APPENDIX C

Final Survey Criteria

United States Department of the Interior

FISH AND WILDLIFE SERVICE
1875 Century Boulevard
Atlanta, Georgia 30345

In Reply Refer To:
FWS/R4/ES

JUL 20 2006

Memorandum

To: Assistant Regional Director, Migratory Birds & State Programs, Southeast Region
Regional Chief, National Wildlife Refuge System, Southeast Region

From: acting Assistant Regional Director, Ecological Services

Subject: Concurrence with Distribution of Ivory-billed Woodpecker (IBWO) Survey Criteria for Federal Activities in Arkansas and Portions of Mississippi

The Arkansas Field Office (AFO) has cooperatively developed a recommended survey protocol for the IBWO in Arkansas and a small portion of Mississippi. Those included in the development/review of these recommendations include:

- USFWS Arkansas, Louisiana, and Mississippi Ecological Services Field Offices
- USFWS Region 4 RO Ecological Services
- USFWS Region 4 RO Refuges
- USFWS Region 4 RO Federal Assitance
- USFWS Cache River National Wildlife Refuge
- USFWS White River National Wildlife Refuge
- USFWS Migratory Birds Hazen Field Office
- USFWS Lower Mississippi Valley Joint Venture Office
- Arkansas Game and Fish Commission
- Arkansas Natural Heritage Commission
- Louisiana Department of Wildlife and Fisheries
- Mississippi Department of Wildlife Fisheries and Parks
- Cornell University Lab of Ornithology
- Arkansas Field Office of The Nature Conservancy

Development of the attached document began in October 2005. Through collaboration with the partners listed above, the document has undergone several reviews and revisions. The potential IBWO range (where surveys would be recommended) was determined based upon verified and likely sightings and/or sound recordings documented by the Cornell Lab of Ornithology as well as the distribution of large contiguous forest blocks. The potential IBWO range extends roughly from Monroe and Woodruff Counties, Arkansas in a southeasterly direction along the lower Cache/White River floodplains to a point in Bolivar County, Mississippi near the confluence of the White and Arkansas Rivers with the Mississippi River. This area comprises eight counties in

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Arkansas and one county in Mississippi. Potential habitat within this recommended survey area was defined based on historical habitat use accounts, other life history accounts, and the expert opinion of Service biologists and partners.

Again through cooperation of the partners listed above, the AFO also developed a set of recommended search criteria appropriate for federally funded or permitted activities proposed within potential IBWO habitat. In establishing the survey requirements, the AFO separated potential actions into those that would result in a permanent conversion of habitat and those that would only result in short-term disturbances. These guidelines indicate when searches may be warranted and what search techniques would be appropriate to determine presence/absence of the IBWO and avoid take associated with the action. They also recommend when initiation of section 7 consultation may be appropriate.

The AFO seeks concurrence from the regional office programs listed below, and approval to distribute these criteria to Federal and State agency partners as a guide to determine presence/absence of the IBWO and to aid in the determination for the need to initiate section 7 consultation. These recommended search criteria will be reevaluated at least every five years or more frequently in the case of new information regarding the status, life history, or distribution of the IBWO.

Attachment

Please initial to indicate concurrence:

Name and Title	Initial	Date
Emily Jo Williams ARD Migratory Birds and State Programs, Region 4	EJW	7/21/2006
Jon Andrew Chief, NWRS, Region 4	JMA	8-8-06

Ivory-billed Woodpecker Recommended Survey Criteria
For Federal Actions in Arkansas/Mississippi
USFWS, Arkansas Field Office
June 27, 2006

The following survey recommendations apply to any federally funded or permitted activity within the Ivory-billed Woodpecker (IBWO) potential range (Attachment 1) in areas of potentially suitable nest/roost habitat (see second bullet below). For activities that result in the permanent conversion of potentially suitable habitat, we recommend the use of a survey protocol similar to that developed for the Grand Prairie Area Demonstration Project through the section 7 consultation process. Activities, such as forest management and routine national wildlife refuge/wildlife management area (NWR/WMA) operations, that do not result in permanent habitat conversion will need less intensive surveys to make sure that visual and noise disturbance, habitat modifications, or other factors do not adversely affect or "take" the IBWO. The Endangered Species Act defines take as "to harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, or collect, or to attempt to engage in any such conduct; may include significant habitat modification or degradation if it kills or injures wildlife by significantly impairing essential behavioral patterns including breeding, feeding, or sheltering."

Although, the survey criteria discussed later in this document will *generally* serve as guidelines for various activities, we recognize that no framework will adequately serve all possible scenarios. If project impacts are questionable or uncertain, recommendations will be developed on a case-by-case basis through informal or formal consultation as defined by section 7 of the Endangered Species Act. These recommendations were developed with the input and review of Service personnel, the Arkansas Game and Fish Commission, the Arkansas Natural Heritage Commission, the Louisiana Department of Wildlife and Fisheries, the Mississippi Department of Wildlife Fisheries and Parks, the U.S. Army Corps of Engineers, the Cornell University Lab of Ornithology, and the Arkansas Field Office of The Nature Conservancy. This document shall undergo an interagency review at least every five years to ensure that the recommendations reflect current knowledge of the status and/or life history of the IBWO. More frequent review is recommended in the event of significant new information regarding IBWO status and/or life history.

To determine the need for section 7 consultation, we recommend that federal action and permitting agencies take the following steps:

- Determine if the proposed federal activity will take place within the IBWO potential range described in Attachment 1. All federal activities within this area should be evaluated for possible impacts to IBWO. The description of this zone is subject to change if new information becomes available.

- Determine if the proposed activity will take place within potentially suitable IBWO nest/roost habitat. Potentially suitable habitat is defined as any forested land within the potential range that is dominated by trees equal to or greater than 16 inches diameter at breast height (dbh). Unsuitable habitat includes areas lacking trees greater than 16 inches

dbh such as recent reforestation sites, young pine plantations, and cleared land of all types.

- If the answer is "yes" to *both* of the above determinations, informal consultation with the appropriate Ecological Services (ES) Field Office is recommended. For actions in Arkansas, contact the Arkansas Field Office in Conway; in Mississippi contact the Mississippi Field Office in Jackson (see Attachment 1 for specific contact information).

- The informal process will determine if the activity constitutes permanent or long term conversion of forested habitat to non-forested habitat or conversion of "potentially suitable nest/roost habitat" to unsuitable habitat. We define long term as a period of one year or longer. If the activity will result in a conversion, refer to the section below entitled "Conversion Activities" for recommended survey criteria. Forest management activities must result in significant loss of suitable nest/roost habitat on a landscape scale to qualify as a conversion. As opposed to a conversion of habitat, most forest management and other NWR/WMA operations will qualify as disturbance and therefore less intensive surveys are recommended. Refer to the section entitled "Forest Management and NWR/WMA Operations" to determine the appropriate surveys for these activities.

Conversion Activities

Activities in this category include any action that will permanently convert suitable forested habitat to non-forest or result in a long term (one year or longer) conversion to unsuitable habitat. Examples include, but are not limited to, new road construction; pipeline construction; canal construction; reservoir construction; or construction of power transmission lines. In general, forest management activities do not qualify as a conversion. These activities are conducted under the guidance of an approved forest management plan that has completed the section 7 endangered species consultation process. These management plans are developed with the intent of attaining Desired Forest Conditions (DFCs) that provide diverse habitats for many species, including the IBWO. If in doubt about a management action, agencies should consult the appropriate ES field office to determine appropriate survey methods. The following criteria serve as guidelines for conducting IBWO surveys to detect potential impacts from habitat conversion. They were developed based upon our current understanding of IBWO life history and habitat requirements and could change as new information is acquired. Where life history data are lacking, these recommendations are based on assumptions developed using best professional judgment. Specific assumptions are detailed later in this document.

Habitat Conversion Survey Criteria

1. Always search the footprint of any conversion activity that occurs in suitable IBWO habitat within the IBWO potential range (Attachment 1).
2. A one mile (~1600 meters) buffer around the footprint should also be searched with the exception as stated in number three below.
3. Anything within 200 ft. (61 m) of existing structures, but outside the footprint of the construction area, does not need to be surveyed. Structures include residences, farm

sheds, hunting cabins, churches, and other permanent buildings. They do not include duck blinds, box stands, or abandoned structures.

4. If an "A" or "B" (Attachment 2) cavity is found, conduct physical or electronic observations (see Attachment 3) of the cavities for the last two hours of daylight for two non-consecutive days separated by at least one week. The location of the cavity should be recorded using GPS and/or maps, and photograph(s) of the cavity taken. Inform the appropriate ES field office before starting any observations of "A" or "B" cavities.
5. If "A" or "B" foraging (feeding) sign with a freshness ranking of 1 (Attachment 4) is found, the location of the foraging tree should be recorded using GPS and/or maps, and photograph(s) taken.
6. Searches for IBWO cavities and foraging sign should preferably be conducted during the leaf off period using transects spaced so that all trees with a dbh of 16 inches or larger can be inspected from all sides. Transect spacing may vary depending on habitat structure. If surveyors choose to work during the leaf on period, transects should be adjusted to ensure a full view of all trees with a dbh of 16 inches or larger. A survey report should be submitted to the appropriate ES field office and include GPS or mapped locations of all "A" and "B" cavities, locations of "A" and "B" foraging sign with a freshness ranking of 1 (Attachment 4), photographs, information on IBWO sightings or other activities, and a general description of stand conditions including species composition and tree size. This report must be provided to the appropriate ES field office before any habitat alteration or other non-survey related work takes place at the site.
7. If an "A" or "B" cavity is found, no non-survey related work on the project should proceed until the Ecological Services field office is contacted and all observations have been completed. If the surveys or observations indicate IBWO use of the survey area, all project activities should stop, and the appropriate ES field office should be contacted immediately. In such instances, formal section 7 consultation may be necessary.
8. If an "A" or "B" cavity not identified in the pre-activity survey is found during project implementation, all conversion activities within suitable habitat within one mile of the cavity should cease until the cavity has been monitored as described in survey criterion number four above. If IBWO use is documented, all project activities should cease pending consultation with the Service.
9. In general, surveys will remain valid for five years depending on the condition of the forest at the time of the survey. In order for the survey to be valid for years two through five, "A" and "B" cavities identified in year one should be revisited prior to project implementation to ensure no new use of the area by IBWOs. Each cavity should be monitored as described in survey criterion number four above. If habitat conditions change during years two through five such that they improve for IBWO foraging (e.g. significant insect, fire, or wind damage), a new survey may be required before initiating construction.
10. Activities involving minor impacts, forest fragments, or forest fringes will be addressed on an individual basis. The Service will make a recommendation on the need for and extent of surveys after consulting with the action agency.

Forest Management and NWR/WMA Operations

Activities in this category include federal actions that may result in a temporary disturbance to any nearby IBWOs but will not result in a conversion of potentially suitable nest/roost habitat to unsuitable forested or non-forested habitats. The most common example of an action meeting these criteria is forest management on national wildlife refuges or federally funded state wildlife management areas. In general, forest management activities do not qualify as a conversion. These activities are conducted under the guidance of an approved forest management plan that has completed the section 7 endangered species consultation process. These management plans are developed with the intent of attaining DFCs that provide diverse habitats for many species, including the IBWO. If in doubt, action agencies should consult the appropriate ES field office to determine appropriate survey methods. Other activities that could potentially result in harassment of the IBWO through noise or other disruption within suitable habitat, such as the use of explosives to remove beaver dams or upgrade of primitive roads to all weather roads, also may meet the disturbance threshold. Surveys are not recommended for many routine activities, such as those listed in Table 1. If uncertainty exists about potential impacts, the appropriate ES field office should be contacted. The following recommended search criteria are based on the same life history information and assumptions as the habitat conversion criteria. Unless otherwise noted, these criteria are only applicable during the non-nesting season (June 1 – January 31). The Service should be contacted if disturbance activities are planned during the nesting season (February 1 – May 31).

Forest Management and NWR/WMA Operations Criteria

1. Always search the footprint of any disturbance that occurs in potentially suitable IBWO habitat within the IBWO potential range (Attachment 1).
2. A 200 ft. (61 m) buffer around the footprint should also be searched with the exception as stated in survey criterion number three below. The justification for this buffer distance is provided in Attachment 5.
3. Anything within 200 ft. (61 m) of existing structures, but outside the footprint of the construction area, does not need to be surveyed. Structures include residences, farm sheds, hunting cabins, churches, and other permanent buildings. They do not include duck blinds, box stands, or abandoned structures.
4. If an "A" or "B" cavity (Attachment 2) is found, conduct physical or electronic observations (Attachment 3) of the cavities for the last two hours of daylight for two non-consecutive days separated by at least one week. The location of the cavity should be recorded using GPS and/or maps, and photograph(s) of the cavity taken. Inform the appropriate Ecological Services field office before starting any observations of "A" or "B" cavities.
5. If "A" or "B" foraging (feeding) sign with a freshness ranking of 1 (Attachment 4) is found, the location of the foraging tree should be recorded using GPS and/or maps, and photograph(s) taken.
6. Searches for IBWO cavities and foraging sign should preferably be conducted during the leaf off period using transects spaced so that all trees with a dbh of 16 inches or larger can be inspected from all sides. Transect spacing may vary depending on habitat

structure. If surveyors choose to work during the leaf on period, transects should be adjusted to ensure a full view of all trees with a dbh of 16 inches or larger. A survey report should be submitted to the appropriate Ecological Services field office and include GPS or mapped locations of all "A" and "B" cavities, locations of "A" and "B" foraging sign with a freshness ranking of 1, photographs, information on IBWO sightings or other activities, and a general description of stand conditions including species composition and tree size. This report must be provided to the appropriate ES field office before any disturbance causing activities or other non-survey related project work takes place at the site.

7. If an "A" or "B" cavity is found, no non-survey related work on the project should proceed until the ES field office is contacted and all observations have been completed. If the surveys or observations indicate IBWO use of the survey area, all project activities should stop, and the ES field office should be contacted immediately. In such instances, formal section 7 consultation may be necessary.
8. If an "A" or "B" cavity not identified in the pre-activity survey is found during project implementation, all activities within 200 ft. of the cavity should cease until the cavity has been monitored as described in survey criterion number four above. If IBWO use is documented, all project activities should cease pending consultation with the Service.
9. In general, surveys will remain valid for five years depending on the condition of the forest at the time of the survey. In order for the survey to be valid for years two through five, "A" and "B" cavities identified in year one should be revisited prior to project implementation to ensure no new use of the area by IBWOs. Each cavity should be monitored as described in survey criterion number four above. If habitat conditions change during years two through five such that they improve for IBWO foraging (e.g. significant insect, fire, or wind damage), a new survey may be required before initiating construction.
10. If beaver management activities involve the use of explosives to remove dams, the following steps should be taken to avoid impacts to the IBWO:
    a. Dam removals using explosives *should* take place after May 31 and before February 1 to make sure that any nearby nestlings have fledged and no later than one hour before sunset to make sure that birds entering roosts nearby are not injured or killed.
    b. If the use of explosive must occur during the nesting period (February 1 to May 31) or later than one hour before sunset, survey trees within the blast debris zone (100-foot radius) to make sure that no "A" or "B" cavities are in the vicinity.
    c. If any "A" or "B" cavity is observed the blasting crew should leave the area and the cavity should be observed for two non-consecutive days separated by at least one week in the evening as previously described to make sure that it is not occupied by an IBWO.

    We recommend that to fully account for and avoid impacts associated with beaver management or other potentially disruptive activities, agencies should develop a programmatic section 7 detailing all potential impacts and steps taken to avoid these impacts. For agencies such as the Service with Forest Management Plans, beaver control activities may be evaluated during section 7 consultations along with other forest management practices.

11. Activities involving minor impacts, forest fragments, or forest fringes will be addressed on an individual basis. The Service will make a recommendation on the need for and extent of surveys after consulting with the action agency.

Table 1. Routine habitat management and operation/maintenance activities excluded from the survey recommendations.

Activity	Description
Road maintenance	Grading, mowing, or repair of existing roads. This does not include upgrade of primitive roads to gravel or pavement.
Right-of-Way maintenance	Mowing or routine repair of previously cleared ROW for electrical lines, gas lines, or other utilities.
ATV use	Use of ATV's to conduct normal routine resource management and law enforcement activities.
Watercraft use	Use of non-motorized or motorized watercraft to conduct normal routine resource management and law enforcement activities.

Assumptions and Justification:

- IBWO would avoid nesting within 200 ft. (61 m) of a regularly used structure due to continual, but irregular disturbances, and would have reduced, if any, foraging in these areas.
- A forested area dominated by trees with a dbh of 16 inches or greater would provide nesting and roosting opportunities for IBWO. Tanner (1942) noted that the smallest inside diameter ever measured for an IBWO nest was seven inches. Interior cavity and tree diameter measurements at cavity height for three nests at the Singer Tract indicate that each nest had walls approximately two inches thick. Using these measurements, the minimum tree diameter required to support a nest is approximately 11 inches. Using Girard form class 78 (e.g. Nuttall Oak and Sweet Gum) to estimate bole taper, a tree with a dbh of 16 inches would measure approximately 11 inches at a height of 32 feet (the height of two merchantable logs) (Oderwald 2003). The nests recorded by Tanner (1942) at the Singer Tract ranged from 55 to 70 feet in height, although nests as low as 15-25 feet were noted in Florida. Given the height of nests recorded at the Singer Tract, we feel that limiting the definition of potentially suitable cavity trees to a dbh of 16 inches or larger is a conservative estimate. Some species of trees such as green ash have a more pronounced taper and would result in the need for an even larger dbh to support a nest cavity at a height of 32 feet.

- ❖ Observation of IBWO cavity use would be more effective in the evenings. IBWO generally emerge from the roost late in the morning and return to the roost at about dusk (Tanner 1941).
- ❖ IBWO typically range in a radius extending 0.75 to 1.0 mile (maximum 1.5 miles recorded) from their nest cavity to forage during the breeding season (Tanner 1942). Surveying a buffer distance of one mile from the footprint of the activity reduces concerns about habitat conversion from construction activities.
- ❖ IBWO will travel longer distances from their roost cavity to potentially suitable foraging habitat during the non-nesting season (Tanner 1942), but habitat conversion this far from the IBWO cavity is not considered likely to have an adverse effect on the species.

Please note that the above survey criteria for conversion and disturbance activities are *guidelines*. These criteria were developed to aid agencies in complying with the Endangered Species Act. We recognize that some activities may not fit the above descriptions and encourage agencies to contact the appropriate ES field office with any questions regarding potential impacts within the consultation zone.

Literature Cited

Oderwald, R.G. 2003. Top diameters for Mesavage and Girard form class volume tables. Foresters Incorporated. http://www.foresters-inc.com/html/web/publications/Web%20FCvols.pdf

Tanner, J.T. 1941. Three years with the Ivory-billed Woodpecker, America's rarest bird. Audubon Mag. 43(1):5-14. *As cited in* Jackson, J.A., 2002. Ivory-billed Woodpecker (*Campephilus principalis*). The Birds of North America Online (A. Poole, Ed.). Ithica. Cornell Laboratory of Ornithology.

Tanner, J.T. 1942. The Ivory-Billed Woodpecker. Research Report No. 1, National Audubon Society, New York.

Attachment 1

DRAFT
Ivory-billed Woodpecker
Potential Range
June 27, 2006

With the rediscovery of the Ivory-billed Woodpecker (IBWO) on the Cache River National Wildlife Refuge (NWR) and Dagmar Wildlife Management Area, the U.S. Fish and Wildlife Service (Service) and our partners have taken measures to protect the habitat of this rare and endangered species. In addition to forming a recovery team and several working groups, conservation land managers are working together to protect and enhance IBWO habitat. Refuges, the Service's Federal Activities office, the Federal Highway Administration, and the Corps of Engineers have entered into Endangered Species Act section 7 consultations with the Service to evaluate activities and make sure that they avoid adverse impacts. More consultations are anticipated in the future. In an effort to provide direction to affected parties and assist action agencies in determining whether consultation would be appropriate, the Service has identified the area where the IBWO would be most likely to occur.

Tanner (1942) classified IBWO habitat outside of Florida as the bottomlands of the Mississippi Delta and other river bottoms outside of the Mississippi Delta. The IBWO potential range for Arkansas and Mississippi is based on this classification and supporting evidence of IBWO presence. The IBWO potential range comprises that portion of Arkansas and Mississippi in and around the bottomland hardwood forest of the lower White River basin where the IBWO was rediscovered, the lower Arkansas River basin, and the batture (floodplain) of the Mississippi River in the vicinity of the confluence of the White, Arkansas, and Mississippi Rivers.

Federal agencies authorizing, funding, or carrying out an action in potentially suitable IBWO habitat in this area are advised to consider potential impacts to the IBWO and enter into section 7 consultation (formal and informal) with the appropriate ES field office[1] as appropriate. For the purpose of assisting affected parties in determining whether they should enter into consultation, the Service defines suitable IBWO habitat as forested areas dominated by trees with a dbh of 16 inches or greater. This definition of suitable habitat and the extent of the IBWO potential range described here are subject to change as new information becomes available. The information in this attachment will be reviewed by an inter-agency team concurrently with the main recommended IBWO survey criteria document (at least every five years).

The Service based the identification of the IBWO potential range on available IBWO biological information; however, because that information is limited, several assumptions were based on best professional judgment.

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[1] **Contact:** U.S. Fish and Wildlife Service, Arkansas Field Office, 110 South Amity Road, Suite 300, Conway, Arkansas 72032, 501-513-4470; or Mississippi Field Office, 6578 Dogwood View Pkwy., Ste. A., Jackson, MS 39213, 601-321-1123.

The IBWO potential range includes suitable habitat in parts of Arkansas, Desha, Jefferson, Lincoln, Monroe, Phillips, Prairie, and Woodruff Counties in Arkansas; and Bolivar County, Mississippi. Within these counties the IBWO potential range is confined to:

1. The mostly contiguous forest primarily in the lower White River floodplain encompassing the Service's Cache River and White River National Wildlife Refuges (NWR), the Arkansas Game and Fish Commission's (AGFC) Dagmar and Wattensaw Wildlife Management Areas (WMA), and adjacent forested private lands. This area is commonly referred to as the "Big Woods." The IBWO potential range generally follows the edge of the large, contiguous forest but also includes:

    a. Forested corridors containing potentially suitable IBWO habitat extending outward from the edge of the core contiguous forest until the width decreases to less than 0.25 mile for a distance of more than 0.25 mile, and
    b. Forested corridors containing potentially suitable IBWO habitat along Bayou DeView and Bayou LaGrue extending upstream about ten miles from the forest core.

    These inclusions and cut-off criteria are based on the following:

    The forested corridor along Bayou DeView where IBWO presence was confirmed averages 0.5 mile or more in width. The Service assumes that as corridors become narrower than this, their suitability for IBWO use decreases, and therefore corridors whose width decreases to less than 0.25 mile for a distance of more than 0.25 mile are not considered suitable IBWO habitat.

    Tanner (1942) found that the IBWO travels distances of 0.75 to 1.0 mile from its nest during nesting season. However, foraging distance for the IBWO during the non-breeding season is unknown. Based on anecdotal information, Tanner (1942) believed IBWO winter ranges were much larger than nesting season ranges (Jackson 2002). The Service assumes that the IBWO may travel six to ten miles from its roost during the non-nesting season.

2. The batture lands of the Mississippi River extending from the vicinity of the mouth of the White River to about eight to ten miles south of the mouth of the Arkansas River in Desha County, AR and Bolivar County, MS.

3. The forest encompassing the AGFC's Black Swamp WMA, Cache River NWR, and adjacent forested private lands. Although, separated from the contiguous forest of the Big Woods, these areas are included because they constitute a large block of potentially suitable forest habitat and because there is evidence, but not verification, of IBWO presence.

4. The portions of the lower Arkansas River floodplain inside the levees in Desha, Lincoln, and Jefferson Counties, Arkansas from the confluence of the Arkansas and Mississippi Rivers to about 12 miles upstream of Dam 2.

The IBWO potential range includes the lands described above because of a) verified sightings of IBWO along Bayou DeView on Cache River NWR; b) sound recordings of possible IBWO "double knocks" and "kent" calls on lower White River NWR; c) predominant forest composition of the area that meets the working definition of suitable IBWO habitat; and d) contiguous forest is of sufficient size to support one or more IBWO breeding pairs. Tanner (1942) reported breeding densities of IBWO ranging from a maximum density of one pair per 6.25 square miles to one pair per 17 square miles in bottomland hardwood habitat of the Singer Tract in Louisiana.

The AGFC's Bayou Meto WMA and adjoining private land are not included in the IBWO potential range because they are isolated from the included areas by expanses of at least several miles of predominantly agricultural lands and no evidence of IBWO presence has been documented there.

The Service assumes that non-contiguous forested tracts (fragments) of less than 40 acres outside of the Big Woods forested matrix are not suitable IBWO habitat. The landscape outside the Big Woods forested matrix (IBWO potential range) is a predominantly agricultural matrix and there is little on no connectivity between forest fragments. The Service assumes the IBWO would tend to avoid small, disjunct forested tracts when contiguous forest is available. The 40-acre cut-off is also based on one of the cut-off criteria for forested corridors extending outward from the forest core. For such forested corridors, the cut-off is reached when the width of the corridor decreases to less than 0.25 mile for a distance of more than 0.25 mile. A 0.25 mile by 0.25 mile square tract equals 40 acres.

The Service assumes that forested tracts greater than 40 acres outside the described potential range, but in proximity to the Big Woods forested matrix, and small forested tracts less than 40 acres that are in proximity to, and mostly surrounded by, the Big Woods forested matrix could be used by the IBWO. Therefore, we recommend that action agencies contact the appropriate ES field office to determine if consultation would be appropriate for actions in these forested tracts.

The Service assumes the IBWO would avoid using areas directly adjacent to human habitation, and therefore does not consider as potentially suitable habitat forested areas within 200 ft. of an occupied structure including residences, farm sheds, hunting cabins, and churches. This does not apply to duck blinds, box stands, or abandoned structures.

Within the IBWO potential range, section 7 consultation (formal or informal) is advised only for lands that contain suitable IBWO habitat, which is defined as forested areas dominated by trees with a dbh of 16 inches or greater. The IBWO requires forested habitat to fulfill its life cycle requirements. Larger trees are more suitable for foraging because of their increased susceptibility to decay and insect infestation. Tanner (1942) reported that 87 percent of IBWO foraging in northeastern Louisiana was on trees with a dbh greater than 12 inches. Ivory-billed Woodpeckers also need larger trees to accommodate the size of their nest and roost cavities. Furthermore, Tanner's (1942) investigation of IBWO cavities in the southeastern United States showed that nests typically ranged from 40 to 70 feet above ground, with the lowest nest cavity

being at 25 feet above the ground. To accommodate a cavity of suitable size for IBWO nesting (minimum inside cavity diameter of seven inches) at 32 feet above the ground, a dbh equal to or greater than 16 inches is necessary. Various tree species are used by the IBWO for nesting, roosting, and foraging (Tanner 1942).

References

Tanner, J.T. 1942. The Ivory-Billed Woodpecker. Research Report No. 1, National Audubon Society, New York.

Jackson, J.A. 2002. Ivory-billed Woodpecker (*Campephilus principalis*). The Birds of America Online (A. Poole, Ed.). Ithaca: Cornell Laboratory of Ornithology; Retrieved from Birds of North America Online database; http://birds.cornell.edu/BNA/Account/Ivory_billed_Woodpecker/.

Attachment 2

Ranking of potential Ivory-billed Woodpecker cavities (modified from Cornell Lab of Ornithology, October 2005)

A: very large cavity in size range of IBWO with irregular oval or rectangular shape

B: cavity larger than typical Pileated Woodpecker (PIWO) cavity but shape is fairly regular, nearly perfect round or oval;

or, cavity of irregular shape and within upper size range for PIWO, lower size range for IBWO

C: cavity of fairly regular shape, nearly perfect oval or round, in the upper size range for PIWO and lower size range for IBWO

D: cavity too small for IBWO

For examples of life-size cavity dimensions and shapes see below.

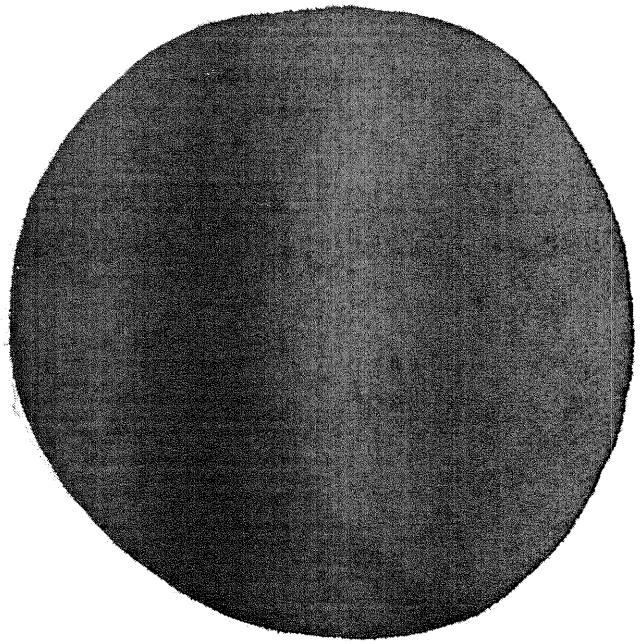
Note: Size and shape are not the only descriptors of a potential IBWO cavity. IBWOs construct their own nest, therefore many cavities of other origin may be excluded. Factors that may exclude an otherwise suitable cavity (size and shape) include:

- Cavities originating from a knot hole or tree injury
- Cavities with no overhead protection
- Cavities inhabited by squirrels or other mammals

If a cavity meets the size and shape criteria but is of undetermined origin, it should be treated as an "A" or "B" cavity.

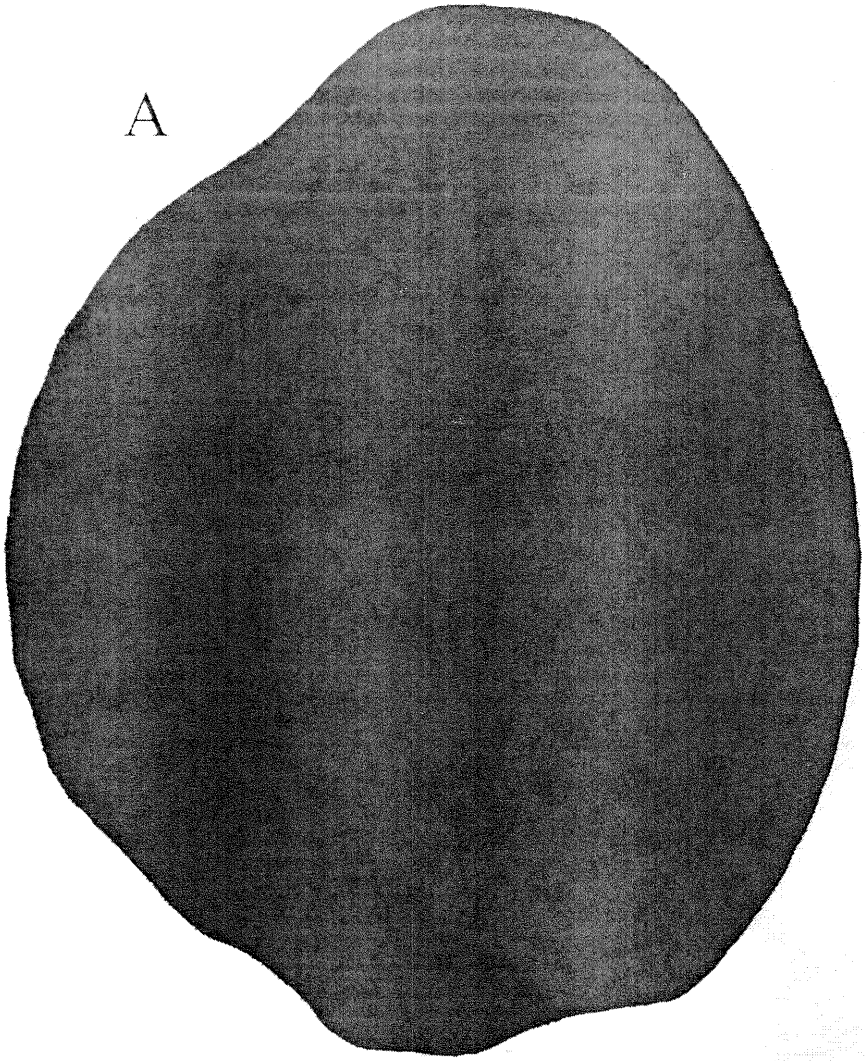
As an example, the number of cavities encountered in 2 km^2 of cypress-tupelo swamp in Bayou de View included 1 'A' cavity, 3 'B' cavities, 10 'C' cavities, and hundreds of 'D' cavities or cavities disqualified due to the reasons discussed above.

D



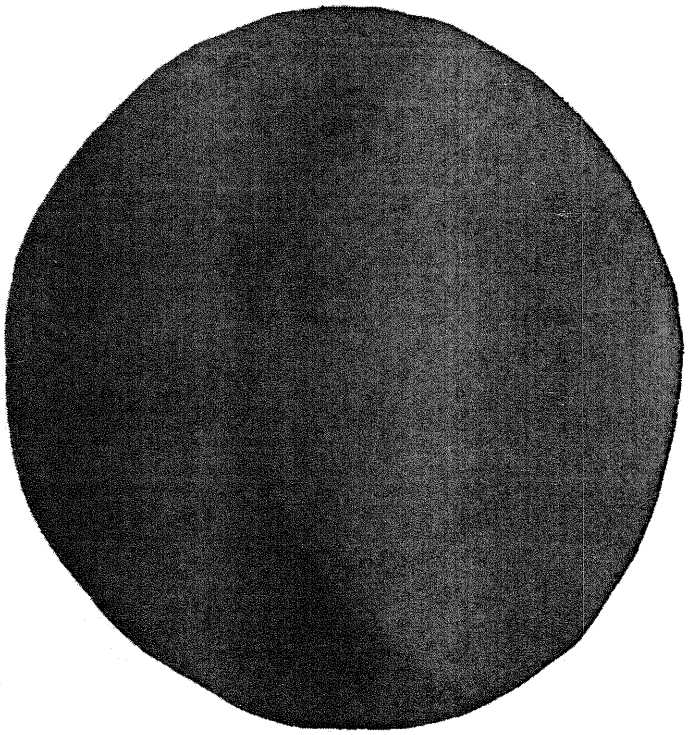
typical PIWO: 3.3 x 3.5 inches (8.4 x 8.9 cm)
neat, nearly round shape, or neatly oval shape

A



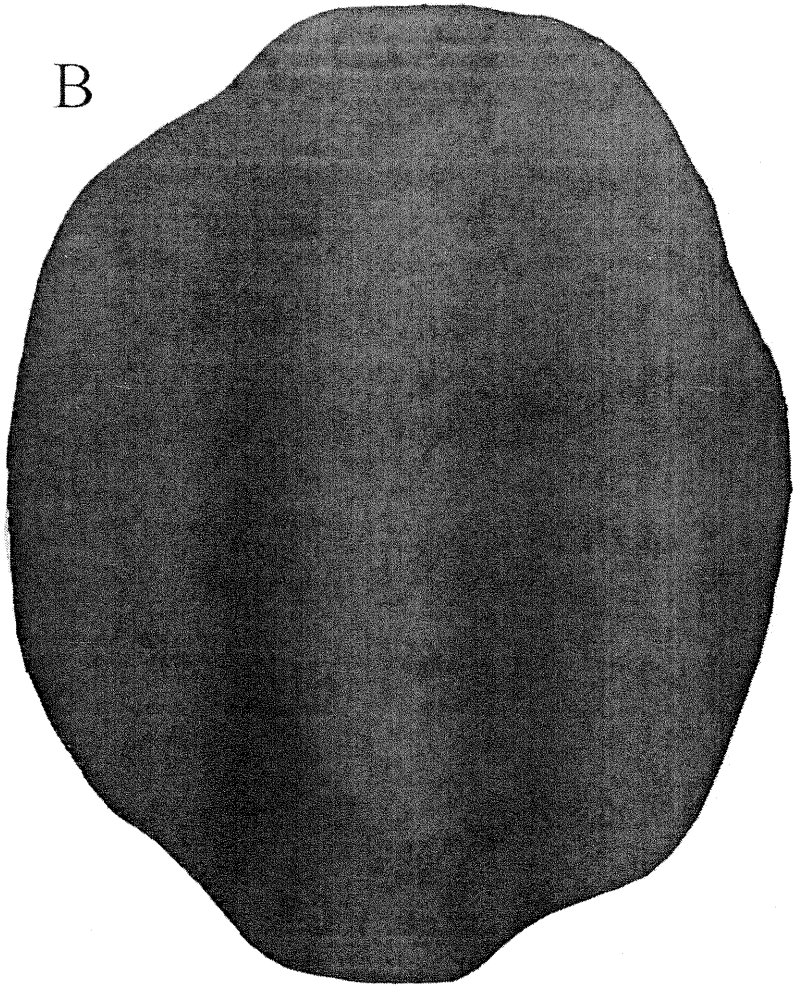
typical IBWO: 4.3 x. 5.4 inches (10.9 x 13.7 cm)
oval, irregular shape

C



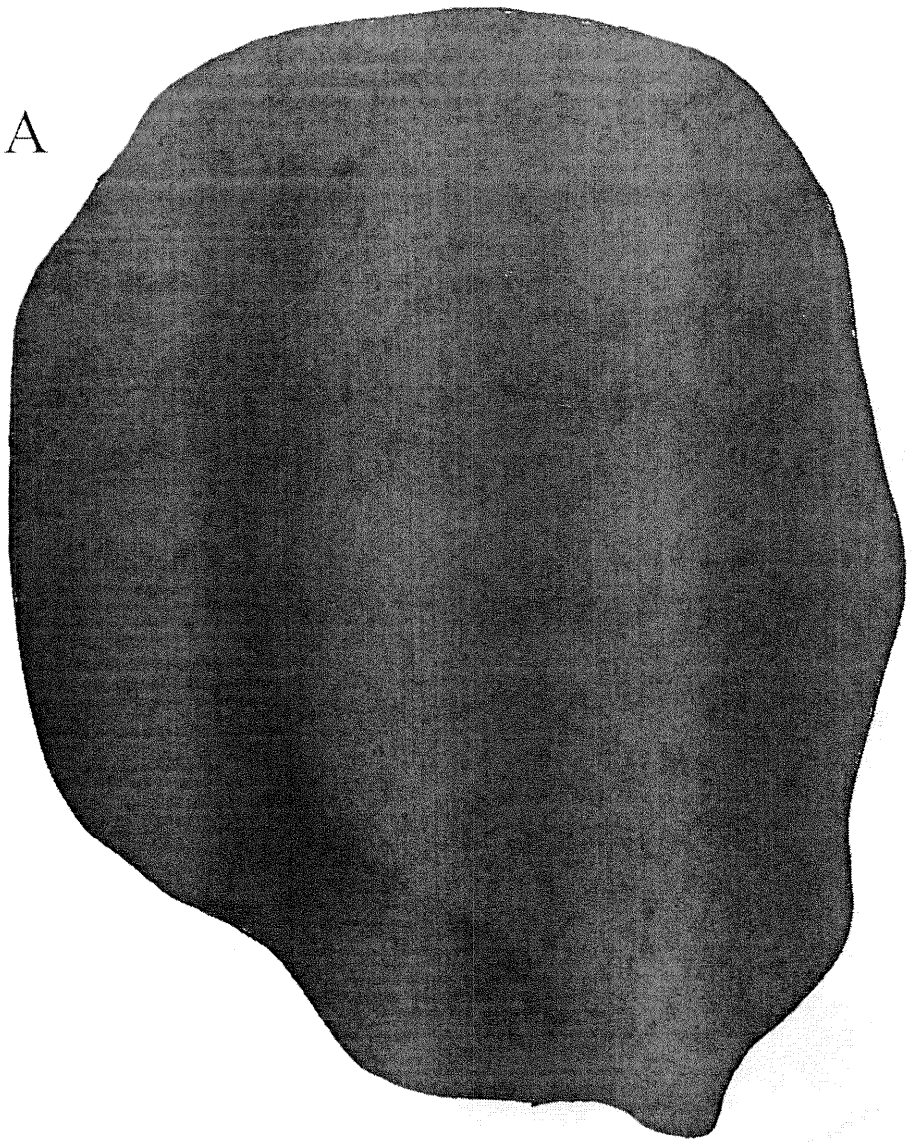
large PIWO: 3.5 x. 3.7 inches (8.9 x 9.4 cm)

B



small IBWO: 4.0 x 5.0 inches (10.2 x 12.7 cm)

A



largest recorded IBWO: 4.75 x 5.75 inches (12.1 x 14.6 cm)

Attachment 3

Cavity and forage tree monitoring techniques

The recommended survey criteria state that either physical or electronic monitoring are acceptable for determining presence or absence of IBWO at "A" or "B" cavities. We do not have specific recommendations on techniques or equipment except that the method employed should be capable of documenting and preferably capturing images of IBWO activity at the designated site with minimum disturbance. For any given "A" or "B" cavity, four total hours of observation is recommended. .

If physical observation is preferred, we recommend that the observer remain concealed by camouflage clothing and/or a blind. The observer should maintain the maximum distance possible from the target tree while retaining the ability to determine the presence of IBWO. This distance will vary depending on forest conditions. Binoculars and/or a spotting scope are required to maintain a maximum distance from the IBWO and to assist with observations. A camera to document any IBWO use is also recommended.

Agencies may choose to use electronic observation techniques as opposed to placing a person in the field. We do not have recommendations for specific equipment; however it should be able to reliably document the presence or absence of IBWO. Based on the experience of Cornell University researchers, most commercially available monitoring devices are not sensitive enough to reliably detect the movement of animals the size of IBWO at the distances encountered in the field. Custom built devices may be capable of this and the Service is open to the use of any motion triggered device that is sensitive enough to detect IBWO. Another option is the use of programmable photo equipment that can be set to take a series of pictures for a given time period. For example, one could deploy a programmable camera at a cavity and schedule it to take a picture every ten seconds for two hours each day for two non-consecutive days. This would result in 1,440 photos over a two day period. Weatherproof digital photo units that can accomplish this task are readily available on the commercial market. Software that allows the expedient review of these pictures as a "time-lapse video" is also available.

Attachment 4

Ranking of potential Ivory-billed Woodpecker foraging sign (modified from Cornell Lab of Ornithology, October 2005)

Rank potential forage trees based on the criteria below. After ranking, apply the freshness criteria. Coordinates should be recorded and pictures taken for sign with "A" and "B" rankings that score "1" on freshness scale. Sign with a "C" ranking regardless of freshness should not be recorded.

A. Best
- Bark tight
- Scaling with only bark removed
- No excavation or very thin excavation of wood layer
- Straight horizontal scars or no scarring of wood layer

B. Good
- Bark tight
- Scaling with some digging in wood layer
- Conical or non-rectangular shaped pits
- Horizontal scars with undulating edges

C. All other forage sign
- Bark loose and/or sloughing
- Extensive excavation into wood layer
- Pits or furrows only
- Rectangular shaped pits

Freshness of scaling -

1 Chips and wood fresh, NOT weathered
2 Chips and wood weathered
3 No chips present, powdery wood, obvious decay

Attachment 5

Justification for buffer distance to avoid disturbance impacts

The appropriate distance to survey around disturbance activities (specifically those associated with forest management) is difficult to determine. The sound from activities such as felling, transporting, and loading trees can carry a substantial distance through wooded habitats. However, at some distance this noise falls below the disturbance threshold. Almost all forest management activities in the Mississippi Alluvial Valley that involve the use of heavy equipment take place outside the nesting period of the IBWO (February – May). The justification for the 200 ft. buffer around forest management activities assumes that no disruptive actions such as timber harvests will occur within the nesting season. If such activities are proposed within the nesting season, the agency should contact the appropriate Service ES office.

The 200 ft. buffer width was chosen based on the following assumptions:

- This distance is far outside the range that any trees felled within the treatment area might land.
- Most timber harvest operations will move fairly quickly, typically covering around 10 acres per day. The noise disturbance to any given roost hole would be temporary.
- The primary risk of disturbance outside the nesting season involves frightening an individual away from its chosen roost hole near sunset. If this were to occur, the bird might be exposed to inclement weather, predators, or other risks. As sunset nears, most of the heavy equipment operation will either cease or gravitate towards the log loading areas. Given that most log loading areas are located away from the outer edges of the treatment area and/or near an existing road, the likelihood of logging activities disturbing an evening roosting bird is small. If the log loading area is located near the edge of the treatment, the previously surveyed buffer area around the treatment will ensure that no roost(s) are located with 200 ft. of the area.
- Logging operations could disturb roosting birds during the morning, but outside the nesting season these individuals should be highly mobile and able to avoid this temporary disturbance. IBWO are known to maintain several roost holes at any given time, therefore a temporary disturbance at the site of one roost should not preclude the individual from locating a roost before the subsequent sunset.

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