United States Department of the Interior

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IN REPLY REFER TO:

July 26, 2007

Mr. Ed Lambert
Memphis District Corps of Engineers
167 North Main Street B-202
Memphis, TN 38103-1894

Re: Informal Consultation for the Grand Prairie Area Demonstration Project

Dear Mr. Lambert:

This is the Fish and Wildlife Service's (Service) response to the Memphis District Corps of Engineers June 7, 2007 Supplemental Biological Assessment (SBA) for the Grand Prairie Area Demonstration Project (GPADP), Arkansas, Prairie, Monroe, and Lonoke Counties, Arkansas and its effects on the Ivory-billed Woodpecker (*Campephilus principalis*) (IBWO) per section 7 of the Endangered Species Act (Act) of 1973, as amended (16 U.S.C. 1531 et seq.). It presents information on our current understanding of IBWO biology and life history requirements, descriptions of the bottomland hardwood forest ecosystem in the lower White River basin (i.e., the project's "Action Area") and basin hydrology, the results of our reevaluation of the potential effects of the GPADP on the IBWO, and the Service's response to the SBA's "not likely to adversely effect" determination.

The U.S. Army Corps of Engineers (Corps) and Service reentered into informal consultation in November 2006 in response to the lawsuit filed in federal court alleging inadequacy of the Corps and Service's prior informal consultation, the Service's adoption of comprehensive survey guidelines for the IBWO, and the continuation of development of comprehensive monitoring and adaptive management plans, and IBWO surveys. A complete administrative record of this consultation is on file at the Service's Arkansas Delta Ecological Services Suboffice, Augusta, AR.

Consultation History

Following the announcement of the rediscovery of the IBWO in the Bayou de View area of the Cache River National Wildlife Refuge in eastern Arkansas on April 28, 2005, the Service began working within the agency and with conservation partners to identify and address issues vital to both the short and long term protection of the species. The Service took steps to secure the area in which the rediscovery was made and entered into informal consultation with the Corps regarding the effect of the GPADP on the IBWO.

Construction on the pump station was just getting underway when the IBWO announcement was made and the Corps convened a meeting with the contractor, Service, and Arkansas Game and Fish Commission staff on May 9, 2005 to discuss this new development and to do a reconnaissance survey of the small wooded tracts immediately adjacent to the pump station site. Service staff recommended that the Corps not allow the contractor conduct any clearing until the consultation was completed.

The Corps coordinated reconnaissance surveys along the proposed pipeline route from the pump station site through Mike Freeze/Wattensaw Wildlife Management Area and at pipeline/canal alignments that intersected forested tracts within the GPADP project area. From May 12, 2005 through May 17, 2005 representatives of the GPADP Interagency Team (interagency team), which included the Corps, Arkansas Game and Fish Commission, White River Irrigation District and the Service, inspected over 35 sites. The purpose of these early surveys was to characterize forest conditions at proposed pipeline/canal crossings to determine their potential as IBWO habitat and to suggest avoidance measures. The Corps subsequently halted construction on the project. They produced their Biological Assessment on May 25, 2005. The Corps requested that the Service complete its review of the BA by June 3, 2005 and indicated that they intended to resume construction on the pump station on June 6, 2005. The Service notified the Corps in correspondence dated June 2, 2005 that we would not complete our review of their BA by the requested date and reminded the Corps of the requirements of the Endangered Species Act directing federal agencies to not make any irretrievable commitment of resources until the consultation process is concluded.

The Service sent a letter to the Corps on June 8, 2005 recommending modifications and actions to avoid the likelihood of adverse effects which would allow us to concur with the not likely to adversely affect conclusion in the BA. The recommendations included: conducting preconstruction surveys for the IBWO, delaying or halting construction if credible reports of IBWO within one mile of the construction site were received, long term monitoring to determine the effect of water diversions on the floodplain forest and its hydrologic regime, and implementation of an adaptive management plan to reduce or eliminate any identified effect of withdrawals on the health and function of the White River floodplain ecosystem.

The Corps agreed in principle to the Service's recommendations in a letter dated June 24, 2005, but left commitment to aspects of the recommendations in doubt. Because of the doubt that all of the Service recommendations would be implemented and because many details of the monitoring and adaptive management plans were yet to be developed, the Service and Corps continued to work together under the assumption that the consultation process was still ongoing.

The Corps convened a meeting of the GPADP Interagency Team on July 18, 2005 to begin the process of developing the bottomland hardwood forest and hydrologic monitoring plans. Experts in bottomland hardwood forest ecology and hydrology were solicited to develop these plans and the Service concurrently proceeded to expand and refine its description of potential IBWO range and habitat characteristics as well as criteria for conducting IBWO surveys.

The first IBWO survey was conducted August 12, 2005 in a strip of woods adjacent to the White River at the pump station site due to the contractor's desire to remove the trees at this location.

No IBWOs, cavities, or foraging sign were observed during the search. After initially and erroneously advising the Corps that it would be okay for the contractor to remove the trees, the Service told the Corps that we could not authorize construction while the consultation process was ongoing.

The interagency team met again on September 21, 2005 to review draft monitoring plans and draft survey criteria. As a result, the Service would rewrite the IBWO survey criteria, Mickey Heitmeyer, Ph.D., Univ. of MO, Gaylord Laboratory, would insert details into his bottomland hardwood forest (BLH) monitoring plan proposal, the Service would provide information on reference sites, and the hydrologic monitoring plan developed by Stephen Haase, Ph.D., The Nature Conservancy, would be revised to include groundwater monitoring transducers. It should be noted that while the Service had developed IBWO survey criteria specific to the GPADP for the direct impacts of conversion of a linear strip of forest to non-forest conditions, it continued to refine its characterization of potential IBWO range and habitat and to develop survey criteria for other types of direct and indirect impacts from forest management and other activities. Final monitoring plans and a formal commitment by the Corps to implement all of the recommendations in the Service's June 8, 2005 letter including the most recent version of IBWO survey criteria dated December 21, 2005, were transmitted to the Service on February 1, 2006.

While the Service was evaluating the Corps commitment, staff from the Corps, Service, and other GPADP interagency team members conducted IBWO surveys along the pipeline Right-of-Way (ROW) through the Mike Freeze/Wattensaw Wildlife Management Area from March 6-15, 2006. Three cavities of interest were observed in a baldcypress tract on the north side of the survey area. Subsequent evaluation of these cavities by Mr. Elliott Swarthout, Cornell Lab of Onithology Ivory-billed Woodpecker Search Team Field Supervisor, judged them to be unsuitable as possible IBWO cavities. This concluded field work for 2006 as the Corps was unable to complete surveys on the east and west ends of the pipeline ROW.

Upon final review of the BLH and hydrologic monitoring, and adaptive management plans, along with the results of IBWO surveys, the Corps commitment to complete surveys at the ends of the pipeline ROW, and their agreement to implement all of the Service's recommendations, the Service determined that these actions would be protective of the floodplain forest, and thus the IBWO. The Service concurred with the Corps "not likely to adversely affect" determination on March 22, 2006. This concluded our informal consultation.

Description of the Proposed Action

The GPADP is an agricultural irrigation water supply project. The GPADP would divert 487,700 acre-feet of surface water from the White River annually to supply water to 247,556 acres of irrigated cropland in the 362,662-acre project area. The plan presented in the Corps' General Reevaluation Report and supplemental project planning documents specifies that White River water would be distributed to approximately 867 farms in the project area through 102 miles of new canals and 290 miles of pipelines. A 1,640-cubic feet per second (cfs) capacity pump would be located at De Vall's Bluff. On-farm features of the project include construction of 8,849 acres of new on-farm irrigation reservoirs, on-farm tail water recovery systems, establishment of native prairie vegetation on approximately 3,000 acres of canal rights-of-way,

and the annual flooding of 38,529 acres of harvested rice fields for waterfowl. In addition, a 99-acre widened section of Canal 1000 would be constructed as a regulating reservoir to improve operation efficiency.

The proposed action includes pre-construction surveys, procedures to follow if Ivory-billed Woodpeckers are found in proximity to construction sites, project monitoring, and implementation of an adaptive management plan. The pre-construction surveys would be conducted according to survey criteria developed by the Service (U.S. Fish and Wildlife Service 2006), which include searching a one-mile radius around a proposed construction site in areas of potentially suitable IBWO habitat. Any potential IBWO cavities and foraging would be identified and would receive additional monitoring to document possible use by IBWO. If IBWO are found to be using an area within one mile of the proposed construction site, construction would either be delayed or halted and the Service would be contacted. Project monitoring would include hydrologic evaluation, bottomland hardwood surveys, and project operation tracking. Plans for each of these monitoring components were developed by experts in the respective fields and were reviewed and accepted by the project interagency team, which is comprised of staff of state and federal resource agencies as well as the project sponsor.

Finally, the Corps will implement an adaptive management plan developed in consultation and coordination with the Service and the interagency team. This plan describes the organization and responsibilities of the participating agencies, procedures for collecting and evaluating monitoring data, criteria that would trigger adaptive management actions, and potential actions that could be implemented if monitoring revealed any adverse effects of the project.

The portion of the White River and its adjacent floodplain from Interstate 40 (mile 126.6) downstream to St. Charles (mile 57.0) was designated by the Corps as the reach of the River potentially affected hydrologically by the project. The Service has described the action area (Figure 1) to include the portion of the GPADP area on the Grand Prairie Terrace, the area in the lower White River basin potentially effected hydrologically by the project as described by the Corps' and the lands extending one mile from pipeline and its ROW through the Mike Freeze/Wattensaw Wildlife Management Area for reasons that will be explained and discussed in the "Effects of the Action" section of this consultation.

Background on the Ivory-billed Woodpecker

Prior to the 2004 sightings of the Ivory-billed Woodpecker along Bayou De View in the Cache River National Wildlife Refuge, the last well-documented sighting was of an unpaired female in cut-over forest remnants of old-growth bottomland hardwood forest on the Singer Tract in northeastern Louisiana in 1944 (Fitzpatrick *et al.* 2005). The decline and eventual disappearance of the IBWO coincided with the systematic clearing and alteration of forest habitats, especially virgin old growth forests, across the southeastern United States between 1880 and the 1940s. A reduction in suitable habitat due to large scale conversion of forest habitats resulted in a consequential reduction in the amount of forest and thus the number of dead and dying trees, a primary source of available food resources for the IBWO. In addition, extensive collection for

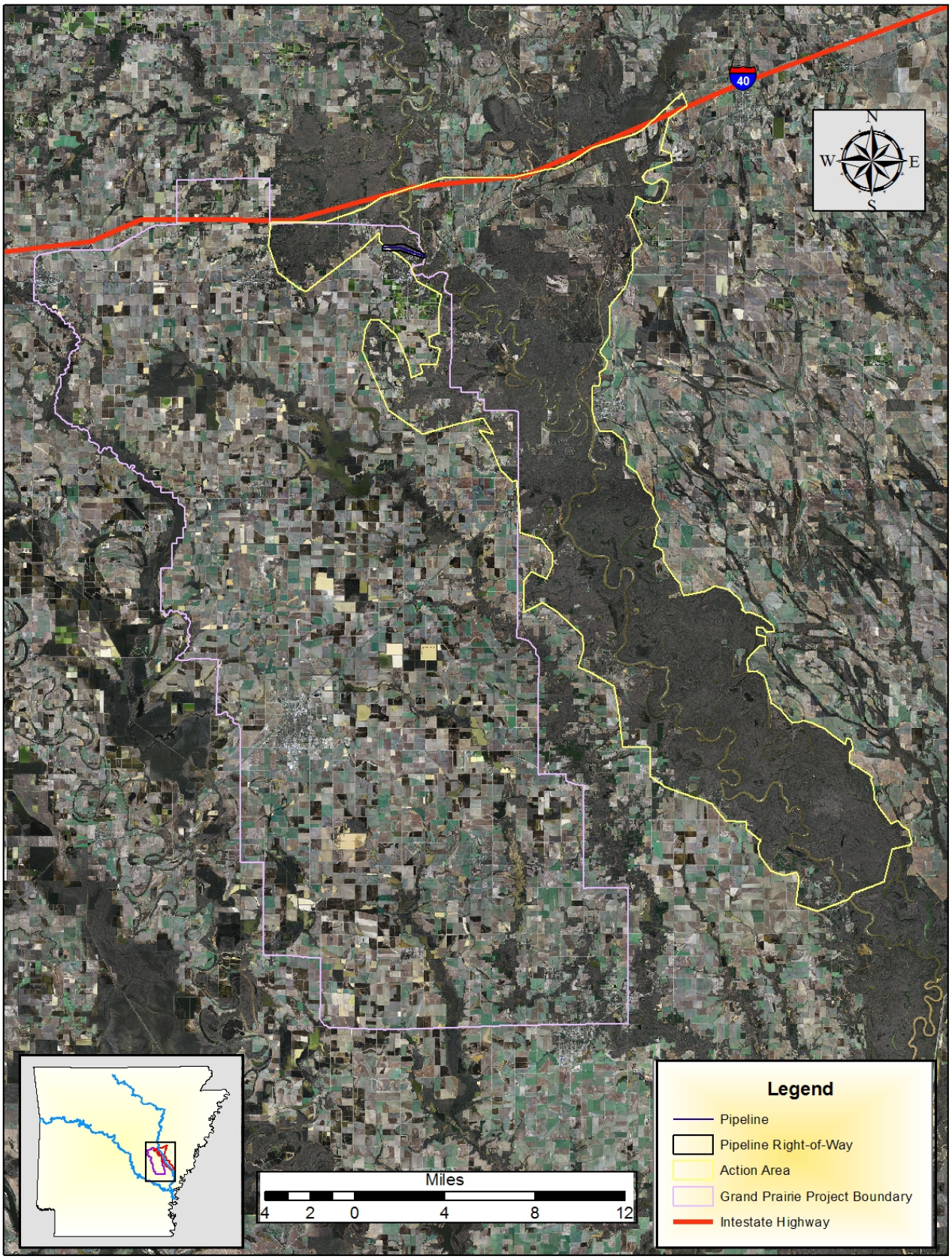

Figure 1. Grand Prairie Area Demonstration Project Ivory-billed Woodpecker Informal Consultation Action Area.

bills and plumages and specimens taken by professional collectors for scientific purposes (Fitzpatrick *et al.* 2005) resulted in taking of hundreds of specimens and accelerated the species decline through the early 1920s. Data indicate that most of over 400 specimens were taken between 1880 and 1910 (Jackson 2002).

The IBWO was apparently common and widely distributed throughout the southeastern United States prior to European settlement and ranged from North Carolina on the east coast, south to include all of Florida, west to the coastal plain of Texas and eastern Oklahoma, and north in the Mississippi Alluvial Valley to the confluence with the Ohio River, and then eastward into Kentucky and Illinois adjacent to the Ohio River (Hasbrouck 1891, Jackson 2004) (Figure 2). The historic range in Arkansas included the old-growth bottomland forests in the eastern part of the state, the bottomland forests in south-central Arkansas around the confluence of the Ouachita and Saline Rivers, and possibly other locations in southwest Arkansas (James and Neal 1986, Tanner 1942).

The IBWO is one of 11 species of large woodpeckers in the genus *Campephilus*. It is the largest woodpecker in North America and is noted for its glossy black plumage and conspicuous white stripe running from each cheek down each side of its neck to the back, where they curve together to form a large triangular patch on the lower back. Males display a prominent pointed scarlet crest, while the female's crest is entirely black. The bill is large and ivory white and the eyes are yellow. Aside from the larger size, the most significant distinguishing characteristic that sets the IBWO apart from the similar looking Pileated Woodpecker is the prominent white trailing edge on the underside of the wings. The white secondaries are visible on the top and underside, differentiating it from the Pileated Woodpecker which shows white on the leading edge from the underside and a white patch on the top of the wings.

Current Status and Potential Distribution of the Ivory-billed Woodpecker

The current distribution and population of the IBWO within its historic range is currently unknown. From 1944 to 2005 there have been at least 30 possible IBWO encounters in nine states (Figure 3). One of the most recent and probably most promising sightings occurred in Florida in 2006. While conservation agencies hold a cautious view, researchers in Florida have compiled the most compelling evidence of the occurrence of the IBWO in Florida in over 20 years with observed sightings on 14 occasions and acoustical signals on 41 occasions (Hill *et al*. 2006). However, since the last confirmed sightings of the species in Louisiana in the 1940's the only other generally accepted sightings were those associated with the rediscovery of the IBWO in Arkansas in 2004/05 as documented by Fitzpatrick *et al.* (2005). It should be noted, however, that there is some debate among ornithologists and birders regarding the evidence of at least one IBWO being found in eastern Arkansas (Fitzpatrick *et al.* 2005, Fitzpatrick *et al.* 2006, Jackson 2006, Sibley *et al.* 2006).

The potential population of IBWO in Arkansas is unknown; however, population potential can be postulated based on density estimates reported by Tanner (1942) as they relate to known habitat conditions and forest tract size in the lower White River basin. Based on an examination of the data presented by Tanner (1942), Hunter *et al*. (2006) contend that the Singer tract at

Figure 2. The Historic Range of the Ivory-billed Woodpecker. Adapted from Jackson (2002).

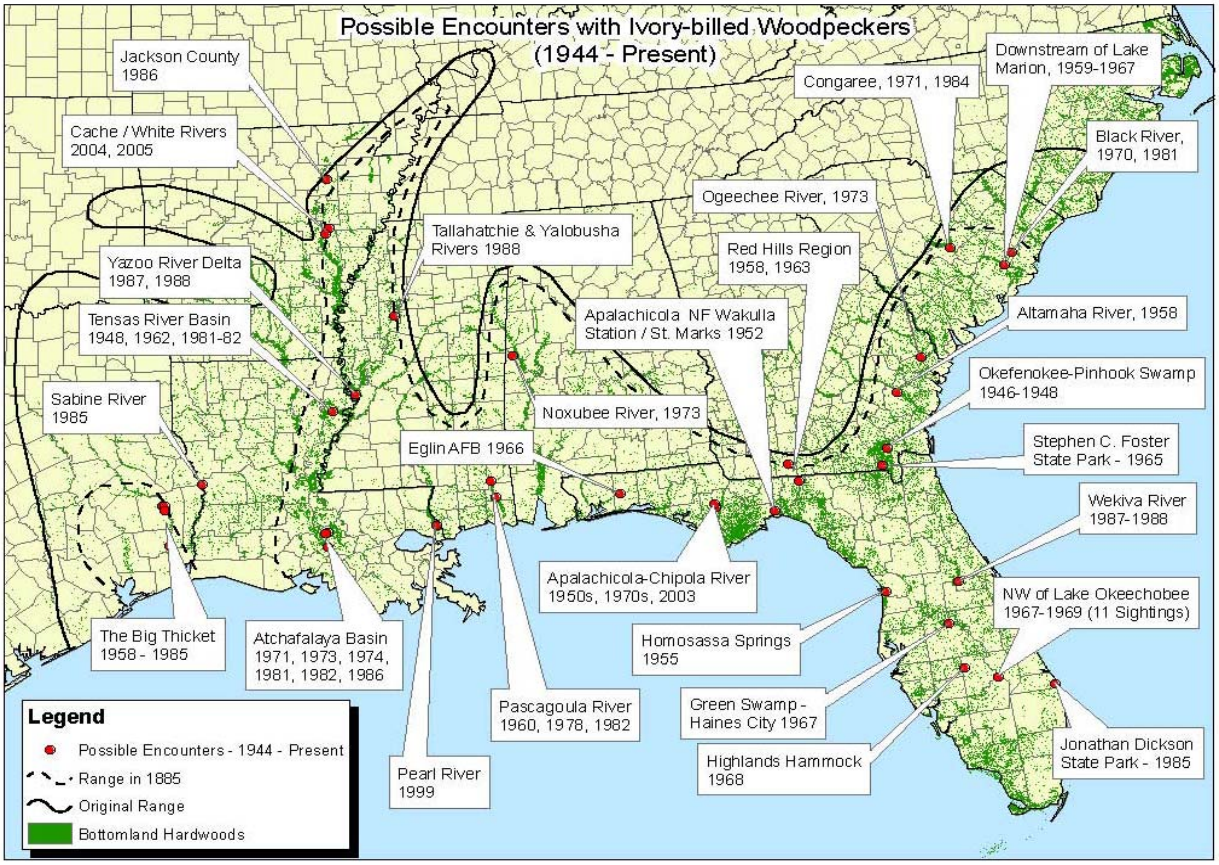

Figure 3. Possible sightings of the Ivory-billed Woodpecker from 1944 to Present.

80,000 acres was apparently not enough habitat to support even a small population sustainably. Thus, they concluded that a large area is apparently required to support even small populations.

Tanner (1942) reported density estimates ranging from one pair per six square miles (about 4,000 acres) in Florida to one pair per 17 square miles (about 11,000 acres) in Louisiana. Approximately 300 square miles (about 200,000 acres) to 850 square miles (about 550,000 acres) would be required to support 50 pairs.

Status and distribution of IBWO in Arkansas can only be speculated. The initial sightings in Arkansas were centered around the Bayou de View area in Monroe and Woodruff Counties (Figure 4) (Fitzpatrick et al 2005). Since the initial sighting in February 2004, the Cornell Lab of Ornithology (CLO) in cooperation and with the assistance of The Nature Conservancy, U.S. Fish and Wildlife Service, Arkansas Game and Fish Commission, Arkansas Natural Heritage Commission, Audubon Arkansas, as well as others has conducted extensive searches throughout the lower White River basin. CLO field crews comprised both paid staff and volunteers, employed various search strategies including active searching, stationary observations, decoys, playbacks of recordings of IBWO "kent" calls and territorial double-knock display drums from the Powerful Woodpecker (*Campephilus pollens*), cavity and feeding tree transect surveys and monitoring, and autonomous recording units (Swarthout *et al. 2005,* Rohrbaugh *et al. 2006*).

Figure 4. Ivory-billed Woodpecker Sightings documented during the 2004/2005 Cornell Lab of Ornithology led searches.

Several concentrated searches employing 20 or more observers were conducted along the Cache River, Bayou De View, and Mike Freeze/Wattensaw WMA during the winter 2006-07 search season. To date, over 60,000 hours of search effort have been expended in this effort and evidence of IBWO has been documented from the lower White River basin near the Mississippi River north to Bayou de View (Swarthout *et al. 2005,* Rohrbaugh *et al. 2006*), a distance of nearly 80 miles.

In addition to the CLO led searches, the Arkansas Highway and Transportation Department along with representatives of the Service, conducted IBWO surveys during January and February 2006 along the ROW of the proposed U.S. Highway 79 White River bridge and highway replacement west of Clarendon, AR (Arkansas Highway and Transportation Department 2006) (Figure 5). The road alignment traverses approximately three miles of bottomland hardwood forest at the boundary between the Cache River and White River NWRs. Employing the Service's recommended survey criteria, AHTD and others searched a one-mile wide buffer around the propose highway alignment. Transect lines were established at 50 meter intervals and two person teams looked for cavities and signs of IBWO foraging.

The best evidence of IBWO collected was a four-second video shot by David Luneau on April 25, 2004. From 2004 through 2006, 30 possible encounters with IBWO were reported by CLO led searchers; however, only seven visual sightings made during the 2004-2005 search were considered authoritative. Three of the 2005-2006 search season sightings were suggestive of IBWO, but not definitive. (Swarthout *et al. 2005,* Rohrbaugh *et al. 2006*). Over 1032 cavities were discovered during the CLO and AHTD searches. Of these 669 ranked out as meeting the minimum criteria to be considered potentially suitable for IBWO. No IBWO use was detected at any cavities during subsequent monitoring. Two hundred fifty five locations of feeding trees suggestive of IBWO feeding activity were mapped during the 2005-2006 search season. However, subsequent observations of feeding trees failed to reveal any IBWO feeding activity. Ability to differentiate potential IBWO feeding from that of other woodpeckers has been problematic at best.

Multiple IBWO encounters were reported on the Mike Freeze/Wattensaw WMA by public and by professional volunteers participating in the 2006-2007 Arkansas IBWO search. The encounters have been visual and auditory, consisting of brief fly-bys, observation of perched birds, detection of kent calls and double knocks. The encounters began in August 2006 and continue through May 2007. None of the encounters are considered definitive but collectively they do suggest a strong possibility of IBWO presence on the WMA. The general location of Mike Freeze/Wattensaw encounters is shown on the IBWO Sightings Map Figure 6) (Pers. Comm., Steve Osborne 2007).

Information collected during the CLO led searches including audio recordings and visual observations as well as reported public sightings deemed credible by experienced natural resource agency staff suggests an extensive IBWO distribution within the lower White River basin. Based on search results and habitat conditions, the Service has identified the potential range of the IBWO as comprising "that portion of Arkansas and Mississippi in and around the bottomland hardwood forest of the lower White river basin where the IBWO was rediscovered,

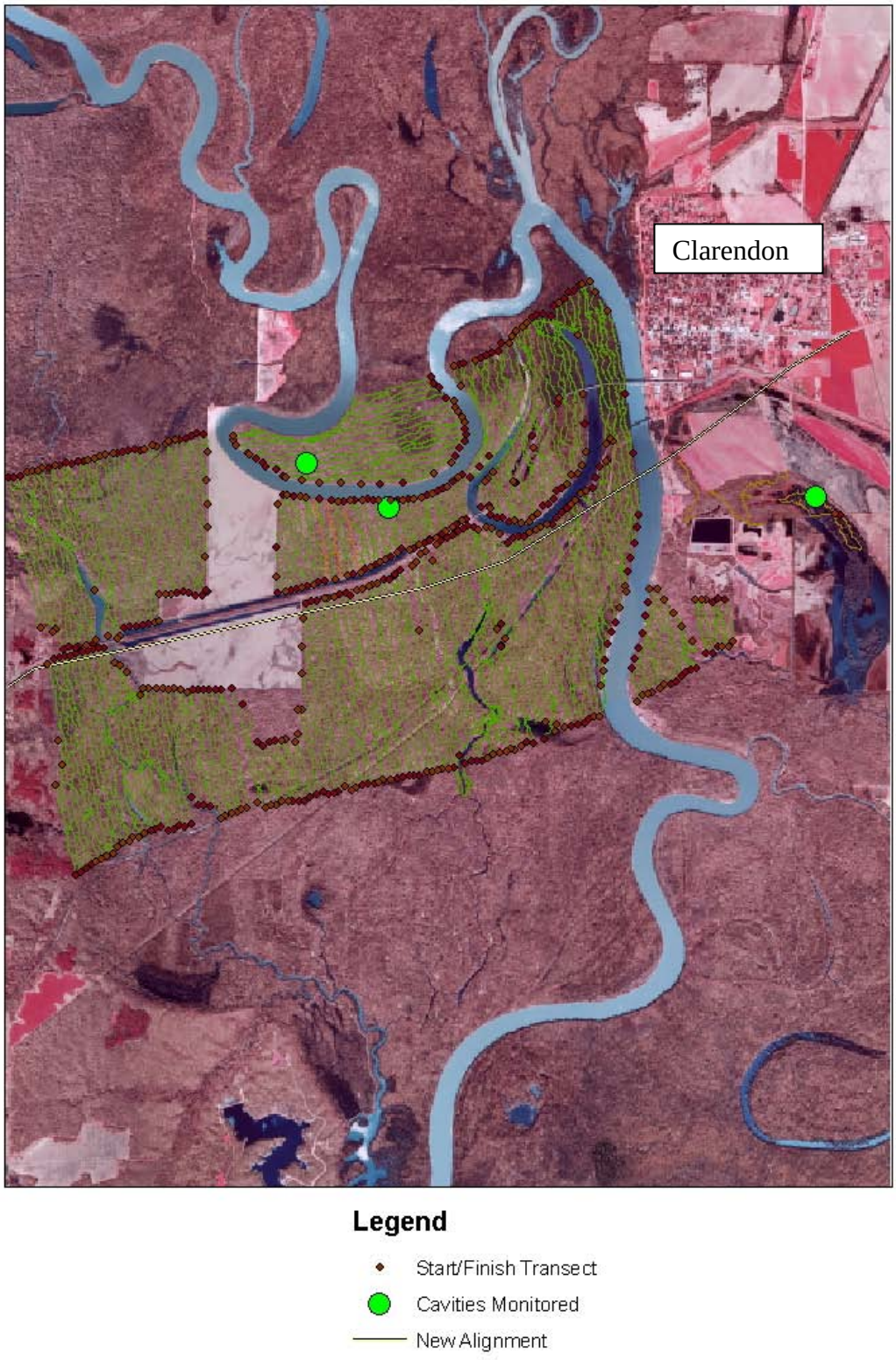

Figure 5. Arkansas Highway and Transportation Department Searches for Ivory-billed Woodpecker Cavity and Foraging sign along proposed U.S. Highway 79 alignment, 2006.

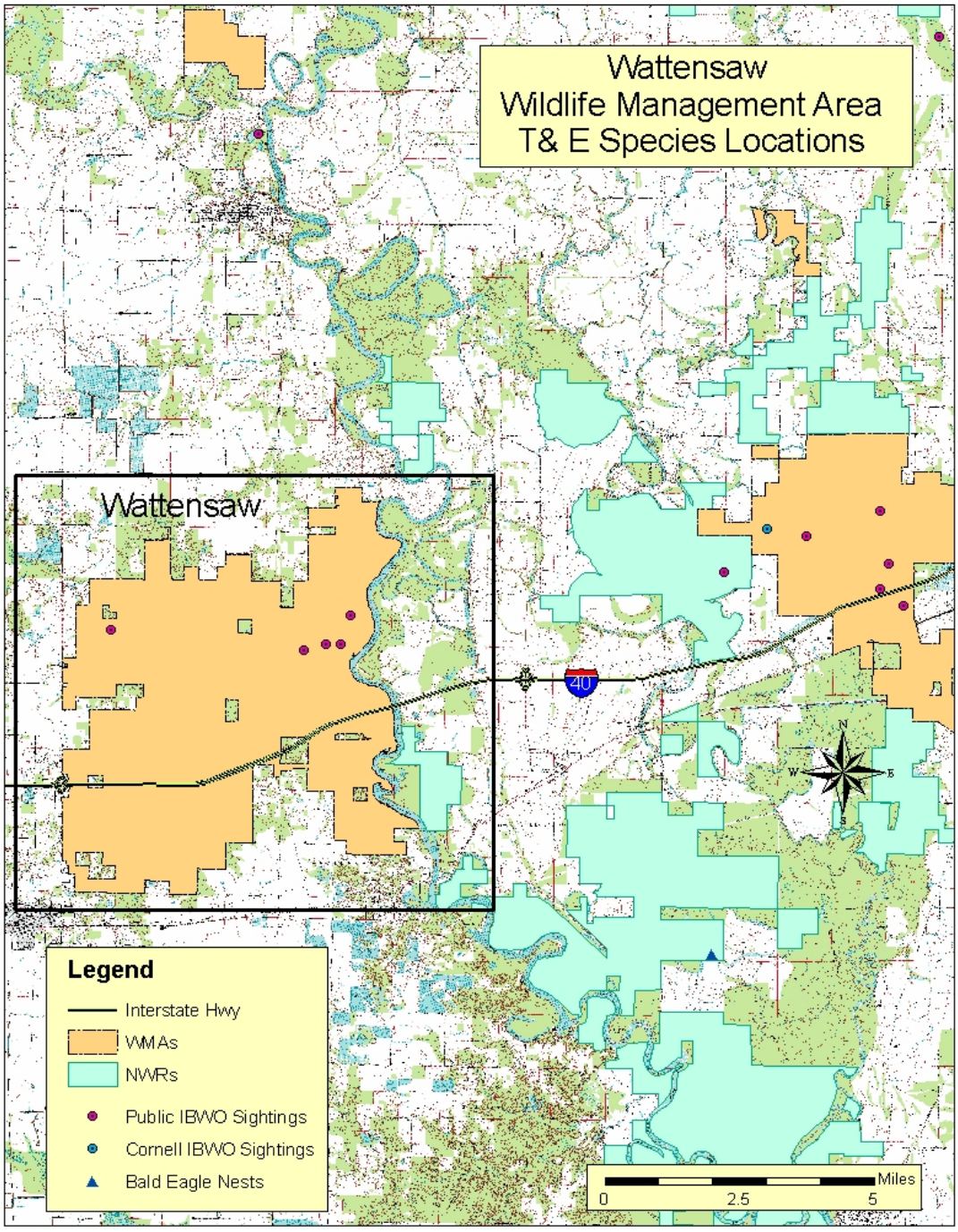

Figure 6. Reported Ivory-billed Woodpecker Sightings on Mike Freeze/Wattensaw Wildlife Management Area, August 2006 through May 2007.

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" (U.S. Fish and Wildlife Service 2006).

Potential range includes suitable habitat[a] in parts of Arkansas, Desha, Jefferson, Lincoln, Phillips, Prairie, and Woodruff Counties in Arkansas; and Bolivay County, Mississippi. The Service further refines the definition of potential range to be restricted to the mostly contiguous forest primarily in the lower White River floodplain generally following the edge of the contiguous forest including forested corridors extending outward from the contiguous forest, the batture lands of the Mississippi River to about eight to ten miles south of the mouth of the Arkansas River, the forest encompassing Arkansas Game and Fish Commission's Rex Hancock/Black Swamp WMA, Cache River NWR and adjoining private lands, and the portions of the lower Arkansas River floodplain to about 12 miles upstream of Dam 2 (U.S. Fish and Wildlife Service 2006).

It is not possible to provide a definitive assessment of population size at this time, but it is likely that the population of birds in Arkansas is extremely small. If the IBWO persists within other portions of its historic range, it is likely that these individual populations are small as well. However, with expansion in size and age of many forests throughout the southeast, there is hope that improved habitat conditions will provide the opportunity for the number of remaining birds to increase.

Life History and Ecology

Information on the life history and ecology of the IBWO is limited to a few early studies, the most comprehensive of which was done by James T. Tanner during the late 1930s-early 1040's (Tanner 1942), and information extrapolated from other similar species. While Tanner's work provided a significant snapshot into the world of the IBWO, it should be noted that during this time he was working in some of the last old growth forest remaining in the south and a virtual forested island in a growing sea of agriculture in the Mississippi Alluvial Valley. Observations and conclusions from his work could represent a microcosm in a larger sphere of the species life history.

The IBWO is large bird averaging about 20 inches in length with a 30 inch average wingspan. It is a sleek and a strong flyer, well adapted to traveling for long distances (Tanner 1942). They use cavities excavated in the dead or dying portion of a live tree, though dead trees may also be used, for nesting and roosting. IBWO excavate large cavities with irregularly shaped openings, somewhat oval and ranging in size from 4-5.7 inches wide and 6-6.7 inches high. Cavities have been found mostly between about 15 and 70 feet up in the tree with the outside diameter of the tree at the cavity ranging from 13 to 22 inches (Tanner 1942, Allen and Kellog 1937). The shape and size of known cavity openings are generally distinguishable from the Pileated Woodpecker, which is typically excavates oval or round holes under 3.5 inches in width.

Breeding is generally thought to occur between January and April. Clutches of up to five eggs have been reported, but most clutches were reported to contain between two and four eggs. Tanner (1942) estimated that eggs are incubated for about 20 days, and it is thought that fledging occurs in about 35 days with young birds being fed by both parents. Young birds may remain

[a] The Service defines suitable habitat as forested areas dominated by trees with a diameter at breast height (dbh) of 16 inches or greater (U.S. Fish and Wildlife Service 2006).

with the parents foraging and roosting nearby through the summer and up to the next breeding season.

IBWO have been observed nesting or roosting in nine species of trees including baldcypress, Nuttall oak, green ash, and sweetgum. They appear to have favored roosting areas and may frequently use the same cavity. They can be faithful to the same roost cavity for at least a year and a half (Tanner 1942).

Based on a limited number of stomach samples and anecdotal information it appears that beetles from the long-horned beetle family Cerambycidae are an important component of the IBWO diet. Beetle larvae are collected by stripping the bark of recently dead (about two to three years) trees and excavating rotted wood. (Tanner 1942). However, many other species of wood boring insects and various nuts including pecans and acorns, and fruits from hackberry, persimmon, poison ivy and other species, have also been recorded from stomach samples and feeding observations.

Population density was estimated by Tanner (1942) to range from one pair per six square miles (3,840 acres) of mixed pine and bottomland forest habitat in Florida to one pair per seventeen square miles (10,880 acres) of bottomland forest in Louisiana. The birds he studied on the Singer tract in Louisiana tended to have their roosting area in the center of their range and they returned there to roost almost every night. One pair of birds that he followed during the nesting and summer season usually ranged from three-fourths to one mile from their roosting ground with the maximum distance recorded at about one and one-half miles. A lone young male bird that Tanner followed in another section of the Singer tract typically ranged about two miles from the roost he was regularly using and he once followed the bird two and one-half miles from the roost. Tanner emphasized that the ranges for these birds were recorded during spring and summer and believed that the winter range was probably larger than in summer. He cited an observation of J.J. Kuhn who followed a pair for hours before losing them. The place where he lost them was two miles from where he first found them and "had traveled in a semicircle of at least three and one-half miles in about four hours."

Tanner believed that Ivory-billed Woodpeckers were not sedentary birds and that at times they would wander considerable distances. He again referenced an observation by Mr. Kuhn who reported seeing three Ivory-bills leave a roost in cypress trees near a small lake about ten miles north of the Singer tract that was bordered for several miles by cut over land. Tanner felt that food abundance was the determining factor in wandering and range; that adequate food supplies prompted birds to remain in one locality, but that birds would have to move considerable distances to find another suitable area when those food supplies diminished.

Habitat Requirements

James Tanner's observations of IBWO habitat use in the Singer Tract in Louisiana constitute the best historical information available (Hunter *et al.* 2006). Tanner (1942) reported that the birds he studied there primarily used the sweetgum-oak forest type in the "first bottoms." The "first bottoms" are relatively high bottomland hardwoods that are not frequently flooded or flooded for long durations. Tanner found sweetgum and Nuttal's oak to be the number one and two trees

foraged upon most frequently; however, he also recorded Ivory-bills foraging on thirteen other species of trees (Tanner 1942).

Throughout its historic range, Ivory-billed Woodpeckers used a variety of habitats ranging from upland pine forests and cypress swamps in Florida and Cuba to bottomland hardwood forests and cypress swamps in Louisiana and Arkansas (Allen and Kellogg 1937, Tanner 1942, Jackson 2004, Fitzpatrick *et al.* 2005, Rohrbaugh *et al.* 2006). Key among all these habitat types was the abundance of expansive patches of "virgin" forest with a relatively high proportion of very large and old trees that supported a high proportion of dead and dying trees (Hunter *et al.* 2006). It should be noted that the Singer tract was not an unbroken, closed-canopy forest of giant old growth trees. Rather, it included not only some of the last remaining large old-growth "virgin" forest but also small trees and areas of recent disturbance and logging (Hunter *et al.* 2006). Furthermore, Hunter *et al.* (2006) suggest that the species may have keyed into forests that have suffered catastrophic events such as hurricanes, tornadoes, fire, and other disturbances, and that the species may be more appropriately described as one that "requires disturbances of substantial size and hence forests of large enough size to contain the large scale disturbance regimes that would maintain favorable habitat.

Current Habitat Conditions in the GPADP Action Area

The GPADP Action Area (Figure 1) includes the Grand Prairie project area itself on the Grand Prairie terrace, the area in the lower White River basin potentially affected hydrologically by the project from Interstate 40 to approximately St. Charles, Arkansas, as described by the Corps' and the lands extending one mile from the pipeline and its ROW through Mike Freeze/Wattensaw Wildlife Management Area

The Grand Prairie project area is on the prairie terrace, a Pleistocene feature thirty to fifty feet above the White River floodplain that historically consisted of large areas of prairie grasslands, herbaceous wetlands, upland hardwood forests and savannahs, and bottomland hardwood forests along streams (Heitmeyer *et al.* 2000). It is currently primarily in agricultural production with forested areas confined to lands in public ownership or the lowest wettest areas along streams and drainages. Most of the project area is outside the area considered to be within the potential range of the IBWO (U.S. Fish and Wildlife Service 2006).

With over 300,000 acres of contiguous forest, the bottomland hardwood forest of the lower White River basin comprises the largest remaining block of forest remaining on any tributary of the Mississippi River. This is significant in that nearly 89 percent of the wetlands in Arkansas' portion of the Mississippi Alluvial Valley had previously been converted to other uses (Yaich 1994). Within this area over 250,000 acres is in state and federal ownership and is managed primarily for the benefit of fish and wildlife resources. It is important to note that over the past 20 years a significant amount of land in the area has been replanted to trees through reforestation efforts by the Cache River National Wildlife Refuge and through the Wetland Reserve Program.

Information regarding the species composition, forest community types, and conditions on public lands have been collected over the years by resource professionals with the U.S. Fish and Wildlife Service and Arkansas Game and Fish Commission during timber cruises and habitat

surveys related to management of the federal national wildlife refuges and state wildlife management areas in the basin. Subsequent to the rediscovery of the IBWO, the Service initiated new habitat inventories in 2005 within the lower White River basin to, among other things, document existing habitat conditions and provide land mangers with information to facilitate future management decisions (Wilson *et al.* 2006).

The habitat survey comprised sampling of approximately 90,603 acres on Cache River NWR, White River NWR, Dagmar WMA, Trusten Holder WMA, Mike Freeze/Wattensaw WMA and other habitats outside the action area. The surveys included measurement of diameters, species and stress conditions of live trees, dead tree volume and condition, and other habitat parameters (Wilson *et al.* 2006). The habitat survey information was compiled by the Lower Mississippi Valley Joint Venture Office and preliminary results include identification of stands with the highest habitat values to prioritize search efforts. Maps depicting preliminary results of this habitat inventory are included in Appendix 1.

Oak and oak-mixed hardwood forest types are the dominant cover types in the lower White River basin, with overcup, Nuttall, water, willow, and cherrybark oaks being the most abundant species. Other hardwoods associated with the dominant cover types include sugarberry, green ash, red maple, American elm and various hickories. Baldcypress and water tupelo swamps are found on the lowest wettest areas (Krystofik and Phillips 2002).

The forests of the lower White River basin are considered to be mature forest; however, they are "generally characterized by small and widely scattered patches of older trees within expansive patches of younger (<100 ears old) forests and some scattered small patches of heavily disturbed stands" (Hunter *et al.* 2006). Within the Bayou De View area, where the initial sightings of the IBWO occurred, the forest is dominated by baldcypress and water tupelo with some of the oldest baldcypress trees ranging in age from 800-1000 years old or more. Timber harvests have occurred throughout the area on a regular basis from at least the early 1940's.

The forest in the vicinity of the pipeline from the pump station through Mike Freeze/Watttensaw Wildlife Management Area is comprised primarily of mature upland hardwoods. The area is at the edge of the prairie terrace and is dissected by numerous drainages. One portion of the area is in the White River floodplain and is comprised of a stand of large baldcypress trees.

While characterized as the largest contiguous block of bottomland hardwood forest on any tributary of the Mississippi River, the forest canopy in the lower White River basin is broken by many isolated and linear features on the landscape. Large and small agricultural fields and other forest openings are found in the basin, which in places limit contiguous forest to low wet areas and streams. The basin is also traversed by numerous county, state, and federal highways, transmission line ROWs, gas pipeline ROWs, as well as numerous waterways. These linear features in the landscape cause breaks in the forest canopy ranging from only a few feet for small sloughs or bayous, 200 to 300 feet along highways, to over 600 feet along the White River channel.

Factors affecting the IBWO Environment Within the Action Area

The primary reason for the decline of the IBWO throughout its range appears to be a reduction in suitable habitat due to large scale logging and conversion of forest habitats. Important Ivory-billed Woodpecker habitat features include extensive, continuous forest areas, very large trees, and agents of tree mortality resulting in a continuous supply of recently dead trees or large dead branches in mature trees (Jackson 2002). With the majority of the land in public trust, either under state or federal ownership, it is reasonably certain that forest conditions favorable to the IBWO will be improved over time as stands are manage to meet the desired forest conditions. The LMVJV Forest Resource Conservation Working Group (2007) published recommendations on "forested conditions that would meet the conservation objective of providing forested habitat capable of supporting sustainable populations of all forest dependant wildlife species," including Ivory-billed woodpeckers. These recommendations include active and passive management designed to achieve a diverse and heterogeneous forest with vertical structure comprised of ground, shrub, and overstory vegetation, including at least two dominant emergent trees per acre. Cavity trees as well as dead and stressed trees are also recommended components of the forest.

The ability to maintain and promote a healthy forest with large stands that include large trees and an adequate supply of dead and dying trees on a sustainable basis is the clear challenge to land mangers. The U.S. Fish and Wildlife Service and Arkansas Game and Fish Commission, the major landowners within the action area, are fully committed to meeting the Desired Forest Conditions, which will substantially aid in meeting the need.

Another factor affecting the IBWO habitat in the action area is hydrology, the life blood of bottomland hardwood forest systems. The White River, like all other rivers, exhibits seasonal, annual, and cyclic variability in stage and discharge (measured in cubic feet per second – cfs). This variability results in times of low in-channel flows that leave sandbars and other portions of the channel exposed and times when the river overtops its banks and inundates the floodplain. The timing, duration, frequency, and rate of change of overbank flooding in conjunction with the geomorphology of the floodplain dictate not only forest composition, but also forest health. Forest communities develop and flourish under patterns of inundation to which species are adapted. Species such as baldcypress and water tupelo are adapted flood duration approaching 100 percent, whereas Nuttall oak and sweetgum are adapted to survive flood durations of up to one to two months during the growing season (Wharton *et al.* 1982; p55).

The hydrology of the lower White River basin has been altered by the extensive manipulation of the river for flood control, hydropower generation, navigation, municipal and infrastructure development and as a water source for irrigation. The six major dams on the White River and its tributaries have altered the inter and intra-annual flow characteristics of the lower White River by moderating high flows, reducing peak discharge, reducing variability in flow magnitude, and by altering the frequency of high flow events (Figure 7). Conversely, low flows are higher than they were historically, flow variability is reduced and the recurrence intervals between extreme low flows has been extended (Krystofik *et al.* 2005). In addition, flow and, consequently, stage, in the White River is also affected by other factors including clearing, ditching and draining of lands in the watershed, channelization of tributary streams and stage on the Mississippi River.

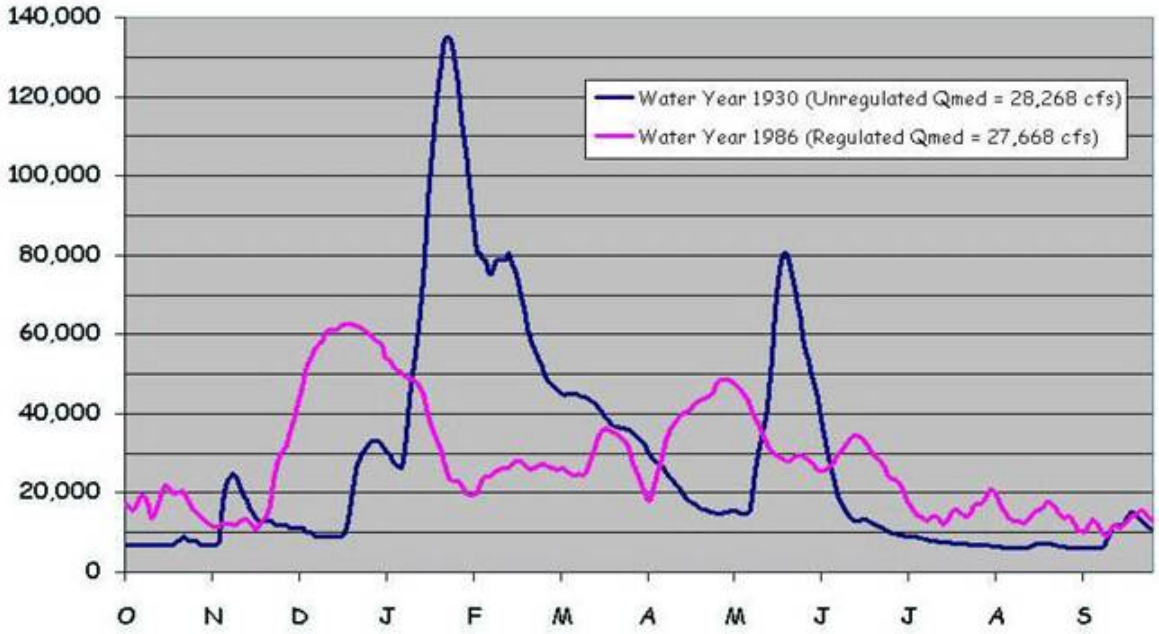

Figure 7. Pre and Post Dam Median Flows on the White River at Clarendon, AR Comparing Water Years 1930 and 1986.

The Mississippi River can affect the stage up to Clarendon, Arkansas, located 100 river miles above the confluence of these two rivers.

The effect and significance of the perturbation of stage on the White River was illustrated in a survey conducted by Tom Foti (former chief of research for the Arkansas Natural Heritage) and an interagency team. They identified vegetation along a transect and correlated this information with elevation and flood characteristics. They found that BLH flood frequencies during the growing season under existing conditions were extended beyond what would have occurred under pre dam conditions (Corps of Engineers 1999). These wetter conditions could lead to gradual conversion of forest communities with species adapted to limited flooding, such as Nuttall oak and sweetgum, to communities with species such as overcup oak and bitter pecan that are adapted to wetter conditions.

One other factor that could affect the IBWO within the action area is disturbance, and a key question is: What is the IBWOs tolerance to humans and human disturbance? Historically, the IBWO inhabited large and likely somewhat remote, forests. The IBWO now lives in an environment where there are varying amounts and types of human disturbance. Within the forest itself there is considerable human activity associated with hunting seasons, fishing, and forest management. Timber harvest activities involve use of heavy machinery and trucks to cut and remover the logs. Highways, including some that receive heavy use (i.e., Interstate 40) traverse the area. The initial sighting that led to the eventual announcement of the rediscovery of the IBWO was within one-fourth mile of a well used state highway. Tanner (1942) was able to set up a blind at the foot of an active nest tree to observe nesting and brood rearing behavior, and followed IBWOs through the forest for miles. He concluded that “The Ivory-bill is not unusually wary of man nor seriously affected by man’s presence” (Tanner 1942; pg 100). Conversely,

reports of recent sightings often describe an abrupt withdrawl and avoidance of humans by the Ivory-bills when they are spotted by the bird. It appears, then, that IBWOs are wary of humans, but are, or soon, acclimate to human activity.

The land within the potential range of the IBWO in Arkansas is not pristine wilderness untouched by human activity, though it is an incredible natural resource and is among the best of what is left. It has historically been managed and developed for a diversity of interests including timber production, agricultural production, land and water based transportation, and flood protection. Public and private interests continue to manage and develop land within the basin; however, the majority of the land is managed for fish and wildlife conservation under the auspices of federal and state conservation agencies. There is also a great deal of interest in conservation among private owners as evidenced by the considerable acreages enrolled in conservation programs and managed to support commercial hunting operations.

Because the land will continue to be manipulated, the Service has taken steps to help ensure that these actions avoid take of the IBWO by developing recommendations on when consultation and searches for IBWO presence within proximity of the proposed action area would be recommended (U.S. Fish and Wildlife Service 2006). Survey recommendations were tailored to two major land manipulations, conversion activities, and Forest Management/National Wildlife Refuge-Wildlife Management Area Operations. Conversion activities are those which permanently convert suitable forested habitat to non forest habitat or result in a long term (>1 year) conversion to unsuitable habitat. Searches for conversion activities extend from the footprint of the activity out one mile in potentially suitable IBWO habitat.

Potentially suitable IBWO habitat is defined as any forested land within the IBWO's potential range that is dominated by trees equal to or greater than 16 inches diameter at breast height (dbh). The 16 inch dbh criteria was chosen because a forested area with trees of that size would provide nesting and roosting opportunities for the IBWO. Areas with smaller trees could not accommodate the large cavity required by the IBWO (see U.S. Fish and Wildlife Service (2006) for more detail). Selection of a one mile search radius was based on the typical 0.75 to 1.0 mile foraging range of IBWO during the nesting season reported by Tanner (1942). This is a critical time during a species life cycle when brood rearing adults need access to foraging habitat. While the maximum range recorded by Tanner was 1.5 miles, this was the exception, not the rule.

The ability of the IBWO to fly long distances was discussed above in the section on Life History and Ecology. Tanner (1942) reported a lone juvenile male to range up to 2.5 miles from his roost cavity. When discussing a species range it is important to understand how that concept relates to the ability of an animal to meet its physiological requirements. Home range is the area within which most of an animal's activities occur and is generally centered around some favored feeding ground or patch of cover. This "center of activity" is in turn surrounded by a somewhat larger area which contains different feeding areas, resting places and escape cover that it visits occasionally and is easily crossed by the animal (Dasman 1964; pg 117). Tanner reported that IBWO will travel longer distances from their roost cavity to potentially suitable foraging habitat during the non-nesting season. Based upon Tanner's observations and the expertise of woodpecker experts, the Service assumed that unpaired individuals as well as paired birds during

the non breeding season can range considerable distances of up six to ten miles from their roost in search of suitable foraging habitat.

Effects of the Action

The Corps estimated that 135 acres of forest would be cleared for pipeline and infrastructure construction, a direct effect of the project. Direct effects are those that occur immediately as a result of the action (U.S. Fish and Wildlife Service 1998; pg. 4-25). Sixty of the 135 acres cleared would be allowed to regenerate after construction is completed and the remaining 75 acre impact would be mitigated by reforesting 380 acres of cleared land. Within the IBWO's potential range, approximately 400,000 acres of land is being conserved and managed by public resource agencies, federal conservation program easements, and private conservation interests such as The Nature Conservancy and Ducks Unlimited. In addition, thousands of acres of land are being enrolled in conservation programs to restore more habitat. The conversion of 135 acres, with much of the area within the pipeline ROW through Mike Freeze/Wattensaw WMA being only marginally suitable for IBWO, comprises less than one-half of one percent of available habitat within the IBWO range. The forest through the WMA along the pipeline ROW is mature, but not old and does not contain large areas of disturbance that would provide large concentrations of foraging conditions attractive to IBWO.

The main pipeline exiting the pump station would traverse approximately 1.25 miles across the southern portion of the Mike Freeze/Wattensaw Wildlife Management Area. IBWO surveys within a one mile radius along the pipeline ROW were conducted. No IBWO cavities or foraging were detected and no sightings have been reported within this area. The closest potential IBWO sightings to the proposed pipeline were on Mike Freeze/Wattensaw WMA approximately 3.5 miles away. These sightings are beyond the normal range of nesting pairs of 0.75 to one mile (1.5 miles maximum) reported by Tanner (1942) and further than the 2.5 mile distance he recorded for a lone male during the non-nesting season. Therefore, no nesting or foraging individuals appear to be using the forest from the proposed pipeline ROW out to within their normal range during the nesting season.

Noise from construction of the pump station at De Vall's Bluff and construction of the pipeline across Mike Freeze/Wattensaw WMA would occur for some distance from the work sites. The noise from this construction activity is temporary and is not expected to disturb IBWO to the degree that it would result in take because, 1) Surveys conducted by the Corps and a multi-agency team did not reveal nesting, roosting, or foraging activity by IBWO in the area, and 2) IBWO apparently acclimate to noise disturbance as evidenced by the timber harvesting that has been ongoing in IBWO range for over 50 years and the close proximity of IBWO sightings to heavily traveled state and federal highways. Noise from operation of the pump would have a minimal effect because the pumps would be operated by electric motors housed inside a concrete block building that is a short distance from U.S. Highway 70, a well used highway.

The GPADP would use a 1,640 cubic foot per second (cfs) capacity pump to withdraw 487,700 acre-feet of water annually from the White River. This quantity of water equals 158 billion gallons, approximately two percent of the approximately 7.36 trillion gallons that flow on average past the Clarendon gage annually (Tracy James, Pers. Comm. 2005). However, this

amount of pumping has the capability to reduce stage by up to one foot during times of lower flows. The effect to stage at higher flows is projected to be much less (Figure 8). This indirect effect of the project could have significant consequences to the hydrology of the lower White River and could alter both in-channel and off-channel processes and biota. Indirect effects are those effects that are caused by or result from the proposed action, are later in time, and are reasonably certain to occur (U.S. Fish and Wildlife Service 1998; pg. 4-27). The Service expressed concerns about the potential for the project to affect hydrology in correspondence dated October 4, 2001. The actual effect of project on the hydrology of the lower White River and its associated floodplain ecosystem will only become known after several years of project operation; however, several factors combine to mitigate potential impacts of project withdrawals from the White River.

First, dam operations on the upper White River and tributaries have maintained higher than normal stages through the growing season. The study correlating vegetation communities across the floodplain to hydrologic conditions conducted by the multi-agency team led by the Arkansas Natural Heritage Commission concluded that the reduced flows could have a beneficial effect on floodplain vegetation (Corps of Engineers 1999, pgs. EIS 70-71). They concluded that project operation would reduce flows during this time that would create conditions that would "better approximate the "natural" or without-reservoirs than do current release rules." They further concluded that although this reduction in flows could cause "instability" of vegetation at boundaries between hydrologically controlled vegetation types and allow higher hydrologic zone species (i.e., Nuttall oak, sugarberry, green ash, etc.), to move to lower areas typically dominated by lower zone species such as overcup oak and bitter pecan. In this instance, project operation could have a long-term benefit to the IBWO since the bird appears to prefer these higher zone species (Tanner 1942).

Any change to hydrology will cause forest communities adapted to certain hydrologic regimes to shift in response to the new conditions. If the hydrologic change was toward more frequent or longer duration floods, stress and mortality of the existing vegetation would be imminent. When the change involves a reduction in flood frequency and duration, the change would be gradual and would occur as individual plants were removed from the forest either by natural mortality or harvest. Species adapted to wetter conditions are capable of surviving in drier conditions, whereas species not adapted to maintaining themselves during flooding begin to show signs of stress with only small increases in flood duration and die as flood duration increases (Wharton *et al.* 1982, pg. 38). The reduction in flood frequency and duration would be a significantly greater concern if the resulting effect was to convert wetland to upland. The GPADP is not projected to do that. Across the Arkansas portion of the Mississippi Alluvial Valley the greatest loss of bottomland hardwoods has been to the higher forest communities. The project is projected to create conditions conducive to support higher wetland species favored by the IBWO. Thus, the project could have long term benefit to the species.

The second factor that would mitigate the effect of GPADP operation is that cutoff levels were established in the Corps' February 2000 Record of Decision. These minimum flows were designated to prevent excessive withdrawals. Summer minimum flows ranging from 21,220 cfs during June to 9,650 cfs from August to October are well above historic lows under both pre- and postdam conditions. This is the time that the majority of project withdrawals are to occur.

Winter minimum flows are below optimum flows for flooding riparian habitats, but withdrawals during this time are expected to be low and would have a minor effect on stage due to the high volume of water coming down the river at this time (Figure 8).

Minimum flows are not a panacea and do not necessarily prevent adverse impacts to the riverine or floodplain ecosystem. If flows were to be reduced to these minimum flow levels consistently, there would be a significant adverse impact. In all but the driest times, this event would be unlikely to occur. Even if it did occur during the dry period (late summer/early fall), the minimum flows are artificially higher than historic lows. Long term monitoring of bottomland hardwoods, hydrology, and project operations will allow detection of any possible adverse impacts from the project and permit adjustments to project operations as outlined in the Adaptive Management Plan to be implemented before any permanent damage could occur.

Cumulative Effects

Cumulative effects include the effects of future State, tribal, local or private actions that are reasonably certain to occur in the action area considered in this biological opinion. Future Federal actions that are unrelated to the proposed action are not considered in this section because they require separate consultation pursuant to section 7 of the Act.

The majority of land in the action area is in federal or state ownership and is managed for conservation purposes. Management on state lands includes forest management, beaver control, and public use facility development and maintenance. Though beneficial to the IBWO, these actions are not considered cumulative effects because the state lands in this area were purchased or maintained through federal funds and require section 7 consultation. Natural Gas pipelines that would cross the IBWO potential range have been proposed. These are not considered cumulative effects because they have federal nexus through the Federal Energy Regulatory Commission and would require section 7 consultation. A bridge replacement and new highway alignment that would cross IBWO potential range near Clarendon has been approved and is nearing the construction phase. A section 7 consultation has been conducted for this project and found that it is not likely to adversely affect the IBWO.

Timber harvesting is likely to occur on private land in the IBWO potential range having suitable habitat on their property. Individuals who own forest land in this area typically place a high value on this land for its personal and commercial recreational values. Much of the land is held as hunting ground for primarily deer and ducks. Forest management, therefore, would be done to enhance their value for these species. This management would generally be compatible and in most cases beneficial to the IBWO.

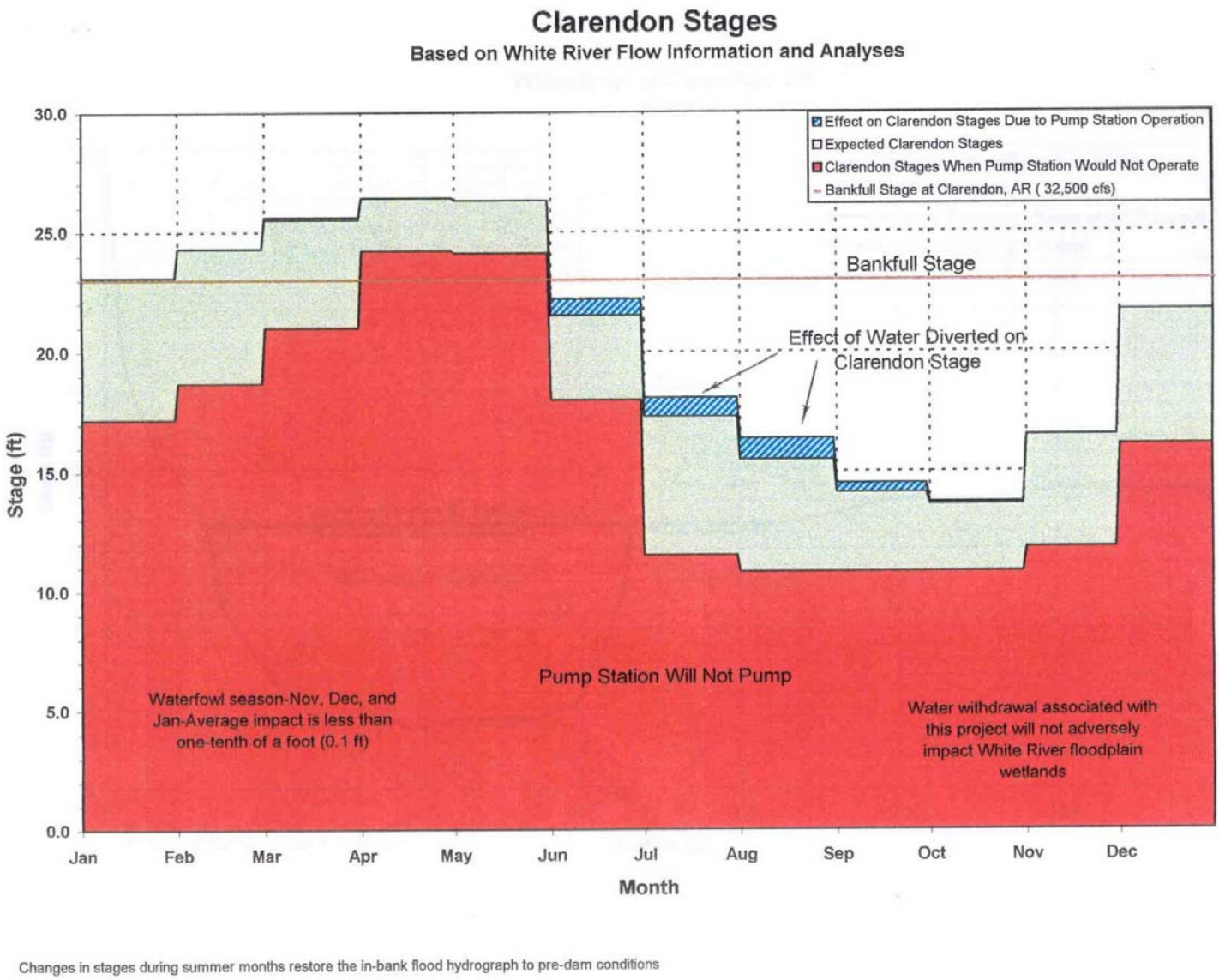

Figure 8. Effect of Grand Prairie Area Demonstration Project Withdrawals on White River Stage. (Source: Memphis District, Army Corps of Engineers.)

Conclusion

After reviewing the current status of the Ivory-billed Woodpecker, the current status and potential distribution of the Ivory-billed Woodpecker, factors affecting the IBWO environment within the action area, the effects of the Grand Prairie Area Demonstration Project and the cumulative effects, the Service concurs with the Corps of Engineers conclusion to its Biological Assessment that the Grand Prairie Area Demonstration Project, which includes IBWO surveys, long term environmental monitoring and adaptive management, is not likely to adversely affect the Ivory-billed Woodpecker. Monitoring in the action area is a very valuable tool that will provide an "early warning" alert to the Corps of the potential for incidental take by detecting potential changes to the IBWO habitat quickly. This would permit implementation of remedial actions per the approved Adaptive Management Plan before these changes could have any adverse impact on IBWO or its habitat, and also alert the Corps to the possible need to enter into formal consultation with the Service. Direct loss of potential IBWO habitat, primarily from pipeline construction, will be small and will be mitigated by reforestation of previously cleared forest. No incidental take is expected, nor authorized, and therefore, the project will not jeopardize the continued existence of the Ivory-billed Woodpecker. No critical habitat has been designated for this species; therefore, none will be affected.

We appreciate your conscientious efforts to promote the recovery of the IBWO. If you have any questions regarding this letter, please contact me at 501-513-4475, or Joseph Krystofik at 870-347-1506.

Sincerely,

Mark Sattelberg
Field Supervisor

cc: Mr. Sam Hamilton. USFWS, Atlanta, GA
Ms. Noreen Walsh, USFWS, Atlanta, GA
Mr. Jack Arnold, USFWS. Atlanta, GA
Mr. Ken Graham, USFWS, Atlanta, GA
Mr. Keith Weaver, Cache River NWR, Augusta, AR
Mr. Steve Reagan, White River NWR, St. Charles. AR
Mr. Scott Henderson, Arkansas Game & Fish Commission, Little Rock, AR
Ms. Karen Smith, Arkansas Natural Heritage Commission, Little Rock, AR
Mr. Scott Simon, The Nature Conservancy. Little Rock. AR
Mr. Martin Blaney, Arkansas Game & Fish Commission. Russellville, AR
Mr. Craig Uyeda, Arkansas Game & Fish Commission. Little Rock. AR
Mr. Randy Young, Arkansas Natural Resources Commission, Little Rock, AR
Mr. Dennis Carmen, White River Regional Irrigation District, Stuttgart, AR

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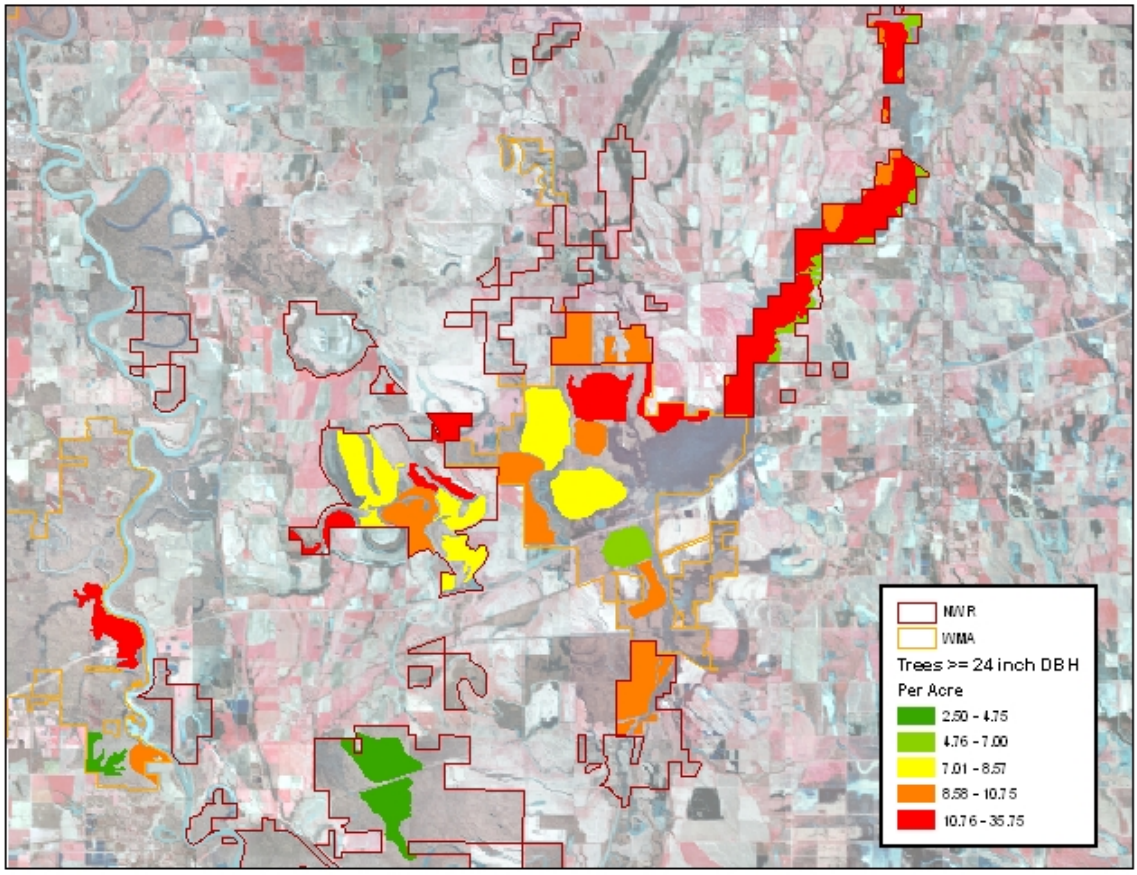
Appendix 1

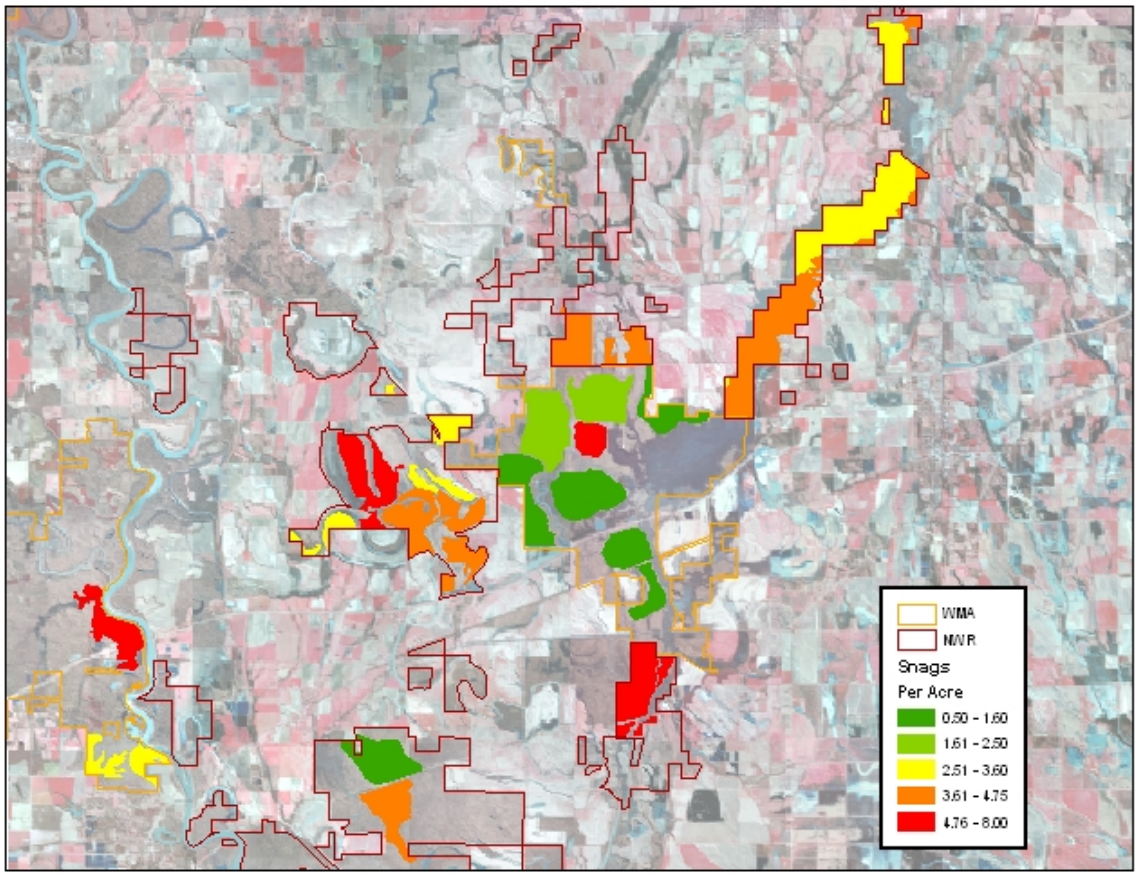
Maps of Ivory-billed Woodpecker Habitat Inventories in the lower White River Basin (Lower Mississippi Valley Joint Venture 2007)

Preliminary Analysis of Habitat Inventory - Cache/Dagmar Area
Density of Large Diameter Trees

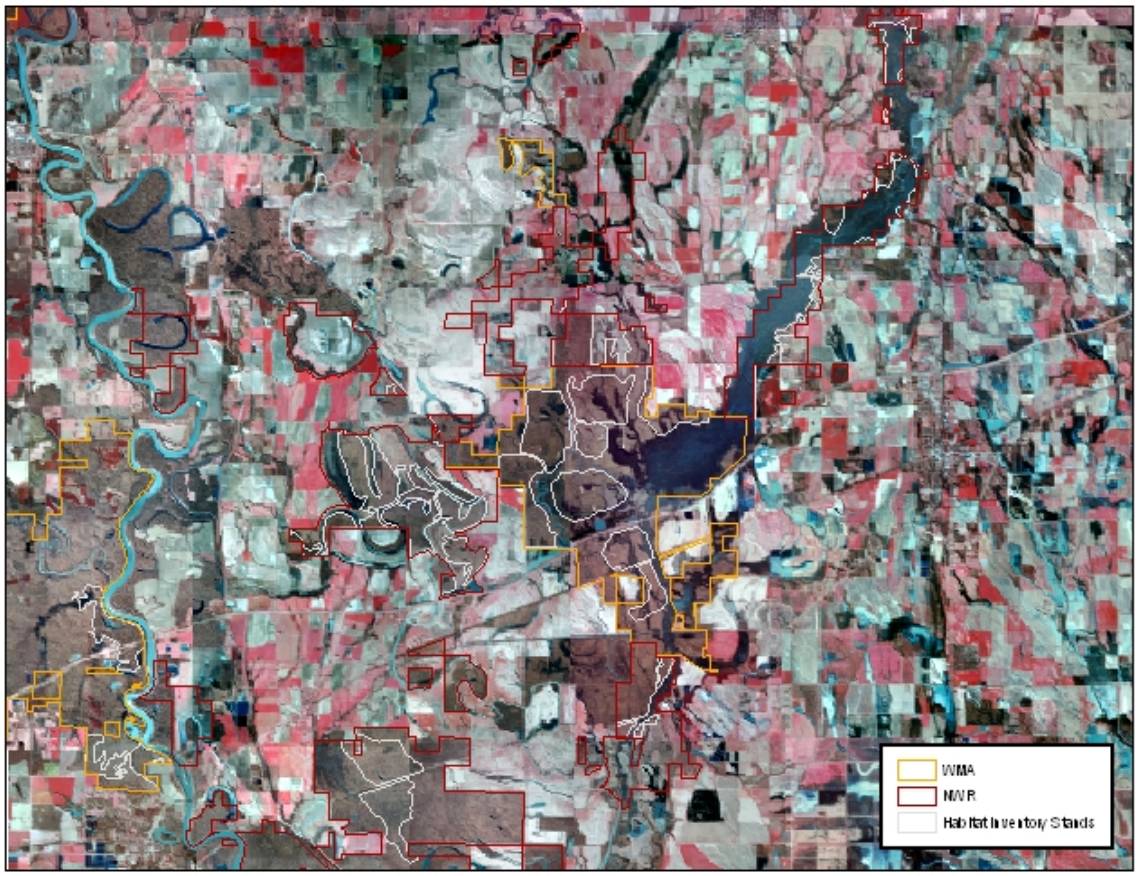


Preliminary Analysis of Habitat Inventory - Cache/Dagmar Area

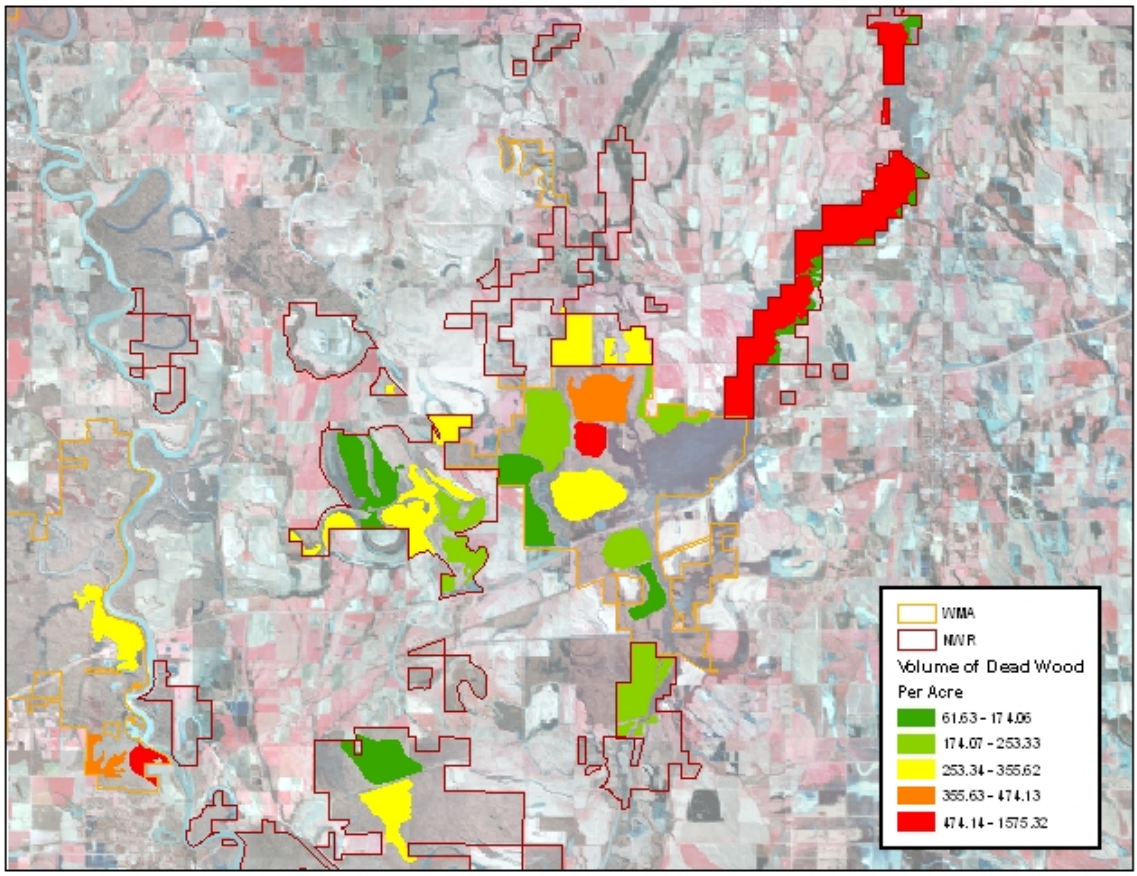
Density of Snags



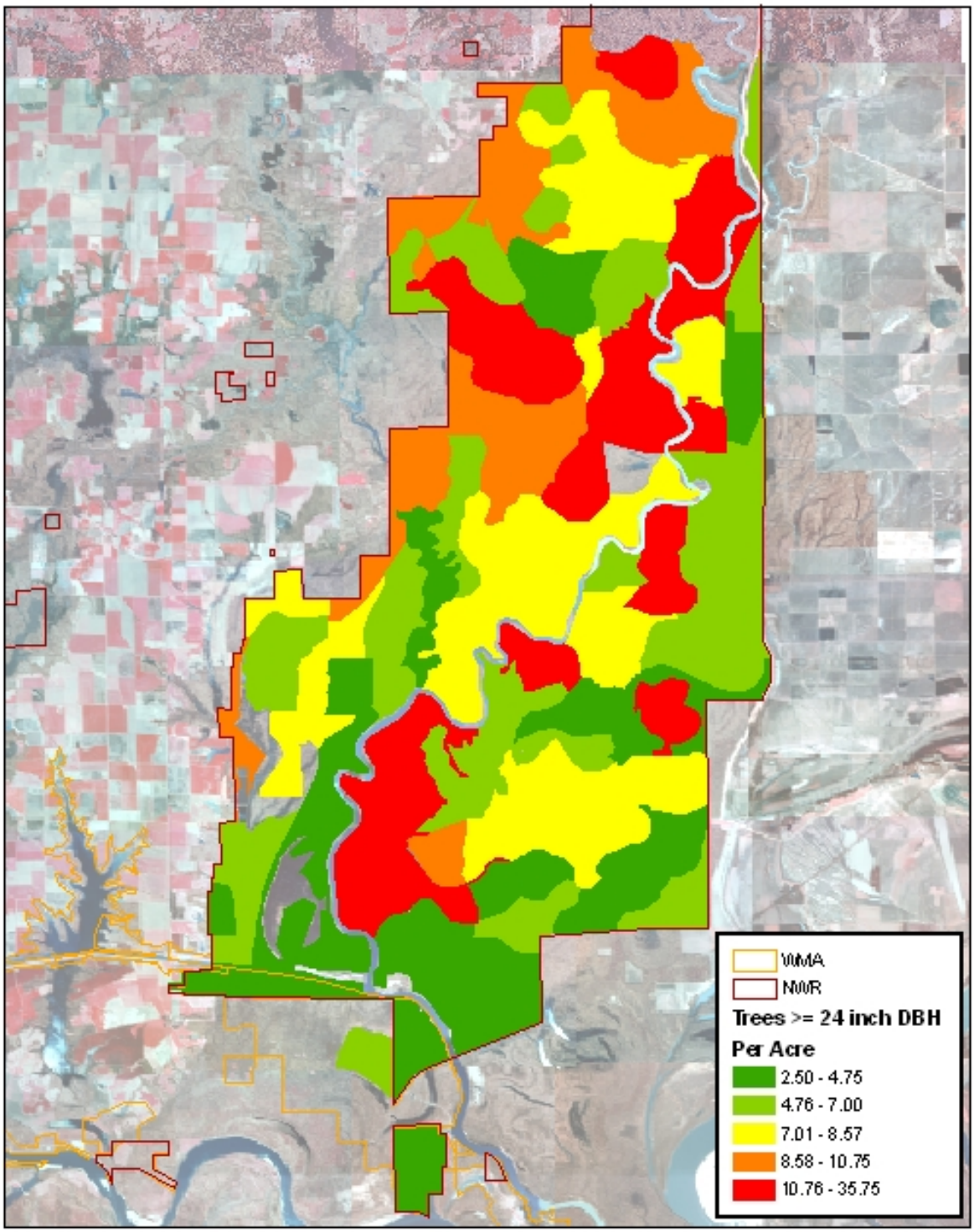
Habitat Inventory Stand Overview - Cache/Dagmar Area



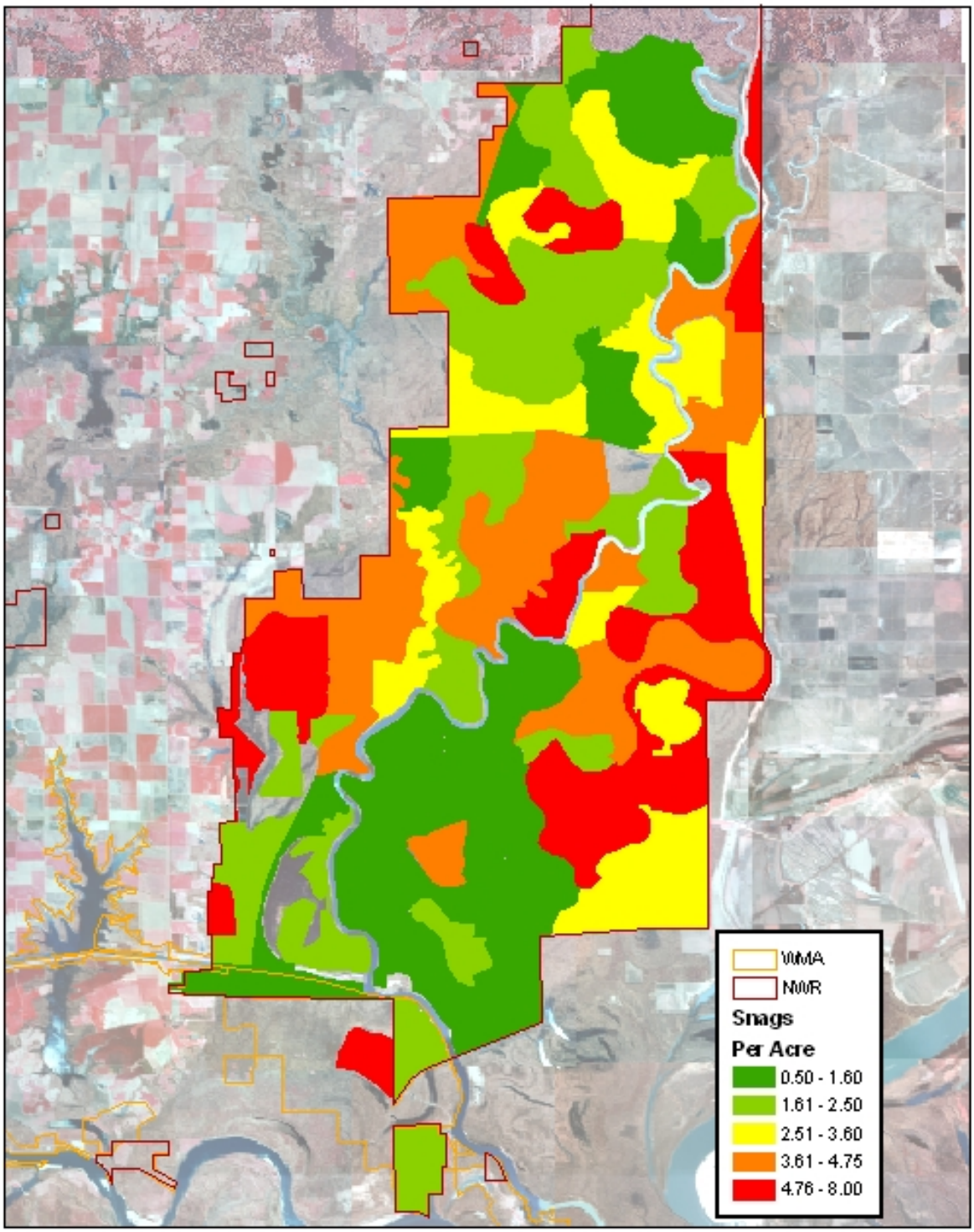
Preliminary Analysis of Habitat Inventory - Cache/Dagmar Area
Total Volume of Dead Wood



Preliminary Analysis of Habitat Inventory - White River Area
Density of Large Diameter Trees



Preliminary Analysis of Habitat Inventory - White River Area
Density of Snags



Habitat Inventory Stand Overview - White River Area