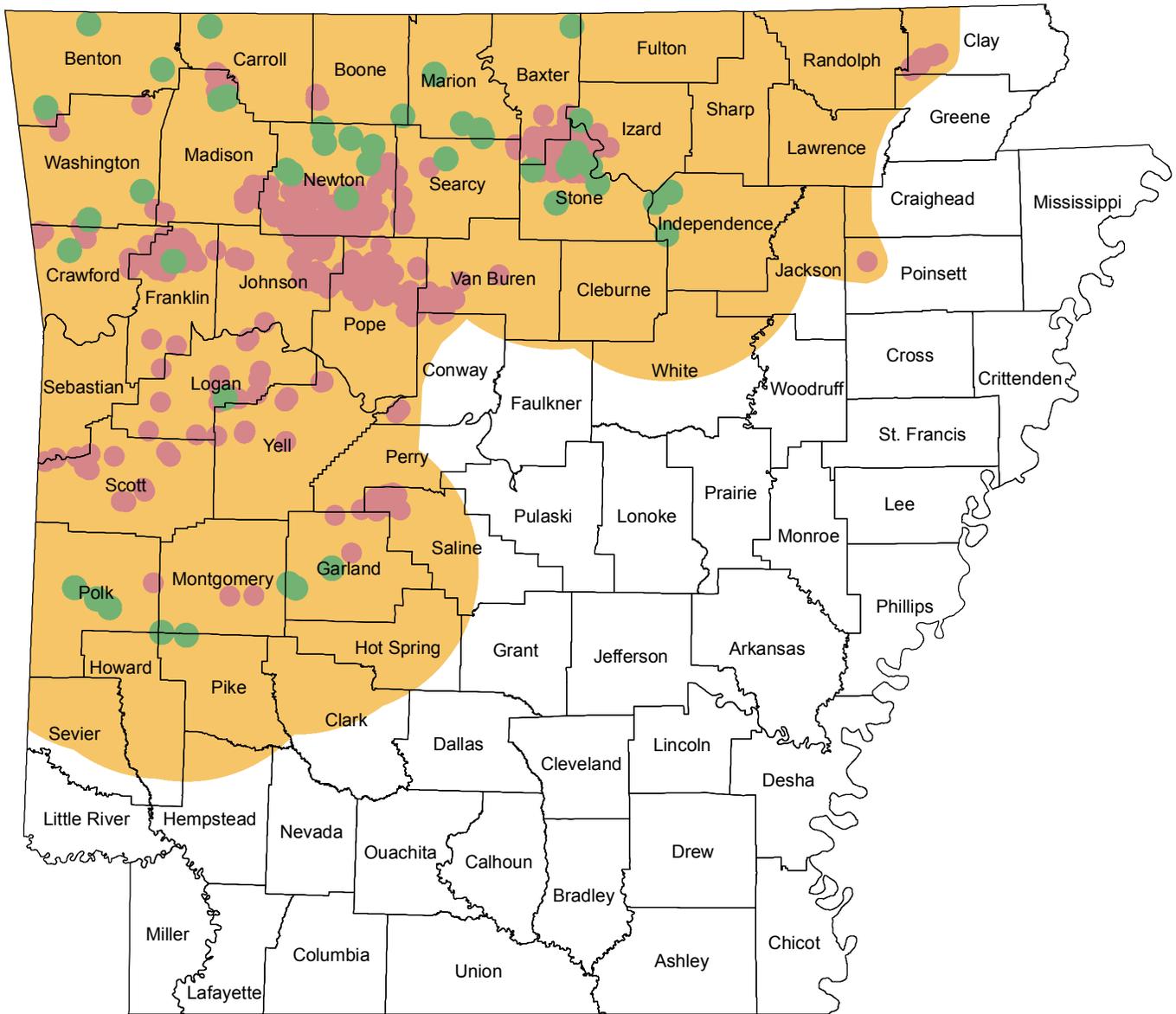


Northern Long-eared Bat



- NLEB Hibernaculum (3mi Buffer)
- NLEB Catch Records (2 1/2mi Buffer)
- NLEB Consultation Area

NORTHERN LONG-EARED BAT CONSULTATION AREA AND SURVEY GUIDANCE FOR ARKANSAS

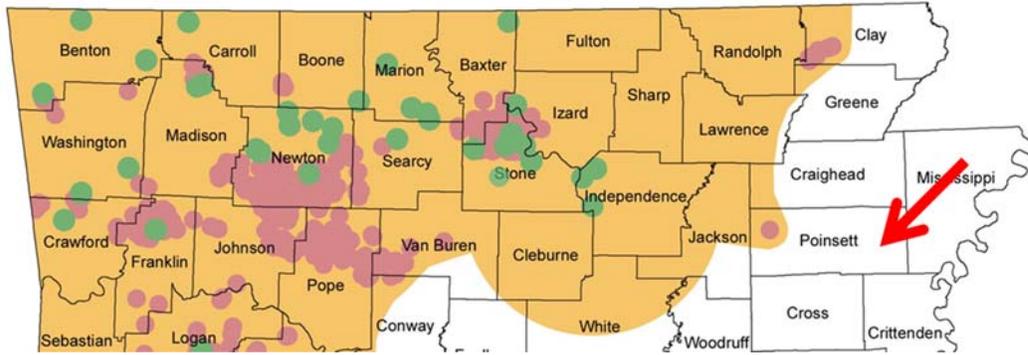
Description of Map Boundaries and Guidelines

The Northern Long-eared bat (NLEB) Endangered Species Act Section 7 Consultation Area (CA) for Arkansas was created by buffering ⁽¹⁾ all known records including: mist net capture, hibernaculum, and maternity sites. Rabies data for Arkansas also was evaluated to further refine the CA. Large gaps between known records are also included in the CA due to the NLEB's migratory potential ⁽²⁾. Gaps are often a lack of survey data not an indication of a negative survey. Individual buffers are also applied to all known records (2.5 miles for mist net captures and maternity roosts; three miles for hibernaculum) within the CA ⁽¹⁾.

Please note the endangered Indiana Bat occurs throughout much of the NLEB range in Arkansas. Therefore surveys may be conducted simultaneously for both species on the same project in these areas using the *2015 Range-wide Indiana Bat Summer Survey Guidelines*. However, the following guidelines regarding consultation and surveys are specific to the NLEB within Arkansas and does not supersede or replace any responsibilities of federal action agencies to avoid, minimize, and mitigate for adverse effects to the Indiana Bat. Additionally, survey requirements (as provided below) are based on the following factors: location, timing, disturbance size, and habitat suitability for NLEB. Project proponents should conduct a habitat assessment prior to conducting surveys to ensure habitat is suitable for NLEBs. During the summer NLEBs typically roost singly or in colonies in cavities, underneath bark, crevices, or hollows of both live and dead trees and/or snags (typically ≥ 3 inches dbh). A presence/absence survey is not required in areas with unsuitable habitat. If necessary, conducting a habitat assessment can be as simple as sending habitat pictures to the Arkansas Ecological Field Office for review.

NO CONSULTATION AREA

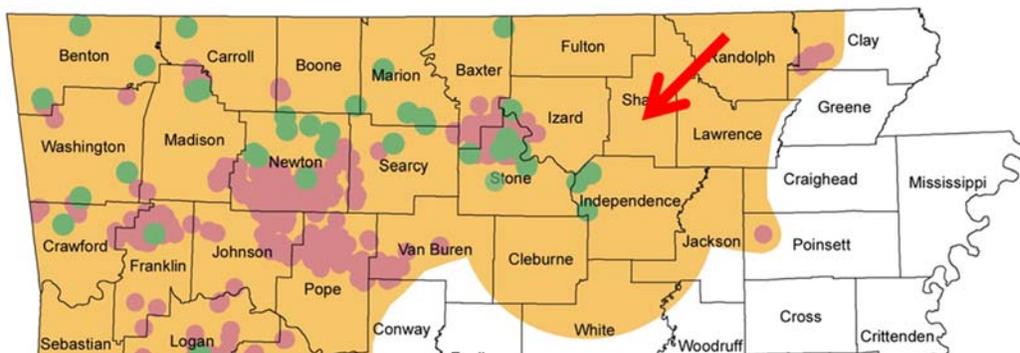
If a project requiring tree removal (i.e., forest management or forest conversion (including clear cutting)) ⁽³⁾ occurs outside of the CA, then no consultation is necessary for NLEB. See map below.



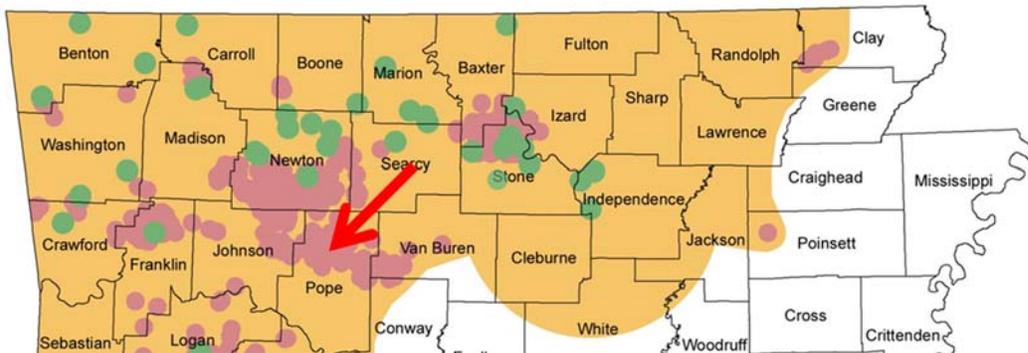
- NLEB Hibernaculum Individual Buffer (3 miles)
- NLEB Catch Record Individual Buffer (2.5 miles)
- NLEB Consultation Area

CONSULTATION AREA – WINTER SEASON

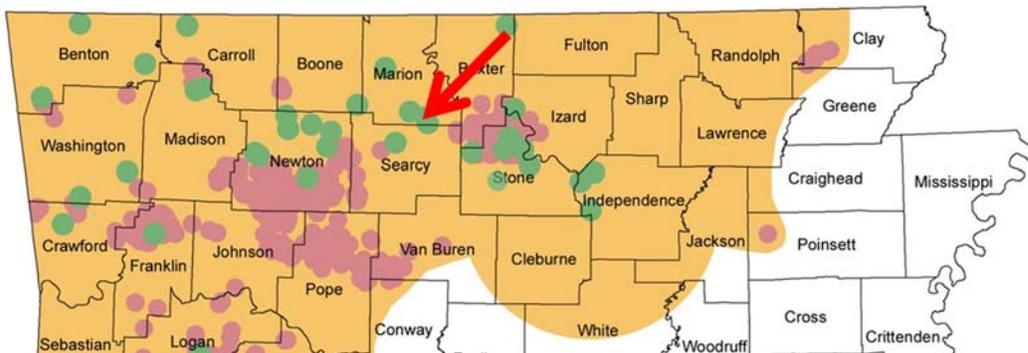
If a project requiring tree removal occurs inside the CA, but outside of an individual buffer, from October 15 – April 1 (winter classification for locations outside of known hibernaculum individual buffer) ⁽⁴⁾, consultation is required. However, the U. S. Fish and Wildlife Service (Service) will not require a survey and with adequate justification a may affect, not likely to adversely affect (NLAA) determination may be appropriate. See map below.



If a project requiring tree removal, other than forest conversion/clear cutting⁽³⁾, occurs within a 2.5 mile catch record individual buffer for mist net captures and known maternity roosts from October 15 – April 1 (winter classification for locations outside of known hibernaculum buffer), consultation is required. However, the Service will not require a survey and with adequate justification a NLAA determination may be appropriate. If forest conversion/clear cutting within a 2.5 mile individual buffer occurs from October 15 – April 1 (winter), consultation is required and an affect determination by the federal action agency will be assessed case by case. See map below.

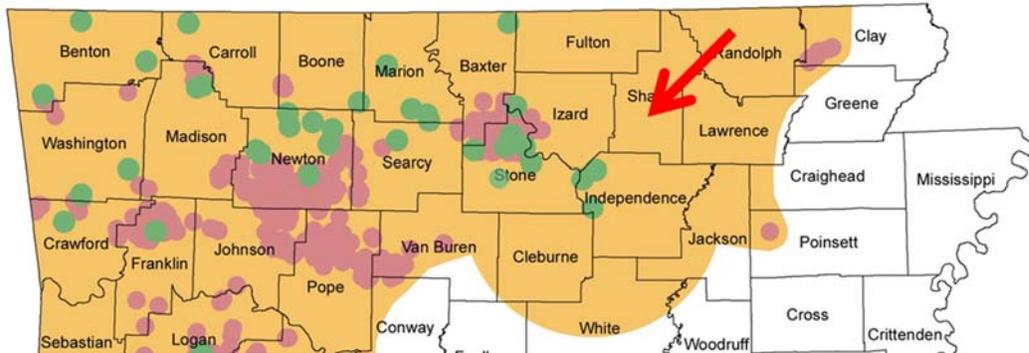


If a project requiring tree removal, other than forest conversion/clear cutting⁽³⁾, occurs within a three mile buffer of known hibernaculum from November 30 – March 15 (winter classification for locations inside of known hibernaculum buffer), consultation is required. However, the Service will not require a survey and with adequate justification a NLAA determination may be appropriate. If forest conversion/clear cutting within a three mile individual buffer occurs from November 30 – March 15 (winter), consultation is required and an affect determination by the federal action agency will be assessed case by case. See map below.

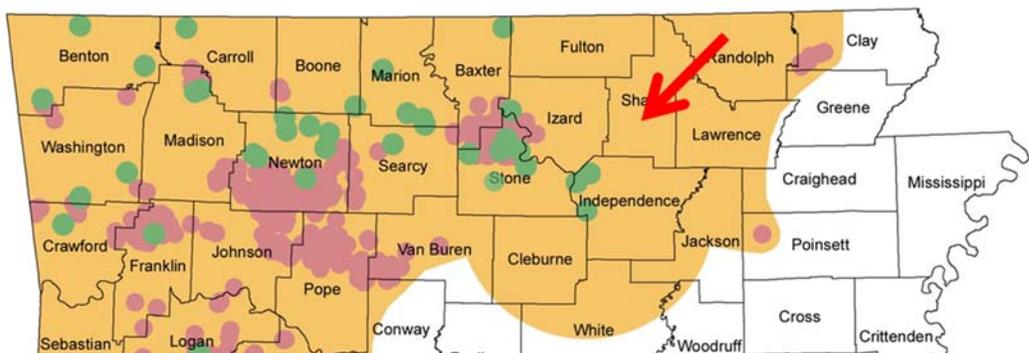


CONSULTATION AREA – SUMMER SEASON

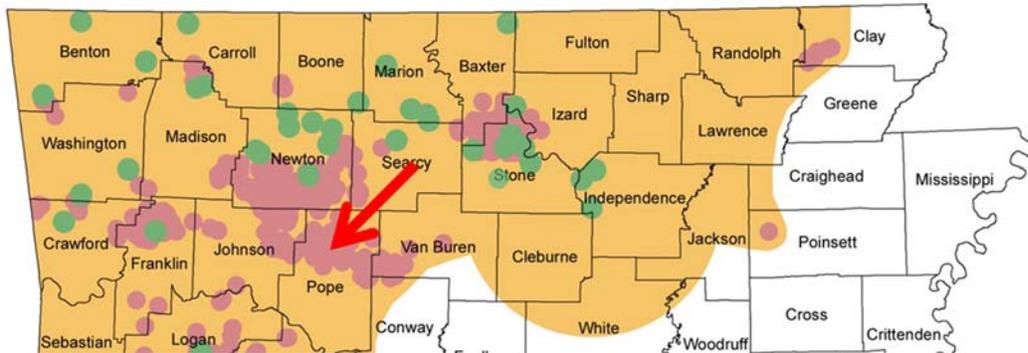
If a project requiring tree removal occurs inside the CA from April 1 – October 15 (summer classification for locations outside of known hibernaculum buffer), but outside of an individual buffer, and the project is **one acre or less** (not necessarily contiguous), consultation is required. However, the Service will not require a survey and with adequate justification a NLAA determination may be appropriate. See map below.



If a project requiring tree removal occurs inside the CA from April 1 – October 15 (summer classification for locations outside of known hibernaculum buffer), but outside of an individual buffer, and the project is **more than one acre** (not necessarily contiguous), consultation and surveys ⁽⁵⁾ will be required if suitable habitat is present. Alternatively, the federal action agency can forego surveys by assuming presence. If presence is assumed or the survey results are positive and NLEB's are present, further consultation is necessary. If the survey results are negative, then with adequate justification, a NLAA determination may be appropriate. See map below.



If a project requiring tree removal occurs within a 2.5 mile catch record individual buffer for mist net captures and known maternity roosts from April 1 – October 15 (summer classification for locations outside of known hibernaculum) and suitable habitat is present, consultation is required and a may affect, likely to adversely affect (LAA) determination may be appropriate. However, if the action agency chooses to survey, with adequate justification and negative survey results, a NLAA determination may be appropriate. See map below.



If a project requiring tree removal occurs within a three mile buffer of known hibernaculum from March 15 – November 30 (summer classification for locations inside of known hibernaculum buffer) and suitable habitat is present, consultation is required and a determination of LAA may be appropriate. However, if the action agency chooses to survey, with adequate justification and negative survey results, a NLAA determination may be appropriate. See map below.



Justification

1. Data suggest that NLEB's will forage one mile away from their roost (Sasse and Pekins 1996). Additionally, Timpone *et al.* (2010) found that roosts trees used by NLEB's are often found within 2.4 miles of each other. Therefore, the Service has buffered all known mist net captures and maternity sites in Arkansas with a 2.5 mile individual buffer.

NLEB's have been documented roosting in trees during the swarming period up to three miles away from their hibernaculum (Lowe 2012). Therefore, the Service has buffered all known hibernaculum in Arkansas with a 3 mile individual buffer.

The NLEB CA was created by buffering known records that occur on the periphery of their known range in Arkansas, by five miles or 35 miles, depending on the location (five miles for mist net captures and maternity roosts; 35 miles for hibernaculum). The five mile buffering around mist net captures and maternity roosts was achieved by doubling the 2.5 mile buffer. The 35 mile buffering around known hibernaculum was set due to the NLEB's known short regional migratory movements of 35 to 55 miles between seasonal habitats (summer roosts and winter hibernaculum) (Nagorsen and Brigham 1993; Griffin 1940b; Caire *et al.* 1979). The 35 mile buffer was determined to be the most appropriate for Arkansas due to existing occurrence and rabies data within the state. See paragraph below (#2) for more information regarding occurrence and rabies data.

2. Large gaps between known records are included in the CA due to the NLEB's migratory potential. Data suggests that the Service should include areas between known summer locations (mist net captures and roosts) and known hibernaculum in the Arkansas CA. However, certain areas of the state (to the south and east of the CA) are excluded from the CA due to the best available scientific data for Arkansas suggesting the absence of NLEB. For instance, Blake Sasse (AGFC pers. comm.) suggests that Pulaski County should not be included in the CA at this time, due to lack of NLEBs submitted for rabies sampling in Pulaski County, over 1300 dead bats have been submitted to the lab, with only one being identified as an NLEB (comprising less than 0.1%). Whereas in the northern Arkansas counties (including counties in the heart of the Ouachita Mountains) which comprise the core of NLEB range in Arkansas, NLEB generally comprise greater than 10% of bats submitted for rabies sampling. Penor *et al.* (1996) conducted a survey at the Camp Joseph T. Robinson Military Installation in North Little Rock (Pulaski and Faulkner Counties), Arkansas and did not capture any NLEB. Also, data have been collected in northeast and east Arkansas to suggest that the CA should not extend any

further into the delta or gulf coastal plain. Even though suitable habitat (bottomland hardwoods) exists in these areas, multiple studies have been conducted in areas with quality habitat (e.g., state-owned wildlife management areas and national wildlife refuges) and no NLEB's have been found (Gardner and McDaniel 1978; Fokidis et al. 2005; Medland et al. 2006). In addition, an annual report submitted by Risch *et al.* (2014) documented 117 net nights of effort in Jackson and Woodruff Counties with zero NLEB captures.

3. "Throughout the range of NLEBs, forest conversion is expected to increase due to commercial and urban development, energy production and transmission, and natural changes. Forest conversion can result in a myriad of effects to the species, including direct loss of habitat, fragmentation of remaining habitat, and direct injury or mortality. Forest conversion is the loss of forest to another land cover type (e.g., grassland, cropland, development, pine plantation) and may result in: loss of suitable roosting or foraging habitat; fragmentation of remaining forest patches, leading to longer flights between suitable roosting and foraging habitat; removal of (fragmenting colonies/networks) travel corridors; and direct injury or mortality (during active season clearing). While forest conversion may occur throughout all States within the species' range, impacts to the NLEB and their habitat typically occur at a more local-scale (*i.e.*, individuals and potentially colonies).

Clearcutting and similar methods is summarized here as the cutting of most or all trees from an area. However, specific definitions are provided within the Society of American Foresters' Dictionary of Forestry. In general, NLEBs prefer intact mixed-type forests with small gaps (*i.e.*, forest trails, small roads, or forest-covered creeks) in forest with sparse or medium vegetation for forage and travel rather than fragmented habitat or areas that have been clearcut.

Forest management activities, unlike forest conversion, typically result in temporary (non-permanent) impacts to NLEB summer habitat. Continued forest management and silviculture is vital to the conservation and recovery of the NLEB. Forest management is the practical application of biological, physical, quantitative, managerial, economic, social, and policy principles to the regeneration, management, utilization and conservation of forests to meet specific goals and objectives (Society of American Foresters (SAF)(a), http://dictionaryofforestry.org/dict/term/forest_management). Silviculture is the art and science of controlling the establishment, growth, composition, health, and quality of forests and woodlands to meet the diverse needs and values of

landowners and society on a sustainable basis (SAF(b), <http://dictionaryofforestry.org/dict/term/silviculture>)” (USFWS NLEB Final Rule 2015).

4. “In general, NLEBs arrive at hibernacula in August or September, enter hibernation in October and November, and emerge from the hibernacula in March or April (Caire *et al.* 1979, p. 405; Whitaker and Hamilton 1998, p. 100; Amelon and Burhans 2006, p. 72). The spring migration period typically runs from mid-March to mid-May (Caire *et al.* 1979, p. 404; Easterla 1968, p. 770; Whitaker and Mumford 2009, p. 207); fall migration typically occurs between mid-August and mid-October” (USFWS NLEB Final Rule 2015).

Therefore, considering Arkansas is located at the southernmost latitude of NLEB range, the data supports the Service’s summer and winter season date designations for Arkansas. More specifically, the data suggests that NLEB’s staging, swarming, and seasonal migratory patterns warrant a longer summer season designation within hibernaculum buffers than other known records (i.e, mist net and maternity). For example, Roger Perry (USFS pers comm) has collected NLEB’s via mist netting near a known hibernaculum in mid-November in Arkansas. These data suggest that NLEB’s were still swarming in mid-November prior to entering their hibernaculum. However, we would not anticipate catching this species outside of the three mile hibernaculum buffer at this time of year. Therefore, areas outside of the three mile hibernaculum buffer, including known mist net capture records and maternity sites, do not warrant an extended summer season designation.

5. NLEB surveys should be conducted between May 15 and August 15. The USFWS's **2015 Range-wide Indiana Bat Summer Survey Guidelines** may be used for presence/probable absence surveys for the NLEB in 2015.

At present, the following acoustic software programs have been approved by the USFWS for presence/probable absence surveys for Indiana bats and NLEB:

BCID version 2.7b or newer

EchoClass version 3.0 or newer

Kaleidoscope Pro version 2.2.2 or newer