MANAGEMENT PLAN

RED-COCKADED WOODPECKER

Picoides borealis

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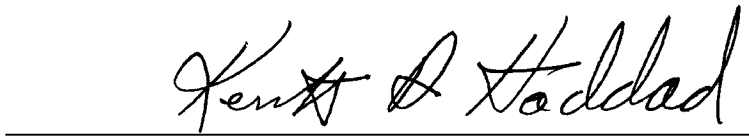

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August 8, 2003

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EXECUTIVE SUMMARY

The Florida Fish and Wildlife Conservation Commission (FWC) proposes to reclassify the red-cockaded woodpecker, *Picoides borealis*, as a Species of Special Concern pursuant to the procedural requirements embodied in Rule 68A-27.0012, Florida Administrative Code (F.A.C.) (Appendix 1). The FWC also proposes to prohibit the take, harassment, possession, sale, or transport of red-cockaded woodpeckers and their eggs, nests, or dens (i.e., cavities) except as authorized by permit from the executive director, with such permits being issued for activities that further the goals and objectives of this management plan. Collectively, these rules provide a legal basis, at the state level, to (1) continue the prohibition of direct take imposed under the species' existing designation as Threatened, (2) regulate impacts related to management, monitoring, and research activities, and (3) authorize incidental take under such programs as Safe Harbor or approved Habitat Conservation Plans (HCP) if they further the goals and objectives of the management plan.

This management plan provides the framework for conserving and managing the red-cockaded woodpecker in Florida and includes (1) an assessment of the threats responsible for the species' apparent status as a Species of Special Concern, (2) a clear statement of the conservation goal and objective targeted by the management plan, and (3) the conservation actions, FWC regulations, and incentives believed necessary to achieve the stated goal and objective. A monitoring plan for assessing future status, an implementation strategy for the management plan, and areas for future research also are included.

The FWC conservation goal for the red-cockaded woodpecker is to secure and maintain a stable or increasing Florida population at a level above the threshold defining a Species of Special Concern. Based on the premise that Florida will continue to represent at least 25% of the range-wide population, the conservation objective is to secure and maintain at least 1,349 potential breeding groups (1,686 active clusters) in Florida by the year 2020 and beyond. To facilitate achievement of the stated goal and objective, conservation actions will focus on 6 geographically discrete management units and the 17 metapopulations identified therein (Figures 1-7).

This management plan fulfills the requirements of Rule 68A-27.0012, F.A.C. (Appendix 1), which went into effect June 29, 1999. The listing process for red-cockaded woodpeckers was initiated in September 2001 by FWC acceptance of a valid petition for listing action (Appendix 2). FWC staff reviewed the status of the red-cockaded woodpecker relative to Florida's listing criteria (Appendix 3) and summarized the results in a Final Biological Status Report (Appendix 4). Based on that report, in January 2002, the Commission determined that listing the red-cockaded woodpecker as a candidate for Species of Special Concern designation was warranted

and directed FWC staff to develop a management plan for the species. This document fulfills that directive pursuant to Rule 68A-27.0012, F.A.C. (Appendix 1). Consideration of the management plan by the FWC was scheduled for the November 20-22, 2002 Commission meeting, but subsequently was postponed until the September 3-5, 2003 meeting.

Public comments and outside review were formally solicited and incorporated at several junctures during the listing process (Appendix 5). Public comment periods were noticed in the Florida Administrative Weekly (1) to solicit information on the biological status of the red-cockaded woodpecker to be considered during the development of the Final Biological Status Report, (2) to solicit information on the conservation needs of the red-cockaded woodpecker and any economic and social factors that should be considered in its management, and (3) to solicit public input on the Draft Management Plan, including any information regarding the anticipated regulatory economic and social impacts of management plan implementation. Public comments also were heard at the September 5–7, 2001 FWC meeting, when the petition to initiate the listing process was presented, at the January 23-25, 2002 FWC meeting, when the results of the biological status assessment were reported, and at the September 3-5, 2003 FWC meeting when the management plan and associated rule changes were considered by the Commission.

TABLE OF CONTENTS

LIST OF TABLES

LIST OF FIGURES

LIST OF APPENDICES

SPECIES MANAGEMENT PLAN

INTRODUCTION

The red-cockaded woodpecker (*Picoides borealis*) is a small bird (19.0-21.6 cm [7.5-8.5 in] in length) with a black cap and nape, black and white barred back, white underparts, and large white cheek patches. A territorial cooperative breeder, the red-cockaded woodpecker typically inhabits open, mature pine forests with sparse midstory vegetation and excavates its cavities exclusively in old growth, living pines. Although cavities are excavated in at least 7 different pine species, longleaf pine (*Pinus palustris*) is considered preferred where it occurs (U.S. Fish and Wildlife Service 2003). Once a common bird throughout the southeastern United States, the current distribution of the red-cockaded woodpecker is highly fragmented and characterized by a preponderance of relatively small, isolated populations. The species has been extirpated from 6 of the 17 states where it previously occurred (Hooper et al. 1980, Jackson 1994, U.S. Fish and Wildlife Service 2003) and has been reduced to less than 3% of its estimated abundance prior to European settlement (U.S. Fish and Wildlife Service 2003). Loss and degradation of suitable habitat are the primary reasons for decline, and they remain the greatest obstacles to the species' recovery (U.S. Fish and Wildlife Service 2003).

In June 2001, Florida Fish and Wildlife Conservation Commission (FWC) staff conducted a preliminary status review of the red-cockaded woodpecker. The review was not based on a perceived change in the species' status, but rather was undertaken as a precursor to the development of a species management plan according to the procedural requirements of Florida's 2-phase listing process (Rule 68A-27.0012, Florida Administrative Code [F.A.C]; Appendix 1). The results of the preliminary status review prompted FWC staff to develop a petition (Appendix 2) to reclassify the red-cockaded woodpecker as a Species of Special Concern in accordance with the criteria defined in Rule 68A-1.004, F.A.C. (Appendix 3). Currently, the species is on the state list of Threatened species (Rule 68A-27.004, F.A.C.) and listed as Endangered by the U.S. Fish and Wildlife Service (USFWS, 50 CFR 17). In September 2001, the FWC determined the petition was sufficient and directed staff to undertake a comprehensive assessment of the red-cockaded woodpecker's biological status and to summarize the results in a Final Biological Status Report (Appendix 4). Based upon that report, in January 2002, the FWC determined that listing the red-cockaded woodpecker with a Species of Special Concern designation was warranted and directed staff to develop a management plan for the species. This document fulfills that directive pursuant to Rule 68A-27.0012, F.A.C. (Appendix 1). Consideration of the management plan by the FWC was scheduled for the November 20-22, 2002 Commission meeting, but subsequently was postponed until the September 3-5, 2003 meeting.

Public comments and outside review were formally solicited and incorporated at several junctures during the listing process (Appendix 5). The following public comment periods were noticed in the Florida Administrative Weekly: (1) September 28–November 13, 2001 to solicit information on the biological status of the red-cockaded woodpecker to be considered during the development of the Final Biological Status Report; (2) February 15–April 5, 2002 to solicit information on the conservation needs of the red-cockaded woodpecker and any economic and social factors that should be considered in its management; and (3) September 13–October 28, 2002 to solicit public comment on the Draft Management Plan, including any information

regarding the anticipated regulatory economic and social impacts of management plan implementation. Public comments also were heard at the September 5–7, 2001 FWC meeting, when the petition to initiate the listing process was presented, and at the January 23-25, 2002 FWC meeting, when the results of the biological status assessment were reported. The September 3-5, 2003 Commission meeting provided a final opportunity for public comment on the management plan and the proposed listing action.

The red-cockaded woodpecker management plan includes (1) an assessment of the threats responsible for the species' status as a Species of Special Concern; (2) a statement of the conservation goal and objective targeted by the management plan; (3) conservation actions, incentives, and regulations recommended to achieve that goal and objective; (4) a monitoring plan to assess red-cockaded woodpecker status; (5) an implementation strategy for the management plan; and (6) suggested areas for future research. Many of the techniques recommended as conservation actions are fundamental to red-cockaded woodpecker management and should be considered carefully by agencies, managers, and landowners seeking to enhance the species on their lands. However, the specific mixture of activities will depend on the history of the land in question, the current status of the resident red-cockaded woodpecker population, the overall management objective, and the availability of existing and future financial resources.

Traditionally, number of active clusters has been the standard measure of population size for the red-cockaded woodpecker. A new standard, number of potential breeding groups, was established in the federal recovery plan (U.S. Fish and Wildlife Service 2003) and is considered preferable because it more accurately reflects the health and reproductive potential of a population. Accordingly, the conservation objective of this management plan is expressed in terms of potential breeding groups. Active clusters, however, are used to describe existing populations because most previous data are reported in that format. To facilitate use of the new standard, comparisons between potential breeding groups and active clusters are provided throughout the plan based on the estimated average ratio of 1.25 active clusters per potential breeding group (U.S. Fish and Wildlife Service 2003).

DEFINITIONS

The following glossary defines scientific terms as they pertain to red-cockaded woodpecker assessment, conservation, and research described in this management plan.

Active Cavity Tree — Any tree containing 1 or more cavities exhibiting fresh pine resin associated with cavity construction, cavity maintenance, or resin well excavation by red-cockaded woodpeckers.

Active Cluster — The aggregate of active and inactive cavity trees used and defended by a group of red-cockaded woodpeckers.

Artificial Cavity Tree — Any tree containing 1 or more artificial (i.e., constructed) cavities. There are 2 types of artificial cavities: drilled (Copeyon 1990) and inserts (Allen 1991).

Area of Occurrence	The geographic area inhabited by all individuals in a population. Typically, the amount of habitat in which individuals are known to occur.
Augmentation	The use of translocation to increase the size of a population or metapopulation.
Extent of Occurrence	The geographic area encompassing all locations of individuals of a species, including intervening areas of unoccupied habitat. Synonymous with range.
Florida Population	All individuals of the species within the state of Florida.
Generation	The average age of breeders in a population. Using Vortex 8.41 software (Miller and Lacy 1999), the estimated generation times for male and female red-cockaded woodpeckers were 6.5 and 5 years, respectively (FWC, unpublished data).
Group	The social unit in red-cockaded woodpeckers, which consists of a breeding pair with or without 1 or more helpers, or a solitary bird.
Helper	An adult that delays its own reproduction to assist in the rearing of another breeding pair's young. Helpers typically are related to the breeding pair they assist.
Immigration	The movement of 1 or more individuals into a population or metapopulation.
Long-term	An extended period of time relative to the life span of individuals in a population. Length is based on commonly used viability procedures and practicality, but is typically at least 100 years.
Management Unit	One of a set of 6 areas in Florida designated to ensure a geographically balanced approach to red-cockaded woodpecker conservation efforts and continued representation of habitat types and genetic resources.
Metapopulation	For the purpose of this management plan, the term applied to a designated aggregate of neighboring red-cockaded woodpecker populations within a management unit. Genetic exchange within and/or among metapopulations is important to the long-term viability of the species and may be accomplished through immigration or translocation.

Population	Individuals of the same species that occur in a defined area at the same time and regularly interact or interbreed.
Potential Breeding Group	An adult male and adult female that occupy the same active cluster and attempt to nest or successfully fledge young, with or without the assistance of 1 or more helpers.
Range-wide Population	All individuals of the species throughout the entire extent of its area of occurrence. For red-cockaded woodpeckers, the range-wide population includes individuals found in Florida, Georgia, South Carolina, North Carolina, Virginia, Mississippi, Alabama, Louisiana, Arkansas, Oklahoma, and Texas.
Recruitment Cluster	A cluster of artificial cavity trees, or suitable inactive natural cavity trees, located in suitable habitat and close to existing groups.
Restrictor	A metal plate used to prevent or repair an enlarged cavity entrance (Carter et al. 1989).
Suitable Cavity	A dry, clean cavity with a single entrance, a solid base, and an entrance tunnel and chamber that are not enlarged.
Translocation	The artificial movement of juvenile red-cockaded woodpeckers between or within populations or metapopulations. Typically single females are moved to single males, or unrelated pairs are moved to recruitment clusters.
Viable Population	A stable population with a high probability (e.g., more than 90%) of surviving for a long-term period (e.g., 100 years).

THREAT ASSESSMENT

FWC staff undertook an assessment of the underlying reasons for the range-wide decline of the red-cockaded woodpecker as a necessary precursor to the design and implementation of effective conservation measures. First, FWC staff examined the population parameters that put the species at risk in relation to the criteria used to define listed species in Florida (Rule 68A-1.004, F.A.C.; Appendix 2). The Final Biological Status Report for the red-cockaded woodpecker (Appendix 4) specified 1 criterion underlying the proposed designation as a Species of Special Concern.

1. **Population reduction.** There was an estimated range-wide population reduction of at least 20% over the last 20 years based on (a) an observed decline of all monitored populations except 1 between 1970 and the early 1980s (U.S. Fish and Wildlife Service 2003), (b) an estimated decline of at least 23% in the range-wide population during the 1980s (James 1995), and (c) the inference that population gains due to aggressive management during the 1990s were not enough to offset losses in the previous decade.

Furthermore, there is a suspected range-wide population reduction of at least 20% during the next 20 years based on (a) a potential extirpation rate of 11-23% for small and/or isolated populations as predicted by 2 demographic models (Letcher et al. 1998, Walters et al. 2002), (b) the potential for the continued loss of suitable habitat especially on private lands, and (c) the low probability of sustaining population gains made during the 1990s without the continued application of aggressive management techniques.

The second assessment step involved an examination of the threats, past and present, responsible for the range-wide decline of the red-cockaded woodpecker. The following factors have been well documented in the literature as having an adverse impact on the species' distribution, abundance, and long-term viability.

1. **Large-scale loss of suitable habitat**, especially through the following practices:
   a. **Intensive logging of old-growth pine forests** during the late 1800s and early 1900s and subsequent conversion to agricultural fields and other land uses.
   b. **Clearcutting of second-growth pine forests,** beginning in the 1950s and continuing to date, and subsequent conversion to agricultural fields, real estate, or pine plantations with short stand rotations.

2. **Degradation and/or unsuitability of remaining pine habitat** due to:
   a. **Exclusion and suppression of fire**, which may lead to smaller group sizes, reduced productivity, cluster abandonment, and/or low-quality foraging habitat due to (i) replacement of native pines by off-site pine species and hardwoods, (ii) increased hardwood encroachment at the expense of pines and groundcover, (iii) higher stand densities and a predominant midstory, and (iv) changes in the abundance, species composition, and distribution of the arthropod community.
   b. **Reliance on dormant season prescribed burns,** which are not as effective as early or mid growing season burns at reducing hardwoods and promoting native groundcover vegetation (Sparks et al. 1998, 1999).
   c. **Low availability of old-growth pines**, which are required for cavity excavation and are an important component of optimal foraging habitat.

3. **Habitat fragmentation and group isolation**, which increase the species' vulnerability to local extirpations due to adverse genetic, demographic, and environmental events.

CONSERVATION GOAL AND OBJECTIVE

Red-cockaded Woodpecker Conservation Goal

Given knowledge of the current population status and the threats underlying previous population decline, it should be possible to set a scientifically defensible, reasonable, and explicit conservation goal for the red-cockaded woodpecker in Florida. **The most ambitious and optimistic conservation goal, and the one toward which this management plan is aimed, is to secure and maintain a stable or increasing Florida population of the red-cockaded woodpecker at a level above the threshold defining a Species of Special Concern.** If that goal was met and the species' range-wide population trend also was stable or increasing, the FWC could determine that removing the red-cockaded woodpecker from the Species of Special Concern list was warranted.

On the other hand, future population declines in Florida or elsewhere may necessitate the less optimistic goal of maintaining the red-cockaded woodpecker as a Species of Special Concern. Given the FWC's lack of jurisdiction outside of Florida, the absolute minimum conservation goal would be to ensure that the Florida population of red-cockaded woodpeckers does not decline to the extent that it causes, solely or in part, the species to meet the criteria defining a Threatened species.

Red-cockaded Woodpecker Conservation Objective

To facilitate assessment of progress toward the conservation goal, FWC staff established a highly measurable conservation objective for the red-cockaded woodpecker. Two main factors were carefully considered: (1) the distribution and status of the Florida population in 2000, and (2) the FWC listing criteria for a Species of Special Concern. Appendix 6 presents a complete discussion of these factors and the process used to develop the conservation objective. However, because the derivation of the objective is not intuitive without some explanation, the main points are summarized below.

1. In 2000, the distribution of the red-cockaded woodpecker in Florida was highly fragmented and restricted to areas where suitable habitat remained (Figure 1). Although the species' was known to occur on at least 34 properties (Table 1), only 4 properties (12%) supported more than 50 active clusters (40 potential breeding groups). Property ownership favored state lands (53%), but 70% of the active clusters occurred on federal properties in northern Florida.

2. In 2000, the range-wide population of red-cockaded woodpeckers was estimated at 5,627 active clusters (4,502 potential breeding groups) (U.S. Fish and Wildlife Service 2003). Florida represented 25% of the range-wide population, with an estimated 1,404 active clusters (1,123 potential breeding groups) (Table 1).

3. Based on the premise that Florida will continue to represent at least 25% of the range-wide population, numerically the Florida population could remain stable, or decline by

9% over the next 20 years, and still meet the minimum delisting requirements for a Species of Special Concern (Table 2). However, long-term viability models for individual populations strongly suggest that maintaining the Florida population at or below the 2000 level would be problematic given the species' fragmented distribution and the preponderance of properties supporting fewer than 50 active clusters (40 potential breeding groups). Furthermore, a stable or declining Florida population would not provide a buffer against losses that might occur elsewhere in the species' range.

Upon consideration of these factors, FWC staff concluded that setting the conservation objective at the 2000 status level or at the minimum delisting size for a Species of Special Concern would not insure achievement of the stated conservation goal for the red-cockaded woodpecker. Instead, FWC staff determined that it would be more appropriate to use a geographic approach to derive the numerical component of the conservation objective. To this end, 6 discrete management units were established in Florida (Figure 1) and 17 metapopulations were identified therein (Table 3, Figures 2-7). Next, the set of guidelines listed below were developed and applied to the targeted management units and metapopulations. These guidelines considered both the numerical and spatial components of long-term viability and included 2 important assumptions. First, all metapopulations and populations would be managed to achieve optimal habitat conditions and spatial configuration of active clusters, and second, periodic exchange of genetic material would occur within and among metapopulations either through immigration or translocation.

1. **By the year 2020, achieve at least a 20% increase in the Florida population.** This increase is considered necessary to secure a stable or increasing Florida population of red-cockaded woodpeckers and to offset declines that might occur elsewhere in the species' range.

2. **By the year 2020, secure and maintain (a) at least 100 potential breeding groups per management unit, (b) at least 2 metapopulations per management unit, and (c) 40 or more potential breeding groups in at least 1 of the metapopulations in each management unit.** This distribution is necessary to maintain existing habitat types and genetic resources, and to buffer losses due to hurricanes or other catastrophic events. It also will facilitate a statewide approach to conservation efforts and ensure that each management unit contains at least 1 metapopulation large enough to persist for 100 years.

3. **By the year 2020, increase metapopulations within management units (a) to at least 10 potential breeding groups if below 10 potential breeding groups in 2000, (b) to at least 25 potential breeding groups or 15% growth (whichever is higher) if above 9 but below 25 potential breeding groups in 2000, (c) to at least 40 potential breeding groups or 15% growth (whichever is higher) if above 24 but below 40 potential breeding groups in 2000, (d) by at least 15% or a net increase of 10 potential breeding groups if above 39 but less than 100 potential breeding groups in 2000, and (e) by at least 10% if above 99 potential breeding groups in 2000.** These increases are necessary to achieve a 20% increase in the Florida population and to maximize the number of metapopulations capable of long-term persistence.

Based on the application of these guidelines to the targeted management units and metapopulations (Table 3), the conservation objective recommended by FWC staff is **to secure and maintain at least 1,349 potential breeding groups (1,686 active clusters) of red-cockaded woodpeckers in Florida by the year 2020 and beyond.** This would constitute a 20% increase in the Florida population over the next 20 years (2000-2020). Upon achievement of the conservation objective, each management unit would support between 2 and 4 metapopulations and between 100 and 609 potential breeding groups (Table 3), which would allow confident prediction of continued population stability and satisfy the future trend component of the listing criteria (Appendix 3). Annual monitoring of metapopulations will be necessary through 2020 to ensure adequate progress toward the conservation objective.

This conservation objective provides multiple provisions for attaining the conservation goal of removing the red-cockaded woodpecker from Florida's Species of Special Concern list. It will result in at least a 20% increase in the Florida population over the next 20 years, which is considered necessary to secure a stable or increasing population and to offset declines that might occur elsewhere in the species' range; it will insure the continued representation of the species' habitats and genetic resources throughout Florida; and it will facilitate the establishment and maintenance of individual metapopulations large enough to persist for at least 100 years. Achievement of Florida's conservation objective also will be an important contribution towards the range-wide recovery of the species, especially on properties designated as Essential Support Populations in the federal recovery plan (U.S. Fish and Wildlife Service 2003).

The conservation objective is ambitious but certainly not unrealistic. Because Florida already supports a relatively large number of red-cockaded woodpeckers, the objective is not designed to affect a substantial increase in the Florida population, but rather to secure and maintain enough viable metapopulations to insure the species' long-term occurrence throughout the state. Furthermore, in 2000, 46% of the Florida properties with a known occurrence of red-cockaded woodpeckers had developed a management plan for the species and 69% had an active monitoring program (FWC, unpublished data). The continuation and possible expansion of these existing activities is much less daunting than the task of developing a statewide management and monitoring program from the ground up. Finally, and perhaps most importantly, because the life history and habitat requirements of the red-cockaded woodpecker are well known, a variety of proven management techniques exist. Thus, the biggest challenge to achieving the conservation objective may be the ability of agencies, managers, and landowners to secure the funds necessary to manage the species on a long-term basis.

Strategies to Achieve the Conservation Objective

Maintaining the Florida red-cockaded woodpecker population at a level above the threshold for listing as a Species of Special Concern will require an organized and comprehensive approach. Extensive and intensive efforts will be necessary to (1) manage metapopulations and populations for long-term viability and growth, (2) coordinate and conduct survey and monitoring activities, (3) periodically assess the status of the Florida and range-wide populations, and (4) conduct research specific to the species' management and conservation in Florida. Completion of these tasks cannot be accomplished by the FWC alone, but will require partnerships with public and private land managers.

Based on the concept of management units and metapopulations previously described, FWC staff identified 2 key strategies required to achieve the conservation objective.

1. **By the year 2020, secure and maintain a Florida population of at least 1,349 potential breeding groups (1,686 active clusters) of red-cockaded woodpeckers within the 17 targeted metapopulations.**
    a. Establish a Memorandum of Agreement (MOA) with the USFWS regarding the role of each agency in:
        i. Prioritizing, coordinating, and funding conservation activities in Florida.
        ii. Facilitating the development of management plans for targeted metapopulations and/or individual properties within metapopulations.
    b. Conduct a risk assessment for each metapopulation and prioritize metapopulations according to their immediate management needs.
    c. For each metapopulation, establish a MOA among the relevant property owners to determine the role of each in coordinating, funding, and conducting management and monitoring activities on federal, state, local government, and private lands. Initially focus on the metapopulations ranked highest in the risk assessment.
    d. Develop and implement a long-term management plan for each metapopulation. Initially focus on the metapopulations ranked highest in the risk assessment.
        i. Include the results of the risk assessment.
        ii. Establish a numerical goal and a timeline for achieving that goal. The metapopulation goals in this plan (Table 3) represent the minimum size required to meet Florida's conservation objective; setting higher goals based on the amount of potential habitat within each metapopulation is strongly encouraged.
        iii. Identify needs and opportunities to manage and/or restore habitat.
        iv. Identify needs and opportunities to increase the number, distribution, and/or density of potential breeding groups. Once existing populations are stabilized, consider reintroducing the species in areas where it has been extirpated (Appendix 7).
        v. Develop strategies to achieve and maintain optimal immigration rates. When immigration is achieved through translocation, develop a strategy to map the genealogy of translocated birds to prevent deleterious genetic effects.
        vi. Assess existing monitoring activities and identify additional needs and opportunities.
        vii. Submit draft management plans to the FWC and USFWS for review and comments.
    e. FWC will seek funding to conduct the metapopulation risk assessment and to facilitate development of the metapopulation MOAs and management plans. FWC also will implement management plans for the metapopulations where it is the lead as designated by the MOA to the extent possible given budget and staffing constraints.
    f. Establish a Florida red-cockaded woodpecker working group to promote communication between and among agencies, managers, biologists, and private

landowners. FWC will organize and facilitate this group, which will meet at least once a year to discuss management achievements and failures, new techniques, translocation strategies, regulatory issues, data collection and management, training needs and opportunities, and other topics as deemed necessary. Initially the group will meet to assist with the metapopulation risk assessment (Conservation Strategy 1b) and the identification and ranking of unsurveyed and potential properties (Conservation Strategies 2a and 2b). Thereafter, it may be possible for the group to meet in conjunction with the annual regional translocation strategy meeting, which is facilitated by the USFWS and usually held in Tallahassee in August.

2. **Locate extant but unknown potential breeding groups of red-cockaded woodpeckers within management units and metapopulations.**
   a. Identify and rank, according to priority, properties where red-cockaded woodpeckers are known to occur but a baseline survey of potential breeding groups has not been completed or conducted recently (Appendix 8). Consider amount of suitable habitat and proximity to known populations during the ranking process.
   b. Identify and rank, according to priority, potential properties where red-cockaded woodpeckers are not known to occur but suitable habitat may exist (Appendix 9). Consider the likelihood of occupancy and proximity to known populations during the ranking process.
   c. Establish a MOA between the FWC and the relevant property owners to determine the role of each in coordinating, funding, and conducting red-cockaded woodpecker surveys on federal, state, local government, and private lands where landowners willingly grant access to their property.
   d. FWC will seek funding to identify and rank properties, and to the extent possible, will plan and conduct surveys on properties where it is the lead as designated by the MOA.
   e. Complete baseline surveys on occupied but incompletely surveyed properties, with emphasis placed on the highest ranked properties.
   f. Conduct surveys on potential properties, with emphasis placed on the highest ranked properties.
   g. Manage properties with completed surveys and/or confirmed occupancy in accordance with Conservation Strategy 1.
   h. Because extant but unknown potential breeding groups do not constitute an actual increase in the Florida population, modify metapopulation descriptions and management plans to account for groups found through increased survey efforts and revise the numerical component of the conservation objective accordingly.

RECOMMENDED CONSERVATION ACTIONS

Proposed FWC Regulations

The FWC considers the following rules necessary to protect red-cockaded woodpeckers and facilitate their conservation while efforts to secure the species in Florida are underway.

1. **List the red-cockaded woodpecker, *Picoides borealis*, as a Species of Special Concern.**

2. **Prohibit the take, harassment, possession, sale, or transport of red-cockaded woodpeckers, *Picoides borealis*, and their eggs, nests, or dens (i.e., cavities) except as authorized by permit from the executive director, with such permits being issued for activities that further the goals and objectives of the species' management plan.**

Collectively, these rules provide a legal basis, at the state level, for prosecuting direct take in accordance with Florida Statute 372.0725 (killing or wounding of any species designated as Endangered, Threatened, or Species of Special Concern) and for regulating impacts related to management, monitoring, and research activities. Furthermore, the proposed rules provide a basis for authorizing incidental take under such programs as Safe Harbor or approved HCPs (see section on Private Lands below).

Management Actions

Accomplishment of the conservation objective will require a long-term commitment by numerous agencies, managers, and landowners to manage red-cockaded woodpeckers and their habitat in Florida. Fortunately, much is known about the life history and habitat requirements of the species and a variety of proven management techniques exist. The management actions listed below briefly outline the key principles and activities that should be considered when developing the metapopulation management plans. A more comprehensive discussion of red-cockaded woodpecker management is included in the federal recovery plan (U.S. Fish and Wildlife Service 2003). The specific mixture of management actions undertaken for each metapopulation will depend on the history and existing condition of the properties located therein, the current status of the resident red-cockaded woodpecker population(s) on those properties, other resource management considerations, and the availability of existing and future funding.

1. **Monitor clusters and potential breeding groups in existing populations.**
   a. Determine cluster status (active or inactive) annually during the nesting season (April-July).
   b. Determine number of potential breeding groups by monitoring active clusters for nests and/or conducting group censuses during the nesting season.

2. **Maintain and protect active clusters in existing populations.**
   a. Mark and map individual cavity trees to facilitate identification in the field.
   b. Maintain at least 4 suitable cavities in each active cluster. If necessary, install restrictor plates on existing cavities (Carter et al. 1989) or construct artificial cavities (Copeyon 1990, Allen 1991).
   c. Prescribe burn active clusters every 1 to 3 years to maintain an open forest structure, control midstory encroachment, and promote pine regeneration. When possible, burn during the growing season to retain or restore native groundcover.

Dormant season burns and/or mechanical removal of midstory vegetation may be required for initial fuel reduction.

d. Protect individual cavity trees against damage from fire, wind, root compression, and southern pine beetle infestations.
e. Retain and protect older pines (over 60 years old) as potential cavity trees.
f. Retain dead and dying cavity trees and all other snags, unless they present a safety hazard.
g. Minimize human disturbance in active clusters, especially during the nesting season.
h. If necessary, initiate efforts to restore appropriate ground cover species.

3. **Increase the number of potential breeding groups in existing populations.**
   a. Translocate potential mates to active clusters occupied by single birds (i.e., place a juvenile female with a single male or a juvenile male with a single female).
   b. Construct recruitment clusters to facilitate new group formation through natural dispersal. The distance between recruitment clusters and existing active clusters should be greater than 0.4 km (0.25 mile) but less than 3.2 km (2 miles) (U.S. Fish and Wildlife Service 2003).
   c. Augment populations with less than 30 potential breeding groups (U.S. Fish and Wildlife Service 2003) by translocating unrelated pairs of juveniles to recruitment clusters. Locate recruitment clusters near existing groups (see above) to optimize occupancy, increase group density, and minimize isolation. (Note: Translocation should not be considered until the factors contributing to a population's small size have been identified and corrected.)
   d. If necessary, improve and/or restore habitat in sites selected for recruitment clusters prior to constructing artificial cavities. Thereafter, manage recruitment clusters like active clusters (i.e., mark and map cavity trees, prescribe burn, etc.).

4. **Provide quality foraging habitat for active clusters and recruitment clusters (active or inactive) in existing populations.**
   a. On public lands, use the recovery standard (Appendix 10) established in the federal recovery plan (U.S. Fish and Wildlife Service 2003). This standard also is recommended for private lands being managed for increased population size. Where warranted, use silviculture to achieve the pine habitat conditions recommended under the federal recovery plan (U.S. Fish and Wildlife Service 2003).
   b. On private lands, use the standard for managed stability (Appendix 11) established in the revised federal recovery plan (U.S. Fish and Wildlife Service 2003). When warranted, use silviculture to achieve the pine habitat conditions recommended under the standard for managed stability.
   c. Consult with the FWC and USFWS to develop site-specific foraging habitat guidelines for areas where achieving the federal standard for recovery on public lands or for stability on private lands would be difficult due to low pine basal area or other habitat characteristics (e.g., central and southern Florida
   d. Prescribe burn foraging habitat every 1 to 3 years to maintain an open forest structure, control midstory encroachment, and promote pine regeneration. When

possible, burn during the growing season to retain or restore native groundcover. Dormant season burns and/or mechanical removal of midstory vegetation may be required for initial fuel reduction.

5. **Identify and secure private properties with existing or potential red-cockaded woodpecker habitat.**
   a. Rank properties based on the number of potential breeding groups, amount of existing or potential habitat, proximity to occupied habitat, and potential for connecting isolated populations or groups.
   b. Contact owners of highest ranked properties to discuss Safe Harbor, public acquisition, conservation easements, and other options.
6. **Restore or create red-cockaded woodpecker habitat in currently unoccupied areas.**
   a. Use prescribed fire or mechanical methods to promote regeneration of native pines and to reduce hardwoods and other midstory vegetation. Use growing-season burns to mimic the natural fire regime and promote native groundcovers. Dormant season burns may be necessary for initial fuel reduction.
   b. Consider the value of off-site pines as existing and potential habitat. When warranted, remove off-site pines and seed and/or plant native pine and groundcover species on sites where restoration cannot be achieved through prescribed fire alone. Rather than clear-cutting off-site pines, consider conducting a seed tree cut and underplanting with the native pine species.
   c. Prioritize restoration sites based on their proximity to existing occupied habitat and their potential for connecting isolated groups or populations.

Private Lands Incentives

Private lands will play an important role in the long-term conservation of the red-cockaded woodpecker in Florida. Although most of the properties targeted for management are under public ownership, 7 of the 17 designated metapopulations include private lands (Table 3). To promote the enhancement of red-cockaded woodpeckers on private lands in Florida, FWC staff will:

1. **Develop and implement a statewide Safe Harbor program for red-cockaded woodpeckers in Florida.** The establishment of a Safe Harbor program in Florida would provide heretofore nonexistent incentives for private landowners to manage, maintain, or increase the number of red-cockaded woodpecker groups on their property without fear of additional land-use restrictions. Private landowners enrolling in Safe Harbor voluntarily agree to manage for red-cockaded woodpeckers and to maintain a "baseline" number of groups on their property (i.e., the number of groups present at the time they enroll in the program). In exchange, they are authorized to incidentally take groups above the established baseline if they are in compliance with the program. Under a statewide Safe Harbor program, administrative authority would be transferred from the USFWS to the FWC (U.S. Fish and Wildlife Service 2001). Florida's Safe Harbor program should be proactive and seek to enroll private lands with the greatest conservation value to red-cockaded woodpeckers. Potential candidates include the private properties within the targeted metapopulations (Table 3) and/or private properties

that are inhabited by red-cockaded woodpeckers and adjacent to public lands being managed for the species.

2. **Inform private landowners of existing land-use incentive programs.** These include the Florida Forestry Stewardship Program, the Wildlife Habitat Incentives Program, the Environmental Quality Incentives Program, the Landowner Incentive Program, and the Private Stewardship Grants Program. FWC staff will review these and other programs to determine which provide the best incentives for managing red-cockaded woodpeckers on private lands and disseminate their findings through brochures, pamphlets, and/or the FWC's home page on the Internet (http://www.floridaconservation.org). FWC staff also will seek to identify and/or develop other innovative programs to encourage the conservation of red-cockaded woodpeckers on private lands. To the extent possible, FWC staff will work with private property owners on a case-by-case basis to develop the best management strategies for the red-cockaded woodpeckers on their lands.

The HCP process will be used to mitigate for the loss of red-cockaded woodpeckers on private lands due to otherwise lawful activities. Incidental take will require the development of a management plan and mitigation strategy for each property under consideration and subsequent approval by both the FWC and the USFWS. Public lands within metapopulations should be considered as potential HCP mitigation sites.

Monitoring Plan

Monitoring will be necessary to measure the success of management actions undertaken for red-cockaded woodpecker conservation in Florida. The primary purpose of monitoring will be to detect changes in abundance and trends in the Florida population by determining the number of active clusters and the number of potential breeding groups in the metapopulations targeted for management (Table 3). The federal recovery plan (U.S. Fish and Wildlife Service 2003) provides a thorough description of the methods used to monitor these parameters. In general, cluster status should be assessed during the nesting season (April- July) by checking the cavity trees within each potentially active cluster for evidence of recent red-cockaded woodpecker activity. Number of potential breeding groups also should be determined during the nesting season either by visiting each active cluster every 7 to 11 days until a nest is found or by determining group size in active clusters where nesting is not observed. For the purpose of evaluating statewide progress toward the conservation objective, active clusters and potential breeding groups should be monitored in accordance with the guidelines (Appendix 12) established in the federal recovery plan (U.S. Fish and Wildlife Service 2003).

Additional monitoring activities will depend on the management needs of individual metapopulations and/or the properties located therein. For example, color-banding adults and nestlings to obtain detailed data on group size and reproductive success is highly recommended in small or fragmented populations, and is required for sites that plan to donate or receive translocated birds (U.S. Fish and Wildlife Service 2003). Other types of monitoring may be needed to (1) assess the impact of translocation on donor populations; (2) determine the effectiveness of artificial cavities, recruitment clusters, midstory control, and other management techniques; (3) evaluate mitigation programs or research results; (4) determine cavity suitability;

or (5) delineate and assess foraging habitat. Monitoring needs and protocols beyond the inventory of active clusters and potential breeding groups should be developed in consultation with the FWC and the USFWS and included in the metapopulation management plans.

Agencies, biologists, and landowners within the targeted metapopulations will be asked to report their management activities and monitoring results to the FWC on an annual basis. In most cases, a copy of the annual report used by the USFWS will fulfill this request. (The report form is available on the Internet at http://rcwrecovery.fws.gov). FWC staff will review these data relative to the listing criteria for Species of Special Concern and Threatened status (Table 2). If monitoring reveals that any of the following thresholds have been reached, FWC will recommend reassessment of the red-cockaded woodpecker's biological status.

1. **Verification of 1,349 or more potential breeding groups (1,686 active clusters) in Florida.** This would meet the numerical component of the conservation objective and, depending on the species' range-wide status, could lead to its removal from Florida's Species of Special Concern list.

2. **Verification of 562 or fewer potential breeding groups (702 active clusters) in Florida or the loss of 28 potential breeding groups (35 active clusters) or more per year.** This would constitute, or predict, a 50% decline in the Florida population and trigger a re-evaluation of status for possible reclassification to Threatened under listing Criterion A (Table 2).

3. **Verification of the loss of 17 potential breeding groups (22 active clusters) or more per year in Florida.** This would trigger a re-evaluation of status for possible reclassification to Threatened under listing Criterion C (Table 2).

In addition, every 5 years FWC staff, in consultation with the USFWS, will review the status of the range-wide population. If the data indicate substantial or continued declines in other states, reassessment of biological status relative to the listing criteria will be recommended.

Future Research

Compared to many other listed species, the red-cockaded woodpecker has been the subject of considerable research and, as a result, much is known about its life history and habitat requirements. Accordingly, FWC staff limited their assessment of future research needs to topics deemed most relevant to the species' long-term management and conservation in Florida.

1. **Obtain additional demographic data for populations in central and southern peninsular Florida.** The conservation objective of this management plan is based, to a large extent, on long-term viability models derived for populations in North Carolina (Letcher et al. 1998, Walters et al. 2002). Yet available data suggest some basic demographic differences between peninsular Florida and more northern populations. In general, nest success and fledging production are lower, survival of breeding adults is higher, and there are more female helpers (DeLotelle and Epting 1992, DeLotelle et al. 1995, Bowman et al. 1997). Additional research is needed to further determine the extent

and reasons for these differences. Based on the results, modification of individual metapopulation goals and/or the numerical component of the conservation objective may be warranted.

2. **Describe and quantify foraging habitat characteristics in central and southern Florida.** In general, home ranges are larger in central and southern Florida than elsewhere in the species' range (Patterson and Robertson 1981, Beever and Dryden 1992, DeLotelle et al. 1987, Bowman et al. 1997). Although large home ranges generally are attributed to poor habitat conditions, other factors such as the density and distribution of potential breeding groups may be involved. Additional studies are needed to define optimal foraging habitat in central and southern Florida, which will facilitate the development of foraging habitat management guidelines specific to the region

3. **Re-evaluate genetic variability.** Translocation is an important tool for managing red-cockaded woodpecker populations in Florida and elsewhere. Because relatively few existing populations are large and/or stable enough to donate birds, recipient and donor sites often are far apart and located in different habitat types. Previous studies have revealed some genetic structure across the species' range, but no direct evidence of local adaptations has been found (Stangel et al. 1992; Haig et al. 1994, 1996; Stangel and Dixon 1995). As a result, concerns about the possible negative impacts of long-distance translocations on the species' genetics have been over-ridden by the need to stabilize or increase small populations before they become extirpated. Recent advances in DNA techniques, however, have greatly improved the precision with which genetic variation is detected (e.g., see references in Barrowclough et al. 1999, Milot et al. 2000). Additional testing of genetic material, using these new techniques, is needed throughout Florida to ensure that existing and future translocation practices do not have a deleterious effect on local genetic resources.

ANTICIPATED ECONOMIC AND SOCIAL IMPACTS

An assessment of the anticipated economic and social impacts of implementing the red-cockaded woodpecker management plan was based on the rules proposed therein and on issues raised through the public comment process. The rules proposed for FWC action are the addition of the red-cockaded woodpecker to the state Species of Special Concern list and a prohibition on take except as permitted by the FWC executive director. Seven sets of written comments were received during the comment period for the draft management plan. Technical, scientific, and editorial comments were considered during the revision and finalization of the plan, whereas the economic and social issues are discussed below. The parties potentially affected by the plan include public land managers, private landowners, scientific researchers, and citizens of the state of Florida.

Economic Impacts

1. **Cost of implementing the proposed rules.**
   a. **Estimated cost to FWC.** The proposed rules will necessitate a commitment of staff time to review permit applications; to develop, implement, and oversee the

statewide Safe Harbor program; and to review permit applications for incidental take under Safe Harbor or through the HCP process.

b. **Estimated cost to potentially affected parties.** Overall, the proposed rules should not increase the costs incurred by parties affected by their implementation. There are no fees associated with the permits issued by FWC. Furthermore, private landowners already must obtain permits from the FWC and the USFWS to develop lands where red-cockaded woodpeckers occur, and they are required to finance the mitigation activities associated with permits under the HCP process. Moreover, the creation of a statewide Safe Harbor program in Florida could be financially beneficial to private landowners who, by participating in the program, might increase their eligibility to receive funds through state and federal land-management incentive programs.

2. **Cost of implementing the management plan.**

a. **Estimated cost to FWC.** Implementation of the management plan will require recurring funds for personnel, travel, meetings, equipment, management, and research. The full scope of the FWC's commitment will depend, in part, on the MOA with the USFWS and on the number of metapopulations where the FWC is the designated lead. An unknown number of full or part-time temporary biologists will be needed to coordinate and oversee implementation of the plan and to perform survey, monitoring, and management activities on the targeted metapopulations. Specific budget needs are difficult to project and will be addressed on an annual basis as part of the FWC's operational planning process.

b. **Estimated cost to other agencies and land managers.** Implementation of the plan will have a financial impact on numerous public agencies. Federal agencies (i.e., U.S. Fish and Wildlife Service, U.S. Forest Service, National Park Service, and U.S. Air Force) should be impacted the least, given their existing requirement to manage for red-cockaded woodpeckers pursuant to the Endangered Species Act. The financial impact on state agencies (i.e., Florida Division of Forestry, Florida Department of Military Affairs, Florida Park Service, and St. Johns River and South Florida water management districts) will likely be greater, but will not be known until the metapopulation MOAs and management plans are developed.

Social Impacts

The anticipated social impacts of implementing the management plan were difficult to assess because none of the public comments addressed this issue. Potentially positive social impacts include increased public awareness of red-cockaded woodpeckers and old-growth pine habitats in Florida, public recognition and support of the FWC for taking a comprehensive approach to red-cockaded woodpecker management, and the development of integrated working relationships among the various public agencies and private landowners involved with the species' management in Florida. Conversely, if the plan is not implemented there could be negative social implications. The red-cockaded woodpecker is a high-profile species and recognized by the public as an "indicator" of healthy, old-growth pine forests. Continued loss of the species and its habitat could erode public confidence in the FWC's ability to manage and

conserve the wildlife resources of the state. Furthermore, there would be fewer opportunities to encounter and study the species.

IMPLEMENTATION STRATEGY

A prioritized approach to the implementation of the management plan will help ensure achievement of the conservation objective for the red-cockaded woodpecker in Florida. Prioritization of strategies and conservation actions also will facilitate the extensive coordination and cooperation necessary to successfully implement the plan. Given the various constraints of the numerous public and private land managers potentially affected by the plan, the schedules and tasks associated with its implementation should be both justified and feasible.

Priority Actions

FWC staff considers the following conservation actions to be of the highest priority and recommends primary or signification participation by the FWC:

1. **Implement the proposed rules for the red-cockaded woodpecker.** These rules will provide a legal basis, at the state level, for prosecuting direct take; regulating research, monitoring, and management activities; and authorizing incidental take under Safe Harbor or an approved HCP.

2. **Develop an MOA with the USFWS.** Given the red-cockaded woodpecker's federal status as Endangered, the USFWS and FWC share responsibility for managing the species in Florida. The MOA will avoid duplication of conservation efforts and clarify how the 2 agencies will work together to prioritize, coordinate, and fund red-cockaded woodpecker conservation activities in Florida.

3. **Develop and maintain a red-cockaded woodpecker database for Florida.** FWC staff, in collaboration with Florida Natural Areas Inventory, will maintain a comprehensive database and map to document changes in the species' status as determined by monitoring. The database also will include basic information on ownership, habitat, and management activities for metapopulations and individual properties.

4. **Conduct a risk assessment for each metapopulation and prioritize metapopulations according to their immediate management needs.** Although all metapopulations are important, some will require more immediate attention than others. A prioritized risk assessment will allow available resources to be directed where they are most needed.

5. **Establish and convene a meeting of the Florida red-cockaded woodpecker working group.** Focus initial discussions of the metapopulation risk assessments and the identification and ranking of unsurveyed and potential properties.

6. **Coordinate the initiation of MOAs, management plans, and conservation activities for metapopulations.** Initially, FWC staff will focus their attention on the metapopulations with the most immediate management needs. Meetings will be held to

initiate communication among managers and landowners within these metapopulations. Emergency MOAs or management plans may be necessary to address critical situations.

7. **Coordinate with the USFWS to develop a statewide Safe Harbor program for red-cockaded woodpeckers in Florida.** Safe Harbor will provide heretofore nonexistent incentives for private landowners to manage, maintain, or increase red-cockaded woodpeckers on their property without fear of additional land-use restrictions.

Proposed 12-Month Implementation Schedule

Given existing FWC staffing and budget appropriations, it should be possible to initiate the following tasks between November 2003 and September 2004.

1. Implement the proposed rules for the red-cockaded woodpecker.

2. Develop the MOA with the USFWS to clarify each agency's role in prioritizing and coordinating conservation activities in Florida and reviewing and approving management plans for metapopulations and/or individual properties.

3. Develop and maintain the red-cockaded woodpecker database and map for Florida.

4. Organize and convene a meeting of the Florida red-cockaded woodpecker working group.

5. Prepare a risk assessment for each metapopulation and prioritize conservation activities based on the most immediate needs.

6. Draft a written plan for Florida's statewide Safe Harbor program and submit to the USFWS for review and comment.

Management Plan Review and Revision

To ensure steady progress toward the conservation objective, every 5 years FWC staff will review the status of the Florida population relative to the management plan's implementation. Revision of the plan may be warranted if monitoring data reveal a declining trend in Florida, despite management efforts. Future research on population demographics, habitat requirements, genetic variability, and/or management techniques also could necessitate a revision of the plan.

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TABLE 1. Status of the Florida red-cockaded woodpecker population in 2000 by property ownership.[a]

Ownership Property	AC	PBG	Percent of State Total
Federal (8 properties, 24%)	**1,081**	**865**	**77**
Apalachicola Ranger District, Apalachicola National Forest	486	389	
Avon Park Air Force Range	20	16	
Big Cypress National Preserve	42	34	
Eglin Air Force Base	301	241	
Ocala National Forest	22	18	
Osceola National Forest	63	50	
St. Marks National Wildlife Refuge	9	7	
Wakulla Ranger District, Apalachicola National Forest	138	110	
State (18 properties, 53%)	**268**	**214**	**19**
Babcock/Webb Wildlife Management Area	27	22	
Blackwater River State Forest	26	21	
Bull Creek Wildlife Management Area	1	1	
Camp Blanding Training Site	14	11	
Central Florida Reception Center, South Unit	1	1	
Citrus Tract, Withlacoochee State Forest	46	37	
Corbett Wildlife Management Area	13	10	
Croom Tract, Withlacoochee State Forest	5	4	
Goethe State Forest	30	24	
Hal Scott Preserve[b]	7	6	
KICCO Wildlife Management Area	1	1	
Ochlockonee River State Park	3	2	
Picayune Strand State Forest	3	2	
Platt Branch Mitigation Park	4	3	
St. Sebastian River State Buffer Preserve	8	6	
Tate's Hell State Forest	29	23	
Three Lakes Wildlife Management Area	49	39	
Triple N Ranch Wildlife Management Area	1	1	
Private (7 properties, 21%)	**48**	**38**	**3**
Avalon Plantation	7	6	
Escape Ranch	9	7	
Fisheating Creek Phase I Conservation Easement	3	2	
Florida Red Hills	6	5	
Other (2 properties)	15	12	
T.M. Ranch	8	6	

Ownership Property	AC	PBG	Percent of State Total
Local Government (1 property, 3%)	**7**	**6**	**1**
Stanton Energy Center	7	6	
TOTAL (34 properties, 100%[c])	**1,404**	**1,123**	**100**

[a]AC = active cluster, PBG = potential breeding group. Potential breeding groups were estimated from active clusters based on the estimated average ratio of 1.25 active clusters per potential breeding group (U.S. Fish and Wildlife Service 2003).

[b]Co-owned by State of Florida and Orange County.

[c]Total does not add to 100% due to rounding.

TABLE 2. Minimum Species of Special Concern delisting requirements and minimum Threatened species listing requirements for the red-cockaded woodpecker in Florida.[a,b]

Listing Criterion	Florida 2000 Status	Minimum Species of Special Concern Delisting Requirements	Minimum Threatened Species Listing Requirements
A. Future Population Trend	1,404 AC 1,123 PBG	*<20% decline within next 20 years[c] range-wide* 81% of 1,404 AC = ≥1,137 AC (13 per year) 81% of 1,123 PBG = ≥910 PBG (11 per year)	*≥50% decline within next 20 years[c] range-wide* 50% of 1,404 AC = ≤702 AC (35 per year) 50% of 1,123 PBG = ≤562 PBG (28 per year)
B1. Extent of Occurrence[d]	46,100 miles^2	*≥7,700 miles^2 range-wide* 25% of 7,700 miles^2 = ≥1,925 miles^2	*<2,000 miles^2 range-wide* 25% of 2,000 miles^2 = <500 miles^2
B2. Area of Occupancy[e]	253 miles^2 1,404 AC 1,123 PBG	*≥770 miles^2 range-wide* 25% of 770 miles^2 = ≥193 miles^2 193 miles^2 ÷ 0.18 miles^2 = ≥1,072 AC 193 miles^2 ÷ 0.18 miles^2 = ≥858 PBG	*<200 miles^2 range-wide* 25% of 200 miles^2 = <50 miles^2 50 miles^2 ÷ 0.18 miles^2 = <278 AC 50 miles^2 ÷ 0.18 miles^2 = <222 PBG
C. **Future Population Size and Trend**	3,510 adults[g] 1,404 AC 1,123 PBG	*≥10,000 adults AND <10% decline within next 20 years[c] range-wide* ≥25% of 10,000 = ≥2,500 adults 91% of 1,404 AC = ≥1,277 AC (6 per year) 91% of 1,123 PBG = ≥1,022 PBG (5 per year)	*<2,500 adults AND ≥20% decline with next 13 years[f] range-wide* 25% of 2,500 adults = <625 adults 80% of 1,404 AC = ≤1,123 AC (22 per year) 80% of 1,123 PBG = ≤898 PBG (17 per year)
D. Mature Individuals	3,510 adults[g]	*≥1,000 adults range-wide* 25% of 1,000 adults = ≥250 adults	*<250 adults range-wide* 25% of 250 adults = <63 adults
E. Extinction Probability	Unknown	*<10% probability within 100 years range-wide* Unknown	*≥20% probability within 33 years[h] range-wide* Unknown

[a]AC = active cluster, PBG = potential breeding group. Potential breeding groups were estimated from active clusters based on the estimated average ratio of 1.25 active clusters per potential breeding group (U.S. Fish and Wildlife Service 2003).

[b]Minimum requirements were based on the status of the Florida population in 2000 and the premise that Florida will continue to represent at least 25% of the range-wide population. Appendix 3 provides a complete description of the FWC listing criteria.

[c]Twenty years equal 3 generations based on the estimated generation time for male red-cockaded woodpeckers (6.5 years x 3).

[d]Florida extent of occurrence in 2000 was calculated by using ArcView GIS software to draw a convex polygon around the outer perimeter of the species' known range.

[e]Florida area of occupancy in 2000 was calculated by multiplying the number of active clusters by the average minimum home range size reported for the red-cockaded woodpecker (0.18m^2, Engstrom and Sanders 1997). Minimum active clusters and potential breeding groups for this criterion were derived by dividing the minimum Florida area of occupancy (25% of the range-wide area) by the average minimum home range size.

[f]Thirteen years equal 2 generations based on the estimated generation time for male red-cockaded woodpeckers (6.5 years x 2).

[g]Florida number of adults in 2000 was based on a mean group size of 2.5 adults per active cluster (U.S. Fish and Wildlife Service 2003).

[h]Thirty-three years equal 5 generations based on the estimated generation time for male red-cockaded woodpeckers (6.5 years x 5).

TABLE 3. Management units, metapopulations, and properties targeted for red-cockaded woodpecker management activities in Florida.[a,b]

Management Unit Metapopulation Property	Ownership	2000 Status AC	2000 Status PBG	2020 Goal AC	2020 Goal PBG
Western Panhandle		**327**	**262**	**362**	**290**
Blackwater River Metapopulation		26	21	31	25
Blackwater River State Forest	State	26	21		
Eglin Metapopulation		301	241	331	265
Eglin Air Force Range	Federal	301	241		
Eastern Panhandle		**678**	**542**	**761**	**609**
Apalachicola Metapopulation		665	531	730	584
Apalachicola Ranger District, Apalachicola National Forest	Federal	486	389		
Ochlockonee River State Park	State	3	2		
St. Marks National Wildlife Refuge	Federal	9	7		
Tate's Hell State Forest	State	29	23		
Wakulla Ranger District, Apalachicola National Forest	Federal	138	110		
Red Hills Metapopulation		13	11	31	25
Avalon Plantation	Private	7	6		
Other Private Lands	Private	6	5		
Northern Peninsula		**77**	**61**	**125**	**100**
Camp Blanding Metapopulation		14	11	31	25
Camp Blanding Training Site	State	14	11		

Management Unit Metapopulation Property	Ownership	2000 Status AC	2000 Status PBG	2020 Goal AC	2020 Goal PBG
Osceola Metapopulation[c]		63	50	94	75
Osceola National Forest	Federal	63	50		
North-Central Peninsula		**108**	**87**	**145**	**116**
Goethe Metapopulation		35	28	50	40
Goethe State Forest	State	30	24		
Private Lands	Private	5	4		
Ocala Metapopulation		22	18	31	25
Ocala National Forest	Federal	22	18		
Withlacoochee Metapopulation		51	41	64	51
Citrus Tract, Withlacoochee State Forest	State	46	37		
Croom Tract, Withlacoochee State Forest	State	5	4		
South-Central Peninsula		**129**	**103**	**166**	**133**
Avon Park Metapopulation		31	25	50	40
Avon Park Air Force Range	Federal	20	16		
KICCO Wildlife Management Area	State	1	1		
Private Lands	Private	10	8		
Big Econ Metapopulation		23	19	31	25
Central Florida Reception Center, South Unit	State	1	1		
Hal Scott Preserve	State/County	7	6		
Stanton Energy Center	City	7	6		
T.M. Ranch	Private	8	6		

Management Unit Metapopulation Property	Ownership	2000 Status AC	 PBG	2020 Goal AC	 PBG
St. Sebastian Metapopulation		8	6	13	10
St. Sebastian River State Buffer Preserve	State	8	6		
Three Lakes Metapopulation		60	48	72	58
Bull Creek Wildlife Management Area	State	1	1		
Escape Ranch	Private	9	7		
Three Lakes Wildlife Management Area	State	49	39		
Triple N Ranch Wildlife Management Area	State	1	1		
Southern Peninsula		**85**	**68**	**126**	**101**
Babcock/Webb Metapopulation		27	22	31	25
Babcock/Webb Wildlife Management Area	State	27	22		
Yucca Pens Unit, Babcock/Webb Wildlife Management Area	State	Unk	Unk		
Big Cypress Metapopulation		45	36	51	41
Big Cypress National Preserve	Federal	42	34		
Picayune Strand State Forest	State	3	2		
Private Lands	Private	Unk	Unk		
Corbett/Dupuis		13	10	31	25
Corbett Wildlife Management Area	State	13	10		
Dupuis Environmental Area	State	0	0		
Fisheating Creek Metapopulation		7	5	13	10
Fisheating Creek Phase I Conservation Easement	Private	3	2		
Platt Branch Mitigation Park	State	4	3		
Private Lands	Private	Unk	Unk		

Management Unit Metapopulation Property	Ownership	2000 Status		2020 Goal	
		AC	PBG	AC	PBG
TOTAL		**1,404**	**1,123**	**1,686**	**1,349**

[a]AC = active cluster, PBG = potential breeding group. Potential breeding groups were estimated from active clusters based on the estimated average ratio of 1.25 active clusters per potential breeding group (U.S. Fish and Wildlife Service 2003).

[b]The following guidelines were used to establish the management unit and metapopulation goals for 2020: (1) by the year 2020, achieve at least a 20% increase in the Florida population over the next 20 years; (2) by the year 2020, secure and maintain (a) at least 100 potential breeding groups per management unit, (b) at least 2 metapopulations per management unit, and (c) 40 or more potential breeding groups in at least 1 of the metapopulations in each management unit; and (3) by the year 2020, increase metapopulations within management units (a) to at least 10 potential breeding groups if below 10 potential breeding groups in 2000, (b) to at least 25 potential breeding groups or 15% growth (whichever is higher) if above 9 but below 25 potential breeding groups in 2000, (c) to at least 40 potential breeding groups or 15% growth (whichever is higher) if above 24 but below 40 potential breeding groups in 2000, (d) by at least 15% or a net increase of 10 potential breeding groups if above 39 but less than 100 potential breeding groups in 2000, and (e) by at least 10% if above 99 potential breeding groups in 2000. Appendix 6 provides a complete description of these guidelines and the process used to develop the conservation objective for the red-cockaded woodpecker in Florida.

[c]To achieve at least 100 potential breeding groups in the Northern Peninsula Management Unit, the 2020 goal for the Osceola Metapopulation was set at 75 potential breeding group.

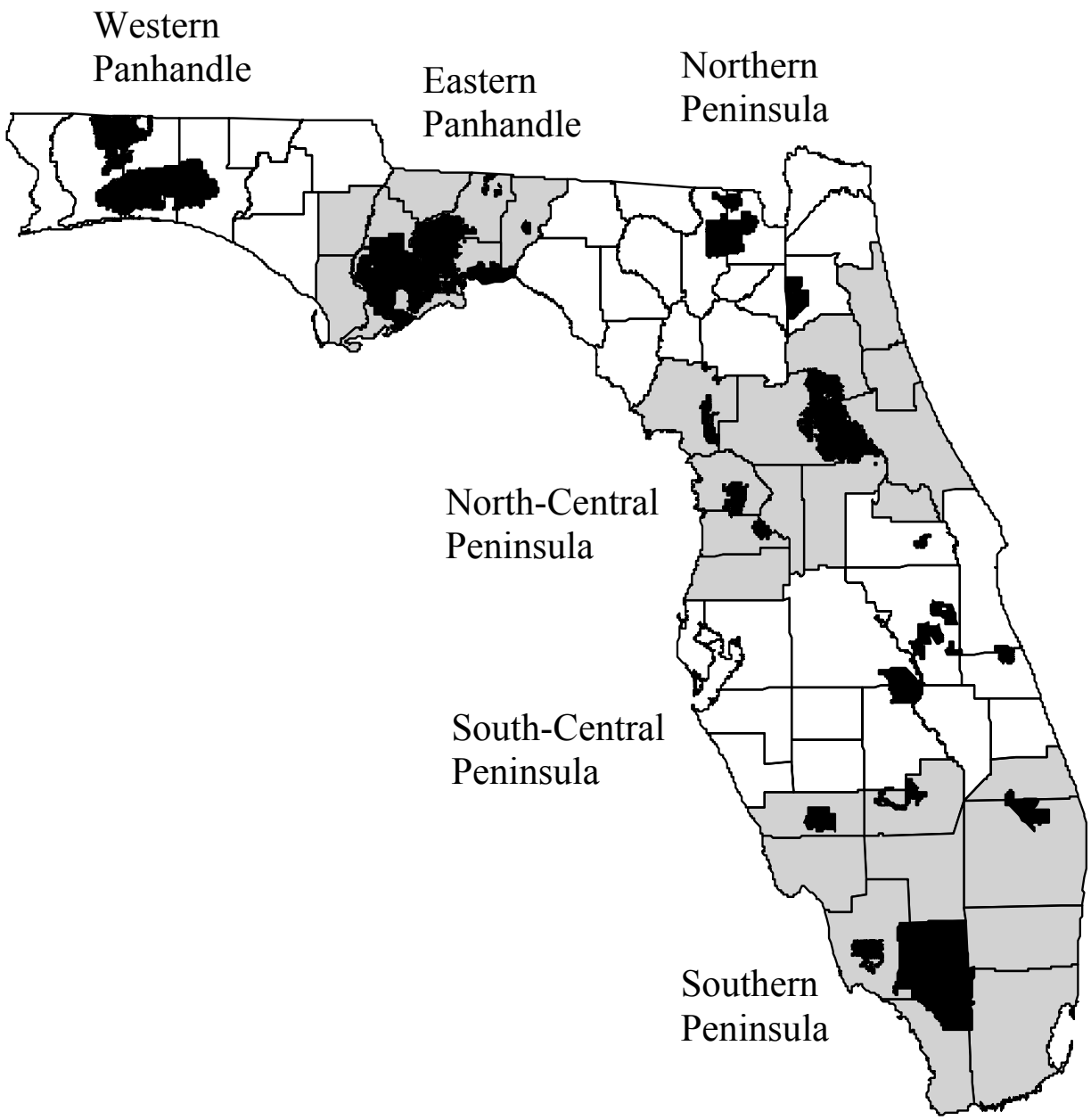

Figure 1. Distribution of the Florida red-cockaded woodpecker population in 2000 and location of designated management units.

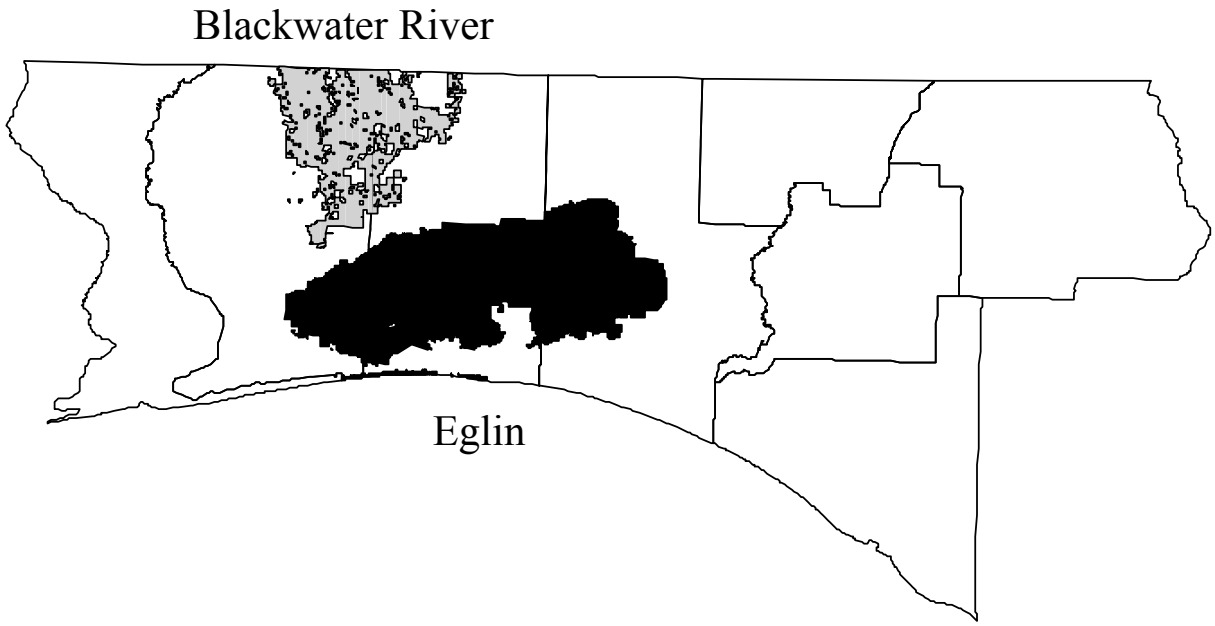

Figure 2. Metapopulations in the Western Panhandle Management Unit. (See Table 3 for a list of individual properties in each metapopulation.)

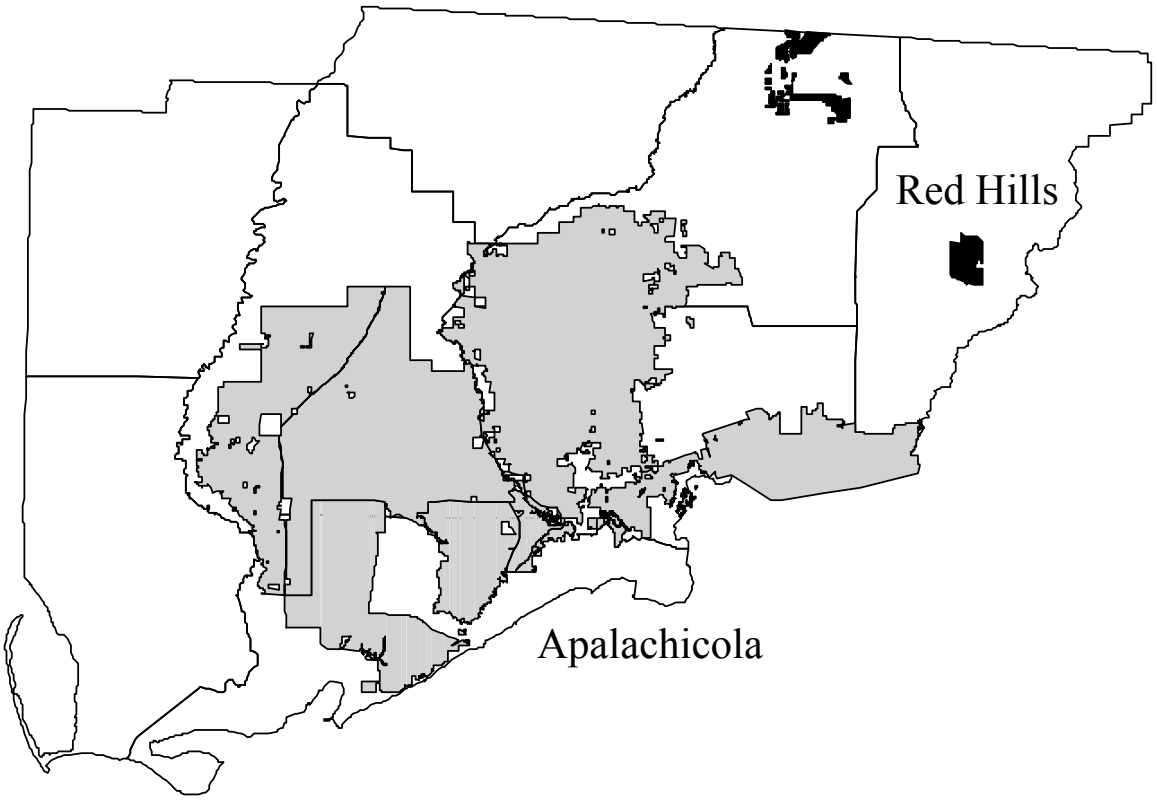

Figure 3. Metapopulations in the Eastern Panhandle Management Unit.

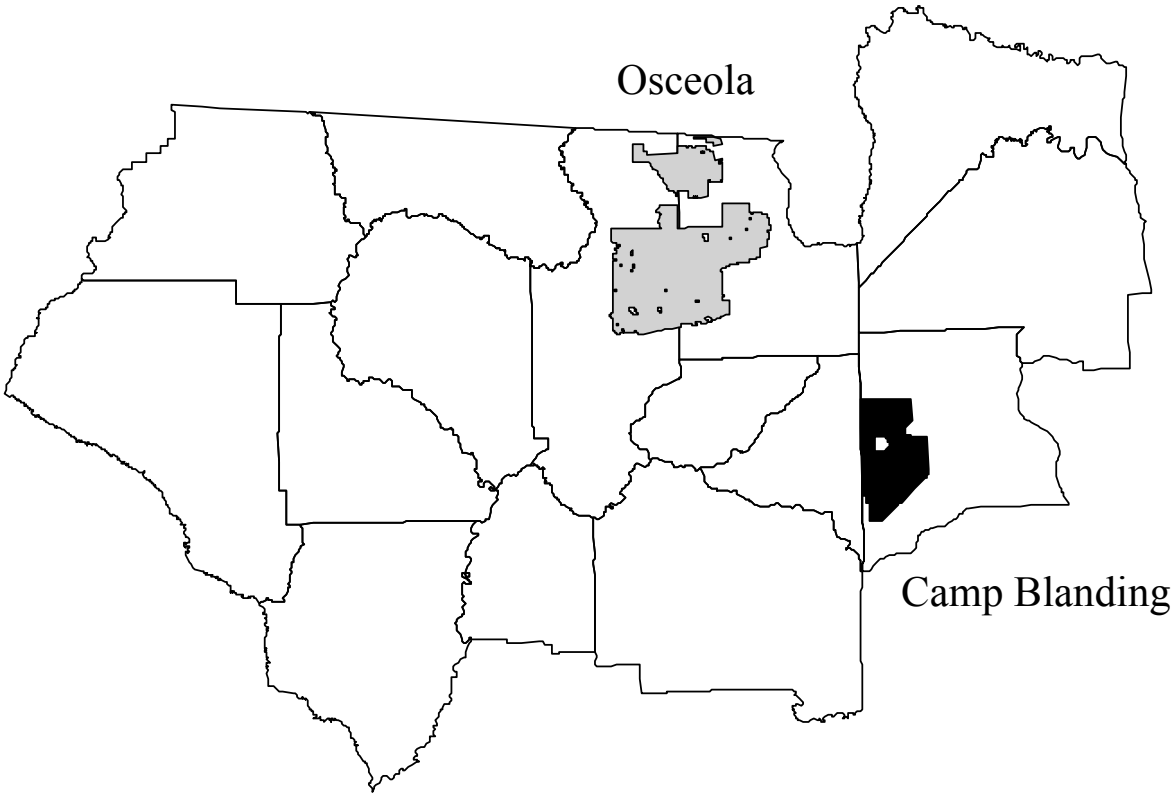

Figure 4. Metapopulations in the Northern Peninsula Management Unit.

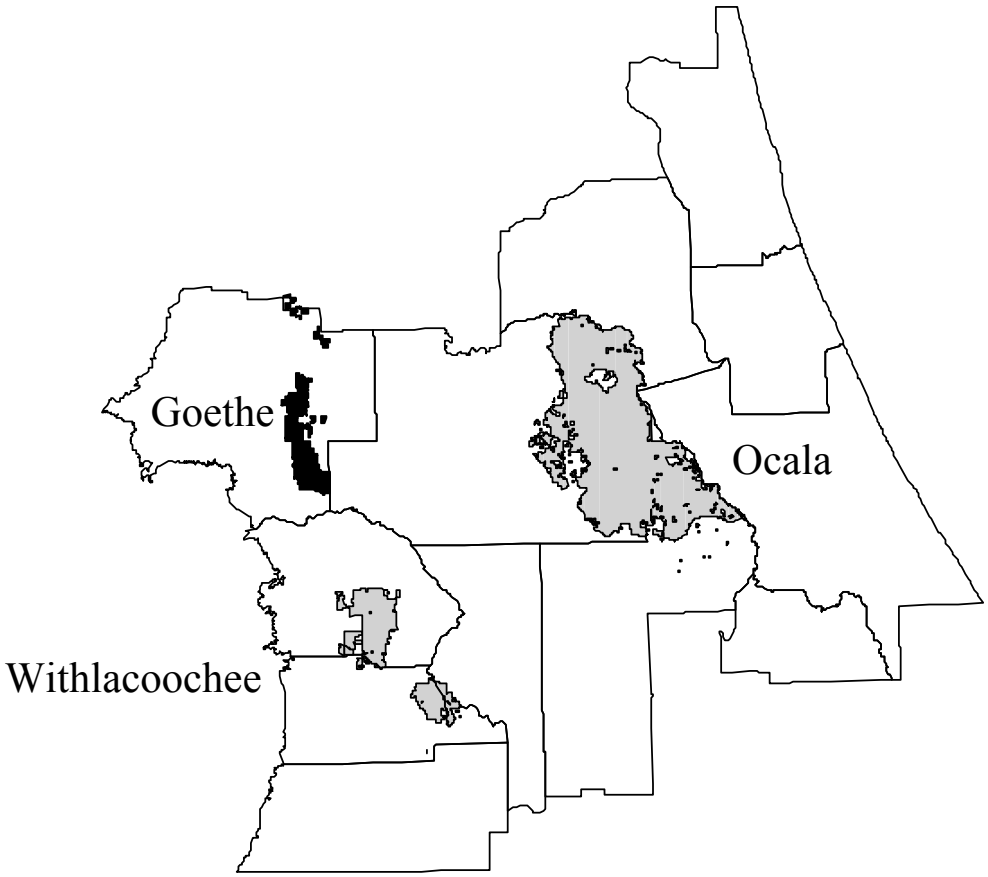

Figure 5. Metapopulations in the North-Central Peninsula Management Unit.

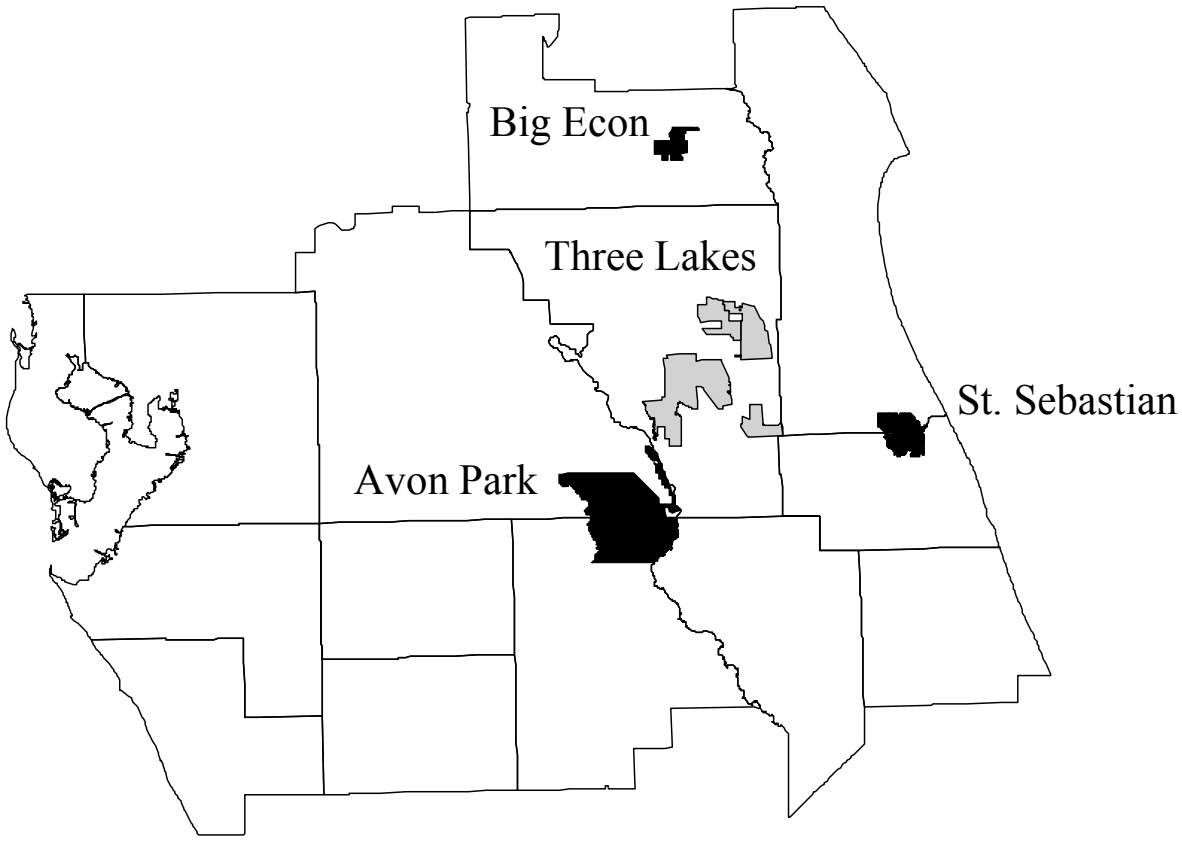

Figure 6. Metapopulations in the South-Central Peninsula Management Unit.

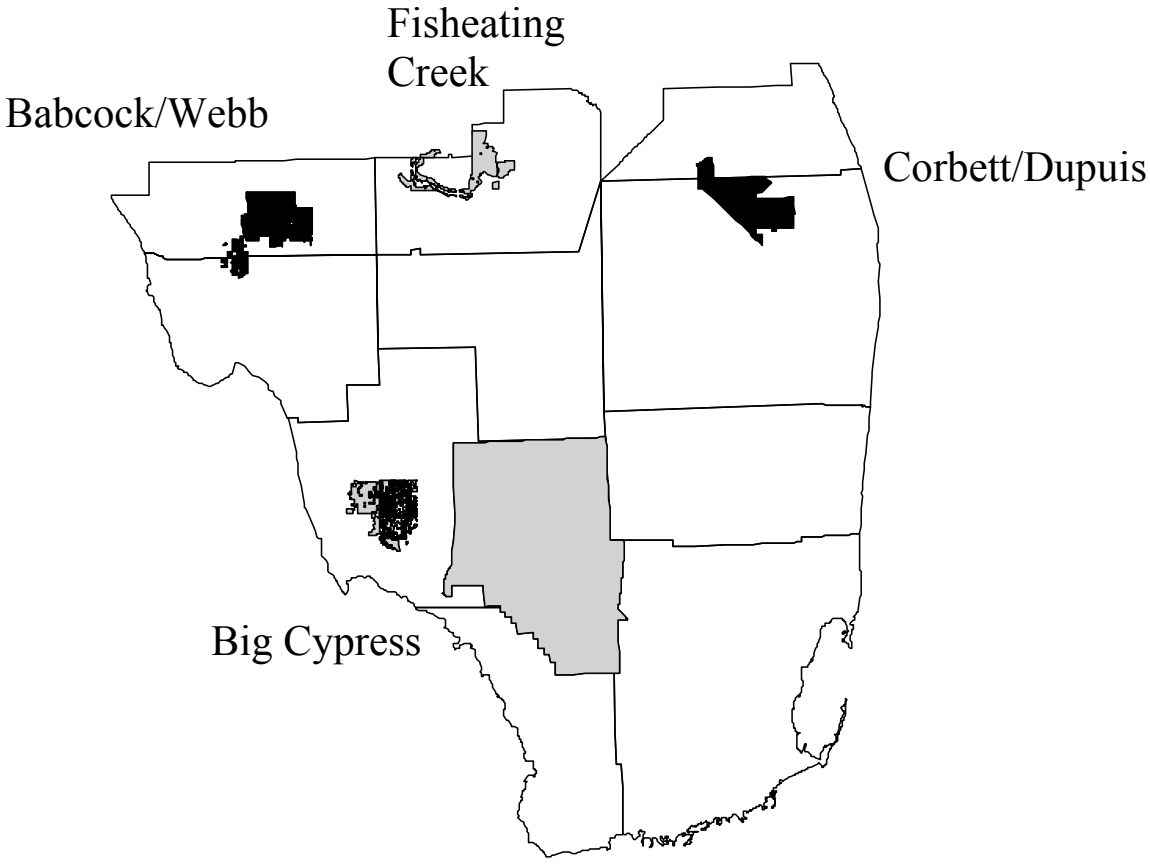

Figure 7. Metapopulations in the Southern Peninsula Management Unit.