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Red-cockaded Woodpecker

U.S. Fish & Wildlife Service

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U.S. Fish & Wildlife Service

Red-cockaded Woodpecker

The red-cockaded woodpecker (RCW) is a small bird measuring about 7 inches in length. Identifiable by its white cheek patch and black and white barred back, the males have a few red feathers, or "cockade". These red feathers usually remain hidden underneath black feathers between the black crown and white cheek patch unless the male is disturbed or excited.

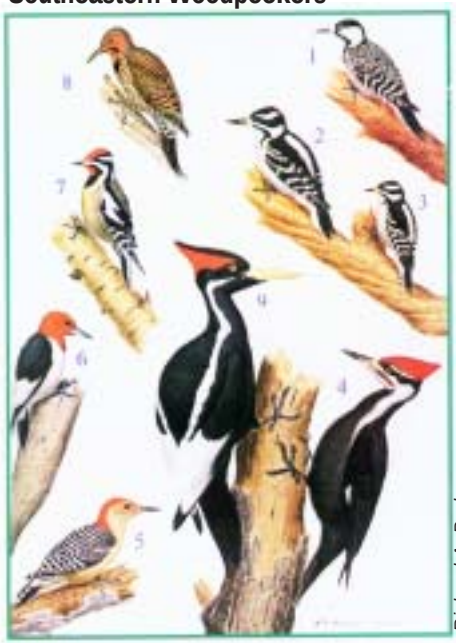
Description

The common name came into use during the early 1800's when 'cockade' was regularly used to refer to a ribbon or other ornament worn on a hat. Female RCWs lack the red cockade. Juvenile males have a red 'patch' in the center of their black crown. This patch disappears during the fall of their first year at which time their 'red-cockades' appear.

The RCW shares the southeast with seven other species of woodpeckers. Hairy and downy woodpeckers could be mistaken for RCWs as they are also small and have black and white barred wings, but not a barred back. Only the RCW has the white cheek patch. Other woodpecker species, including the red-bellied, red-headed, pileated, northern flicker and yellow-bellied sapsucker, can be distinguished from the RCW by either having very noticeable red on their head or lacking the black and white bars on the back.

Southeastern Woodpeckers

1 Red-cockaded
2 Hairy
3 Downy
4 Pileated
5 Red-bellied
6 Red-headed
7 Sapsucker
8 Flicker
9 Ivorybill (extinct)



Richard A. Parks

Plate of southeastern woodpeckers; from Thomas M. Imhof's "Alabama Birds"

Cover: male RCW at nest cavity entrance; Phillip Jordon

Historical Distribution and Abundance

RCWs were once considered common throughout the longleaf pine ecosystem, which covered approximately 90 million acres before European settlement. Historical population estimates are 1-1.6 million "groups", the family unit of RCWs. The birds inhabited the open pine forests of the southeast from New Jersey, Maryland and Virginia to Florida, west to Texas and north to portions of Oklahoma, Missouri, Tennessee and Kentucky. The longleaf pine ecosystem initially disappeared from much of its original range because of early (1700's) European settlement, widespread commercial timber harvesting and the naval stores/turpentine industry (1800's). Early to mid-1900 commercial tree farming, urbanization and agriculture contributed to further declines. Much of the current habitat is also very different in quality from historical pine forests in which RCWs evolved. Today, many southern pine forests are young and an absence of fire has created a dense pine/hardwood forest.

Virgin longleaf pine forest in Escambia Co. FL; photographer unknown

Top: Turn of the century (1900) logging of virgin longleaf pine forest in east Texas; courtesy of the East Texas Research Center, Steen Library, Forest History Collections, Stephen F. Austin State Univ, Nacogdoches, TX. Bottom: Turn of the century (1900) logging of longleaf pine forest in east Texas; courtesy of the East Texas Research Center, Steen Library, Forest History Collections, Thompson Family Lumber Enterprises Collection, P90T:202, Stephen F. Austin State Univ., Nacogdoches, TX

RCW delivering food to nestlings; Derrick Hamrick

Decline of RCWs

The primary habitat of the RCW, the longleaf pine ecosystem, has been reduced to 3% of its original expanse. This reduction of suitable habitat has caused the number of RCWs to decline by approximately 99% since the time of European settlement (see map on pages 12-13). The RCW was listed as endangered in 1970 and received the protection of the Endangered Species Act (ESA) with its passage in 1973. At the time of listing, the species had declined to fewer than 10,000 individuals in widely scattered, isolated and declining populations. Today there remains about 5,600 groups or 14,000 birds. Most populations were stabilized during the 1990's due to management based on new understanding of RCW biology and population dynamics. However, there are still populations in decline and small populations throughout the species' current range are still in danger of extirpation.

Top: seven-day old RCW nestling. Nestlings are banded at 7-10 days old; Ralph Costa, USFWS; bottom: Helper male feeding juvenile male; Derrick Hamrick

Life History and Reproductive Biology

The red-cockaded is a territorial, non-migratory species. The RCWs social system is more complex than most species of birds; individuals live in groups normally consisting of a breeding pair and zero to four male (rarely female) offspring from previous years. These offspring, know as "helpers"assist in incubating eggs and brooding and feeding nestlings produced by the breeding pair. The RCW social system is referred to as a cooperative breeding system, that is, the breeding pair receives assistance from offspring in the raising of young. In mid-April, the female RCW usually lays a clutch of three to five white eggs in the breeding male's roost cavity. Eggs hatch after 10-12 days of incubation (among the shortest incubation in birds) and nestlings fledge from the nest cavity 24-27 days after hatching. RCW nestlings are altricial, that is, they do not have feathers when hatched and their eyes

are not open. They require a lot of care from parents and helpers who will feed the nestlings and clean the cavity of waste during the nestling period. In contrast, quail are precocial; they hatch fully feathered and are able to feed themselves when led to food by the parent. After fledging, the nestlings continue to be fed by adults for up to six months at which time the majority of fledglings disperse from the territory where they hatched. Mortality is high (68%) for female fledglings as they disperse to search for breeding vacancies. Male fledglings either disperse or remain on their natal territory to become helpers. Annual mortality is also high (57%) for male fledglings. Although re-nesting may occur if a clutch or brood is lost, RCWs typically have only one successful nesting attempt annually. Double brooding (two successful nests in one breeding season) has been documented but is extremely rare.

Diet and Foraging Behavior

The diet of RCWs consists mostly of insects in the egg, larvae and adult stages. These include beetles, ants, roaches, spiders and other insects found in or on pine trees. Fruits and seeds make up a small portion of the overall diet. Methods of foraging include flaking away bark and probing under the bark using their specialized forked tongue to extract insects. Large, older trees are preferred for foraging. In general, males forage on the limbs and upper trunk while females forage on the trunk below the crown. This division of foraging area is most noticeable in winter when insect numbers are at their lowest and their activity slows due to cold weather, making it harder for RCWs to detect prey. Differences in the foraging behavior of males and females may help to reduce competition between them when food is scarce.

Top: Male RCW bringing food to nest cavity (note difficulty seeing red-cockade); Jim Hanula, USFS; bottom: RCW active cavity tree (note candle-like appearance and evidence of recent prescribed fire); Ralph Costa, USFWS

Roosting and Nesting Cavities

The RCW is the only North American woodpecker to excavate roost and nest cavities in living pine trees. While longleaf pine is the preferred species for excavation, other species such as loblolly, shortleaf, slash and pond pine are also used depending on the local forest type and tree species availability. The use of live pines as roosting and nesting sites may have evolved in response to living in a fire maintained ecosystem where frequent fires, primarily in the growing season, eliminated most standing dead pines (snags). Longleaf pine is thought to be preferred by the woodpeckers because it is the most fire-adapted of the pines. Longleaf pine has a unique 'grass' stage when young, producing an abundance of long green needles that burn during ground fires, thus protecting the growing stem. Longleaf also produces more resin when wounded than other pines, making them more resistant to insect

Top: female RCW working on resin well; Derrick Hamrick; bottom: black rat snake climbing RCW cavity tree; Richard N. Conner, USFS

outbreaks such as the southern pine beetle. RCWs use this increased resin flow for cavity defense by chipping holes, called 'resin wells', above and around the entrance to the cavity as a defense against predators. Rat snakes, skillful at climbing trees, are the main predators of RCW nests. Resin flow produced by the wells creates a physical and chemical barrier that impedes the snake's movement up the tree. The birds also scale the outer bark off the tree above and below the cavity entrance, exposing sapwood around the cavity entrance forming a 'plate' around the cavity. Resin flowing from the wells created by the RCWs may eventually coat the trunk, thus making the cavity tree conspicuous from a distance, giving it a candle-like appearance.

Each member of the group roosts in a separate cavity. Cavities are excavated in mature pines, generally over 80 years old. Cavity excavation takes one to six years. The birds

Top: active RCW cavity with many resin wells, heavy resin flow and cavity "plate"; Ralph Costa, USFWS; middle: juvenile male RCW, just prior to fledging; Derrick Hamrick; bottom: advanced cavity start, almost to heartwood; Bob Hooper, USFS

slowly excavate through the resinous sapwood before reaching the relatively sap-free heartwood. RCWs choose older trees for cavity excavation. They need trees mature enough to have sufficient heartwood for a cavity free of sap and because many mature trees are infected with red heart fungus. This fungus softens the heartwood and allows for easier excavation of the roosting chamber. Individual cavities are known that have been used by RCWs for over six generations, or approximately 30 years. The aggregate of cavity trees used by a group is referred to as a 'cluster'. The cluster consists of one to numerous cavity trees; trees may contain new cavity 'starts' and completed cavities. Cavity trees within a cluster may be 'active', currently being used by a RCW, or 'inactive', not being used by a RCW.

Top: completed, very active cavity (note the large resin wells, thick resin flow and plate formation, indicating a cavity that has been in use for years); Bob Hooper, USFS; middle: RCW cluster in longleaf pine forest; Bob Hooper, USFS; bottom: RCW cluster in shortleaf pine/loblolly pine forest; Phillip Jordon

Ecological Niche

Besides being unique among North American woodpeckers, red-cockaded woodpeckers are 'primary' cavity nesters, meaning they are responsible for the construction of cavities. In the southern pine ecosystem there are many 'secondary' cavity users that benefit from the RCWs work. RCWs are considered a 'keystone' species because use of their cavities by these animals contributes to the species richness of the pine forest. At least 27 species of vertebrates have been documented using RCW cavities, either for roosting or nesting. Species include birds, snakes, lizards, squirrels and frogs. Many of these species, for example wood ducks, only use the cavities that have been abandoned by RCWs; abandonment usually occurs because the entrance tunnel was enlarged by pileated woodpeckers.

Top: southern flying squirrel using RCW cavity; D. Craig Rudolph, USFS; bottom: great-crested flycatcher using inactive RCW cavity for nest; Derrick Hamrick

However, southern flying squirrels, red-bellied woodpeckers, red-headed woodpeckers, eastern bluebirds, brown-headed nuthatches, tufted titmice and great crested flycatchers are the species most commonly seen in RCW cavities, and can use normal, unenlarged cavities that RCWs could also use. RCW cavities are a valued resource for many species and competition occurs for their use.

Red-cockaded Woodpeckers and Fire

A healthy, productive RCW population is also an indicator of a healthy southern pine ecosystem. RCWs and southern pines both evolved in a fire-dominated system. Many other species within this system show adaptations to fire. The most prominent adaptation of RCWs is their use of living pines for cavity excavation. The history of fire in the southeast has a natural and human component. Research has suggested the ecosystem evolved in response to slow-moving ground fires started by lightning

Top: lightening-ignited wildfire in longleaf pine forest; Ralph Costa, USFWS; bottom: slow moving ground fire in longleaf pine forest likely typical of 'historic' natural and human ignited fires; D. Craig Rudolph, USFS

strikes, which occur more frequently in the southeast than anywhere else in North America. Most fires started by lightning strikes occur in the spring and summer growing season, when thunderstorms are more prevalent. Native Americans and later European settlers used fire to clear land and improve hunting grounds. However much of this burning was accomplished during the winter, the non-growing season. Frequent fires created an open forest, with large pines, little to no mid-story, and a diverse herbaceous groundcover; described by many 19th century naturalists as 'park-like' because they could easily ride horses and wagons across the land. Many of the groundcover plant species show

Top: white birds-in-a-nest (Macbridea alba), federally listed as threatened, endemic to longleaf pine forests in Florida; one of many listed, rare, endemic, herbaceous plants unique to southeastern pine ecosystems; Joan Walker, USFS; bottom: longleaf pine - wiregrass habitat; a result of frequent growing season prescribed fires; Joan Walker, USFS

Historic Distribution of Red-cockaded Woodpecker (Jackson 1971, Hooper et al. 1980).

Current Red-cockaded Woodpecker Distribution (Federal, State, and Private Sector Biologists 1993, 1994; updated 2002)

Historic and current (1995); updated 2002, distribution map of RCW; courtesy of Our Living Resources: A Report to the Nation on the Distribution, Abundance, and Health of U.S. Plants, Animals, and Ecosystems, National Biological Service, USDI. Red-cockaded Woodpecker; Costa and Walker, 1995

Distribution of Red-cockaded Woodpeckers

Top: longleaf pine forest with turkey oak midstory; Ralph Costa, USFWS; middle: high quality, longleaf pine RCW foraging habitat; Felica Sanders,USFWS/ Clemson University/ SCDNR; bottom: longleaf pine forest with young trees and wiregrass understory; Joan Walker, USFS

adaptations to fire and are termed 'pyrophytic' or 'fire-loving'. For example, wiregrass is a highly flammable bunchgrass, typically producing seed only after a summer growing season burn. Because of its unique fire-loving properties, the biodiversity of herbaceous groundcover in longleaf pine forests is among the world's highest.

Habitat Management

Degradation and loss of habitat led to the rapid decline of RCWs. Conservation and management of adequate habitat is central to recovery goals. Quality habitat includes forests with trees old enough for roosting, generally at least 80-120 years old, depending on species of pine. Hardwood midstory results in cluster abandonment; therefore, it is critical that hardwood

midstory be controlled. Prescribed burning is the most efficient and ecologically beneficial method to accomplish hardwood midstory control. Either mechanical and/or chemical treatment may also be required for initial control of the midstory. Foraging habitat must also consist of a forest of older pines with little or no midstory. Each RCW group uses from 75-200 acres of foraging habitat. The acres used depend upon habitat quality and population density. For example, a park-like forest of older, larger pines and open understory is of higher quality than a dense forest with many small, young pines. The area required for RCW foraging on high quality sites is less than sites of lower quality. However, habitat management for forage and cavity trees must include the development of a young age class of pines to insure the necessary older trees for future generations of RCWs. The application of controlled burns is essential in keeping the structure of the forest beneficial to RCWs.

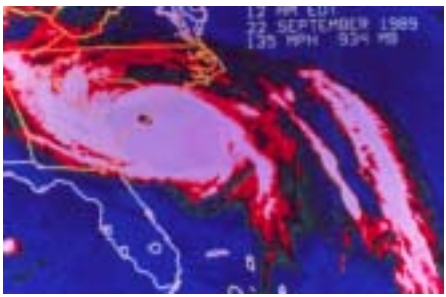
Prescribed burning in longleaf pine forest; D. Craig Rudolph, USFS

Cavity Management and Population Augmentation

Today's RCW populations, especially small ones, will not increase to viable sizes without human intervention. Several management techniques, introduced in the early 1990's, have been responsible for increasing RCW populations. One of the most successful has been the installation of artificial cavities. Cavities are critical to RCWs nesting and roosting and their presence for each group member increases the chances for survival and persistence of the group. There are two main techniques for providing artificial cavities for RCWs. These include drilling holes that mimic natural cavities and installing boxes called 'inserts' within a suitable tree.

Top: Hurricane Hugo, September 1989, eye centered over the Francis Marion National Forest; NASA; bottom: Francis Marion National Forest post-Hurricane Hugo; Ralph Costa, USFWS

These techniques were put to the test after Hurricane Hugo destroyed 87% of the active cavity trees on the Francis Marion National Forest in 1989, the second largest RCW population at the time. Installation of artificial cavities, both inserts and drilled, helped to stabilize the population after this devastating loss.



Translocation of juvenile RCWs is another management technique used in RCW recovery. Translocation involves moving one or more juvenile RCWs between or within populations to achieve management goals. These goals include

Top: subadult female and male in preparation for translocation to a recruitment cluster; Mike Lennartz, USFS; bottom: wildlife biologist installing artificial cavity insert; USFS

saving critically small populations in danger of 'extirpation' or disappearing; developing a better spatial arrangement of groups to reduce isolation; introducing birds to suitable habitat; and increasing genetic diversity in critically small populations. Typically, two types of translocations are conducted: a female juvenile is moved to a solitary male group; and an unrelated male and female juvenile are moved to a 'recruitment' cluster in hopes of establishing a new group. Recruitment clusters are established by installing artificial cavities in unoccupied but suitable habitat. Refining translocation techniques has made this an invaluable tool for recovery. The most important component, quality habitat, consisting of open park-like pine forests, suitable nesting and roosting cavities, and adequate foraging habitat, must be in place before translocations are conducted.

Conservation Efforts

Recovery efforts for the RCW began with the listing of the bird in 1970 and passage of the Endangered Species Act of 1973. The U. S. Fish and Wildlife Service outlined goals and guidelines for recovery of the RCW in the Recovery Plan written in 1979 and revised in 1985 and 2003. Recovery will be achieved when we have numerous self-sustaining populations of woodpeckers. Once Endangered Species Act de-listing criteria are met, the size, number, and distribution of populations will be sufficient to counteract threats associated with small population size, environmental factors, such as annual fluctuations in weather and prey abundance, genetic viability, and catastrophic events, thereby maintaining long-term viability for the species as defined by current understanding of these processes. Regions and habitat types currently occupied by the species will be represented as adequately as possible, given habitat limitations. The Recovery Plan identifies eleven recovery units based on ecoregions. Populations required for recovery are

Top: artificial cavity insert with metal restrictor plate to prevent damage by pileated woodpeckers (note artificially created resin wells and non-toxic white paint to imitate resin flow);USFS; below: wildlife biologist banding eight-day-old RCW nestling; Jody Bock, Clemson University

distributed among the recovery units to ensure the representation of broad geographic and genetic variation within the species historic range. The recovery strategy includes the participation of federal agencies, state agencies and private landowners. Approximately 66% of RCWs occur on federal lands, including numerous national forests, national wildlife refuges, and military installations, one national park and one Department of Energy facility. Eleven percent of RCWs occur on state lands and private lands harbor approximately 23% of known RCWs.

Wildlife biologist climbing RCW nest cavity tree, with ten foot sectional Swedish climbing ladders, to capture and band nestlings; Nancy Jordan, Clemson University

Knowledge of RCW biology and life history increased significantly during the 1990s. Research findings have led to significant conservation initiatives. Many property managers and biologists band their RCWs (both adults and nestlings), survey and map cavity trees and annually monitor nesting activities to assess population health. Research findings on the bird's natural history and ecology have enabled landowners and managers to implement habitat improvement programs. The positive population trends (early 1990's to present) on many public and private lands are a direct result of successful implementation of a well-coordinated regional translocation program and habitat improvements, such as controlling midstory, prescribed burning, and installing artificial cavities.

Private Land Conservation Partnerships

Although public lands, both federal and state, are central to recovery efforts, approximately 23% of RCWs (1296 groups in 10 states) reside on private lands. In the early 1990's, the U.S. Fish and Wildlife Service, realizing that population declines on private lands were hindering recovery efforts, developed and implemented strategies for RCW conservation on private land.

Protected, active red-cockaded woodpecker cluster on industrial forest land. Several industrial forest landowners have taken leadership roles, via habitat conservation plans, in red-cockaded woodpecker conservation and management on their property; Jeremy Poirier, International Paper

The benefits of conserving RCWs on private lands are numerous. They include reducing habitat fragmentation rates, maintaining or enhancing occupied habitat, restoring populations to unoccupied habitat, maintaining or increasing population numbers, establishing buffers for adjacent public land populations, reducing effects of catastrophic events, such as hurricanes or southern pine beetle outbreaks, providing corridors to other populations, serving as reservoirs of genetic diversity, providing birds for other populations, and contributing to research on life history and ecology, management techniques and conservation strategies.

Many private landowners are concerned with restrictions on the use of their land should an endangered species, such as RCWs, be found on or move to their property. One of the foundations of the private land

conservation strategy of the U.S. Fish and Wildlife Service has been to alleviate landowner's fears of endangered species restrictions while also minimizing the economic impact of conservation.

Strategies include Memorandums of Agreement (MOA), Habitat Conservation Plans (HCP) and Safe Harbor agreements. MOAs are generally between the U.S. Fish and Wildlife Service and corporations.

Active red-cockaded woodpecker cavity tree in urban setting on private land enrolled in safe harbor. Approximately 5% (70 groups) of the 1296 red-cockaded groups living on private land are in urban settings, such as horse farms, golf courses and subdivisions. The remaining 95% are on quail plantations and industrial forest lands; J.H. Carter III.

They outline actions by which a corporation can manage for RCWs and/or their habitat while simultaneously meeting their corporate objectives for land management. HCPs, once approved by the Service, provide landowners with "incidental take" (defined by the ESA as taking that "is incidental to, and not the purpose of, the carrying out of an otherwise lawful activity") of selected RCW groups in exchange for 'creation' of new groups, management of occupied habitat and/or restoration of suitable habitat. Via an HCP, private landowners typically 'create' a new woodpecker group to mitigate and minimize for loss of a group they might want to eliminate from their land.

By far the most successful of the private lands conservation strategies

is Safe Harbor. Originally developed for RCW conservation, the Safe Harbor approach is now being applied to many other listed species that occur on private lands. Under a Safe Harbor agreement, a landowner voluntarily agrees to protect and manage habitat for the 'baseline' population; that is the number of groups on the property at the time the agreement is signed. The landowner also implements specific habitat improvements (such as prescribed burning, midstory hardwood removal, installation of cavities) to further enhance occupied and/or unoccupied, but potentially suitable, habitat. If the habitat improvements encourage the creation of RCW groups above the 'baseline', the landowners are under no obligation to provide habitat for the new groups. Safe Harbor agreements ensure that baseline RCW populations are managed properly and remove regulatory concerns of landowners by eliminating their legal responsibilities for groups above the baseline.

A tract of virgin longleaf pine forest on private land in south Georgia; oldest trees are 400-500 years old. Only about 3000 acres of the southeast's original 90,000,000 acres of virgin longleaf pine forest remains; Grant Hilderbrand, USFS

As of 2002, 146 landowners had enrolled 338,697 acres in Safe Harbor agreements, harboring 351 RCW groups in 5 states. While landowners are under no obligation to encourage the creation of new RCW groups, many have done so by establishing recruitment clusters. Overall, the private lands conservation strategy for RCWs, including MOAs, HCPs and Safe Harbor, has resulted in the protection of approximately 561 groups of woodpeckers in 10 states, 43% of groups known on private land. This significant contribution is helping to reverse the loss of habitat and RCWs on private land.

Historic Time Line for Red-cockaded Woodpeckers

1807	Red-cockaded woodpecker "discovered" and described as new species by Louis Jean Pierre Vieillot; given scientific name of *Picus borealis*, the northern woodpecker.
1810	Alexander Wilson describes the red-cockaded woodpecker as a new species and names it *Picus querulus*. Because Viellot's scientific name came first, today the bird is known as *Picoides borealis*, the red-cockaded woodpecker, the common name provided by Wilson.
1821	John James Audubon captures a red-cockaded woodpecker near Bayou Sara, Louisiana and paints its portrait from a living specimen; he releases it two days later.
1880's	Red-cockaded woodpecker populations begin a precipitous decline that continues through the 1930's as land is cleared for agriculture, timber and the war effort (World War I).
1911	F. E. L. Beal publishes first account of the red-cockaded woodpecker's diet.
1928	L.A. Hausman describes the red-cockaded woodpecker as a "very causal visitant into the southern portion of New Jersey", suggesting it has been extirpated by this date (assuming it nested in the state - likely in the south/central Jersey pine barrens).
1939	James Gut finds red-cockaded woodpecker fossil wingbone in a Rock Spring, Florida streambed, indicating presence of red-cockaded woodpeckers in Florida during the Pleistocene.
1946	Red-cockaded woodpecker extirpated in Missouri.
1958	Red-cockaded woodpecker likely extirpated in Maryland; occasional sightings in 1974 and 1976 are considered "transients".
1968	Department of Interior identifies the red-cockaded woodpecker as a rare and endangered species.
1970	U.S. Fish and Wildlife Service officially lists the red-cockaded woodpecker as an endangered species.
1970	J.D. Ligon publishes first account on behavior and breeding biology of red-cockaded woodpecker.
1970	First red-cockaded woodpecker symposium held at Okefenokee National Wildlife Refuge, Georgia.

1970	"Symposium on the Red-cockaded Woodpecker", proceedings of the first symposium, is published.
1973	Red-cockaded woodpecker receives Federal protection with the passage of the Endangered Species Act.
1979	"Red-cockaded Woodpecker Recovery Plan" approved by U. S. Fish and Wildlife Service.
1983	Second red-cockaded woodpecker symposium held in Panama City, Florida.
1983	"Red-cockaded Woodpecker Symposium II Proceedings", proceedings of the second symposium is published.
1985	First revision of the "Red-cockaded Woodpecker Recovery Plan" is approved.
1986	"Report of the American Ornithologists' Union Committee for the Conservation of the Red-cockaded Woodpecker" is published.
1986	First successful translocations of red-cockaded woodpeckers are conducted.
1987	First in-depth study into the sociobiology of the red-cockaded woodpecker is published.
1988	First estimate of viable population size is published.
1989	Hurricane Hugo devastates Francis Marion National Forest, home of the second largest red-cockaded woodpecker population.
1990	Scientific Summit on the red-cockaded woodpecker is held in Live Oak, Florida; Summary Report is published.
1990	Drilled cavities are invented.
1990	First investigation into the genetic health of red-cockaded woodpeckers is published.
1991	Cavity inserts are invented.
1992	R.W. McFarlane publishes "A Stillness in the Pines", the first book about red-cockaded woodpeckers.
1993	Third red-cockaded woodpecker symposium held in North Charleston, SC.
1993	U.S. Fish and Wildlife Service and Georgia Pacific Corporation establish first private land partnership, a memorandum of agreement, for conservation and management of red-cockaded woodpeckers.

1994	Red-cockaded woodpecker extirpated in Tennessee because of demographic isolation.
1995	U.S. Forest Service issues “Final Environmental Impact Statement for the Management of the Red-cockaded Woodpecker and its Habitat on National Forests in the Southern Region”.
1995	“Red-cockaded Woodpecker: Recovery, Ecology and Management”, the proceedings of red-cockaded woodpecker Symposium III, is published.
1995	Safe harbor policy is created and first red-cockaded woodpecker safe harbor permit is issued for the North Carolina Sandhills region; similar permits are issued for Texas (1998), South Carolina (1998), Virginia (2000) and Georgia (2000).
1995	U.S. Fish and Wildlife Service issues “A Current Bibliographic Resource for the Red-cockaded Woodpecker”; updated annually.
1996	U.S. Army issues “Management Guidelines for the Red-cockaded Woodpecker on Army Installations”.
1998	U.S. Fish and Wildlife Service issues “Strategy and Guidelines for the Recovery and Management of the Red-cockaded Woodpecker and its Habitats on National Wildlife Refuges”.
1999	U.S. Fish and Wildlife Service institutes the “Annual Red-cockaded Woodpecker Population Data Report”, a system to track population size and trend and habitat accomplishments on all public lands and private lands, in partnerships with the Service, harboring red-cockaded woodpeckers.
2000	U.S. Fish and Wildlife Service launches red-cockaded woodpecker website <http://rcwrecovery.fws.gov>.
2001	Red-cockaded woodpecker extirpated in Kentucky due to catastrophic loss of pine forest caused by southern pine beetle epidemic.
2001	R.N. Conner, et al. publishes “The Red-cockaded Woodpecker: Surviving in a Fire-maintained Ecosystem”, the second book on red-cockaded woodpeckers.
2003	Second revision of the “Red-cockaded Woodpecker Recovery Plan” is approved.
2003	Fourth red-cockaded woodpecker symposium held in Savannah, Georgia.

The following federal and state agencies and private organizations manage lands that are directly involved in the recovery of the red-cockaded woodpecker. Additionally, the Bureau of Indian Affairs, various other state agencies (see below), and many individual and corporate private landowners are assisting significantly in supporting conservation and recovery programs for the red-cockaded woodpecker. The U.S. Fish and Wildlife Service appreciates and is thankful for the numerous private and public sector partners that are helping save the red-cockaded woodpecker.

Federal

Department of Agriculture
U.S. Forest Service

Department of Defense
U.S. Air Force, U.S. Army, U.S. Marine Corps, U.S. Navy, National Guard

Department of Energy

Department of Interior
National Park Service, U.S. Fish and Wildlife Service

State

Florida Division of Forestry, Florida Fish and Wildlife Conservation Commission, Florida Park Service, North Carolina Department of Agriculture, North Carolina Department of Environment and Natural Resources, North Carolina Wildlife Resources Commission, South Carolina Forestry Commission, South Florida Water Management District, Saint John's River Water Management District

Private

The Conservation Fund

The Nature Conservancy
North Carolina Chapter, Virginia Chapter

Other state agencies harboring, managing and conserving red-cockaded woodpeckers on lands under their administration:

Louisiana Department of Agriculture and Forestry, Oklahoma Department of Conservation, South Carolina Department of Natural Resources, South Carolina Department of Parks, Recreation and Tourism, South Carolina Department of Transportation in cooperation with the South Carolina Chapter of The Nature Conservancy, Texas Forest Service, Texas Parks and Wildlife Department

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This pamphlet was originally drafted by Ms. Felicia Sanders, a Master's degree graduate student (1998 - 2000) at Clemson University studying red-cockaded woodpeckers and enrolled in the U.S. Fish and Wildlife Service's Student Career Experience Program (SCEP) at the Service's Clemson Field Office.

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CELEBRATING A CENTURY of CONSERVATION