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Group Comments to FWS Draft Revised Guidelines on Indiana bat Survey Guidance

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RE: Group Comments to FWS "Draft Revised Rangewide Indiana Bat Summer Survey Guidelines (January 2013)" and Associated Documentation as identified in the Notice of Availability in the Federal Register /Vol. 78, No. 6/Wednesday, January 9, 2013/Notices, pp. 1879-1880.

This comment package is submitted on behalf of 41 individuals – all of them active in bat ecology and ESA compliance for the Indiana bat. Many are permitted by FWS to mist net for Indiana bat in completion of presence-probable absence surveys. The list includes individuals that work with software, hardware, consulting, and academia in both the public and private sector.

Thank you for this opportunity.

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Group Response to FWS Draft Revised Guidelines & Proposed Alt Sample Protocol.pdf
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COLLECTIVE RESPONSE TO:
FWS DRAFT REVISED
RANGEWIDE INDIANA BAT SUMMER SURVEY GUIDELINES
(JANUARY 2013)
AND ASSOCIATED DOCUMENTATION

Elements of this Document:

(11 March 2013)

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This Collective Response
To the FWS Draft Revised
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(January 2013)
and Associated Documentation

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Proposed Alternative Sampling Protocol

We appreciate FWS's efforts to improve upon the 2007 guidelines, but we do not agree with their product in some important way. This document is the combined effort of many individuals to enhance and refine the FWS Draft Revised Rangewide Indiana Bat Summer Survey Guidelines (January 2013) (hereafter FWS DRG).

The role of regulatory compliance is protection of individuals of listed species from impacts that could occur with project development. There are two types of error when meeting this requirement: failing to protect individuals that are present and protecting individuals not present.

Regulatory and scientific communities must use the best available science/information to determine whether a species is present. When this requires sampling, the best techniques should be used. The best techniques should minimize harm, confirm when the species is presence (and to the degree feasible confirm the negative – i.e., absence), avoid false confirmations of presence, and be responsible in terms of timelines and costs.

The best available science clearly indicates that no acoustic software programs accurately and reliably identify Indiana bats. The FWS DRG relies on the assumption that an automated call identification program is available to ID Indiana bats, and this has not happened. Is a continued insistence on techniques that do not work arbitrary and capricious when a better combination of techniques is available?

Our Alternative Protocol uses better science to provide a better product than sampling under the FWS DRG. This is because a combination of sampling methods are used, working from the strength of each. Every technique has strengths and weaknesses; no technique is suitable in every situation. Each technique is used when it provides the best information. The techniques proposed in our Protocol include habitat, netting, and acoustic surveys and radio tracking.

A big advantage of our protocol is its flexibility. Variations on concurrent and sequential net and detector sampling allow biologists to customize their field effort based on the likelihood that bats of the genus *Myotis* are present or absent, and it can play a role in helping to identify productive net sites.

Note: this protocol does not address requirements for winter ecology and it is anticipated that they will continue to be implemented as they are currently.

INTRODUCTION AND BACKGROUND

Sampling for bats in general and Indiana bats specifically consists of trying to find them while they roost, forage, and travel. These activities vary with life stage, season, and for

other reasons, but this discussion, like the Protocol, is limited to the summer maternity season.

The summer ecology of the species is well documented and is not covered here. Suffice it to say, woodlands of many types and many types of openings – especially those within and adjacent woodlands (although not exclusively so) are used. Indeed, both areas with too much or too little forest may be less than optimal for the species. Nevertheless, regulatory compliance is strongly focused on woodland habitats.

AN ALTERNATIVE SAMPLING REGIME

Phase I: Preliminary Habitat Survey

This effort should focus on identifying where to complete field surveys. In large part, as identified in FWS DRG, most (essentially all) wooded lands are potentially suitable travel, forage, or roosting habitat.

The value of a front-end habitat analysis is to determine whether or not, and where, suitable woodland habitats that may support Indiana bats are present, and thus where sampling is required. Areas of known historical or current occurrence (provided by FWS) should typically be treated as occupied habitat and may not require sampling. Detailed field surveys, like those in the FWS DRG to locate potential roost trees in wooded habitats, are unnecessary. Typically, a Preliminary Habitat Survey can be completed in GIS using aerial photography from a variety of sources.

Based on findings of the Preliminary Habitat Survey, one sample site should be placed in each kilometer of habitat along a linear corridor and in each 60 acres of habitat on an areal-based project, where there are no records. This is the level of sampling sites proposed by the FWS DRG.

A study plan should be submitted to FWS for approval. In addition to items 1-5, 7, and 8 identified in FWS RDG Appendix A, the plan should identify locations where potentially suitable habitat will be sampled. If approval from FWS is required to proceed to Phase II, FWS must commit to a timely response period.

Phase II: Field Survey

Field sampling employs both netting and detectors, drawing on the strength of each. Net and detector placement and use should follow those in FWS DRG and in the FWS 2007 Netting Guidelines. See also Appendix 1 below. Criteria provided by FWS for WNS decontamination will also be followed (see Appendix 2 below).

Regardless of whether the project is linear or areal based, the first task undertaken in the field for sampling is to determine whether good net sites are available. Good net sites are those that meet criteria specified in paragraph 2 of the Net Placement section of FWS DRG Appendix C, and criteria provided for net placement in the FWS 2007 Netting Guidelines. Other netting criteria from the FWS 2007 Netting Guidelines should be followed, although we recommend extending the summer sampling season at least

through 31 August and ***strongly*** object to FWS's intent to restrict netting after 1 August (see our response to FAQ #34).

Level of Sampling Effort:

- If good net sites are present, sampling consists of 2 nets for 2 nights (4 net nights), and at least 3 detector nights (which can be completed on a single night).
- If net sites are poor and net sites are not likely to be productive, sampling consists of 2 net for 2 nights (4 net nights) and at least 6 detector nights (typically over a 2-night period).

Notes:

1. *Good habitat – or more narrowly, good roosting habitat, is not synonymous with the availability of good net sites.*
2. *While "good net sites" are best defined by experience field biologists, they are in general defined by netting criteria used in the 2007 guidelines and consist of travel corridors (stream, upland linear openings, and sometimes edges), and sometimes small openings within woods used for foraging and open water where bats drink. Use of "non-characteristic" sites should be justified by the biologist and netting results.*
3. *Some individuals responsible for this protocol believe strongly that net locations should be moved between nights and/or that sampling nights should not be sequential. We strongly encourage this effort as appropriate, especially when net sites are unproductive or under-productive. However, we also acknowledge that if the 2 best sites are netted on the first night, then moving the nets on the second night inherently means that lesser sites are sampled. We encourage net site adjustments to improve them even if the site is not moved in totality. Note this is an important area where netting and detectors work synergistically: if detectors record the presence of large numbers of bats but bats are not caught, net site adjustments are warranted. As feasible, net more net sets, but 2 is the minimum.*

See also Appendix 1 below for a discussion of sampling effort.

Data interpretation:

- If Indiana bats are caught, they are considered to be present
- If No Indiana bats are caught or heard, they are considered to be absent
- If Indiana bats are heard but not caught, complete netting at a minimum of one additional net site (2 nets for 2 nights = 4 net nights); additional efforts beyond the one site are at the digression of the permitted biologist on site. If the Indiana bat is not caught, it is considered to be absent or present in such low numbers that the effects of development *at that site* (in isolation) are insignificant or discountable.

We encourage detector sampling in advance of netting to (a) help place nets in productive locations, (b) screen sites to reduce netting effort, and (c) extend combined detector and net sampling over a longer time frame, up to 4 instead of 2 days. If sites are sampled with detectors in advance of netting:

- 3 detector nights of “advance sampling” can be used in conjunction with netting of a site with good net sites
- 6 detector nights of “advance sampling” can be used in conjunction with netting of a site with poor net sites
- 6 detector nights (over 2 nights) that fail to produce any *Myotis* calls, can exclude a site from netting

See Appendix A for a degree of equivalency between netting and detector efforts.

A big advantage of our sampling protocol is its flexibility. It accommodates concurrent netting and detector sampling for areas where it is anticipated that *Myotis* are likely to occur while allowing advanced sampling to help select net sites. It also accommodates exclusively detector sampling, where *Myotis* are unlikely to occur, such as in portions of the northeast where WNS has seriously reduce numbers of *Myotis*.

If bats are caught, telemetry efforts ensue, following FWS DRG (page 27 Appendix D Phase 4 Radio-Tracking) and 2007 Netting Guidelines.

Note: The intent of our proposed guidelines is to utilize the best aspects of <u>both</u> *netting and detectors. However, some individuals believe strongly that there should be greater flexibility to swap between netting and detectors, noting that just as some locations lack functional net sites, some locations lack functional detector sites. When this occurs (and is documented) surveyors can use 4 nets (rather than 2) per night and no detectors.*

Phase III: Detailed Assessment of Occupied Habitat

When a bat is caught and telemetry studies are completed, a detailed habitat survey should be employed to ascertain the quantity and quality of habitat within 2.5 miles of the colony (or 5 miles of the capture site) that will be lost or impacted with project development.

This effort should include, at a minimum, elements identified in the FWS DRG, but we encourage incorporation of additional criteria (e.g., see Tinsley et al., 2013 SBDN). These data provide the basis for impact assessment of occupied habitat and a base line for avoidance and minimization of impacts and for conservation/mitigation measures.

Appendix 1: Field Survey

Level of Effort

The FWS DRG provides no justification for the level of sampling proposed.

The level of sampling effort we propose in this Protocol:

- Addresses the fact that while more effort is more likely to find bats, this relationship is likely asymptotic to 100% detection, requiring large geometric increases in effort for small arithmetic increases in capture. We believe the proposed level of netting effort has been shown to be high on this curve. In addition, responsible sampling requires a balance between time/costs and results.
- Is generally comparable to effort identified by Romeling et al. (2012), where detectors take an average 28 sample nights to verify presence of known Indiana bats. Thus:
  - ✓ 1 net site (4 net nights) is roughly equivalent to 3 detector nights
  - ✓ Netting a corridor crossing a 2.5 mile radius circle (colony's assumed home range) requires 32 net nights and 24 to 48 detector nights (or 56 to 80 sample nights). If half the length has habitat, the effort is about 34 sample nights.
  - ✓ Based on 1 site per 60 acres, netting a 1 square kilometer (247 ac) areal tract produces 16 net nights and 12 to 24 detector nights (or 28 to 40 sample nights). Netting a 2.5 mile radius circle requires 4 times as much effort.

Note: FWS DRG Appendix B Phase 2 Acoustic Surveys *defines a linear corridor as 100 meters (328 feet) in width. Page 2 FWS DRG says sample sites can be placed up to 1000 feet (305 meters) outside a project boundary. These are in conflict. If a site 305 meters outside samples ONLY towards the project area and the corridor is Zero meters wide, then the* sample *corridor is 610 m wide, but if extended equidistance away from the corridor, the sampled corridor is 1220 meters. A corridor 100 meters wide has a 1320 meters (1.32 km) sample corridor. We propose a simpler scheme. Allow sampling within and survey coverage 0.5 kilometers either side of the centerline, for a total corridor wide of 1 kilometer. It is biologically defensible based on the 2.5 mile radius circle used by a maternity colony and DRG (Appendix C Phase 3 Mist-netting) allows netting within 1 mile of a detection site. More poignantly, if net sites are placed at a 1-kilometer interval along corridors, then coverage extends 0.5 kilometer each direction – along the line and on either side!*

Netting

Nets typically are placed to capture traveling bats: open intra-woodland corridors (man-made and streams), wooded corridors between wooded areas (e.g., fence rows), and woodland edges. Although netting can be adapted to sample for foraging bats, the time and cost is substantially greater than for sampling travel corridors, and so is not part of the standard sampling protocol.

Problems with netting include the ability of researchers to accurately identify the bats caught, the ability to sample some locations (there are no sky hooks to put nets high in open spaces), and the effectiveness/bias of sampling – i.e., species or individuals are

better at avoiding capture or escaping once captured and species frequent sites with differing habitat attributes that may be unknown to the researcher. However, the first of these should be minimal if permittees are properly vetted.

Although some individual logically believe that netting may increase the probability of transmitting WNS, this is conjecture without scientific validation.

Acoustic
Acoustic devices sample calls of traveling bats.

Of the sampling techniques, "listening" for bats should be least detrimental to individuals. Detectors can sample areas where nets cannot be used or would be ineffective, such as open areas, on structures (e.g., met towers), and where good net sites are lacking (regardless of the quality of the habitat).

Unfortunately, sampling as defined in the FWS DRG must be restricted to a subset of larger, open areas. Smaller travel corridors often used by Indiana bats, such as intra-woodland corridors (man-made and streams), areas immediately adjacent to wooded edges, and the space above water surfaces (streams) cannot be sampled because bats alter their calls in these environments or the environment affects the quality of call recorded.

FWS DRG propose sampling larger open areas (e.g., along woodland edges) where bats use search phase calls to look for food or water (and obstacles), and these calls are less discernible and more likely to be confused with calls of other species.

Appendix 2: WNS Decontamination Protocol

FWS DRG require summer mist netting equipment that comes in contact with bats be disinfected based on procedures outlined in the *National White-Nose Syndrome Decontamination Protocol - Version 06.25.2012*.

Preventing spread of WNS is a FWS priority, so decontamination procedures must be a priority. Unfortunately, the WNS Protocol does not address summer mist netting, and in general lacks scientific clarity, making it difficult to interpret and use. The Protocol should including a simple, detailed explanation of decontamination materials and methods required to meet minimum decontamination requirements. To make the document more informative and easier to understand, it should include the science behind the guidelines: what tests were conducted (concentrations, times, and other methods) and test results.

Response TO FWS FAQs for Draft Revised Guidelines

Our document is the combined effort of many individuals to identify areas of concern in the FWS Draft Revised Rangewide Indiana Bat Summer Survey Guidelines (January 2013), Contingency Plan, and associated documents (Frequently Asked Questions - FAQs), and most importantly to provide an alternative sampling scenario.

We anticipated that FWS would provide a compelling argument for merits of proposed changes, based on 'best available science.' However, the document seemed first to be a forum for opinion management. The FAQ document (and by reference the "Contingency Plan") states no less than 12 times that detectors are better than netting – often with the phrase "more effective and efficient". However, FWS also correctly states in FAQ #30 that no automated software program has been field tested and published in peer-reviewed scientific literature. Restated, *there is no validated automated software available to ID Indiana bats*. Indeed, recent and on-going efforts show that existing automated programs consistently incorrectly ID Indiana bats and related species of *Myotis*: eight presentations at the February 2013 SBDN meeting confirmed that software is not available to satisfy FWS criteria.

Because automated call identification is integral and essential to acoustic sampling, the claim by FWS that acoustic sampling is better - "more effective and efficient" - is unsubstantiated. It is not best available science. Indeed, more effective sampling in terms of a "higher detection probability" based on faulty automated call ID is the likely product of *finding Indiana bats when they are not present*.

Thus, while we support FWS in their desire to improve sampling, we do not agree with their opening statement of the FAQ document (FAQ #1 sentence 1): "we *believe* there are new and improved ways to detect the presence of Indiana bats in the summer" [emphasis added]).

Instead, a combination of sampling methods can be used to improve detection and determine presence or probable absence of Indiana bats in summer habitats.

The State of Detection

It is clear that at this time, automated call ID, an essential element of FWS DRG, does not work at the required level and no amount of discussion on types of detectors and their application (FAQ #10 – 15) or the statistical models behind call ID (FAQ #26 & 27) changes that.

There is a simple, ecologically based explanation. The calls of various species, and most importantly closely related species, are similar and exhibit considerable overlap in quantifiable aspects. The calls are most different when bats are flying in an uncluttered environment and they are not feeding. Calls emitted in a cluttered environment and while feeding, are more variable and may be similar to calls of other species.

In order to learn differences in calls among species, calls are collected (call libraries) in an uncluttered environment when the bats are not feeding. Calls that do not conform to this need are excluded from the library by using very selective recording sites (including moving bats to preferred sites) and by culling calls that do not conform, including approach phase calls. Based on these "best case scenario" calls, physical attributes of the calls are quantitatively characterized, and when this is done well, the calls of species of bats collected within the best case can be identified probabilistically – i.e., automated call ID is possible. Tests on the accuracy of automated call ID are performed on calls also collected under a best case scenario.

Automated call identification is only as good as the call library and the quality of the calls collected for identification. Unfortunately, when sampling under natural conditions, bats most frequently are not found in best case scenarios. They are often active in cluttered environments and they are often feeding. Thus, differences between conditions for recording call libraries and survey conditions produce differences in the calls, which is a serious obstacle to correct automated call ID. Calls collected under natural conditions are more variable and thus more likely to be similar to, confused with, and misidentified as calls of other species, especially similar species (for example, species in the genus *Myotis*). This leads to both Type I (finding Indiana bats when they are not present) and Type II errors (not finding Indiana bats when they are present).

In a sense, libraries can be viewed as a statistical population, while calls recorded during surveys can be viewed as a statistical sample. Because of differences in recording conditions, it is, statistically speaking, often incorrect to view calls recorded under survey conditions as a sample of the population of calls included in a library.

In an attempt to compensate for this, FWS DRG require sampling where the calls that are collected better conform to conditions used to build the models for automated ID – i.e. bats are flying in the open and not using search phase calls. Unfortunately, Indiana bats most often travel in acoustically cluttered environments – within woodland corridors (streams and trails) and adjacent to woodland edges within or outside the woodlands. Unfortunately, even flight in open areas does not guarantee that search phase calls are not being used as bats feed and drink.

Detectors therefore do not effectively sample many habitats, perhaps most habitats, frequented by Indiana bats. In FAQ #1, FWS states that "mist nets cannot be deployed in all habitats used by Indiana bats." It is perhaps even more accurate to state that detectors do not record library-comparable search-phase calls in all habitats used by Indiana bats.

The open areas to which FWS DRG constrain sampling are often uncommon, and this constraint may negate one claimed benefits of detectors – efficiency, the ability to survey a large number of locations with relatively little effort. Sampling such areas, and only such areas, is not representative of the habitat used by a species, nor is it likely to determine presence or probable absence on its own.

Every sampling method has strengths and weaknesses. Therefore, a sampling regime that utilizes the strengths of each technique is better than relying upon the weakness of either alone. FWS overlooks this fact in FAQ #20.

Included with our document is a combined netting and acoustic sampling methodology that emphasizes the strengths of each.

Use of the FWS Contingency Plan

This is addressed in FAQ # 33, but because it seems likely, based on recent FWS input, that the DRG will default to the Contingency Plan in 2013, it is addressed here as well. Flaws that plague the DRG are also in the Contingency Plan, and are amplified by adding a step.

The Contingency Plan requires sampling with detectors, adding the step of scrutinizing for high call frequencies, and when found, using software that is unreliable for use in the DRG to identify bat calls, supplemented by visual analyses performed by researchers of various, undocumented skill levels!

Very importantly, the Contingency Plan does not address how a decision will be made when there is a discrepancy between an ID made by unreliable software and an individual whose skill is untested and uncertified.

The Contingency Plan is not a better sampling protocol than the one we proposed, which is a combination of netting and detection.

Why Revise the Guidelines: FAQ #1

FWS states that WNS has reduced the effectiveness of netting. This is not accurate. WNS has reduced the number of bats available for capture, but there is no documentation that the remaining bats are caught at a lesser rate – i.e., that effectiveness is reduced.

WNS has reduced the availability of bats to be "caught" using any sampling technique, including acoustic detection.

Given that we have no quantified documentation on the "effectiveness" of either or any method before or after WNS, there is no way to ascertain whether effectiveness of netting has increased or decreased relative to the effectiveness of detectors.

It is for this reason, and because there are many other conditions that affect sampling, that we propose an increased but flexible sampling regime employing more than a single sampling method that is adjusted to best address conditions faced in the field.

Once again, the stated "higher detection probability" based on automated call ID is at best unreliable because of broad-based inaccurate ID and at worst is the product of very strong Type I error (i.e., *finding Indiana bats when they are not present*).

Time Line: FAQ #7

This says a project can be completed in a single season, but as proposed, it is unlikely for large projects, even when FWS broadens the season to include Habitat Assessments at other times of year.

The timeline for completion of large projects is unrealistic because of reliance on FWS to sequentially check steps of the survey instead of relying upon a more comprehensive review earlier in the consultation process. There is no reason to postpone netting and telemetry until FWS reviews an acoustic report. **FAQ #21** acknowledges as much. This disparity should be clarified.

This level of coordination requires that FWS commit to review in a truly timely manner – for example a 24 or 48 hour turn-around time during the period 15 May to 15 August. To date, our experience does not lead us to believe that FWS has the person-power to make this commitment.

Habitat Assessment: FAQ #9

We question relevance of this requirement for presence/absence surveys. It appears the assessment is to determine if and where sampling should be completed. If so, a field habitat survey is a waste of resources because FWS DRG define virtually all woodlands as suitable habitat requiring sampling (P 3 Par 2). With rare exception this can be ascertained remotely, and as necessary refined when in the field sampling. If the reason is to determine habitat quality and ability to support a maternity colony, criteria used should be better defined (For example, see Tinsley et al., 2013 SBDN), but more importantly, it is of little value and a waste of resources if the habitat is unoccupied.

Conversely, a detailed habitat survey of occupied habitat (determined by project sampling or past records or) can help define conservation needs.

Relationship of a Federal Permit and Surveyor Qualifications: FAQ #18

FWS DRG state that a federal permit is not required to conduct acoustic surveys because there is not a take associated with field efforts.

We do not agree with this interpretation. While it is true the act of recoding acoustic files will not result in take, results of that sampling result in decisions that could result in a take.

Isn't FWS responsible for assuring that individuals who collect data upon which take decisions are made are knowledgeable and qualified? Or will FWS, based on their approved automated call ID, take responsibility for the quality of the data collected? *We strongly recommend that FWS require a permitted bat biologist supervise selection of sampling sites and deployment of detectors.*

Tandem Netting and Detector Sampling: FAQ #20

As noted above, the FWS DRG claim that detectors, dependent on automated call ID, do a better job of finding Indiana bats is incorrect.

While FWS DRG state that they hope new automated software for call ID is available for 2013, they also admitted that it is unlikely, given that there is insufficient time for testing. There must be time for testing by individuals outside FWS (and their contractors) as these individuals have, to date, provided the greatest insight into the accuracy and efficiency (or lack thereof) of existing programs. Outside, independent review is essential.

Under the FWS DRG scenario, this situation essentially ensures implementation of the Contingency Plan.

As noted above, every sampling method has strengths and weaknesses and a sampling regime employing the strengths of both technique is better than relying upon the weakness of either alone. The best way to accurately identify whether the Indiana bat is present is tandem sampling with nets and detectors. Using both sampling techniques minimizes both Type I and Type II error, i.e., not finding bats when they are present and finding bats when they are not present.

Is Validated Automated Software Available: FAQ #30

The basis of this question and answer was addressed above. In short, FWS DRG say reliable automated software is not available, and we agree.

At the February 2013 SBDN meeting there were eight presentations dealing with this question, including three from automated software developers. Users and producers agreed that available software does not satisfy FWS criteria. Users of available software also agreed that without an ***experienced*** individual to visually confirm or reject automated call ID, valid determinations of presence or presumed absence from detectors will continue to be problematic.

Contingency Plan: FAQ #33

See above.

Acceptable Sample Dates: FAQ #34

FWS DRG sets sampling dates as 15 May – 15 August and “encourages” completion of mist-netting before 1 August, in effect shortening the sample season.

The 15 May – 15 August dates have been in use for many years; however, that does not mean they cannot be improved upon. Romeling *et al*. (2012) found that their highest detection rates of Indiana bats near known colonies were 16 – 31 August, 1 – 15 September, and 16 – 30 September. Sparks et al (2008) found that at least half the members of a maternity colony were present in until 15 September. Pre-volancy numbers often peaked in early June, indicating that individuals continue to arriving at

the colony up to the time of parturition. As such, on 1 September, there are more bats in maternity colonies than there are on 15 May.

Unfortunately, recent compliance concerns have focused on locating the "Primary Roost" – used when most members of a maternity colony coalesce into one or a few roost trees about the time of parturition. However, many or most nursery colonies use several to many "Secondary" roost trees earlier and later in the summer. It is shortsighted to focus on the time, perhaps as short as 2 weeks, when most bats are in the Primary (parturition) roost.

While a few bats may depart the maternity colony area in August, this is more than offset by the population increase from young of the year, who are likely more easily caught, making August not just a suitable time to catch Indiana bats, but prime time to catch them, and telemetry studies readily support the goal of determining use of an area.

Further, if more roosts are being used within the colony area, then telemetry studies that locate these multiple roosts will better define the colony area than will a single roost. Thus, late season telemetry studies may better define impacts and suitable conservation measures.

Loss of Data Without Mist Netting: FAQ #35

FWS notes that randomly deployed nets are not effective for monitoring bat populations. We agree, but are unaware of any ***random*** net sites. We are unsure why FWS would consider them random. We agree there are better ways to monitor populations.

Nevertheless, there is a great deal of value in data obtained from compliance netting, and often these data are the only or best data available. Numerous publications contributing to our knowledge of the species are based, at least in part, on netting data. Other than destructive sampling with guns, netting has been the standard sampling technique for over 50 years. Bat capture allows a wide array of data to be collected: species identification; verification of sex, age, physical condition, and parasite loads; indicators of diversity, abundance, and habitat use (type, location, time, height); collection of hair, tissues, and other samples; and the opportunity to track captured individuals. Netting data have been the basis of several models of distribution and take.

While many of these data are not essential to a project-specific presence-absence determination, many may be important to larger or broader decisions made under the ESA auspices. FWS sometimes asks for "additional data" or "researcher insights" obtained from their experience, often largely netting experience, when dealing with new problems or issues, such as guidelines associated with wind farm developments or data in support of potentially listing additional species.

Finally, various ESA compliance activities sometimes use other species as a surrogate for the Indiana bat, and netting data may provide the best information for such use.

Positive Acoustic and Negative Netting: FAQ #40

When you again remove the "belief" that acoustic surveys have higher detection rates this argument is without merit. A higher inaccurate detection rate is worthless.

FWS calls this interpretation conservative, but use of bad data is not consistent with ESA requirements to use "Best Available Science," invalidating the conservative argument. It is conservative only in the sense that it maximizes Type II error in order to minimize Type I error, so bats are assumed present in places where they are absent.

How will the courts respond to this? The presence of an endangered species can legally restrict land use and thus land values – an allowed taking. Is this take of land values acceptable when a species is incorrectly assumed to be present? Is the cost of conservation/mitigation for individuals that do not exist acceptable?

Once again, using both sampling techniques minimizes both Type I and Type II error, allowing both project proponents and FWS to expend resources to benefit bats that are present.

Additional Questions and Comments

Guidelines for Guideline Development

We support FWS's permit requirements: individuals who could take a bat as a result of their actions while sampling must be permitted.

The primary directive of the guidelines is compliance sampling and individuals contributing to the guidelines should be experienced in and qualified to obtain a federal permit to undertake compliance sampling.

Assess the Effectiveness of Netting and Detector Sampling

FWS should gather and analyze a meta-data base (a minimum of 5 year's data) from paired netting and detector sampling on compliance projects completed across the range of the Indiana bat. The data could be obtained by implementing our proposed guidelines. This analysis is important to understand the association between sampling with nets and detectors. These analyses should also address regional differences, including impacts of WNS.

This effort would be independent of continued development, testing, and refinement of detector capabilities.

For How Long are Surveys Valid?

FWS needs to be clarified for how long surveys are valid. DRG mention at least 2 years. That does not work for projects that take more than 2 years to complete, whether they are large developments or timber sales contracted for multiple years.