

Recovery Outline for the Ivory-billed Woodpecker

Campephilus principalis
September, 2005

Common Name

Ivory-billed Woodpecker

Scientific Name

Campephilus principalis

Listing Status and Date

Endangered: March 11, 1967(32 FR 4001) and June 2, 1970 (35 FR 8495).

Lead Agency/Region

U.S. Fish and Wildlife Service
Southeast Region

Recovery Team Leader

Jon Andrew, NWRS
Southeast Regional Office
1875 Century Boulevard
Atlanta, GA 30345
404/679 7152
jon_andrew@fws.gov

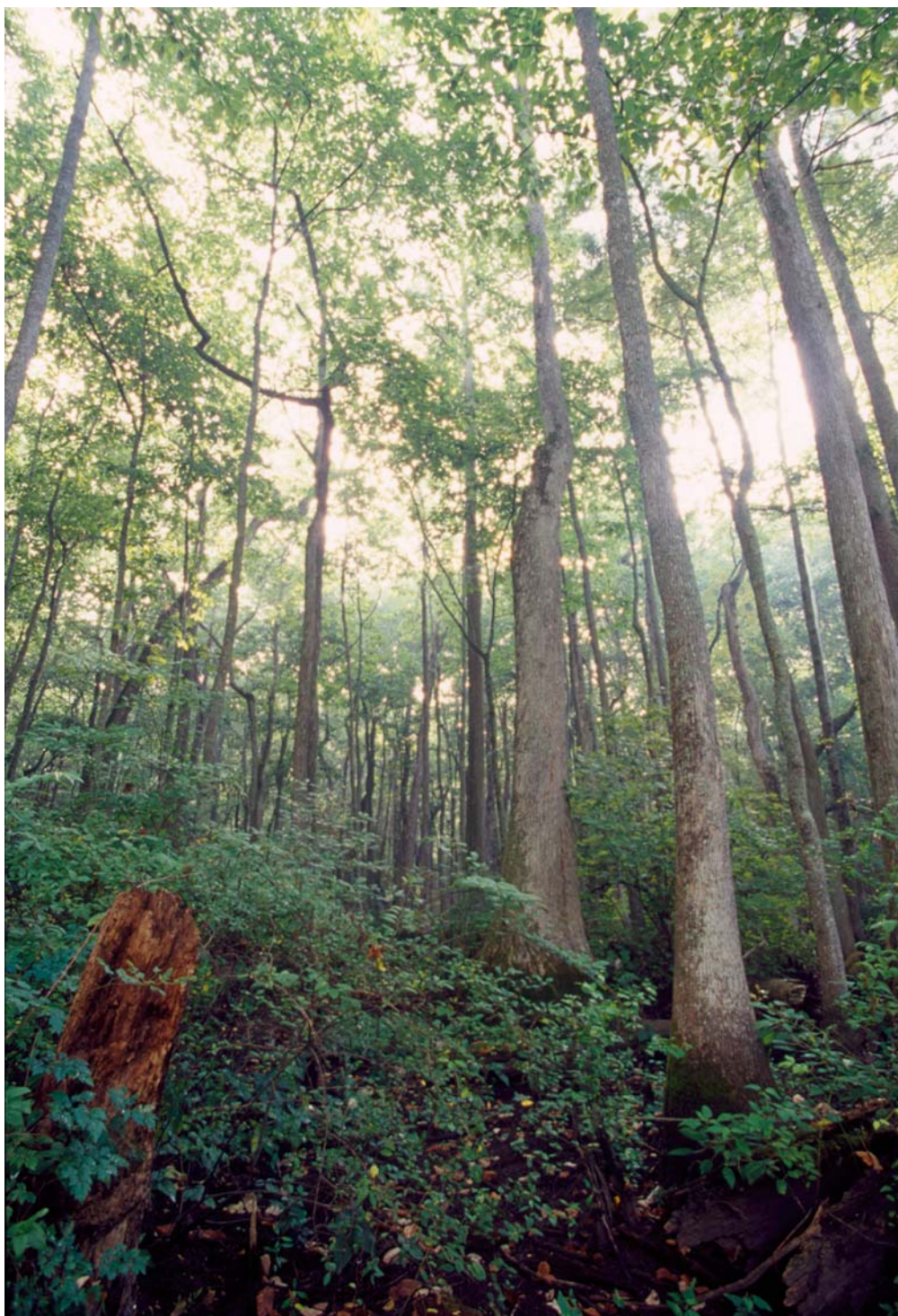
Lead Field Offices

Lafayette, Louisiana Ecological Services
Field Office
646 Cajundome Boulevard
Suite 400
Lafayette, Louisiana 70506
337/291 3124

Cache River National Wildlife Refuge
26320 Highway 33 South
Augusta, Arkansas 72006
870/347 2614

White River National Wildlife Refuge
P.O. Box 205
57 South CC Camp Road
St. Charles, Arkansas 72140
870/282 8200

*Photo: Bottomland hardwoods at Cache
River NWR near Brinkley, Arkansas*



Purpose of the Recovery Outline

This document lays out a preliminary course of action for recovery of the recently rediscovered Ivory-billed Woodpecker. It is meant to provide interim guidance to direct recovery efforts and inform consultation and permitting activities and will be replaced by a more comprehensive draft recovery plan (once that draft has been completed). Recovery outlines are intended primarily for internal use by the U.S. Fish and Wildlife Service; formal public participation will be invited upon the release of the draft recovery plan. However, we will consider any new information or comments that members of the public may wish to offer in response to this outline during the recovery planning process. For more information on recovery efforts for the Ivory-billed Woodpecker, or to provide additional comments, interested parties may contact Jon Andrew, at the above address, telephone number, or e-mail

Note on the Information Sources and Treatment of Uncertainties

This recovery outline is based on the best available scientific and commercial data, including the original listing decisions (1967 32 FR 4001 and 1970 35 FR 8495). Research needed to address information gaps is described in this document and will be part of the implementation table in the recovery plan. For issues in which there is uncertainty associated with the species' conservation needs, caution will be exercised until such uncertainty can be resolved.

Scope of Recovery and Available Information

Our intent is to recover the ivory-billed woodpecker range-wide. Due to its large historical range throughout the Southeastern United States the recovery effort will initially focus on areas in Arkansas where the bird has been seen. Additionally, other areas where recent, credible reports have occurred, e.g., Louisiana, will be carefully evaluated. Recovery efforts will be accomplished within an ecosystem context and particular consideration will initially be given to habitats within the Mississippi Alluvial Valley (MAV).

Following an absence of confirmed reports for more than 60 years, this species was rediscovered in 2004 in the Cache River Basin of Arkansas. Due to its extreme scarcity for much of the previous century, there is very limited



James Tanner on the Singer Tract in the 1930s. Photo from Tanner's collection.

information available on the natural history and ecology of the Ivory-billed Woodpecker. Much of what we understand about the ecology and biology of the species is derived from a single study by James Tanner conducted in the late 1930s (Tanner 1942). Recent sightings, a poor but diagnostic video clip, and sound recordings of "double raps" and "kent" calls are evidence that the species still exists. Information on current status and distribution is otherwise limited to unsubstantiated sight reports. There have been no confirmed sightings of the species elsewhere although several observations by credible observers have been noted. The quantity, quality and reliability of information on this species is poor.

Research and intensive surveys are anticipated to play a major role in the initial steps taken toward recovery because it is not possible to design a comprehensive recovery strategy without information on the status of the population. Once such information is obtained, further development of recovery actions to include specific habitat management or protective measures can be developed. The recovery program for the Ivory-billed Woodpecker requires additional research on all aspects of the species ecology.

All IBW illustrations: ©David Allen Sibley

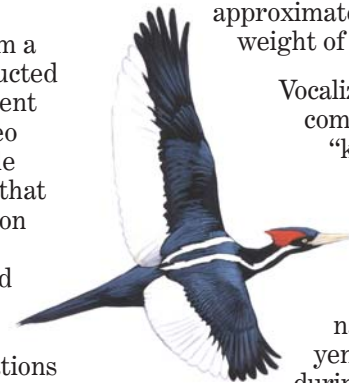
All photos (except photo above):
U.S. Fish & Wildlife Service/Larry Richardson

Overview

Species Description and Life History

The Ivory-billed Woodpecker belongs to a group of 11 species of large woodpeckers of the genus *Campephilus*, inhabiting the Western Hemisphere—primarily Central and South America. Two subspecies are recognized (American Ornithologists' Union 1998): the Northern Ivory-billed Woodpecker (*Campephilus p. principalis*) and the Cuban Ivory-billed Woodpecker (*Campephilus p. bairdii*)*.

The Ivory-billed Woodpecker has long been noted for its striking black and white plumage pattern, large white bill, lemon yellow eye and striking crest of feathers – red in males and black in females (Figure 1). Morphological data from recently collected birds are lacking. The best estimates are from specimen records which indicate an overall length of approximately 48-53 cm, an estimated wingspan of 76-80 cm and a weight of 450-570 g (del Hoyo et al 2002 and Jackson 2002). In comparison, the Pileated Woodpecker (*Dryocopus pileatus*) has an overall length of approximately 40-48 cm and a weight of 250-340 g.



Vocalizations are comprised of a horn like "kent" call resembling the sound of a toy trumpet which functions as a contact and distress call and a nasal "yent-yent-yent" at the nest and during displays. These

calls are represented in recordings from 1935 by A.A. Allen and P. Kellog. There is also a far carrying call described as "kient-kient-kient" of which no recording exists. This call is often used among group members, in chorus, prior to a long distance flight, and reportedly is the loudest contact call of the Ivory-billed Woodpecker, carrying up to a quarter mile (Tanner 1942). Non-vocalizations include a rapid, loud knocking which is characteristic of most members of the genus. Rapping is often described as a "double rap" since it consists of two rapid knocks. Raps may also occur singly. The Ivory-billed is also known to have noisy wingbeats in flight and a relatively rapid wing-beat frequency.

* The status of *Campephilus p. bairdii* in Cuba is uncertain.

The Ivory-bill is known to fly distances of at least several kilometers each day between favored roost sites and feeding areas. Information on daily movements is very limited however. With the exception of these daily, relatively short distance movements in response to food supply or to meet other life history requirements the Ivory-billed does not exhibit typical migratory behavior (Allen and Kellogg 1937). However, Tanner (1942) suspected that the species might be nomadic depending on habitat conditions and population density.

Diet is poorly understood and based on anecdotal observations and the examination of the stomach contents of six collected birds. Beetle larvae appear to be an important component of the diet, which are obtained by stripping bark from recently dead or dying tree trunks and branches and by excavating rotted wood. Members of the long-horned beetle family, *Cerambycidae*, were noted in several instances but several other species of wood boring beetle larvae have also been documented. The diet may at times include various nuts (pecans and acorns) and fruits (hackberry, persimmon, and grapes and poison ivy and possibly tupelo).

Breeding phenology is poorly known. Generally, it is thought that breeding occurs between January and April. Cavities selected are in a dead or dying portion of a live tree although in some cases a dead tree may be used. Cavities range from 4.6 m to over 21 m in height with nests rarely being excavated below 9 m. Nest openings are characteristically oval in shape, with an irregularly shaped rim, being somewhat taller than wide ranging from 10.2 to 14.6 cm wide and 15.2 to 17.1 cm tall. Diameter of the cavity ranges from 17.8 to 26.7 cm inches with a depth of 44.4 to 63.5 cm. Outside diameter of the limb supporting the cavity ranged from 33 to 55.9 cm (Tanner 1942, Allen and Kellogg 1937).

Cavities similar in appearance to nest cavities are used as roost cavities. Roost cavities are used by single individuals, but paired birds or group members often roost in trees within a few hundred meters of each other. The Ivory-billed Woodpecker is reported to be a late riser that leaves its roost after sunrise. Individuals are faithful to one and the same roost cavity for extended periods of up to at least a year and a half. Nest cavities are often constructed in favored roosting areas and may later become



Ivory-billed Woodpecker habitat at Cache River NWR

roost cavities. Thus, in several respects the roosting area is the center of activity in an Ivory-billed Woodpecker home range.

Clutches range from 1-5 eggs but more typically consist of 2 to 4. Incubation is by both sexes and takes about 20 days. Both adults feed the young for a period of about 35 days until fledging and the young may be fed by the parents for an additional two months, and forage with and roost near the parents into the next breeding season.

Historically the Ivory-billed was valued for its ivory colored bill as an ornament used by Native Americans. Later, the rarity of the species made it desirable to private egg and specimen collectors and museum curators. Natural predators are few but it is suspected that raccoons or rat snakes may be predators of nestlings or eggs. Great Horned Owls, Red-shouldered Hawks or Barred Owls may predate recently fledged birds. Birds may also accidentally die as a result of damage to nest or roost trees.

Historical and Current Population Status

The Ivory-bill was once an inhabitant of forested habitats throughout the Southeastern United States and Cuba (Figure 2). Although there is little specific population data available, it is likely that with European settlement and the clearing of the forest the species probably began a decline which

accelerated in the latter half of the 19th century. By the mid-20th century the species was reduced to a very small population. The best studied of these birds were those observed by Arthur Allen and James Tanner along the Tensas River in Louisiana in the late 1930s on what was then known as the “Singer Tract.” A portion of their study site is now a part of the Tensas National Wildlife Refuge. The last widely accepted sightings were made in the Tensas area by Don Eckleberry in 1944. Since that time numerous unconfirmed sightings have been reported throughout the historic range of the species. Many of these sightings seemed highly credible but hard evidence has been lacking.

In February of 2004, Cornell Laboratory of Ornithology biologists became aware of credible sight reports of the Ivory-billed in a portion of Bayou DeView which is located on Cache River National Wildlife Refuge in east-central Arkansas. Subsequently, Cornell biologists and their partners documented the presence of at least one Ivory-billed Woodpecker in that area (Fitzpatrick et al. 2005).

Credible reports continue to be received sporadically elsewhere within the historic range of the species but confirming evidence has been lacking.

Habitat Description and Landownership

The Ivory-billed Woodpecker is a denizen of large, contiguous forests with numerous large trees. A significant portion of the forest must also be in some stage of decay providing a continuous supply of food (Jackson 2002).

Bottomland hardwood forests are frequently noted as important. It is unclear if this view is biased by the scant information on habitat use having been gathered near the end of a long period of population decline. Habitats occupied at the time most of the studies occurred may not have been typical or preferred by the species. Rather the habitat may have been occupied simply because it was the last suitable habitat available. In Florida, bald cypress (*Taxodium* spp.) was noted as an important component of the forest used by Ivory-billed Woodpeckers, especially in conjunction with an adjacent pine forest containing relatively faster growing softwood species. In the Tensas region, Tanner documented use in “upland” sites infrequently flooded and forested primarily with species such as Nuttall Oak (*Quercus nuttalli*), Sweetgum

(*Liquidambar styraciflua*) and Green Ash (*Fraxinus pennsylvanicus*). Tanner also observed that habitat used by Ivory-billed Woodpeckers was also highly favored by other species of woodpeckers, a high density of other woodpecker species being indicative of good Ivory-billed Woodpecker habitat.



Cache River NWR

Density estimates provided by Tanner (1942) indicate a highest recorded density of one pair/6.25 square miles or some 4,000 acres of forest habitat in Florida, and a density of one pair/17 square miles or some 11,000 acres of old-growth bottomland hardwood forest at the Singer Tract in Louisiana. Habitat requirements likely vary seasonally and with habitat conditions, population density, food resources and other factors. None of these influencing factors are understood for this species. It is clear however that the Ivory-bill requires large tracts of forest habitat for survival.

Land ownership in the Cache-White River Basin is comprised of about 326,000 acres in public ownership as National Wildlife Refuge, State Natural Heritage or State Wildlife Management areas. In addition, private conservation interests, primarily The Nature Conservancy of Arkansas and Ducks Unlimited hold in fee or easement nearly 15,000 acres. In addition to fee ownership, the Wetland Reserve Program (WRP) easements,

administered by the Department of Agriculture, Natural Resource Conservation Service, total approximately 52,882 acres. Together these lands total approximately 394,120 acres of current and future habitat that is being managed and conserved in the vicinity of the rediscovery.

Summary Biological Assessment

The recovery potential of the Ivory-billed Woodpecker is uncertain. This is largely due to the lack of any definitive information on the status of the species and its biology and ecology. This lack of information precludes any assessment of population trend or status and frustrates conclusions on the viability of recovery efforts. The status of Ivory-billed habitat and its ability to support a recovering population are also poorly known.

The Ivory-billed has a relatively low reproductive potential, breeding once per year and producing 1-3 fledged young per nest attempt under favorable conditions. Under ideal breeding and habitat conditions, recovery of the population will take many years.

It is widely believed that the Southern forest that was the principal habitat of the Ivory-billed is improving in terms of its ability to support a viable population of this species. The worst forest conditions for this species probably occurred many decades ago-perhaps as many as 60-70 years ago. Conservation efforts at the beginning of the 20th century coupled with forest growth and improved management of forest habitats has led to a much improved habitat condition for Ivory-billed Woodpeckers. The increased age of the forest and thus the size and number of trees is believed to provide better foraging conditions. Indeed, it is suggested that the rediscovery of the species is related to the overall recovery of the forested habitat within the former range of the species.

It is clear that the current status of this species is bleak, but there is realistic reason to hope that recovery to a self sustaining population is achievable. However, any successful attempt at recovery will be dependent on the ability to find additional surviving individuals, learn more about the species, identify limiting factors, potential habitat restoration and management opportunities and quickly applying this information on the ground.

Listing Factors/Primary Threats to the Species

The final rule (32 FR 4001 and 35 FR 8495) did not contain an assessment of the primary threats to the Ivory-billed Woodpecker. A description of each of these threats is presented below; each is classified according to the five listing/delisting factors identified in section 4 of the Endangered Species Act ("Act"; 16 USC 1531 *et seq.*)

Habitat Loss and Degradation (Factor A)

The primary reason for the decrease in Ivory-billed numbers throughout its range appears to be a reduction in suitable habitat (and indirect destruction of their food source) due to large scale conversion of forest habitats. Essential features of Ivory-billed Woodpecker habitat 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). According to Tanner (1942), "In many cases their [Ivory-billed Woodpeckers] disappearance almost coincided with logging operations. In others, there was no close correlation, but there are no records of Ivory-billed inhabiting areas for any length of time after those have been cut over." Noel Snyder (in prep) argues that the close correlation between timber harvesting activities and the decline of the Ivory-bill may reflect an increased exposure to poaching and collecting rather than food limitation in logged over forests. In addition, specific to the Singer Tract, before large scale logging had commenced, Tanner (1942) also commented that the reduced occurrence of recently dead and dying wood was probably responsible for declines of woodpeckers there.

Habitat loss has probably affected Ivory-billed Woodpeckers since the original cutting of virgin forest; with some losses being gradual and others occurring very rapidly. Jackson (1989) estimated that by the 1930's only isolated remnants of the original southern forest remained. Forest loss continued with another period of accelerated clearing and conversion to agriculture of bottomland hardwood forests of the Lower Mississippi Valley during the 1960's and 1970's. The combined effect of those losses has resulted in reduction and fragmentation of the remaining forested lands. The conversion rate of forest to agricultural lands has reversed in the

past few years. Currently, many public and private agencies are working to protect and restore forest habitat. Nevertheless, until more is learned about the Ivory-bill's habitat requirements, the extensive habitat loss and fragmentation and the lack of information on specific habitat requirements remain a threat to this species.

Overutilization for commercial, recreational, scientific, or educational purposes (Factor B)

Historical records indicate that Ivory-billed Woodpeckers (bills and the plumage) were collected and used for various purposes by native and colonial Americans. Collection of ivory-bills for scientific



purposes has been documented since the 1800's. Jackson (2002) presented data indicating that such collecting resulted in the taking of over 400 specimens, mostly between 1880 and 1910. By itself, overutilization may not have caused the widespread decline of Ivory-bill numbers. However collecting in combination with the concurrent habitat loss likely hastened the decline of the species. It is possible that local populations could have been extirpated by collecting. For example, Ivory-billed are believed to have been reduced by excessive collecting, rather than as a result of the conversion of forest habitats in a small area of the Suwanee River region of Florida. In addition, Tanner (1942) indicated that many Ivory-bills were killed merely to satisfy curiosity.

Small Population Size and Limited Distribution (Factor E)

Ivory-billed Woodpecker populations appear to have been in a state of continuous fragmentation and decline since the early 1800's (Jackson 2002, Tanner 1942). Early accounts gave no accurate or definite estimates of abundance, but populations were probably never large and were limited to habitats subject to high tree mortality, e.g., areas that were regularly flooded or burned (Jackson 2002). The small population size and limited distribution of the Ivory-billed Woodpecker place this species (previously thought to be extinct)

at risk from naturally occurring events and environmental factors. The Ivory-bill is currently known to occur in only one area in southeastern Arkansas. While a substantial amount of habitat is protected in the area in which the species was rediscovered, threats exist from normal environmental stochasticity. For example, sporadic natural events such as tornados or ice storms could destroy the only remaining nest or roost trees or severe weather conditions could result in nesting or fledging failures. Additionally, the exact number and genetic health of remaining birds is unknown. Ivory-bills in small populations are at risk from genetic and demographic stochastic events (such as normal variations in survival and mortality, genetic drift, inbreeding, etc.).

Summary Threats Assessment

The primary threats contributing to the listing of the Ivory-billed Woodpecker are habitat loss and degradation, collection and the small size of the remaining population. The number and location of Ivory-billed Woodpeckers which may still remain is not known. Therefore another significant threat in the short term is our lack of knowledge of the status of the species, its ecology and what constitutes suitable habitat.

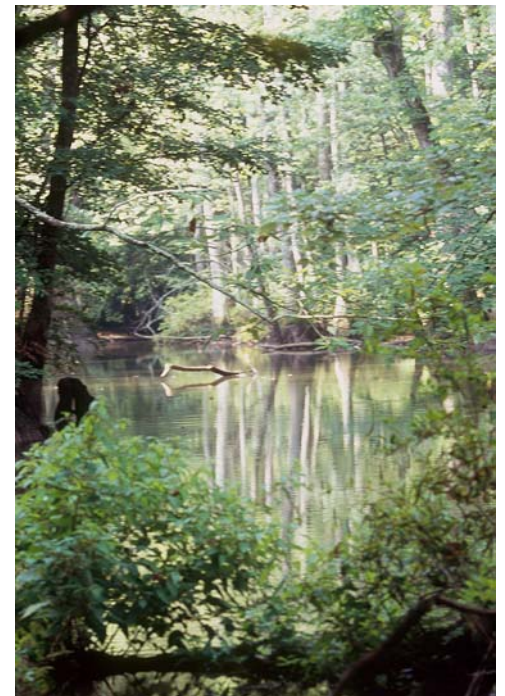
Lacking additional information on this species it is difficult to determine other key factors which may currently be threatening or hampering recovery. The proper management and where possible, expansion, of large blocks of contiguous forest represent one of the most valuable conservation measures that could be taken as it is widely believed that loss of such habitats was the principal factor leading to the decline of the species. In general, forest conditions for this species, especially on public lands, continue to improve as forest management has been enhanced, the forest has aged, and timber volume has increased.

Conservation Efforts

Current conservation efforts have focused primarily on learning more about the status and distribution of the species in the Cache and White River drainages of Arkansas. Cornell University and The Nature Conservancy of Arkansas in coordination with the Fish and Wildlife Service and the State of Arkansas conducted extensive surveys beginning in the winter of 2004 in an attempt to confirm the presence of Ivory-billed Woodpeckers. These surveys have

proven to be extremely arduous and have resulted in a meager number of sightings. Survey efforts are expected to be enhanced and refined for the 2005-2006 survey season.

Key areas on Cache River NWR where the Ivory-billed Woodpecker has been recently observed have been placed under special management with access limited and closely managed to avoid possible impacts on the nesting, roosting or feeding birds. These management actions will continue but will be modified depending on the level of public use and a determination of the degree to which the public use may have an impact.



Bottomland hardwoods at Cache River NWR

Forest management on Cache River and White River National Wildlife Refuges has been suspended while additional information is gathered and the forest management plan is reviewed to determine if any changes are necessary to ensure that adverse impacts on Ivory-billed Woodpeckers will not occur. Educational efforts are underway to inform the general public, hunters and anglers of the possible presence of Ivory-billed Woodpeckers in the area and how to report possible sightings. Some experimentation with methods for enhancing food supply has begun. Such "morticulture" experiments are an attempt to determine the most effective techniques for creating habitat for larval stages of various insects, most notably the beetles of the family Cerambycidae.

There have been no confirmed sightings on the adjacent State lands at Dagmar or Black Swamp Wildlife Management Areas but managers of those areas have also established a moratorium on timber harvest, are managing public access by providing viewing points and are facilitating the ongoing search effort. In short, management has been implemented under the assumption that some birds may still be present.



Ivory-billed Woodpecker habitat at Cache River NWR

An active land acquisition program is underway at Cache River NWR in cooperation with The Nature Conservancy of Arkansas as the refuge has long been a regional priority for land protection in the refuge program. This priority was primarily driven by North American Waterfowl Management Plan objectives for wintering habitat for the mid-continent mallard population. Since 1995 the Fish and Wildlife Service has purchased 23,456 acres as additions to Cache River NWR. Lands were purchased primarily (74%) using revenue from the Migratory Bird Conservation Fund also known as the Duck Stamp Fund. The remaining lands were purchased with appropriations under the Land and Water Conservation Fund.

A quantitative delineation of potential Ivory-billed habitat to be used in support of decision making on any potential habitat management actions is being

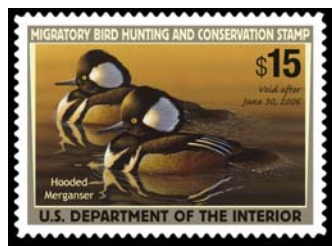
developed under the umbrella of the recovery effort.

In May of 2005 a series of three “Town Hall” meetings were held in the communities of Brinkley, Stuttgart and Augusta to provide information on the rediscovery and the first steps which are expected to be taken towards recovery. Concerns over potential land acquisition plans, impacts on public use and questions about the natural history of the species were answered. Similar meetings are planned for the fall/winter of 2005-2006. Other outreach efforts include interpretive materials on how to identify an Ivory-billed Woodpecker, where to report sightings, informational signage and interpretive programs.

Summary Conservation Efforts

Conservation efforts to date have been directed toward confirming the existence of the species and learning more about it. Nevertheless, very little is known about the status of the species in Arkansas or elsewhere in its historic range.

The principal conservation actions to be taken include improving and expanding the survey effort in Arkansas as well as other formerly occupied locations and describing the habitat of the species sufficiently so that the most likely locations for other extant populations may be identified and searched. Additional efforts include evaluating current management practices and their effects on Ivory-bills and conducting public outreach and education.



2005-06 Federal Duck Stamp

rediscovery has ignited significant interest on the part of the general public and conservation organizations nationally and internationally. Strong support exists for taking the needed steps to assess population status, delineate habitat and determine the proper management actions which might be needed. Such efforts are planned to be undertaken immediately with later actions adapted once additional information on the species is obtained.

Summary Assessment of Recovery Status

The overall status of the species is unknown and remains the key aspect of the recovery effort most in need of attention. Therefore, extensive survey work, refinement of survey methods, research and development of a habitat model are the most immediate recovery actions needed.

In the interim, forest habitat believed to support any remaining Ivory-billed Woodpeckers should be managed under the assumption that the species is present. This would not necessarily require

significant changes in some aspects of management. Traditional public use activities have occurred for many decades with no apparent or documented impact. Indeed, if a population still exists it has done so amidst intensive public use, including duck hunting and other types of hunting and fishing. Forest management plans will need to be reevaluated to determine what, if any, changes may be needed to provide for enhanced habitat for the Ivory-billed Woodpecker.

A substantial outreach and education program is needed. The perceived absence of the Ivory-billed Woodpecker for such a long period has resulted in a general lack of understanding of the ecology of the species, its uniqueness and the need to conserve it for future generations. A successful conservation program for the species is contingent upon public support, especially those in local communities in close proximity to the rediscovery. It is fortunate that the local community has such a strong connection with the natural environment. Alienation of this important constituency should be avoided. Rather, a proactive approach is required to keep the local public informed on developments in management and recovery. Success in this effort will play a major role in improving the chances for successful recovery.



Preliminary Recovery Strategy

Recovery Priority Number

The Ivory-billed Woodpecker is assigned a recovery priority number of 18 on a scale of 1C (highest) to 18 (lowest; the “C” indicates the potential for conflict with human economic activities) (USFWS 1983a,b).

This priority system is designed to direct our efforts toward the plants and animals in greatest need. In this priority system, the degree or magnitude of threat is the highest criterion, followed by the immediacy of the threat and the taxonomic distinctiveness of the species (monotypic genus, then species, then subspecies, variety or vertebrate population). As we obtain more data and knowledge regarding this species, its habitat requirements, and potential threats, the Ivory-billed Woodpecker’s recovery number will very likely change.

Recovery Goal and Objectives

Recovery to the point that protections of the ESA are no longer necessary – in other words delisting – is the goal of every recovery plan. However, in the case of this species, where there is limited available information on the threats it faces, down-listing from endangered to threatened will be the interim objective of the recovery plan.

It is difficult to determine the extent of recovery which could be possible for this species. We know very little about the numbers and distribution of Ivory-bills needed to sustain a viable population. The range of the species has changed significantly since European settlement. Habitat conditions for the species have changed dramatically in the 60 years since it was last confirmed. With the exception of increased forest loss in the 1960s and 1970s the overall condition of the historic habitats of the Ivory-bill are thought to have improved from the declines of the late 19th and the first half of the 20th centuries. Today a substantial amount of forest remains and is reaching an age and structure thought to be more suitable to support Ivory-billed Woodpeckers. At this time it is at least possible to assume that viable populations could be sustained in a handful of areas such as the Cache and White River Basins in Arkansas, the Atchafalaya and Pearl River areas of Louisiana, the Lower Suwannee, Appalachian and Chipola River areas of Florida or perhaps the Santee River drainage of South Carolina. Specific



Old-growth bottomland hardwood forest at Cache River NWR

delineation of what might constitute recovery awaits more thorough analysis of the habitat which remains and what a minimum viable population might require. However, a substantial and sustained increase in numbers will be required before downlisting could occur.

Recovery will likely require more intensive, careful management and assemblage of larger block sizes of habitat through acquisition in fee or conservation easement. This is somewhat consistent with current approaches to forest management on public lands in the Lower Mississippi Valley region and would not require a major shift in conservation planning.

An assessment of threats to the species beyond the simple lack of knowledge regarding population viability and habitat quantity or quality will need to be made. Other sources of mortality or threats to population viability are not clearly known at this time.

Initial Action Plan

Listed below are the initial actions believed to be necessary for the recovery of the Ivory-billed Woodpecker. All or a part of these actions are expected to be implemented prior to completion of the full recovery plan scheduled for the spring of 2007. The tasks listed will also be incorporated, as appropriate, into the draft recovery plan as it is developed.

1.0 Decision-based Population and Habitat Monitoring

Need

Additional Ivory-billed survey work focused primarily in the Cache and White River Basins is considered the highest priority short term action. Additional survey work is needed in other parts of the historical range where habitat and sighting information indicates potential for presence of the species. Accordingly, there exists a need for survey protocol development, training of surveyors and a repository or data base for all sightings received by the Recovery Team accompanied by a management plan (validation methods, prioritization of validity of reports etc.) for that information.

Purpose

To coordinate the design and implementation of a multi-scale monitoring program that explicitly addresses biological planning and programmatic decision-making processes.

Population Monitoring

Task 1.1: Develop protocols/procedures for recording, classifying, and responding to reported Ivory-billed Woodpecker sightings.

Task 1.2: Develop and implement winter 2005/2006 search plan for the Cache/Lower White River basin.



Cache River NWR

Task 1.3: Develop adaptive-based survey design to facilitate (expanded) search efforts based on ancillary data (e.g., previous sightings, output from biological models, spatial data on distribution of stressed/dying trees).

Task 1.4: Develop teams which could be deployed to rapidly assess the veracity of sightings in other areas.

Task 1.5: Identify a team of Fish and Wildlife Service field biologists who could be deployed to assist with ongoing survey efforts in Arkansas and elsewhere based on the outcomes from habitat modeling and any promising reports of sightings that may be received.

Habitat Monitoring

Task 1.6: Develop protocols/procedures for coordinated, ground-based forest inventory/monitoring program designed to identify characteristics important to Ivory-billed Woodpeckers.

Task 1.7: Develop web-based, forest inventory geodatabase to consolidate and archive data.

Task 1.8: Pursue new remote sensing technologies and data (e.g., LiDAR, ASTER) to augment ground-based inventory/monitoring activities.

Task 1.9: Characterize and assess the adequacy of foraging habitat as determined by forest inventory/monitoring programs and assess the efficiency and effectiveness of forest management prescriptions intended to increase foraging habitat.

2.0 Population/Habitat Models Need

In order to facilitate survey efforts identified above in Section 1.0 and to inform potential management actions in the future there is a need to delineate quantitatively the relationship between Ivory-billed Woodpecker populations and habitat.

Purpose

Develop population/habitat relationship models that guide and inform conservation planning, assessment, and management at multiple spatial scales (site-scale, Cache/Lower White River basin; Mississippi Alluvial Valley eco-region; historic range across the southeastern United States).

Task 2.1: Express Tanner’s Ivory-billed Woodpecker study conclusions for the Singer Tract population as an energetic foraging model.

Task 2.2: Develop Cache/Lower White River basin Ivory-billed Woodpecker population/habitat model to guide the development of forest inventory/monitoring programs, as well as to facilitate landscape characterizations and assessments.

Task 2.3: Where appropriate, refine Cache/Lower White River basin Ivory-billed Woodpecker model to develop a Mississippi Alluvial Valley Ivory-billed Woodpecker population/habitat model to guide the development of forest inventory/monitoring programs, as well as to facilitate landscape characterizations and assessments.

Task 2.4: Develop range-wide potential occupancy model based on outputs from Task 2.1, 2.2, and 2.3 to facilitate search efforts across the southeastern portion of the United States.

Task 2.5: Conduct forest inventories on White and Cache River National Wildlife

Refuges and other locations as deemed appropriate to better define the existing forest stand, its ability to support Ivory-billed Woodpeckers and determine what forest management might be needed to reach a desired future forest condition.

Task 2.6: Develop estimates of the possible existing population using Life Table methodology and information on available habitat and territory size.

Models will address landscape quality and site quality factors presumed to limit Ivory-billed Woodpecker populations. Model assumptions and risks of uncertainty will be documented as testable hypotheses.

Habitat specific parameters will be based on currently available data at the appropriate scale as well as data expected to be available in the near-future.



3.0 Assumption Driven Research Need

Research directed at testing the biological assumptions otherwise implicit in management actions is needed.

Purpose

Research directed at testing biological assumptions. Specifically, the assumptions integrated into the establishment of biological goals and objectives, as well as, the biological response presumed to occur from on-the-ground management actions.

Task 3.1: Assess causative agents of tree mortality, decay rates, and stand replacement processes. Specifically, information is needed on:

1. naturally occurring tree mortality, snag formation, and decay rates across elevation gradients, hydrologic regimes, and soil classes; and
2. tree mortality and snag formation as a result of “typical” silvicultural treatments (e.g., thinning) across elevation gradients, hydrologic regimes, and soil classes.

Task 3.2: Assess methods for “artificially” increasing forage-base. Specifically, information is needed on tree species mortality, decay rates and beetle densities using manipulative silvicultural treatments to stress the trees (e.g., girdling, injection) across elevation gradients, flooding regimes, and soil classes.

Task 3.3: Assessment of densities of beetle larvae (Cerambycidae) larvae (e.g., in the cambium between the bark and sapwood and in the sapwood of stressed/dying trees). Specifically, information is needed on:

1. beetle densities in trees dying of natural processes;
2. beetle densities in trees dying as a result of “typical” silvicultural operations (e.g., thinning);
3. beetle densities in trees dying as a result of “artificial” silvicultural operations (e.g., girdling, injections);
4. methods of conducting forage-base, rapid assessments; and
5. general life history data of wood boring beetles.

Task 3.4: Summarize and compile in a data base the existing literature on the Ivory-billed Woodpecker including gray literature, video and audio material. Compile a record of the locations of all known specimens.

4.0 Landscape Characterization and Assessment

Need

The ability of the Mississippi Alluvial Valley and specifically the Cache and White River Basins to support recovery populations is unknown. The ability of other habitats within the historic range to support recovery populations is also unknown.

Purpose

Characterize the ability of the Cache/Lower White River basin and the Mississippi Alluvial Valley Bird Conservation Region to support Ivory-billed Woodpecker populations based on current and/or projected landscape and site quality conditions. Assess other parts of the species range in terms of its ability to support Ivory-billed Woodpecker.



Bottomland hardwoods at Cache River NWR

Task 4.1: Conduct an assessment of the extent and distribution of foraging habitat (e.g., stressed/dying trees) within the Cache/Lower White River basin based on fall 2004 high resolution, color infrared aerial photography.

Task 4.2: Develop forest type map of the Cache/Lower White River basin based on Fall 2004 high resolution, color infrared aerial photography.

Task 4.3: Analyze 1940 Singer Tract aerial photography for a retrospective look at Tanner’s data using new ancillary data and technologies (e.g., stereoscopic photo interpretation, SURRGO soils data, Saucier geomorphology data).

Task 4.4: Assessment of “suitable” habitat across the MAV and the historic range based on the application of biological models to currently available data sets (e.g., FIA, aerial photography, or other remote sensed data [LiDAR]).

Task 4.5: Pursue new remote sensing technologies and data (e.g., LiDAR, ASTER) to better characterize the landscape based on parameters identified in biological models.

5.0 Conservation Design

Need

Spatially explicit population and habitat objectives are not known for Ivory-billed Woodpecker but are needed in support of

decision making related to conservation and management of the species.

Purpose

Establishment of biological objectives (population and habitat) based on input and output parameters from biological models. These objectives and parameters subsequently form the basis of decision support tools that define in a spatially-explicit manner, the landscape conditions presumed and/or predicted to support Ivory-billed Woodpecker populations.

Task 5.1: Establish population goals and objectives at multiple spatial and temporal scales.

Task 5.2: Establish habitat goals and objectives that support the population goals and objectives and reflect:

1. management of extant (bottomland) forests;
2. protection of extant (bottomland) forests; and

3. restoration of (bottomland) forests at multiple spatial scales.

Task 5.3: Based on biological models, develop decision support tools that facilitate the delivery of conservation programs by maximizing the biological and cost efficiency of management actions.

Task 5.4: Produce maps and technical documents (e.g., management guidelines) that land managers and planners can utilize to implement conservation programs across multiple spatial scales.

Task 5.5: Identify through forest management planning and the best available information the habitat enhancements which will lead to forest stands with the Desired Future Conditions.

6.0 Education and Outreach

Need

The re-discovery of the Ivory-billed Woodpecker generated a great amount of public interest. The recovery effort involves many stakeholders playing

many different roles including assisting with searches and in reporting of sightings. There is a need to develop a consistent message regarding the Service's recovery plan and associated activities. There

is also a need to develop infrastructure and business plans to enhance opportunities to learn about the ecology of the Ivory-bill and its habitat.

Purpose

Identify a consistent message on the approach of the recovery effort and develop a communications plan to be used by Team members and to keep members of the general public and other interested parties informed and involved in the recovery effort. The message will change as more is learned through the recovery process.

Task 6.1 Develop a communications plan and strategy for how best to communicate progress and issues encountered by the Recovery Team (now underway).



Ivory-billed Woodpecker habitat at Cache River NWR

7.0 Public Use and Access in Occupied Habitat

Need

Public use activity could increase to levels where impacts on Ivory-billed Woodpeckers or their habitat may result and no policy or guidelines exist for management of public use.

Purpose

Provide guidelines for management of public use so that policies are consistent on refuge lands and managed to avoid impacts on Ivory-billed woodpeckers.

Task 7.1 Develop guidelines for public use and other activities in Ivory-billed Woodpeckers habitat. For example, develop types of use, timing and amount of activity in the vicinity of known roost or nest trees as well as habitat known to be used for foraging.

Task 7.2 Develop public access and viewing points such as boardwalks, towers, blinds and platforms.

8.0 Management of a Rediscovered Population

Need

Rediscovery of nesting or roosting bird(s) will result in intense interest on the part of researchers and land managers. The overall management approach, protocols for research and monitoring and ESA and Refuge permit procedures need to be developed to assure the necessary work is completed

without impact to nesting or roosting birds. There will also continue to be a need for management of forested habitats to continue towards achievement of an identified Desired Future Condition.

Purpose

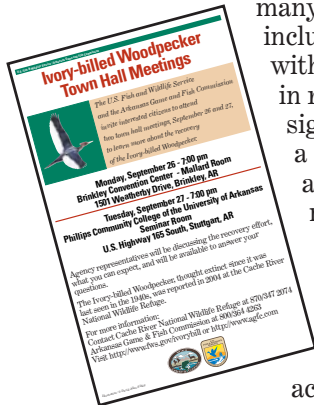
Provide policy framework for habitat management, population monitoring and research activities so that these activities may proceed and benefit recovery without resulting in adverse impacts.

Task 8.1: Develop guidelines for monitoring of nesting, roosting or feeding Ivory-billed Woodpeckers. For example, methods and procedures to be used to monitor the rediscovered bird(s) and draft permits authorizing the monitoring activity.

Task 8.2: Assess the need for intervention to enhance reproductive success, productivity and survival.

Task 8.3: If feasible determine genetic health and viability of the population.

Task 8.4: Consistent with a Desired Future Condition of forested habitats in the Mississippi Alluvial Valley identified in coordination with the overall recovery effort and an ecological assessment of the area implement reforestation activities and forest management practices which will benefit the Ivory-billed Woodpecker and its habitat.



Preplanning Decisions

Planning Approach

The approach to be used in development of the recovery plan is included in the Terms of Reference as approved or amended by the Executive Committee.

Information Management

Information on the recovery of this species will be housed at the Atlanta Regional Office of the Fish and Wildlife Service and at the Lafayette, Louisiana Ecological Services Field Office.

Recovery Plan Schedule

Regional Office Review Draft
April 2006

Public Review Draft
September 2006

Public Comment Period Ends
January 2007

Final Recovery Plan
June 2007

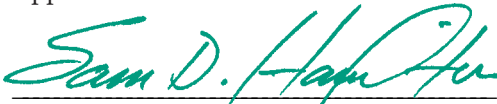
Stakeholder Involvement

Key stakeholders are listed in the Terms of Reference attached as Appendix 1.

Stakeholder Involvement Strategy

The current Recovery Team includes an extensive assortment of local stakeholders. The Corridor of Hope Team, as part of the recovery team, will aid in communications of the work and progress of the recovery activities and also provide feedback to the team. Involvement of these members coupled with periodic Town Hall type meetings and news releases will assist in keeping local stakeholders informed and involved. A plan on the specific approach to be taken is under development in coordination with the State of Arkansas and other recovery team members.

Approved:



Regional Director, Southeast Region
U.S. Fish and Wildlife Service

October 3, 2005

Date



Cache River NWR

Citation

U.S. Fish and Wildlife Service. 2005. Recovery Outline for the Ivory-billed Woodpecker. Atlanta, GA 17 pp.

References and Supporting Literature

Allen, A.A. and P.P. Kellogg. 1937. Recent observations on the ivory-billed woodpecker. *Auk* 54: 164-184.

del Hoyo, J., A. Elliott and J. Sargatal, eds. 2002. Handbook of the Birds of the World, Vol. 7. Jacamars to Woodpeckers. Lynx Edicions. Barcelona, Spain.

Fitzpatrick, J.W., M. Lammertink, M.D. Luneau, Jr., T.W. Gallagher, B.R. Harrison, G.M. Sparling, K.V. Rosenberg, R.W. Rohrbaugh, E.C.H. Swarthout, P.H. Wrege, S.B. Swarthout, M.S. Dantzker, R.A. Charif, T.R. Barksdale, J.V. Remsen, S.D. Simon, and D. Zollner. 2005. Ivory-billed woodpecker (*Campephilus principalis*) persists in continental North America. *Science* 308: 1460-1462.

Jackson, J.A. 1989. Past history, habitats, and present status of the ivory-billed woodpecker (*Campephilus principalis*). Report to the U.S. Fish and Wildlife Service, Atlanta, GA.

Jackson, J. A. 2002. Ivory-billed Woodpecker (*Campephilus principalis*). In: The birds of North America, No. 711 (A. Poole and F. Gill, eds.). The Birds of North America, Inc., Philadelphia, PA.

Jackson, J.A. 2004. In Search of the Ivory-billed Woodpecker. Smithsonian Books. Washington D.C. 294 p.

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

U.S. Fish and Wildlife Service. 1983a. Endangered and threatened species listing and recovery priority guidance. Federal Register 48:43098-43105.

U.S. Fish and Wildlife Service. 1983b. Endangered and threatened species listing and recovery priority guidelines correction. Federal Register 48:51985.