7 in VA and 64.5 miles in WV), a combined total of 2,157.1 acres (408.38 in VA and 1,748.7 in WV), will be cleared within unknown use summer

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habitat in VA and WV (Table x4). Potential roost tree surveys in unknown use summer habitat in WV documented 5,311 potential roost trees, of which 459 were potential primary trees and 4,852 were potential secondary trees. Potential roost tree surveys in unknown use summer habitat in VA documented 8 potential roost trees, of which 7 were potential primary trees and 1 was a potential secondary tree (M.D. Stahl, EQT, email to T. Lennon, Service, October 23, 2017). Approximately 330.02 acres in WV and 402.70 acres in VA were not surveyed for potential roost trees in unknown use summer habitat.

Commented [LTM4]: Waiting to hear back from MVP about how many of these will be removed by the project.

Known or presumed occupied hibernacula are defined as suitable caves/mine portals which are occupied, or presumed to be occupied, by hibernating Ibats. Potential hibernacula surveys for Ibat were conducted along the proposed Project in action area in VA and WV between November 2014 and January 2017 (FERC 2017b). Initially, potential hibernacula surveys yielded a total of 134 suitable caves/mine portals within 5 miles of the action area. Of these, only X were determined to be suitable based on field survey results or information provided by a team of karst specialists; X of which are within the action area (M.D. Stahl, EQT, email to T. Lennon, Service, October 27, 2017). The team included karst specialists with demonstrated experience in karst and karst hydrogeology in southern WV and southwestern VA. MVP has elected to assume that these X suitable caves/mine portals are occupied by the Ibat. The action area is also within 5 miles of 3 known Ibat hibernacula, 1 in VA and 2 in WV (Table x3). Population estimates for Greenville Saltpeter Cave in WV from the 2014–2016 winter surveys range from 4–16 bats (WVDNR 2016). Population estimates for Patton Cave in WV from the 2013–2015 winter surveys range from 0–2 bats (WVDNR 2013, and 2015). The maximum all-time population estimate for Ibats within Tawney's Cave is 14 (Service 2007), but winter surveys conducted in 2009, 2011, and 2013 documented 0 hibernating Ibats (Powers et al. 2015). The most recent Ibat counts in each hibernaculum are summarized in Table x3. In total, there is 1 known hibernacula (Tawney's Cave) and X presumed occupied hibernacula within the action area in VA and WV (Table x4). Adverse effects to Ibats in this habitat category are not expected.

Commented [LTM5]: Waiting for the spreadsheet to be finalized before I add this info in.

Table x3. Known Ibat hibernacula within 5 miles of the action area.

County, State	Hibernaculum Name	Approximate Distance (miles) to Project ^a	Hibernaculum Priority Number ^b	WNS Status (date)	Ibat Population Estimate (date)
Monroe, WV	Greenville Saltpeter Cave	2 (AR)	4	Confirmed ^{1c} (2012)	16 (2012) 4 (2016)
Monroe, WV	Patton Cave	5 (AR)	4	Confirmed (2010)	2 (2013) 0 (2017)
Giles, VA	Tawney's Cave	0.04 (ROW)	4	Confirmed ^{2d} (2009)	14 (2007) 0 (2013)

^a ROW – construction ROW; AR – access road.

^b Priority 1 is highest priority, and most essential to recovery of the species. Priority 4 is least important to recovery (Service 2007).

^c B.D. Sargent, WVDNR, email to T. Lennon, Service, October 19, 2017.

^d https://microbiology.usgs.gov/documents/Swezey_Garrity_2011.pdf

¹ B.D. Sargent, WVDNR, email to T. Lennon, Service, October 19, 2017.

² https://microbiology.usgs.gov/documents/Swezey_Garrity_2011.pdf

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Unknown use spring staging/fall swarming habitat is defined as areas within a 5-mile radius of a presumed occupied hibernacula. ~~As previously mentioned,~~ There are X caves/mine portals that MVP-FERC is presuming are occupied hibernacula within 5 miles of the action area. Approximately 970.6 acres proposed for clearing are classified as unknown use spring staging/fall swarming habitat in VA and WV (Table x4).

Commented [SC6]: This differs from the definition we used for the ACP BO, which was "Unknown use spring staging/fall swarming habitat is defined as areas within a 5-mile radius of a potentially suitable hibernaculum that have not been surveyed." Why are we changing it?

Known use spring staging/fall swarming habitat is defined as areas within a 5-mile radius of priority 3 and 4 hibernacula or a 10-mile radius of priority 1 and 2 hibernacula. ~~As previously mentioned,~~ There are 3 known Ibat hibernacula within 5 miles of the action area (Table x). Approximately 310.1 acres proposed for clearing are classified as known use spring staging/fall swarming habitat, 138.8 acres in VA and 171.3 acres in WV (Table x4).

~~In certain areas known and unknown use summer habitat and spring staging/fall swarming habitat overlap and, but determining the quantity of that overlap is difficult. Thus, for the purposes of this Opinion, total habitat removed will be classified as either summer habitat or spring staging/fall swarming habitat (Table x).~~

Table x4. Ibat habitat in VA and WV (M.D. Stahl, EQT, email to T. Lennon, Service, October 23, 2017).

Habitat Category ³	VA	WV	Total
Suitable unoccupied summer habitat (acres)	258.55	1,005.12	1,263.6
Known use summer habitat (acres)	0	227.8	227.8
Unknown use summer habitat (acres)	408.4	1,748.7	2,157.1
Known or presumed occupied hibernacula (# of cave/mine portals)			
Unknown use spring staging/fall swarming habitat (acres)	N/A	N/A	970.6 660
Known use spring staging/fall swarming habitat (acres)	138.8	171.3	310.1
Appalachian Mountain RU (acres)			

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The Service (2017a) estimates the 2017 hibernating Ibat population is 425 in VA and 1,076 in WV; these numbers indicate an 8.4% decline in VA and a 54.7% decline in WV since the 2015 census. WNS was first detected in VA and WV during the 2008/2009 winter hibernacula surveys (Stihler 2012, Powers et al. 2015). VA and WV hibernacula surveys indicate Ibat populations

³ ~~In certain areas known and unknown use summer habitat and spring staging/fall swarming habitat overlap, but determining the quantity of that overlap is difficult. Thus, for the purposes of this Opinion, total habitat removed will be classified as either summer habitat or spring staging/fall swarming habitat.~~

have decreased at least 95% since the discovery of WNS (<https://www.fws.gov/midwest/endangered/mammals/inba/pdf/2017IBatPopEstimate5July2017.pdf>). The abundance of Ibats rangewide has declined approximately 20% due to the effects of WNS since its onset in 2006 (<https://www.fws.gov/midwest/endangered/mammals/inba/pdf/2017IBatPopEstimate5July2017.pdf>).

EFFECTS OF THE ACTION

The potential effects of the proposed action are described in Appendix B, Table 4. We did not reach a NE determination for Ibat for any of the subactivities.

The project subactivities that may affect, but are NLAA, the Ibat are described in Appendix B, Table 4; NLAA subactivities. For those subactivities of the proposed action that are determined NLAA Ibat, there will be no further discussion in this Opinion.

There are other subactivities of the project, all of which involve tree removal, that are LAA Ibat (Appendix B, Table 4; LAA subactivities). For some components of the proposed action that are likely to adversely affect Ibats, AMMs have been incorporated to ameliorate those effects and those are also noted in Appendix B Table 4. These subactivities, all of which involve tree removal, will temporarily or permanently remove a total of X acres of suitable habitat in the Ibat Appalachian Mountain RU within 4 habitat categories (Table x). For some components of the proposed action that are likely to adversely affect Ibats, AMMs have been incorporated to ameliorate those effects and those are also noted in Appendix X Table X. Time of year restrictions (TOYR) are one of the primary AMMs used. Table 5 below shows when tree removal activities are proposed in each habitat category. Overall, we expect the TOYR (in Table x) to limit the magnitude and duration of adverse effects/impacts to Ibats from these subactivities, as discussed in this section.

Table 5. Tree clearing TOYR by Ibat habitat category.

Habitat Category	TOYR
Known use summer habitat	Trees will be removed between November 15 and March 31 (winter), when Ibats will not be present
Unknown use summer habitat	Trees will not be removed between June 1 and July 31, when young cannot fly
Unknown use spring staging/fall swarming habitat	Trees will be removed between November 15 and March 31 (winter), and potentially in April, May, August, and September
Known use spring staging/fall swarming habitat	Trees will be removed between November 15 and March 31 (winter), when Ibats will not be present

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Suitable unoccupied summer habitat

Ibats are not expected to be present in suitable unoccupied habitat. Therefore adverse effects to maternity colonies in this habitat category are not expected.

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Known or presumed occupied hibernacula

No impacts are anticipated to Ibat hibernacula or hibernating bats.

Commented [LTM11]: Do we need to mention these habitat categories in this section? If so, should they be moved up to the paragraph discussing subactivities that are NLAA?

Known and unknown use summer habitat

We expect direct and indirect effects to Ibats from tree clearing will occur in known and unknown use summer habitat. Approximately 2,384.9 acres (107.1 miles of construction ROW and 76.5 miles of access road) of known use summer habitat (227.8 acres) and unknown use summer habitat (2,157.1 acres) in VA and WV will be cleared. We anticipate tree clearing will impact current Ibat home ranges; however, not all 2,384.9 acres are expected to be occupied by the Ibats. Ibat home ranges vary in size from 205.1-827.8 acres (Menzel et al. 2005, Sparks et al. 2005, Watrous et al. 2006, Kniewski and Gehrt 2014, Jachowski et al. 2014). The 2,384.9 acres of known and unknown use summer habitat to be cleared represents 3-12 home ranges that will be removed if tree clearing were to occur in large blocks. However, the proposed action is linear and is not anticipated to remove entire potential home ranges rather, sections of potential home ranges. Worst case scenario is potential home ranges will be centered along the 107.6 miles of the construction ROW every 5 miles, affecting 22 potential home ranges. This is not a reasonable scenario for several reasons. First, Ibat home ranges for Ibats are not linear, so it is unlikely that the proposed Project's 125-ft wide construction ROW will alter significant portions of potential Ibat home ranges. Second, if bats are displaced from their home range by the Project it is likely that they will only be displaced from a small portion of their home range, not the entire home range. Third, forest cover in the counties in action area is 55-86% (<https://www.fia.fs.fed.us/tools-data/>), which means that if bats are displaced from their habitat there will likely be alternative habitat available within the action area.

Commented [SC12]: This seems to be the same argument as the previous sentence.

Tree removal in known use summer habitat (outside of the active season)

Tree removal in known use summer habitat during the winter is likely to alter roosting, foraging, and travel habitat within the action area. This may result in displaced Ibats expending additional energy on seeking out alternate roosts, foraging areas, and travel corridors when they return the following season. Increased energy expenditure is expected to result in reduced pregnancy success and/or reduced pup survival. There is also the potential that alternation of habitat and removal of roost trees could disrupt maternity colony cohesion and result in colony fragmentation when bats return the following spring. We anticipate that effects will be greatest to pregnant females returning to these areas the first season after tree removal has occurred.

Fidelity of Ibat maternity colonies to their summer range is well documented. In addition to fidelity to the general summer maternity area, roost trees, although ephemeral in nature, may be occupied by a colony for a number of years until they are no longer available (i.e., the roost has naturally fallen to the ground) or suitable (i.e., the bark has completely fallen off of a snag). Although loss of a roost (e.g., blow down, bark loss) is a natural phenomenon that Ibats must

~~have adapted to deal with regularly~~, the loss of multiple roosts, which could comprise most or all of a home range, likely stresses individual bats, affects reproductive success, and impacts the social structure of a colony (USFWS Service 2007).

Commented [SC13]: We say 2 paragraphs above this isn't going to happen, so why are we talking about it here as a possible effect?

Removal of an Ibat primary roost tree (that is still suitable for roosting) in the winter is expected to result in temporary or permanent colony fragmentation. Smaller colonies may be expected to provide less thermoregulatory benefits for adults and for nonvolant pups in cool spring temperatures. Also, removal of a primary roost is expected to result in increased energy expenditures for affected bats. Female bats have tight energy budgets, and in the spring need to have sufficient energy to keep warm, forage, and sustain pregnancies. Increased flight distances or smaller colonies are expected to result in some percentage of bats having reduced pregnancy success, and/or reduced pup survival. Removal of multiple alternate roost trees in the winter is also expected to result in similar adverse effects.

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We anticipate some of the areas that will be cleared during the winter are currently used as a travel corridor between hibernacula and roost trees and that effects will be greatest to pregnant females that expend additional energy to seek alternate travel corridors as a result of tree clearing. If pregnant females dramatically alter their travel corridor they will divert their energetic demands to seek new corridors and will likely give birth to smaller pups, which could decrease pup survival. Ibats consistently follow tree-lined paths rather than cross open areas (Murray and Kurta 2004) and, depending on the amount of forested habitat in the surrounding area, tree removal may fragment the habitat such that Ibats traveling through the area will be more vulnerable to predation, resulting in injury or death. Because we expect Ibats will avoid the cleared areas, depending on the resulting level of fragmentation, tree clearing is likely to make the remaining forest less suitable for roosting or foraging, which will cause Ibats to expend more energy searching for alternative roosting or foraging sites, delaying their ability to gain post-hibernation weight.

~~One The proposed Project will only cross 1 area of known use summer habitat in WV will be crossed by the proposed action. Rangewide. However, across the entire range of the Ibat,~~ the Service (2007) estimates that less than 10% of existing Ibat maternity colonies ~~are likely to have been detected (USFWS 2007).~~ Therefore, some risk exists that primary roosts or multiple alternate roosts will be removed ~~as part of the Project,~~ but because trees in known use summer habitat will be removed outside of the active season when the roost trees are not in use (between November 15 – March 31), and because we do not anticipate that all maternity colony roost trees will be removed ~~by the Project, it is likely that the effects stress~~ on returning Ibats is decreased.

~~Based on MVP's presence/probable absence surveys, it is clear that not all forested habitat, and not even all suitable forested habitat, is occupied by this species. Therefore, it is likely that the Project will impact forest that is unoccupied by Ibats in known use summer habitat and in the~~ rare instance a primary roost tree is cut, as long as alternate roosts remain in the vicinity, effects associated with loss of individual roost trees are likely to be short-term. There is a substantial amount of roosting habitat in the action area and we expect Ibats will relocate roosting areas with minimal effects to individuals.

Commented [SC15]: Why not use the paragraph from the ACP BO top of page 35 instead of this paragraph?

We expect the same types of effects will occur from tree removal outside of the active season in unknown use summer habitat as those described above for known use summer habitat.

Tree removal in unknown use summer habitat (during the active season)

Tree removal in unknown use summer habitat during the active season (April, May, August, and September) is expected likely to result in direct effects affects to undocumented occupied roosts and foraging areas within the action area for Ibats. AMMs (most tree removal will occur during winter; trees will not be removed between June 1 and July 31 when young cannot fly) will minimize these effects on Ibats from loss of undocumented occupied roosts. While bats may ~~even~~ flee during tree removal, removal of occupied roosts (during spring through fall) will is likely to result in direct injury or mortality to some percentage of bats. This percentage is would be expected to be greater if flightless pups or inexperienced flying juveniles are were also present. Felling roost trees during the active season may result in adverse effects to Ibats. If a bat is in the tree and a tree is cut down, the bat may either stay in the tree and potentially be crushed or fly out (adults or volant pups) (e.g., Belwood 2002) during the day and be more susceptible to predation (e.g., by raptors). The risk is also greater to adults during cooler weather when bats periodically enter torpor and would be unable to arouse quickly enough to respond. Belwood (2002) reported on the felling of a dead maple in a residential lawn in Ohio. One dead adult Ibat female and 33 non-volant young were retrieved by the researcher. Three of the young bats were already dead when they were picked up, and 2 more died subsequently. The rest were apparently retrieved by adult bats that had survived. Risk of injury or death from being crushed when a tree is felled is most likely, but not limited, to impact nonvolant pups. The risk is also greater to adults during cooler weather when bats periodically enter torpor and would be unable to arouse quickly enough to respond. The likelihood of potential roost trees containing larger number of bats is greatest during pregnancy and lactation (April-July) with exit counts falling dramatically after this time. Ibat colonies break up over time with smaller exit counts later in the summer (Barclay and Kurta 2007). Direct effects to Ibats from tree removal associated with this Project will mostly be avoided because MVP expects that most tree removal will occur during the winter. However, in some circumstances, active season tree removal will occur and cannot be avoided. MVP has committed to avoiding removal of Ibat roosting/foraging habitat or travel corridors between June 1 and July 31 as part of the proposed action for this Project. The proposed tree clearing window avoids the lactation portion of the maternity period when young are not volant (June to early July). Cutting trees during this time period has the potential to cause the most severe direct effects because non-volant young are more likely be injured or killed during felling. Therefore, the months of active season tree removal will be limited to April, May, August, and September. This reduces the likelihood of lethal impacts to bats by avoiding the period when Ibat colonies are most concentrated (largest colony counts in fewer trees) and young bats cannot fly. We anticipate a small percentage of Ibats ...

The forested habitat within the Project area and within the action area provides suitable foraging habitat for Ibats. Removal The loss of foraging habitat when bats are present is expected to could directly affect the Ibat by disrupting bat foraging patterns within the action area. During tree clearing, some individual bats may avoid crossing the cleared Project area. Bats in this scenario would be subject to take in the form of harassment as they are displaced from their home range. Due to the availability of suitable foraging opportunities in the surrounding landscape, it is likely that these bats will have little difficulty in establishing new foraging areas. Bats that remain loyal to certain foraging areas may continue to crossing through newly cleared areas in the Project area and would likely will have an increased risk of mortality from predation although this risk is not detectable or measurable. Due to the linear nature of the Project, individual bat foraging areas are

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not likely to be significantly altered and indirect adverse effects to individual bats are not anticipated.

Commented [SC19]: See the ACP BO, last paragraph on p 34. Seems like some/all of the effects info from that paragraph could be used here.

Known and unknown use spring staging/fall swarming habitat

Tree removal in known use spring staging/fall swarming habitat (outside of the active season)

Tree removal in known use spring staging/fall swarming habitat during the winter will remove foraging and roosting areas for a concentrated number of Ibats in an abbreviated season (i.e., spring emergence or fall swarming). Bats use the area around hibernacula to build fat reserves prior to hibernation and to socialize and mate in the fall. In the spring, bats spend a few hours or days around hibernacula or migrate immediately to summer habitat. Clearing trees around hibernacula will permanently decrease foraging and roosting habitat, requiring bats to spend more time searching for food, which could result in bats entering hibernation with less fat reserves resulting in decreased overwinter survival or poorer spring body condition or result in less time on social interactions, which could result in decreased breeding success. The spring emergence period (April through May) is also a sensitive time period for bats because WNS affected bats that do not die during hibernation may be weakened by the effects of the disease and may have extremely reduced fat reserves and damage to wing membranes. -WNS affected bats may have difficulty flying and may be less likely to survive long-distance migrations to summer areas. -They may also emerge from hibernation sites earlier and may be more likely to stay closer to the hibernation site for a longer time period following spring emergence.

Commented [SC20]: How will these bats be effected by this subset of the proposed action?

We do not anticipate Ibats will be present during tree removal activities in known use spring staging/fall swarming habitat, a TOYR (trees will be removed between November 15 and March 31, when Ibats will not be present) will be implemented around known hibernacula in WV and VA and no impacts are anticipated to Ibats hibernacula or hibernating bats. However, as discussed above tree clearing will render the habitat temporarily or permanently unsuitable for use by Ibats.

We expect the same types of effects will occur from tree removal outside of the active season in unknown use spring staging/fall swarming habitat as those described above for known use spring staging/fall swarming habitat.

Tree removal in unknown use spring staging/fall swarming habitat (during the active season)

Tree removal in unknown use spring staging/fall swarming habitat may occur during the active season, which may disrupt bats engaging in fall swarming, spring staging, and roosting behavior. -Bats could potentially be killed or injured, or be forced to flee if an occupied roost tree was cut. -During this time period, bats often roost individually rather than in groups, typically have numerous suitable day-roosts available, and frequently roost-switch. -Therefore, there is less potential to affect a tree being used by multiple bats or a large bat colony, and the potential for direct effects is likely restricted to smaller groups or individual bats. -We expect the same types of effects will occur from tree removal during the active season as those described for unknown use summer habitat above.

MVP has incorporated the following conservation measure into the proposed action to ameliorate some of the effects discussed above: MVP acquired a 121-acre property crossed by the Project in Braxton County, West Virginia. The parcel contains mature, upland deciduous forest dominated

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by mostly oak, hickory, and red maple. There are numerous ATV/hunting trails throughout the property, providing travel/foraging corridors for bats. There are numerous existing snags throughout the property. Approximately 860-ft of the Project crosses the eastern portion of the property. After construction, approximately 106 acres will remain as interior forest and will be maintained as such in perpetuity. There are a variety of options for habitat enhancement on this property, including but not limited to, erection of artificial roost structures and establishment of a permanent water source (enhancements will be discussed in coordination with the Service). Ibats have not been detected on this property as of the date of this Opinion, but protection of this site may benefit Ibats affected by this project in the future.

Commented [SC22]: See page 47 of the ACP BO where we discussed a similar issue. I think this info belongs in the Ibat Impacts to Spp section of the Jeopardy Analysis

CUMULATIVE EFFECTS

The Service is not aware of any future state, tribal, local, or private actions that are reasonably certain to occur within the action area at this time; therefore, no cumulative effects are anticipated.

JEOPARDY ANALYSIS

Analysis for Jeopardy

Impacts to Individuals – The proposed action includes removal of **X acres** of Ibat habitat. Removal of an Ibat roost tree when bats are present is likely to result in bats being injured or killed. ~~Therefore, MVP will restrict the r~~Removal of trees ~~will occur in the project area to the period~~between November 15 ~~and~~ –March 31 in known use summer habitat and known use spring staging/fall swarming habitat when Ibats are not known to be present. For ~~the~~ areas where tree removal will ~~be occurring~~ during the ~~Ibat~~ active season, ~~MVP trees~~ will not ~~be removed~~ ~~trees~~ during ~~the time period of~~ June 1 ~~through~~ –July 31 to avoid the period when Ibat colonies are most concentrated and young bats cannot fly. Thus, we only anticipate a small amount of direct mortality from ~~the felling of tree clearings in the action area~~. However, ~~additional adverse some indirect adverse effects are expected. could still stress some Ibats to the point where take is reasonably certain to occur. For example, t~~Tree clearing outside of the active season is expected to result in the loss ~~he loss~~ of a primary roost tree or multiple alternate roost trees, ~~outside of the active season would~~ causing displaced individuals to expend increased levels of energy while seeking out replacement roost trees when they return the following spring. If increased energy expenditure occurs during a sensitive period of a bat's reproductive cycle (e.g., pregnancy) ~~it is expected to result in~~ some percentage of bats ~~will~~ ~~have~~ ~~ing~~ reduced pregnancy success, and/or reduced pup survival, particularly those that may have already been under other environmental stresses (e.g., WNS). ~~It has been hypothesized that T~~these stresses and delays in reproduction could also result in lower fat reserves being deposited prior to hibernation and ultimately lead to lower winter survival rates. For example, females that do give live birth may have pups with lower birth weights or their pups may have delayed development (i.e., late into the summer). This could in turn affect the overwinter survival of the young-of-the-year bats if their delayed development caused them to enter fall migration and winter hibernation periods with inadequate fat reserves. Tree clearing may also render the foraging habitat and/or travel corridors temporarily or permanently unsuitable for use by Ibats, forcing bats to fly farther while foraging ~~at night~~.

To further minimize and to compensate for adverse impacts to Ibats due to habitat loss, MVP will permanently protect 121 acres of suitable forested habitat within Braxton County, WV.

Commented [SC23]: I don't think this belongs in this section, I think it belongs in the Impacts to Spp section below

Impacts to Populations – As we have concluded that individual Ibats are likely to experience some reduction in their lifetime survival or reproductive success, we need to assess the aggregated consequences of the anticipated reductions in fitness of the exposed individuals on the population to which these individuals belong.

Ibat maternity colonies within 2,384.9 acres of known and unknown use summer habitat will be affected by the Project. There are known maternity colonies scattered throughout VA and WV and we further anticipate that there are other maternity colonies in the action area that are currently undocumented or unknown. We expect the AMMs proposed by MVP (Appendix X Table X) will limit potential adverse impacts to maternity colonies, known and unknown, in the action area. Following the AMMs with TOYR, we expect no direct impacts to known colonies when bats are present (November 15 – March 31) and no direct impacts to unknown colonies when lactating females and non-volant pups are present (June – July). This means important avoidance of impacts to the most sensitive individuals, which in turn avoids major reductions in population numbers and reproductive rate in affected maternity colonies.

For known and unknown colonies, given the linear nature of the Project and small acreage of known and unknown use summer habitat affected by the Project within the action area (0.8%), we do not anticipate significant areas of habitat will be removed or otherwise lost (roosting, foraging areas, travel corridors) in any given colony. Given this, we conclude that adequate habitat and roosts will remain to maintain long-term numbers, reproduction, and viability for any given maternity colony.

For known colonies, TOYR further limit impacts from tree removal to the indirect impacts of projects occurring outside of the active season (i.e., known occupied habitat will not be cut when bats are present). In unknown colonies, however, it is possible that occupied roost trees could be cut down during the early and later portions of the active season. This type of event would certainly cause harassment and harm of every bat in the affected trees. However, we expect few bats to be killed by tree clearing activities for the following reasons:

- As previously stated, due to the TOYR (trees will not be cleared during June and July), we do not expect roosts to be cut when lactating females and immobile pups are present.
- In each event, while some of the affected bats would be killed (physical trauma from the falling tree, predation when fleeing the roost in the daytime), we also anticipate that others would survive by flying to other available roosts. Thus, we conclude that most bats in affected roosts will survive this type of event.
- Given the linear nature of the Project and small acreage of known and unknown use summer habitat affected by the Project within the action area (0.8%), we do not anticipate all or most roosts associated with an unknown colony to occur entirely within the action area. We further expect that adequate roosts will remain (i.e., will not be cut) to maintain long-term colony numbers, reproduction, and viability.

Thus, we conclude that overall long-term health and viability of maternity colonies will not be negatively impacted by MVP's activities.

Ibat spring staging/fall swarming habitat within 1,280.7 acres of known and unknown use spring staging/fall swarming will be affected by the Project. We are aware of 3 known hibernacula (Priority 4) and X presumed occupied hibernacula within 5 miles of the action area. Of these, only 1 known hibernacula (Tawney's Cave) and X presumed occupied hibernacula occur within the action area. As previously stated, we anticipate impacts to individual Ibats at some known and unknown use spring staging/fall swarming populations, both direct and indirect, from tree clearing activities. These impacts are primarily expected in unknown use spring staging/fall swarming habitat during the active season, with more limited impacts at known use spring staging/fall swarming habitat outside of the active season. However, we expect few bats to be killed by tree clearing activities for the following reasons:

- As previously stated, due to the TOYR (trees will be removed between November 15-March 31, when Ibats are not present) in known use spring staging/fall swarming habitat, and the modified TOYR in unknown use spring staging/fall swarming habitat (trees will be removed during the winter, and potentially in April, May, and September), we expect that most tree removal activities will occur when bats are not present.
- We anticipate most effects will occur during the first fall swarm after tree clearing. Bats are expected to acclimate to this change and shift to alternative habitat within the known and unknown use spring staging/fall swarming habitat. All effects are expected to be limited and short-term in nature.
- We do not expect a long-term reduction in any hibernating populations because a significant portion of the known and unknown use spring staging/fall swarming habitat will remain.
- If an occupied roost tree is cut in unknown use spring staging/fall swarming habitat during the active season, while some of the affected bats would be killed (physical trauma from the falling tree, predation when fleeing the roost in the daytime), we also anticipate that others would survive by flying to other available roosts. Thus, we conclude that most bats in affected roosts will survive this type of event.
- As previously concluded for maternity colonies, given the linear nature of the Project and small acreage of known and unknown use spring staging/fall swarming habitat affected by the Project within the action area (0.5%), we do not anticipate significant areas of habitat will be removed or otherwise lost (staging, swarming, roosting, foraging areas, travel corridors). We further expect that adequate roosts will remain (i.e., will not be cut) to maintain long-term numbers, reproduction, and viability of the staging/swarming populations.

Thus, we conclude that overall long-term health and viability of spring staging/fall swarming populations will not be negatively impacted by MVP's activities.

Impacts to Species – As we have concluded that populations of Ibats are unlikely to experience reductions in their fitness, there will be no harmful effects (i.e., there will be no reduction in RND) on the species as a whole. Furthermore, as part of MVP's efforts to complete a project with "no net loss" to the environment, and in collaboration with the Virginia and West Virginia state environmental agencies, a mitigation model has been developed for federally listed bats. The mitigation model utilizes interior forest as the benchmark to which habitat impacts are compared. The goal of the model is to identify the quantity of acres required to fully offset forest impacts from the project. Although negotiations with the state agencies are still ongoing, MVP

has agreed to place funding in an interest bearing account to fund the purchase of optimal bat habitat that is essential to the recovery of the species, throughout VA and WV. The amount of acreage will be determined in coordination with the Service and applicable state agencies prior to construction. A Memorandum of Understanding (MOU) with the agencies is currently being developed to establish criteria for ensuring that the funds from the conservation escrow account are disbursed in accordance with the final mitigation proposal.

CONCLUSION

We considered the current overall declining status of the Ibat and the similar condition of the species within the action area (environmental baseline). We then assessed the effects of the proposed action and the potential for cumulative effects in the action area on individuals, populations, and the species as a whole. These types of effects of the proposed action are currently considered primary factors influencing the status of the species. While they may compound those factors, as stated above, we do not anticipate any reductions in the overall RND of the Ibat. It is the Service's Opinion that authorization to construct and operate the pipeline, as proposed, is not likely to jeopardize the continued existence of the Ibat.

INCIDENTAL TAKE STATEMENT

AMOUNT OR EXTENT OF TAKE ANTICIPATED

The Service analyzed the effects to the species above.

The Service anticipates incidental take of the Ibat will be difficult to detect for the following reasons: species has small body size, finding a dead or impaired specimen is unlikely, and species occurs in habitat (forest and caves) that makes detection difficult. However, the following level of take of this species can be anticipated by loss of X acres because this area contains suitable Ibat habitat. To account for differences in Ibat use of the habitat categories (unknown use habitat vs. known use habitat), a multiplier of 0.5 was used to estimate Ibat use for unknown use summer habitat and unknown use spring staging/fall swarming habitat. The anticipated take is described in Table 6 below.

Table 6. Ibat amount and type of anticipated incidental take.

Species	Amount of Take Anticipated	Life Stage when Take is Anticipated	Type of Take	Take is Anticipated as a Result of
Ibat	Small percent of individuals present within X acres of known use summer habitat	Adults	Harm, Harass, Injure, or Kill	Relocating roosting and foraging areas when returning the following season. Disruption of maternity colony cohesion and colony fragmentation. Reduced pregnancy success and/or reduced pup survival associated with

				increased energy expenditure.
Ibat	Small percent of individuals present within X acres of unknown use summer habitat	Adults	Harm, Harass, Injure, or Kill	Reduced survival and fitness associated with the felling of an undocumented occupied roost tree. Relocating roosting and foraging areas. Disruption of maternity colony cohesion and colony fragmentation. Reduced pregnancy success and/or reduced pup survival associated with increased energy expenditure.
Ibat	Small percent of individuals present within X acres of unknown use spring staging/fall swarming habitat	Adults or pups	Harm, Harass, Injure, or Kill	Reduced overwinter survival associated with loss of fall swarming habitat. Temporary reduced reproduction associated with loss or alteration of spring staging, fall swarming habitat, and summer roosting/foraging habitat. Reduced survival and fitness associated with the felling of an undocumented occupied roost tree.
Ibat	Small percent of individuals present within 310.1 acres known use spring staging/fall swarming habitat	Adults	Harm, Harass, or Kill	Reduced overwinter survival associated with loss of fall swarming habitat. Temporary reduced reproduction associated with loss or alteration of spring staging, fall swarming habitat, and summer roosting/foraging habitat.

REASONABLE AND PRUDENT MEASURES

Indiana bat –

- Provide information to individuals involved in project construction on how to avoid and minimize potential effects to the Ibat.
- Ensure that the proposed conservation measures are effective.

TERMS AND CONDITIONS

In order to be exempt from the prohibitions of Section 9 of the ESA, the FERC must comply with the following terms and conditions, which implement the reasonable and prudent measures

described above and outline required reporting/monitoring requirements. These terms and conditions are nondiscretionary.

Indiana bat –

1. Prior to initiation of on-site work, notify all prospective employees, operators, and contractors about the presence and biology of the Ibat, special provisions necessary to protect the Ibat, activities that may affect the Ibat, and ways to avoid and minimize these effects. This information can be obtained by reading Ibat-related information in this Opinion or a fact sheet containing this information can be created and provided by FERC or the applicant.
2. Develop a site specific plan for the Braxton County conservation property that includes descriptions and locations of the proposed conservation measures. Final plans must be reviewed and approved by the Service prior to the completion of construction. A mechanism for preservation must also be in place by the end of project construction or on a date mutually agreed upon by MVP and the Service.
3. Finalize the Ibat/NLEB mitigation MOU and MOA with the agencies prior to the completion of construction.

MONITORING AND REPORTING REQUIREMENTS

Care must be taken in handling any dead specimens of proposed or listed species to preserve biological material in the best possible state. In conjunction with the preservation of any dead specimens, the finder has the responsibility to ensure that evidence intrinsic to determining the cause of death of the specimen is not unnecessarily disturbed. The finding of dead specimens does not imply enforcement proceedings pursuant to the ESA. The reporting of dead specimens is required to enable the Service to determine if take is reached or exceeded and to ensure that the terms and conditions are appropriate and effective. Upon locating a dead specimen, notify the Service's VA Law Enforcement Office at 804-771-2883 and the Service's VA Field Office (VAFO) at the phone number provided below or at 804-693-6694.

Indiana bat – Monitor Ibat activity around Greenville Saltpeter Cave and Tawney's Cave to determine effects to Ibats in the fall swarming/spring staging areas. Two weeks prior to the start of tree clearing place acoustic monitors outside the entrance of each cave. Monitors will remain in place until 2 hibernating seasons after construction. Provide a report including the raw acoustic data every year on January 30th to the VAFO at sumalee_hoskin@fws.gov and WVFO at tiernan_lennon@fws.gov.

CONSERVATION RECOMMENDATIONS

Section 7(a)(1) of the ESA directs federal agencies to utilize their authorities to further the purposes of the ESA 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.

Indiana bat –

- Fund research on understanding/controlling and mitigating the effects of WNS.
- Fund research to improve knowledge of Ibat use of suitable habitat in WV and VA.
- Plant native trees with exfoliating bark in the temporary construction ROW to replace those that were cleared. Contact VAFO (sumalee_hoskin@fws.gov) and WVFO (tiernan_lennon@fws.gov) for area-specific recommendations.
- Purchase or otherwise protect additional Ibat habitat, particularly known use summer habitat and known use spring staging/fall swarming habitat.
- Conduct mist-net surveys and telemetry studies within 5 miles of the pregnant female capture in Wetzel County (WV) to identify occupied roost trees.

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