

## **The Red-cockaded Woodpecker: Surviving in a Fire-Maintained Ecosystem**

Authors: Leonard, David L., and DeLotelle, Roy S.

Source: The Auk, 120(4) : 1201-1205

Published By: American Ornithological Society

URL: [https://doi.org/10.1642/0004-8038\(2003\)120\[1201:TRWSIA\]2.0.CO;2](https://doi.org/10.1642/0004-8038(2003)120[1201:TRWSIA]2.0.CO;2)

---

BioOne Complete ([complete.BioOne.org](https://complete.BioOne.org)) is a full-text database of 200 subscribed and open-access titles in the biological, ecological, and environmental sciences published by nonprofit societies, associations, museums, institutions, and presses.

Your use of this PDF, the BioOne Complete website, and all posted and associated content indicates your acceptance of BioOne's Terms of Use, available at [www.bioone.org/terms-of-use](https://www.bioone.org/terms-of-use).

Usage of BioOne Complete content is strictly limited to personal, educational, and non - commercial use. Commercial inquiries or rights and permissions requests should be directed to the individual publisher as copyright holder.

---

BioOne sees sustainable scholarly publishing as an inherently collaborative enterprise connecting authors, nonprofit publishers, academic institutions, research libraries, and research funders in the common goal of maximizing access to critical research.

The species account format is familiar—brief family introductions and an account for each species. Some accounts are nearly a page in length with subsections on identification, voice, habitat, nesting, status, distribution with elevations, and sometimes notes that discuss taxonomy, boreal and austral migrants, or infrequently reported species. Most welcome is the fact that a good portion of the information is new, not recycled. Another welcome inclusion is both a preferred Spanish name as well as one or more local Spanish names, something useful but rarely presented in Latin American bird guides. Taxonomy generally follows that in Hilty and Brown's *A Guide to the Birds of Colombia*, a convenience to students having access to both works, but the taxonomy of some groups (i.e. *Scytalopus*) has been updated to reflect recent changes.

Two color maps, one of the Sabana de Bogotá, the other of natural areas in the city of Bogotá, are detailed and accurate. The plates will certainly enable anyone to recognize the birds in the area of this book. Helpful is the fact that many female and immature plumages are included. The artist, however, received little mention, being noted only once at the bottom of an introductory page.

Rounding out this fully packed book are a series of appendices that provides lists of migrants, threatened species, species not discussed in the main text, extinct species, and a bibliography of 69 entries. This is a terrific little bird book for students and naturalists of the Bogotá area. One hopes that more like it, in Spanish, will appear for other areas in Colombia and elsewhere.—STEVEN L. HILTY, *Research Associate, University of Kansas, Museum of Natural History, Lawrence, Kansas 66045, USA. E-mail: shilty@hotmail.com*

mostly focusing on the species' cavity trees. Jeffrey R. Walters, working mainly in North Carolina and the panhandle of Florida, has published extensively on the woodpecker's life history, population dynamics, and social system. Much of the book was derived from data collected from the populations studied by the authors. This is understandable; however, a more inclusive summary of what is known about Red-cockaded Woodpeckers from throughout their range would have contributed to a greater understanding of this endangered woodpecker and provided managers with more accurate information.

Chapter 1 is an overview of the Red-cockaded Woodpecker, its habitat, and decline since the arrival of Europeans in North America. Chapter 2 characterizes the fire-maintained pine ecosystems on which the Red-cockaded Woodpecker depends. The history of the ecosystem (geologic and recent), and information on the various pine species used by the woodpecker, are detailed. Sections on the threats to the fire-maintained ecosystem, the longleaf pine (*Pinus palustris*) forest, other southern pines, and the animal community are informative. Chapter 3 outlines the evolution, taxonomy, and morphology of the Red-cockaded Woodpecker. The morphological section is excellent and accurately describes woodpeckers as a group, as well as the Red-cockaded Woodpecker. Chapter 4 sketches the past and present distribution of the woodpecker; chapter 5 presents information on cavity trees, including fungal decay, resin wells, cavity competition, cavity tree section, and cavity tree mortality. The latter chapter is detailed and complete. Chapter 6 summarizes the social behavior, population biology, and the general biology of the Red-cockaded Woodpecker. The sections outlining the evolution of cooperative breeding, why helpers help, and population dynamics are clearly presented. Chapter 7 examines the foraging ecology of the woodpecker and covers substrates used, foraging behaviors, diet, and territory size. Chapter 8 thoroughly covers the relationship between Red-cockaded Woodpeckers and bark beetles. Chapter 9 outlines the reasons for the decline of the Red-cockaded Woodpecker and clearly explains carrying capacity and vital rates. The chapter also explains the multiple factors currently affecting the carrying capacity of Red-cockaded Woodpeckers' habitat. Chapter 10 describes the legal status and the development of Red-cockaded Woodpecker management and introduces the reader to artificial cavities and translocation. Chapter 11 outlines the newest management strategies, provides successful examples of these strategies, critiques new management policies for various agencies and private lands, and introduces the reader to Safe Harbor Agreements and Habitat Conservation Plans. Chapter 12 addresses the future of the Red-cockaded Woodpecker.

Information is presented in an accessible format and editorial errors are rare. We found the writing

---

*The Auk* 120(4):1201–1205, 2003

**The Red-cockaded Woodpecker: Surviving in a Fire-Maintained Ecosystem.**—Richard N. Conner, D. Craig Rudolph, and Jeffery R. Walters. University of Texas Press, Austin, Texas. 363 pp., 15 color plates, and 76 black-and-white figures. ISBN 0-292-71234-0. Cloth, \$60.00.—Written by researchers who have spent most of their professional careers studying the species, *The Red-cockaded Woodpecker: Surviving in a Fire-Maintained Ecosystem* is a *tour de force* covering every aspect of the woodpecker's conservation, habitat, life history, and politics. Richard N. Conner and D. Craig Rudolph have published extensively on Texas Red-cockaded Woodpecker (*Picoides borealis*) populations,

in some sections labored, however, and that the level of detail on any given topic varied from very general to highly specific. A more thorough edit would have minimized information that went beyond the scope of the book, was too speculative, or incorrect. For example, the inclusion of the overkill hypothesis (p. 20) has little, if any, relevance to Red-cockaded Woodpeckers, the relationship between Native American corn fields and Red-cockaded Woodpeckers (p. 60) is conjecture, and the pine forest at the Stanton Energy Center in central Florida is longleaf, not slash pine (*P. elliotii*) (p. 185).

The figures and tables are mostly clear and informative, but several errors can be found. For example, the 1990 distribution map (fig. 4.4) is inaccurate for Florida. Several Florida populations listed in table 4.2 are not included in the figure (e.g. Withlacoochee State Forest, Big Cypress National Preserve), whereas populations not listed in table 4.2 appear to be included in the figure (e.g. Stanton Energy Center, Webb Wildlife Management Area). Furthermore, the size of the polygons does not accurately reflect population sizes. Several tables did not include data from long-studied populations in Florida and elsewhere.

Several important sections or points in the book are, in our opinion, biased or unsubstantiated. In chapter 2, the authors summarize the biogeography of the longleaf pine ecosystem and the Red-cockaded Woodpecker. A lack of macrofossils and the difficulty of identifying pine pollen to species has resulted in a less-than-clear picture of the location of southern pines at the close of the Pleistocene (Schmidtling and Hipkins 1998); this was not made clear in the text. We thought the authors overemphasized one biogeographic picture of the evolution of the southeastern pine ecosystem (and that of the Red-cockaded Woodpecker): a Florida refugium. In our opinion, they give short shrift to at least one alternative idea. Schmidtling and Hipkins (1998) provide convincing evidence (genetic and ecological) that after the Pleistocene longleaf pine was isolated in a single refugium in southern Texas or northeastern Mexico and subsequently spread east. From the perspective of the woodpecker, this scenario is supported by genetic and phylogeographic evidence (see Emslie 1998, Weibel and Moore 2002).

In chapter 3, the authors state (p. 36) that "...the abundance of snags in the pre-Colombian forests may have been lower" than that currently found on an old-growth stand in southern Georgia (the Wade Tract), and therefore also lower in historical pine forests (prompting Red-cockaded Woodpeckers to excavate their cavities in living pines). They continue with "[h]ot head-fires may have consumed more snags than the controlled backfires that are currently typical of the Wade Tract." Not only is it highly speculative to characterize historic fuel loads, fire frequency, and wind direction, but at least one study of an old-

growth pine forest (one in which head-fires occur) reported snags to be abundant (Doren et al. 1993).

In presenting arguments why Red-cockaded Woodpecker might prefer older trees for foraging the authors state (p. 190) "...because Red-cockaded Woodpeckers formerly lived in mixed-age forests, in which only a small portion of the trees were young, they are somehow better adapted for foraging in old trees." It is well documented that old-growth longleaf pine forests have an age class distribution dominated by younger trees, whereas young trees are rare in closed canopy, second growth forests (Platt et al. 1988, Noel et al. 1998).

Several chapters contained information relevant to the conservation of the southeastern pine ecosystem and Red-cockaded Woodpeckers that was pertinent to a diverse audience. In chapter 2, when discussing the significance of fire, the authors stressed a community perspective and convincingly made the case for growing season fire. The importance of public understanding and acceptance of prescribed fire should not be underestimated, and the information in chapter 2 will serve to educate the general public. The inclusion of game and Neotropical species in the discussion of prescribed fire (chapter 2 and 12) also was significant because conflicts between management for game species and Red-cockaded Woodpeckers still arise. Hopefully, these chapters will drive home the point that all the species inhabiting these fire-maintained communities are adapted to short-return interval fires and, thus, should thrive in forests where growing season fire is applied.

Several aspects of Red-cockaded Woodpecker life history that can provide managers with information critical to recovering populations were clearly presented, and their inclusion in this book was important. For example, in chapter 6 the authors outline two important characteristics of Red-cockaded Woodpecker population dynamics. First, the presence of helpers can offset breeder mortality and allow woodpeckers to persist for long periods in suboptimal habitat. Thus, group size is a metric of a population's ability to withstand environmental and demographic stochasticity and is an important diagnostic tool. Second, small populations where active clusters are aggregated can persist longer than larger populations in which clusters are scattered. This point addresses the importance of the placement of recruitment clusters in the spatial context of existing clusters.

Our major criticism of the book is its failure to address geographic variation in the life history of the Red-cockaded Woodpecker and its habitat. Many "facts" presented in this book do not hold true in Florida Red-cockaded Woodpecker populations, especially those in peninsular Florida (the geographic region with which we are most familiar). For example, the authors state (pp. 87-88) that in North Carolina and Texas the time required to excavate cavities in

longleaf pine ranges from 3.7 to 13 years. This is much longer than times that we have documented in Florida, and we have observed many cavities excavated and occupied within six months of initiation. Given the importance of cavities to Red-cockaded Woodpeckers, this difference may drive some of the differences in demography documented across the species' range.

In contrast with the authors' assertion (pp. 93–94), Pileated Woodpeckers (*Dryocopus pileatus*) damage very few cavities in the populations we study. In 23 years, we have not documented a single cavity enlarged by Pileated Woodpeckers at the Stanton Energy Center. Flying squirrels (*Glaucomys volans*; p. 95) are labeled as the "primary rival for cavities," but flying squirrels are rare in the pine flatwoods of central and southern Florida. While we agree that destruction of species usurping Red-cockaded Woodpeckers cavities is not warranted, it is misleading to state (p. 97) that most populations are likely unaffected by species such as Red-bellied Woodpeckers (*Melanerpes carolinus*). In central Florida pine flatwoods, Red-bellied Woodpeckers are the primary kleptoparasites of cavities. Managers need to be aware of the geographic variation in cavity competitors.

The section labeled "Old pines are required for cavity trees" seems contradictory, because the authors repeatedly state (pp. 99–100) that Red-cockaded Woodpecker excavate cavities in trees <75 years old. They also state (p. 98) that "cavity trees that are sufficiently old (probably 150+ years old) have extensive heartwood development in the trunk well into the pine's crown." Thus, in these trees cavities could presumably be excavated at greater heights compared to younger trees, which would provide several benefits to the woodpeckers. However, in forests that we believe were never logged, cavity trees >150 years old are rare (DeLotelle and Epting 1988). In other populations, even in North Carolina pine flatwoods, Red-cockaded Woodpeckers excavate cavities in young trees (Hooper 1988, Zwicker 1995). We agree with the authors that it is short-sighted to suggest that the average age or youngest pines used by woodpeckers for cavities are all that need to be provided for the bird, but it is misleading to suggest that old trees are required. Certainly Red-cockaded Woodpeckers select older trees (>60 years old) for cavities (DeLotelle and Epting 1988), but an overemphasis on old-growth trees (150+ years old) may dissuade managers from establishing or expanding populations into suitable, but young forests, a scenario that we have encountered in peninsular Florida.

Given the geographic range of the Red-cockaded Woodpecker, is this variation relevant? Under current recovery guidelines, the growth and maintenance of populations in southern and central Florida is necessary to recover Red-cockaded Woodpeckers (U.S. Fish and Wildlife Service 2003). On public lands in this

region, 13 Red-cockaded Woodpecker populations are under active management. Thus, from a management point of view, detailing the geographic variation in the Red-cockaded Woodpecker and its habitat is important.

From a scientific point-of-view, a more inclusive geographic summary of what is known about Red-cockaded Woodpeckers would have been valuable. For example, differences in female life history between Florida and North Carolina are notable, but not addressed. DeLotelle and Epting (1992) and DeLotelle et al. (1995) reported that (1) when a breeding male dies and a male helper is present, the breeding female is driven from the territory by the helper; (2) some females are driven from the territory prior to the death of the breeding male; and (3) ~30% of female floaters are aggressively expelled by the breeding pair. These behaviors are conspicuous and occur frequently in the populations we study. Therefore, we were surprised by the following statements: "...the limited observations available suggest that sons do not employ frequent, intense aggression to force their mothers out" (p. 123), and "[h]ow the winner is determined in such cases (i.e. conflicts between breeding and floater females) is unknown" (p. 124). The discussion of female floaters and female helpers (p. 125) was unclear, but our interpretation was that the female helpers in question were not related to the breeding pair. In some of the populations that we study, as well as at the Savannah River population, as many as 30% of helpers are females, and they are usually the daughter of the one or both of the breeding pair in the group in which they help (DeLotelle and Epting 1992, P. Johnston unpubl. data). Given these differences in life history, the following sentence (p. 126) was troubling, "[b]ut these rare aberrations have an insignificant impact on the dynamics of the system, which operates according to the rules we have described." Observations that are rare in North Carolina maybe more frequent and important in other populations (Lennartz et al. 1987, DeLotelle et al. 1995). We believe that given the habitat differences throughout this species' range, operational rules may change from region to region, and determining what drives these changes will likely prove relevant to our understanding of Red-cockaded Woodpecker life history.

Arguably the most important chapter of this book describes the authors' "State-of-the-Art Management." This strategy is proven and we agree with the importance of short- and long-term management as outlined by the authors. Do our criticisms affect the general application of this management strategy, a strategy that we successfully apply in peninsular Florida? We believe the answer is no. More detail, however, of specific management, as related to the installation of artificial cavities, the creation of recruitment clusters, and translocation, was warranted. For example, when describing the most appropriate

location for recruitment clusters the authors state (p. 272) that they "...are located appropriately relative to existing groups, not so close that existing groups simply take them over and not so far that birds dispersing from groups have difficulty finding them." Although the appropriate distance likely varies depending on the region and population, a presentation of a range of distances would have been useful to managers. We also thought that a book advertised as "the essential resource for learning more about the Red-cockaded Woodpecker and planning intelligently for its survival" should have contained more understanding of the needs of small populations. One might argue that small populations are not necessary for the survival of the species; however, the authors state (p. 149) that the best strategy to maintain gene flow is "...preserving as many populations within a region as possible." We concur with this as does the U.S. Department of the Interior, Fish and Wildlife Service Recovery Plan for the Red-cockaded Woodpecker (U.S. Fish and Wildlife Service 2003). Statements (p. 228) such as "...factors affecting only vital rates, and not carrying capacity, have played no role in the declines of the past few decades..." and those on page 229 "...the actions of species other than Pileated Woodpeckers, like those of predators, have never posed a significant threat to Red-cockaded Woodpecker populations" are not correct in regard to many small populations. We work in several small populations where a single predation event or cavity usurpation can drastically affect the population. We agree that the ultimate reason for the condition of the range-wide population is a reduction in carrying capacity, but the proximate reason for extirpation of small populations could involve conditions affecting vital rates. To their credit the authors cautiously acknowledged that the control of competitors and predators (pp. 306–307) may be appropriate in extremely small populations. We absolutely agree that killing competitors or predators is unethical (p. 307), but nonlethal methods exist for reducing their effect on populations. We also agree with the goal of Red-cockaded Woodpecker management (p. 307) "...to maintain populations...in which losses to squirrels and snakes occur regularly but have no significant impact on woodpecker numbers." However, for those working in small populations, this day is in the distant future.

Conner, Rudolph, and Walters have written an important book. Their commitment to the conservation of this small woodpecker is obvious, and they should be commended for their contribution to Red-cockaded Woodpecker biology and conservation. They present extensive data on North Carolina and Texas Red-cockaded Woodpecker populations that have and will continue to contribute to our understanding and conservation of the species. Given that the authors did not address the geographic variation of the Red-cockaded Woodpecker, this book is not a "com-

prehensive overview of all that is currently known about the woodpecker's biology." However, writing a single book detailing all that is known about the Red-cockaded Woodpecker would be a daunting task. This book is an important, and necessary step in summarizing what is known about this species and the habitat on which it depends. Despite our criticisms, this book contains much worthwhile information and should be owned by anyone studying Red-cockaded Woodpeckers or with an interest in conservation.—  
DAVID L. LEONARD, JR., *Department of Wildlife Ecology and Conservation, University of Florida, Gainesville, Florida 32601, USA. E-mail dleonard@gru.net.* ROY S. DELOTTELLE, *DeLotelle and Guthrie, Inc., 1220 S.W. 96th Street, Gainesville, Florida 32607, USA.*

#### LITERATURE CITED

- DELOTTELLE, R. S., AND R. J. EPTING. 1988. Selection of old trees for cavity excavation by Red-cockaded Woodpeckers. *Wilson Bulletin* 16:48–52.
- DELOTTELLE, R. S., AND R. J. EPTING. 1992. Reproduction of the Red-cockaded Woodpecker in central Florida. *Wilson Bulletin* 104:285–294.
- DELOTTELLE, R. S., R. J. EPTING, AND G. DEMUTH. 1995. A 12-year study of Red-cockaded Woodpeckers in central Florida. Pages 259–269 in *Red-cockaded Woodpecker: Recovery, Ecology and Management* (D. L. Kulhavy, R. G. Hooper, and R. Costa, Eds.). Center for Applied Studies in Forestry, College of Forestry, Stephen F. Austin State University, Nacogdoches, Texas.
- DORR, R. F., W. J. PLATT, AND L. D. WHITEAKER. 1993. Density and size structure of slash pine forests in the everglades region of south Florida. *Forest Ecology and Management* 59: 295–311.
- EMSLIE, S. D. 1998. Avian community, climate, and sea-level changes in the Plio-Pleistocene of the Florida peninsula. *Ornithological Monographs*, no. 50.
- HOOPER, R. G. 1988. Longleaf pines used for cavities by Red-cockaded Woodpeckers. *Journal of Wildlife Management* 52:392–398.
- LENNARTZ, M. R., R. G. HOOPER, AND R. F. HARLOW. 1987. Sociality and cooperative breeding of Red-cockaded Woodpeckers (*Picoides borealis*). *Behavioral Ecology and Sociobiology* 20: 77–88.
- NOEL, J. M., W. J. PLATT, AND E. B. MOSER. 1998. Structural characteristics of old- and second-growth stands of longleaf pine (*Pinus palustris*) in the Gulf coastal region of the USA. *Conservation Biology* 12:533–548.
- PLATT, W. J., G. W. EVANS, AND S. L. RATHBURN. 1988. The population dynamics of a long-lived conifer (*Pinus palustris*). *American Naturalist* 131: 491–525.
- SCHMIDTLING, R. C., AND V. HIPKINS. 1998. Genetic

- diversity in longleaf pine (*Pinus palustris*): Influence of historical and prehistorical events. *Canadian Journal of Forest Resources* 28: 1135–1145.
- U.S. FISH AND WILDLIFE SERVICE. 2003. Red-cockaded Woodpecker (*Picoides borealis*) Recovery Plan: Second Revision. U.S. Fish and Wildlife Service, Southeast Region, Atlanta, Georgia.
- WEIBEL, A. C., AND W. S. MOORE. 2002. A test of a mitochondrial gene-based phylogeny of woodpeckers (Genus *Picoides*) using an independent nuclear gene,  $\beta$ -fibrinogen intron 7. *Molecular Phylogenetics and Evolution* 22:247–257.
- ZWICKER, S. M. 1995. Selection of pines for foraging and cavity excavation by Red-cockaded Woodpeckers. M.S. thesis, North Carolina State University, Raleigh.

---

*The Auk* 120(4):1205–1206, 2003

**Mice in the Freezer, Owls on the Porch.**—Helen McGavran Corneli. 2002. University of Wisconsin Press, Madison, Wisconsin. xvi + 347 pp., 42 black-and-white photographs. Cloth, ISBN 0-299-18090-5, \$29.95. Paper, ISBN 0-299-18094.—This book is not only the “official” biography of a legendary couple who were pioneers in wildlife management in Wisconsin, but is a 61 year love story.

As George Archibald says in the Foreword, this is a “heartwarming account, full of unpublished stories and insights about...two of America’s most fascinating and accomplished field naturalists.” Right on! Helen Corneli, an English professor and forty-year friend of the Hamerstoms, began collecting material for this book in 1990 but did not feel able to complete it until after Fran’s death in 1998.

Frederick N. Hamerstrom, Jr., known throughout his lifetime as “Hammy,” was raised in Massachusetts and attended Dartmouth College in New Hampshire. At a dance there he met Frances Flint, a student at Smith College and the only daughter of a wealthy Boston family. Although shy and reserved, he was so smitten that he proposed on their third date. It would be difficult to imagine a greater contrast in personalities. Hammy was a handsome, quiet, diligent, scrupulously honest man who combined courtliness with integrity, discipline with grace, and principle with practicality. Fran, when she met Hammy, was an unusually attractive society belle with amazing energy and a flair for the dramatic. But they loved each other and both were resilient and adaptable. Fran was

always a bit of a rebel; she began smoking cigarettes at age seven and not surprisingly died of lung cancer—but not until age 90.

Hammy completed his undergraduate studies at Harvard, then married Fran in 1931. Their prospects appeared bleak in the depth of the Great Depression, but Hammy enrolled that fall as a student in the Game Conservation Institute in Clinton, New Jersey. The next year the two of them, against severe competition, were chosen by Paul Errington to enter his graduate program in Ames, Iowa. Hammy’s Master’s thesis on nesting of the Ring-necked Pheasant (*Phasianus colchicus*) was published in 1936. Fran diligently analyzed Great Horned Owl (*Bubo virginianus*) pellets and published, with her husband and Errington, a landmark study of owl prey, receiving a prize for the best undergraduate woman’s research project.

In 1937, both joined Aldo Leopold’s graduate program at the University of Wisconsin. For his Ph.D. dissertation, Hammy studied Wisconsin prairie grouse. Fran, the only woman to obtain a graduate degree with Leopold, studied dominance in winter flocks of chickadees for her Master’s degree. After the war, they settled in Plainfield, Wisconsin, to begin their life work on grouse, particularly the Greater Prairie-Chicken (*Tympanuchus cupido*).

Sadly, in spite of Hammy’s dedication, populations of the Greater Prairie-Chicken locally dropped from 86 booming grounds on 87,600 acres to only 3, and elsewhere in Wisconsin declined even more drastically. Ring-necked Pheasant dominance, hybridization with other grouse species, mechanization of agriculture, irrigation, pesticides, and other factors may have contributed to the decline.

The Hamerstoms, especially Fran, were able to galvanize unprecedented support for their various causes. In the immediate postwar period, their home was the coordinating station for sending money, clothing, and food to starving ornithologists in Europe. Their large rustic home was a mecca for sportsmen and birders from great distances—and wealthy patrons, including many of the 175 corporate officers, 82 business executives, 45 lawyers, 27 medical doctors, and the Governor of Wisconsin, who formed The Society of *Tympanuchus Cupido Pinnatus*. That group collected large amounts of money for purchase of land in the Buena Vista marsh; Fran wrote their newsletter, *Boom! Visitors*, called “boomers,” were taught from blinds to observe behavior at the booming grounds of the prairie chicken; massive, perhaps unmanageable, amounts of data were collected. Fran attracted students, called “gaboons,” to help her with extensive studies of raptors and conduct over 20,000 small mammal trap nights; her autobiography listed names of 67 of those volunteers, who helped her, often for an entire summer, in return for their room and board. The second floor of their large home became a dormitory.