

2006

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Recommended Citation

Conner, Richard N.; Saenz, Daniel; and Rudolph, D. Craig, "Population Trends of Red-Cockaded Woodpeckers in Texas" (2006).
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POPULATION TRENDS OF RED-COCKADED WOODPECKERS IN TEXAS

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ABSTRACT.—We tracked population trends of Red-cockaded Woodpeckers (*Picoides borealis*) in eastern Texas from 1983 through 2004. After declining precipitously during the 1980s, woodpecker population trends on federal lands (National Forests and Grasslands in Texas, but excluding the Big Thicket National Preserve) increased between 1990 and 2000, and have been stable to slightly decreasing over the past four years. Litigation against the U.S. Forest Service in the mid 1980s reversed a severe population decline, whereas litigation during the past 8 years hampered recovery efforts for the Red-cockaded Woodpecker. Red-cockaded Woodpecker populations on private and State of Texas lands have steadily declined over the past 15 years, most likely the result of demographic isolation. Limited availability of old pines suitable for cavity excavation, inadequate fire regimes to control hardwood midstory, and demographic dysfunction resulting from woodpecker group isolation remain as significant obstacles to recovery in most populations.

Red-cockaded Woodpecker (*Picoides borealis*) populations have declined precipitously in recent decades, primarily because of loss of forested habitat, short-rotation silviculture, suppression of fire, and serious demographic dysfunction (Conner and Rudolph 1989, Costa and Escano 1989, James 1995, Conner et al. 2001).

Since 1990, the scientific and technical knowledge necessary to effectively manage and recover Red-cockaded Woodpecker populations has become available as a result of the efforts of many individuals involved in both research and management (Conner et al. 2001, U.S. Fish and Wildlife Service 2003). Several management activities that are sufficient to recover Red-cockaded Woodpecker populations have been identified (Conner et al. 2001, U.S. Fish and Wildlife Service 2003, Rudolph et al. 2004). The recovery of the Red-cockaded Woodpecker is dependent on forest management that is directed at site-specific cavity-tree clusters and foraging habitat, and at landscape-level demographics (Conner et al. 2001). Suitably aged potential cavity trees and artificial cavities, open pine forest free of most hardwood midstory, and suitably open foraging habitat with large old pines can be provided through implementation of current guidelines. Landscape-level management using woodpecker translocation to solve inadequate dispersal for mate replacement (demographic problems) must be solved by teams with members from multiple forests across the region (U.S. Fish and Wildlife Service 2003). A breakdown in management effort at ground-level managers or at higher levels of management coordination can seriously impair recovery efforts and eventual results.

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A federal court decision against the U.S. Forest Service in Texas in 1988 (*Sierra Club et al. v. Lyng et al.*, L-85-69-CA) found that the National Forests and Grasslands in Texas had violated Section 7 by failing to consult with the U.S. Fish and Wildlife Service when the population was declining and Section 9 of the Endangered Species Act by failing to appropriately manage habitat for the Red-cockaded Woodpecker, which caused harm to the woodpecker. The initial result of this federal court ruling was a significant improvement in the management of Red-cockaded Woodpecker populations on public lands in Texas and throughout the range of the species across the South (Conner et al. 2001).

Litigation against the U.S. Forest Service in Texas between 1996 and 1999 resulted in court injunctions that excluded fire and reduction of hardwood midstory from upland pine habitat management until summer 2003 (Conner et al. 2001). Thus, fire was not applied in habitat managed for Red-cockaded Woodpeckers in both longleaf (*Pinus palustris*) and loblolly (*P. taeda*)-shortleaf (*P. echinata*) pine habitats for 8 years (1995 to 2003). Because habitat could not be maintained in a condition suitable for U.S. Fish and Wildlife Service translocation requirements, woodpecker translocations for augmentation of single birds and reintroduction to expand small populations were halted on some national forests. Thus, litigation had the potential to seriously hinder recovery efforts during the past decade on national forest lands.

METHODS

Using data collected on the Angelina, Davy Crockett, and Sabine National Forests in Texas from 1983 through 2004 (Conner and Rudolph 1989, Conner et al. 1995, Rudolph et al. 2004), and additional data from annual Red-cockaded Woodpecker population status meetings provided by the National Forests and Grasslands in Texas, the Texas Forest Service, private landowners, and the U.S. Fish and Wildlife Service, we examined population trends of Red-cockaded Woodpeckers in Texas. We used data for the number of active clusters in early spring immediately prior to the woodpecker's breeding season, which begins in late April, for the Angelina, Davy Crockett, and Sabine National Forests. Prior to 1996, data on numbers of active clusters from other forests may not be from spring counts.

Management needed for the recovery of Red-cockaded Woodpecker populations is described by Conner et al. (2001) and includes providing old pines for cavity trees or artificial cavities in younger pines, thinning the pine overstory, reduction of hardwood midstory, prescribed fire to sustain lush grasses and forbs in the herbaceous layer, and woodpecker translocation to solve population demographic problems. We explored how these management factors had been applied to populations and examined how the co-occurrence of events such as litigation affected management and changes in population trends. We examined populations by general ownership category: federal, state, and private.

RESULTS

Populations on Federal Lands. Red-cockaded Woodpeckers on federal lands in Texas are currently found only on the four national forests: the Angelina, Davy Crockett, Sabine, and Sam Houston National Forests. A very small population on the Big Thicket National Preserve was extirpated in 1995 (Table 1). Prior to 1988 management for Red-cockaded Woodpeckers on U.S. Forest Service lands in Texas had primarily involved protection of cavity trees from cutting and removal of hardwood midstory trees from a 15-m radius around cavity trees. However, prior to 1988, some cavity trees were cut and only a few cavity trees had encroaching midstory removed (Conner and Rudolph 1989). Prescribed fire was used irregularly during cool wet seasons, was not applied to all habitats with Red-cockaded Woodpeckers, and was generally not effective in reducing encroaching hardwood vegetation in the pine uplands. As a result, Red-cockaded Woodpecker populations on the national forests in Texas were in severe decline prior to 1988 (Fig. 1, Table 1).

In 1988, litigation against the U.S. Forest Service in federal court in Tyler, Texas (*Sierra Club et al. v. Lyng et al.*, L-85-69-CA), resulted in a court order from Judge Robert Parker that found the U.S. Forest Service had violated Section 7 and Section 9, "take," of the Endangered Species Act because of their failure to correctly manage the Red-cockaded Woodpecker's habitat (Conner et al. 2001). The 1988 court order forced the U.S. Forest Service to begin an intensive management effort to thin pine stands, remove hardwood midstory, increase prescribed burning, install artificial cavities, and translocate woodpeckers to reduce population demographic problems. As a result of the intensified habitat management, the woodpecker populations on federal lands had stabilized by 1990, and subsequently increased at a fairly steady rate until 2000 (Fig. 1).

Table 1. Number of active Red-cockaded Woodpecker clusters in Texas populations on federal, State of Texas, and private lands from 1983 through 2004. Columns with blanks indicate years when data were not available for specific populations.

Population	1983	1984	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004
Federal Forests (total)					224	203	208	193	193	200	223	231	235	246	234	244	266	275	270	270	257	262
Angelina National Forest	38	33	26	26	22	19	22	20	20	22	27	26	23	26	22	21	24	25	27	29	27	26
Davy Crockett National Forest	47	43	38	34	29	28	28	23	27	34	38	38	38	40	39	41	47	55	53	51	51	53
Sabine National Forest					13	11	10	8	8	9	15	16	20	24	23	22	24	25	27	29	27	26
Sam Houston National Forest					160	145	148	141	137	134	141	149	153	156	150	160	168	168	163	164	152	155
Big Thicket National Preserve								1	1	1	2	2	1	0	0	0	0	0	0	0	0	0
State Forests (total)								29	25	25	25	22	22	21	19	19	19	19	17	17	18	17
W. Goodrich Jones								15	14	15	15	14	14	14	14	14	14	14	12	12	13	12
I. D. Fairchild								12	9	8	8	7	7	6	4	4	4	4	4	4	4	4
Huntsville State Fish Hatchery								1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Pine Park (TX Dept. of Trans.)								1	1	1	1	0	0	0	0	0	0	0	0	0	0	0
Private Forest Lands (total)								52	50	48	42	40	38	33	31	31	31	37	37	37	33	33
Brushy Creek/Boggy Slough								18	18	18	15	13	12	10	9	7	7	7	8	9	8	8
Scrappin' Valley								4	4	4	4	4	4	4	4	5	5	10	8	12	10	10
Louisiana-Pacific								15	14	14	13	13	12	9	8	8	7	7	7	2	2	1
Cook's Branch								15	14	12	10	10	10	10	10	11	12	13	12	13	14	14

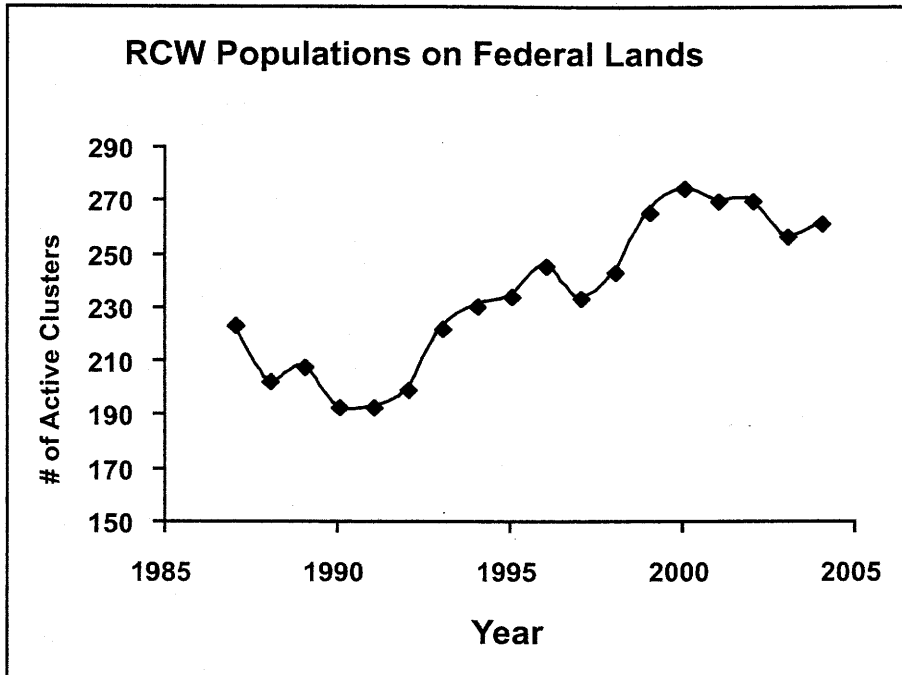


Figure 1. Red-cockaded Woodpecker (RCW) populations on federal lands between 1983 and 2005 in Texas as measured by the number of active woodpecker clusters.

Between 1996 and 1998, litigation against the U.S. Forest Service in Texas by the Sierra Club and Texas Committee on Natural Resources again impacted Red-cockaded Woodpecker management, but this time it impaired necessary management. Preliminary injunctions in 1997 and 1998 from Judge Richard Schell, a federal judge in Beaumont, Texas, brought the use of prescribed fire, thinning, and hardwood midstory control to a complete stop on most national forests in Texas (*Sierra Club et al. v. Glickman et al., Case No. L-85-69-CA*). Concurrent with the absence of management for the Red-cockaded Woodpecker was a halt in the population increase and a gradual population decrease on federal lands in Texas between 2000 and 2004 (Fig. 1).



Close up of Red-cockaded Woodpecker (*Picoides borealis*). Photo by Craig Rudolph and Richard Conner.

Populations on Private Lands. Private lands in eastern Texas support more than 30 Red-cockaded Woodpecker groups. Management on private lands was not directly affected by endangered species litigation that occurred on the national forests. However, litigation against the U.S. Forest Service and observed declines on private lands increased the awareness and concern of some private landowners, which had an effect on their forest management by the mid 1990s. Prior to 1997 Red-cockaded Woodpecker populations on private lands declined steadily (Fig. 2). After 1998, voluntary enrollment by some landowners in the Regional Habitat Conservation Plan for the Red-cockaded Woodpecker on Private Lands in East Texas (Texas RCW HCP) and more than \$400,000 in funds provided by the U.S. Fish and Wildlife Service improved management on private lands at several locations, Scrappin' Valley, Brushy Creek, North Boggy Slough, Cook's Branch, and others, helped stabilize total population numbers on private lands. On two sites, thinning, hardwood midstory control, prescribed burning, artificial cavity installation, and translocation of woodpeckers to replace lost breeders were implemented as part of active management programs. The population at Cook's Branch and Scrappin' Valley offset the continuing losses that occurred on Brushy Creek/Boggy Slough and on Louisiana-Pacific lands (Fig. 2, Table 1). Red-cockaded Woodpeckers on the Louisiana-Pacific lands will likely be extirpated during the next few years (Table 1); their lands containing a single active woodpecker cluster have been sold recently.

Populations on State Lands. During the past 15 years Red-cockaded Woodpeckers were present on the I. D. Fairchild and the W. Goodrich Jones State Forests, the Huntsville State Fish Hatchery, and Pine Park (now extirpated) on Texas Department of Transportation lands near Hemphill, Texas (Table 1). Recovery of woodpecker populations on these four areas is hampered by their small land base, their isolation from other larger populations, and the fact that surrounding lands are either young forest or non-forest habitat. Translocation of woodpeckers to replace lost breeders has not been part of the management in these two small populations on the state forests. Use of prescribed fire has been constrained, primarily on the W. G. Jones State Forest, because of surrounding residential development. As a result of these problems, the woodpecker populations on the two state forests combined have declined by 41% over the past 15 years (Fig. 2, Table 1). Red-cockaded Woodpeckers disappeared from Pine Park near Hemphill soon after their foraging habitat on private forest lands surrounding the park was harvested during the early 1990s.

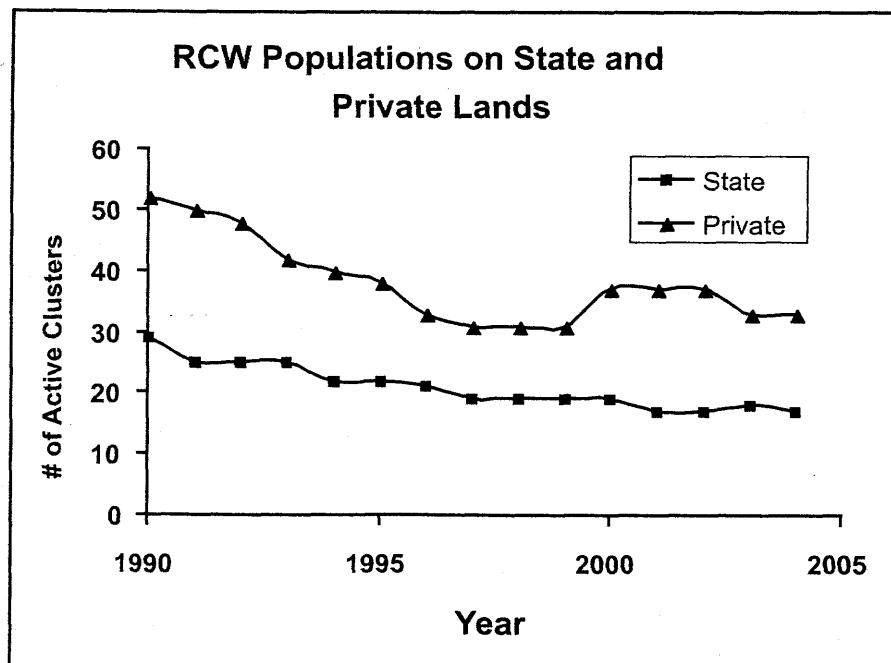


Figure 2. Red-cockaded Woodpecker (RCW) populations on state and private lands between 1990 and 2005 in Texas as measured by the number of active woodpecker clusters.

DISCUSSION

Habitat management for Red-cockaded Woodpeckers is essential in present-day forest landscapes (Conner et al. 2001). The observed population declines and extirpation are ample evidence that the Red-cockaded Woodpecker can not survive without management in the absence of the historic fire regimes that maintained the open character of the pine uplands inhabited by the woodpecker, particularly in the smaller, isolated populations (Saenz et al. 2001). The historic fires that burned unchecked across the landscape day and night and prevented the encroachment of off-site hardwood vegetation in the pine uplands are no longer possible (Conner et al. 2004). Roads, reservoirs, non-forest habitat, and fire suppression greatly reduce the hectares burned by natural lightning-ignited fires on present-day landscapes. Many historic fires were likely of human origin (e.g., ignited by Native Americans), a much less common event in modern forests. Prescribed fire, which is an essential tool for today's forests, is difficult to implement because of the risk of escape (wildfire), air quality issues, and liability issues for property damage from escaped fire and indirect damage from vehicle accidents on smoked-out highways.

Red-cockaded Woodpecker populations on national forest lands will increase or decrease depending on the efficacy of future management. The ability of the U.S. Forest Service to manage habitat, especially using prescribed fire to control encroaching hardwoods, providing an adequate supply of older pines and artificial cavities, and translocating birds to address demographic issues, will depend on internal and external factors. Litigation initiated by the Sierra Club and the Texas Committee on Natural Resources in 1987 resulted in greatly improved forest management for Red-cockaded Woodpeckers and subsequent woodpecker population increases on national forests from 1988 to 2000. Why these same organizations are now pursuing litigation to stop management needed to recover the endangered woodpecker is unknown.

Red-cockaded Woodpecker populations on state and private lands will likely continue to dwindle in the future. There is no large land base on state lands to support large viable populations. The largest population on state lands is on the W. G. Jones State Forest and its close proximity to Houston, Texas, greatly hinders the ability to implement an aggressive prescribed fire program. The future of woodpecker populations on private lands is usually tied to the economic interests of the landowner. On private industrial lands, woodpecker management conflicts with optimization of timber production (Conner et al. 2001). On non-industrial private lands, there is often pressure from owners to develop the land for other uses, particularly residential, if the lands supporting the woodpecker populations are close to urban centers. The woodpecker population increase observed on Cook's Branch (Table 1), near Houston, Texas, demonstrates that knowledgeable landowners who implement proper forest management can make a significant contribution to the recovery of an endangered species.

Non-industrial private landowners usually can not afford the cost of the management necessary to sustain small populations of Red-cockaded Woodpeckers, and typically do not have a sufficiently large land base to provide habitat for a viable population. There is currently insufficient economic incentive to increase Red-cockaded Woodpecker populations on industrial forestlands. As with non-industrial private landowners, current forested state lands in Texas do not have a sufficient land base to manage a self-sustaining, viable population. The future of Red-cockaded Woodpeckers in Texas will likely depend most on federal lands on the national forests. The land base is present on national forests to contain large, viable populations, and there is a legal requirement to recover the woodpecker on federal lands (Conner et al. 2001, USFWS 2003). It is fortunate that science-based management is available with a demonstrated ability to increase woodpecker populations (Conner et al. 2001, USFWS 2003). Science-driven forest management is essential for the recovery of the endangered Red-cockaded Woodpecker in Texas and throughout the rest of the South (Saenz et al. 2001); it is vital for agencies managing for the woodpecker to be able to do their job without unnecessary litigation.

ACKNOWLEDGMENTS

We thank R. W. Maxey, J. A. Reid, and C. E. Shackelford for constructive comments on an early draft of the manuscript. Research conducted within Red-cockaded Woodpecker cluster areas was done under U.S. Fish and Wildlife permit TE832201-0 to Richard N. Conner.

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HABITAT USE OF BREEDING BIRDS IN RIPARIAN FOREST OF THE LOWER RIO GRANDE VALLEY OF TEXAS

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Riparian-dependent birds have been negatively impacted by habitat loss and severe deterioration of this habitat, over this past century. In the Lower Rio Grande Valley (LRGV) of Texas, once-abundant riparian bird species



Plain Chachalacas (*Ortalis vetula*) were present at all three sites. Photo by Larry Ditto.

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Bull. Texas Ornith. Soc. 39(2): 2006