
DEPARTMENT OF THE INTERIOR

Fish and Wildlife Service

50 CFR Part 17

RIN 1018-AB42

Endangered and Threatened Wildlife and Plants; Final Rule to List the Golden-cheeked Warbler as Endangered

AGENCY: Fish and Wildlife Service, Interior.

ACTION: Final rule.

SUMMARY: The U.S. Fish and Wildlife Service (Service) determines the golden-cheeked warbler (*Dendroica chrysoparia*), to be an endangered species under the authority of the Endangered Species Act of 1973 (Act), as amended. This small, insectivorous bird nests exclusively in central Texas in mature Ashe juniper-mixed oak woodland or forest. The golden-cheeked warbler is threatened by habitat loss and fragmentation, which result from urban encroachment into the range of the warbler and widespread clearing of juniper as a range management practice. The threat of brown-headed cowbird parasitism increases in magnitude as habitat becomes more fragmented.

EFFECTIVE DATES: December 27, 1990.

ADDRESSES: The complete file for this rule will be available for inspection, by appointment, at the Ecological Services Field Office, U.S. Fish and Wildlife Service, Stadium Centre Building, 711

Stadium Drive East, suite 252, Arlington, Texas 76011.

FOR FURTHER INFORMATION CONTACT: Robert Short, Field Supervisor (see ADDRESSES at (817) 885-7830 or FTS 334-7830.

SUPPLEMENTARY INFORMATION:

Background

The golden-cheeked warbler is a member of the family Emberizidae. The species was discovered in Guatemala by Osbert Salvin in 1859, and described in 1860 by Philip Lutley Sclater and Salvin (Pulich 1976).

The golden-cheeked warbler is a small, insectivorous bird. In breeding plumage, the male has yellow cheeks outlined in black, with a black stripe extending through the eye to the side of the nape. Its crown, upper parts, throat, neck, upper breast, and streaking along the flanks are jet black. Wings are black with two distinct white bars, and the tail is blackish. The female is less colorful than the male. Her upper parts are yellowish-olive green, the wings and tail are grayish, and the cheeks are not as bright yellow as the male (Pulich 1976).

This species is the only endemic breeding bird of Texas; its entire nesting range occurs within the State (Wahl *et al.* 1990). It occurs in central Texas from Palo Pinto and Bosque Counties, south through the eastern and south-central portions of the Edwards Plateau (Shaw 1989). Pulich (1976) considered 31 counties in central Texas to be the nesting range of the golden-cheeked warbler. The breeding range of the golden-cheeked warbler coincides closely with the range of *Juniperus ashei* (Ashe juniper). The golden-cheeked warbler depends on Ashe juniper for nesting materials and substrate, and singing perches (Kroll 1980, Pulich 1976, Shaw 1989, Wahl *et al.* 1990). The golden-cheeked warbler uses strips of Ashe juniper bark to construct its nest. The strips of bark are bound together with cobwebs to form a compact little cup, which is then lined with fur and feathers. The nest is commonly located about 4.5 meters (15 feet) from the ground, although it varies from 1.5-10 meters (5-32 feet) (Pulich 1976).

Golden-cheeked warbler nesting habitat consists of Ashe juniper and various species of oak, such as *Quercus durandii breviloba* (scrub oak) and *Quercus buckleyi* = *Q. texana* (Texas oak). Oaks (especially deciduous species) apparently provide essential foraging substrate (Wahl *et al.* 1990). The golden-cheeked warbler feeds on whatever insects are available, including caterpillars, green lacewings, small green cicadas, katydids,

walkingsticks, flies, adult moths, and small butterflies. The birds also eat spiders (Pulich 1976).

The golden-cheeked warbler winters in Mexico, Guatemala, Honduras, and Nicaragua. It arrives in Texas on the breeding territory in mid-March. The golden-cheeked warbler returns to the same area year after year (Pulich 1976). The species has a narrow tolerance in habitat requirements. If habitat is destroyed, the birds that are dependent upon it are eliminated from the breeding population (Pulich 1976).

The presence of mature Ashe junipers is a major requirement for habitat of golden-cheeked warblers. Even nests in other tree species contain long strips of Ashe juniper bark (Pulich 1976). Ashe juniper trees begin sloughing bark near the base at about 20 years, and at the crown by 40 years (Kroll 1980). The golden-cheeked warbler is a mature forest dweller because of its dependence on several old-growth attributes of Ashe juniper-oak woodland, including nearly closed canopy, canopy height, and shredding bark of older junipers (Wahl *et al.* 1990).

The golden-cheeked warbler breeding season is mainly in April and May. Usually three or four eggs, rarely five, are laid. The eggs are white or creamy white with varying amounts of brown and less predominant shades of purple. The female incubates the eggs for 12 days. The male plays an active role in feeding and care of the young. Warblers spend much of their time in Ashe junipers during brooding and fledging (Beardmore, Texas A&M University, pers. comm.). The young leave the nest when 8 or 9 days old, but remain nearby in a loose family group while being cared for by both parents (Pulich 1976). Second nesting attempts are made only when the first nest is destroyed or deserted. In one year, 63 percent of the nests observed were deserted because of brown-headed cowbird parasitism (Pulich 1976).

Nest desertion is also caused by habitat destruction, rat snakes, storms, and possibly squirrel predation. Nesting success appears to be low for this species (Pulich 1976).

Pulich (1976) estimated the total adult golden-cheeked warbler population at 15,000-17,000 birds. Wahl *et al.* (1990) reported the median density for all study sites with golden-cheeked warblers to be 15 pairs/100 hectares (247 acres). It was estimated that in urban counties 19,400-55,750 hectares (47,900-137,750 acres) of suitable habitat for golden-cheeked warblers remain. In rural counties, an estimated 12,750-51,000 hectares (31,500-126,000 acres) of suitable golden-cheeked warbler habitat

remain. Based on the assumption that all suitable habitat is occupied, the carrying capacity of the available suitable habitat area would support between 4,800-16,000 pairs of golden-cheeked warblers at a density of 15 pairs/100 hectares (247 acres). Probably not all golden-cheeked warblers in the population are paired, however, and not all habitat is occupied (Wahl *et al.* 1990).

In the December 30, 1982, Review of Vertebrate Wildlife for Listing as Endangered or Threatened Species (47 FR 58454), the golden-cheeked warbler (*Dendroica chrysoparia*) was included as a Category 2 species. Category 2 comprises taxa for which information now in possession of the Service indicates that proposing to list as endangered or threatened is possibly appropriate, but for which conclusive data on biological vulnerability and threat are not currently available to support a proposed rule. In both the September 18, 1985, Review of Vertebrate Wildlife; Notice of Review (50 FR 37958), and the January 6, 1989, Animal Notice of Review (54 FR 554) the golden-cheeked warbler was retained in Category 2.

A petition was received from Timothy Jones by the Service on February 2, 1990, requesting that the Service prepare an emergency listing for the golden-cheeked warbler because the normal listing procedure could be inadequate to protect the bird and its habitat from imminent destruction from clearing and development. The Service treated this document as a petition to list the golden-cheeked warbler under the Endangered Species Act. The Service conducted an extensive review of the status of the golden-cheeked warbler and determined that an emergency posing a significant risk to the well-being of the golden-cheeked warbler existed. An emergency rule listing the species as endangered was published concurrent with a proposed rule on May 4, 1990 (55 FR 18844, 55 FR 18846). The emergency rule expires on December 31, 1990.

Because the emergency rule expires on December 31, 1990, it is necessary that this final rule be effective upon publication to provide for continued protection under the Act. A lapse in protection for the golden-cheeked warbler could result in irrevocable harm to the species if urban construction projects and other activities resume resulting in take of warblers and destruction of habitat. If protection were to lapse, serious law enforcement problems would arise because the Government would have to prove that allegedly unlawful takings did not occur during the period of the lapse.

Accordingly, the Service finds that good cause exists for this rule to take effect immediately upon publication.

Summary of Comments and Recommendations

In the May 4, 1990, proposed rule and associated notifications all interested parties were requested to submit factual reports or information that might contribute to the development of a final rule. The comment period originally closed on July 3, 1990, but was extended to July 9, 1990 (55 FR 23109), to allow individuals to submit comments after the public hearing. Appropriate State agencies, foreign governments, county governments, Federal agencies, scientific organizations, and other interested parties were contacted and requested to comment. Newspaper notices inviting public comment were published in the *Kerrville Daily Times* on June 5, 1990; the *Junction Eagle* on June 7, 1990; the *Dallas Times Herald* on June 8, 1990; the *Austin-American Statesman* on June 12, 1990; and the *San Antonio Express-News* on June 13, 1990. Comment letters were received from 171 entities and are discussed below.

Because the Service anticipated receiving at least one request for a public hearing, a decision was made to schedule one for June 27, 1990, in Austin, Texas. Interested parties were contacted and notified of the hearing, and notices of the hearing were published in the *Federal Register* on June 6, 1990 (55 FR 23109); the *Junction Eagle* on June 14, 1990; the *Austin-American Statesman* on June 19, 1990; the *Kerrville Daily Times* on June 20, 1990; the *Fort Worth Star-Telegram* on June 20, 1990; the *Waco Tribune Herald* on June 20, 1990; the *Dallas Times Herald* on June 20, 1990; and the *San Antonio Express-News* on June 21, 1990.

A total of about 200 people attended the hearing. A transcript of this hearing is available for inspection (see **ADDRESSES**). Comments received in the hearing are also summarized below.

A total of 171 comments were received: 82 supported the proposed listing; 12 opposed the proposed listing; and 77 either commented on information in the proposed rule but expressed neither support nor opposition, provided additional information, or were non-substantive or irrelevant to the proposed listing.

Additional oral or written statements were received from 62 parties at the hearing: 40 supported the proposed listing; 3 opposed the proposed listing; and 19 neither supported nor opposed the proposed listing, or were non-substantive or irrelevant to the proposed listing.

Comments were received from 3 foreign countries, 1 Federal and 2 State agencies, and over 200 private organizations, companies, and individuals. Some individuals or organizations submitted more than one comment, but they were only counted as one. Written comments and oral statements presented at the public hearing and received during the comment period are addressed in the following summary. Comments of a similar nature are grouped into a number of general issues. These issues, and the Service's response to each, are discussed below.

Issue 1: Some commenters stated that there is insufficient data to support the conclusions in the proposed rule. A commenter asked how a listing of the warbler based on empirical reports could comply with the Act.

Response: The status survey performed by Wahl *et al.* (1990) was the result of a two-year study on the golden-cheeked warbler. Studies done for the Balcones Canyonlands Habitat Conservation Plan include information pertinent to the status of the golden-cheeked warbler. A book by Pulich (1976) was the result of more than 10 years of field research on the golden-cheeked warbler. In addition, the Service has discussed the status of this species with several biologists in central Texas who performed extensive research on the species as part of their graduate studies. Although there are still biological questions on the golden-cheeked warbler, including behavior and minimum habitat patch size requirements, the Service believes that the available scientific information strongly supports the need to designate the golden-cheeked warbler as an endangered species. The data that led to that conclusion are presented and discussed in the "Summary of Factors Affecting the Species" section of this rule, particularly under Factor A (loss of habitat) and Factor E (parasitism by brown-headed cowbirds).

Data on the status of the golden-cheeked warbler were gathered in accordance with scientific principles. Widely accepted techniques were used to census birds and analyze vegetation. Newly available community mapping techniques to interpret satellite maps were used to determine a more recent population estimate for the warbler.

Issue 2: Some commenters questioned the validity of findings presented in the status report and questioned the use of satellite mapping that was at least ten years old.

Response: Service biologists have reviewed the status report and accepted it as valid and relevant scientific

information. The Service supports the findings in the status report, and believes that if more recent satellite maps had been used, habitat loss would have been even greater than reported.

Issue 3: Some commenters raised questions regarding the sufficiency or accuracy of the available data, including the variation in the population estimate calculated in the status report.

Response: The Service concludes, as detailed in the "Summary of Factors" section, that there is overwhelming evidence that the status of the golden-cheeked warbler far exceeds the standards required for it to receive protection under the Act. In addition, population size per se is not among the factors upon which listing determinations are based.

Issue 4: A commenter stated that there was too much emphasis on ecological factors and not enough on the species itself.

Response: The purpose of the Act is to "provide a means whereby the ecosystems upon which endangered species and threatened species depend may be conserved * * *." Consequently, it is appropriate that any determination to list a species emphasize ecological factors as well as the detailed species information presented in the Background section.

Issue 5: A commenter asked how golden-cheeked warbler habitat can be differentiated using satellite mapping.

Response: Satellite images (remote sensing) were used in conjunction with a Geographic Information System (GIS) to identify potential habitat of the golden-cheeked warbler. The imagery used for the warbler was collected by Landsat satellites in 1979 and 1981. These satellites collect data on reflected radiances from the earth's surface. Different vegetation types reflect radiation differently. These differences were used to distinguish habitat types. Data from sites known to be quality warbler habitat were examined to determine which particular reflectance data corresponded to warbler habitat. This information was used to identify all areas with similar reflectance. Field work was then done to sample particular sites on the ground. The purpose of this field work was to verify whether the classification of the satellite data had resulted in the identification of vegetational communities that were of the correct vegetational composition for golden-cheeked warblers. In the case of the golden-cheeked warbler this method was found to be very accurate in identifying potential warbler habitat.

Issue 6: Some commenters believe that the Service has singled out Travis

County for protective recovery measures, and has ignored other areas. The commenters stated that protecting Travis County will not protect birds in the rest of Texas and Central America.

Response: The Service agrees that range-wide recovery efforts will be necessary to protect the golden-cheeked warbler. However, Travis County has about 40 percent more golden-cheeked warbler habitat than any other county, and it is some of the best habitat because it is the least fragmented. Many acres of golden-cheeked warbler habitat have been cleared for development in the Austin area. Therefore, the Service has identified Travis County as an important area for golden-cheeked warbler recovery because of excellent remaining habitat and imminent threats.

Very little is known about the status of the golden-cheeked warbler in its winter range in Mexico and Central America. The Service has no enforcement authority on the bird's wintering grounds. If the warbler is listed as endangered, U.S. import or export would be allowed only under permit for scientific purposes, or to enhance propagation or survival of the species. Study of the golden-cheeked warbler on its wintering grounds to determine winter habitat, range, and threats has been identified by the Service as a recovery need.

Issue 7: Several commenters believed there was insufficient notice of the public hearing.

Response: The Service mailed over 700 letters to individuals announcing the public hearing. Letters were mailed to the County Manager in thirty-three counties, including every county within the warbler's range. Newspaper notices were published in Fort Worth, Austin, Waco, Kerrville, Junction, Dallas, and San Antonio. News releases were transmitted to both the UPI and AP wire services. A number of local papers and television news shows ran stories on the proposed listing of the golden-cheeked warbler, including details on the public hearing. The Service has fully complied with the procedural requirements of notification regulations.

Issue 8: Several commenters suggested that further studies and surveys should be conducted and evaluated before a final decision is made on whether or not to list the golden-cheeked warbler as endangered. One commenter suggested that the emergency rule be extended.

Response: Section 4 of the Act requires that listing determinations be made within one year of the proposal. The Service is required to make listing decisions solely on the basis of the best scientific and commercial data

available. The Service believes that available information fully supports this listing.

Issue 9: Several commenters mentioned the need to designate critical habitat for the golden-cheeked warbler.

Response: Critical habitat for this species remains undeterminable at this time. There is currently insufficient information on warbler habitat requirements to support delineation of critical habitat boundaries throughout summer range. Although some areas of warbler habitat have been identified by satellite mapping, all the specific elements of the habitat that are critical to the survival of the golden-cheeked warbler are not known. For example, information is lacking on habitat configuration, fragmentation, corridors, and minimum patch size. Some areas that appear to be suitable habitat from satellite mapping may not be usable by warblers. Biological studies, including one funded by the Service, are being conducted to address this issue. The Service has two years from the date of the original proposed rule (May 4, 1990) to determine what is critical habitat for this species and to designate critical habitat, unless it determines the designation is not prudent.

Issue 10: Some landowners stated that the listing would result in loss of their ability to develop their land and that this should be considered confiscation of privately-owned property without just compensation in violation of the Fifth Amendment.

Response: Listing of a species as endangered or threatened does not result in unconstitutional taking of property by itself because opportunities to obtain exceptions from the prohibitions of the Act are available. The Service is limited by the Act to considering only the best scientific and commercial data available in its deliberations, and cannot take into account economic concerns or non-biological factors during the listing process.

Issue 11: Many of the neutral or opposing comments claimed that listing the golden-cheeked warbler would have a negative effect on cedar clearing for brush control in central Texas.

Response: The section 4 listing procedure requires the Service to analyze biological factors to determine the scientific appropriations of classifying wildlife or plant species as endangered or threatened. Once that procedure is accomplished, other procedures exist, either through section 7 or section 10 of the Act, to analyze impacts posed by particular activities on endangered or threatened species. The Service is under a statutory obligation to

follow through with the listing process based on the best available scientific and commercial information regarding the status of this species as endangered or threatened.

Further, while some juniper clearing may be a violation of the Act, this does not apply to all juniper clearing. Large stands of 100 percent juniper are not suitable habitat for this bird, nor are old fields with only scattered young junipers. In areas that are currently in an early successional stage because of continuous brush clearing or cedar control practices in the area, the habitat is probably not suitable for golden-cheeked warblers, and continuation of such range management practices in these areas is not likely to impact the golden-cheeked warbler. Suitable golden-cheeked warbler habitat includes a mixture of Ashe-juniper trees at least 20 to 40 years old and various species of oak, and a nearly closed canopy. However, in cases where suitability of the habitat for golden-cheeked warblers is questionable, a determination should be made by a trained biologist. The Service is starting to work with such agencies as Texas Parks and Wildlife Department, Soil Conservation Service, and local extension agents to address this issue.

Issue 12: A commenter asked if it would be appropriate for the Service to prepare an Environmental Impact Statement on this action.

Response: As a matter of law, an Environmental Impact Statement is not required for listings under the Act (see section on National Environmental Policy Act at end of rule). Listing decisions are based solely upon biological grounds and not upon consideration of economic or socioeconomic factors.

Summary of Factors Affecting the Species

After a thorough review and consideration of all information available, the Service has determined that the golden-cheeked warbler should be classified as an endangered species. Procedures found at section 4(a)(1) of the Endangered Species Act (16 U.S.C. 1531 *et seq.*) and regulations (50 CFR part 424) promulgated to implement the listing provisions of the Act were followed. A species may be determined to be an endangered or threatened species due to one or more of the five factors described in section 4(a)(1). These factors and their application to the golden-cheeked warbler (*Dendroica chrysoparia*) are as follows:

A. The present or threatened destruction, modification, or curtailment

of its habitat or range. A juniper or "cedar" eradication program (including Ashe juniper) was implemented in Texas in 1948, and from the 1950's to the 1970's, about 50 percent of the juniper acreage was cleared for pasture improvement and urbanization. The central and western range of the warbler has been decimated by clearing of mature Ashe junipers. At one time, juniper was used for aromatic oils, fuel, and fence posts, but more recently it is usually burned on the cleared site. Several counties that had been golden-cheeked warbler habitat, including portions of Gillespie County, all of Mason County, and others, no longer contained suitable habitat by the 1970's (Pulich 1976).

Widespread clearing of juniper as a range management practice and urban encroachment continue to threaten the golden-cheeked warbler and its habitat. Loss of woody cover through clearing reduces the total habitat acreage available to the golden-cheeked warbler and causes fragmentation of larger patches into smaller ones (Wahl *et al.* 1990). Larger areas of continuous cover are often subdivided and fragmented, especially near expanding population centers such as Austin, San Antonio, and the Austin-San Antonio corridor. Because of the growth and development in this corridor, the greatest rate of golden-cheeked warbler habitat loss has occurred in the southern and eastern portions of the Edwards Plateau (Wahl *et al.* 1990).

Junipers often are removed from private and public lands for enhancement of game populations, range improvement, and enhancement of viewsheds. Removal of junipers from old-growth, Ashe juniper-mixed oak woodlands has two negative effects on the quality of warbler habitat: (1) It removes sources of required nesting material, and (2) it reduces total canopy cover, often to the extent that the stand will no longer support warblers. Clearing junipers to benefit game species such as deer and turkey that occupy mid-successional habitats may adversely affect the golden-cheeked warbler, because it eliminates late successional communities needed by the golden-cheeked warbler and other mature growth species.

Wahl *et al.* (1990) estimated the area of potentially suitable habitat remaining for the golden-cheeked warbler across its entire breeding range. The areas sampled by Wahl *et al.* (1990) experienced loss of 15-45 percent of warbler habitat over about 10 years. The rate of habitat loss is greater in areas subject to urban growth and real estate

development, particularly in Travis County. Western Travis County experienced a 40 percent loss in warbler habitat over a 10-year period (4 percent loss/year) and only 16 percent of the county was covered by warbler habitat at the start of the 10-year period (Shaw 1989, Wahl *et al.* 1990). The urban corridor between Austin and San Antonio experienced a 4.4 percent annual loss of golden-cheeked warbler habitat over a 10-year period. Most breeding golden-cheeked warblers inhabit the rapidly changing urban counties on the eastern Edwards Plateau. In the northern portion of the golden-cheeked warbler's range, there was a 15 percent loss of habitat over an 8-year interval. In rural areas, the rate of habitat loss has been steady at about 2-3 percent/year for the last 20 years (Wahl *et al.* 1990). At present rates, the estimated maximum carrying capacity of the habitat will be 2,266-7,527 pairs of golden-cheeked warblers by the year 2000, a reduction in population size of more than 50 percent. Any increase in rates of habitat loss from human effects or other causes will reduce the population further (Wahl *et al.* 1990).

Consistent population growth in the Edwards Plateau region of Texas is a major threat to the golden-cheeked warbler. Loss of warbler habitat caused by human land uses generally results from increasing population pressures (Bunch, on behalf of the Travis Audubon Society and Austin Sierra Club, *in litt.*). An estimated 67 percent of the breeding warblers inhabit rapidly changing urban counties on the eastern Edwards Plateau, including Bexar, Comal, Hays, Travis, and Williamson (Wahl *et al.* 1990; Bunch, *in litt.*). These counties contain large cities such as Austin and San Antonio, and smaller cities such as San Marcos and New Braunfels, all of which are experiencing significant population growth. Estimates of population growth from 1980 to 2000 in the eastern counties of the warbler's range are as follows: Bexar County—988,800 to 1,360,669; Comal County—36,446 to 76,776; Hays County—40,594 to 74,780; Travis County—419,573 to 712,712; Williamson County—76,521 to 251,249 (Texas A&M University 1988). From 1980 to 1988, Bexar County's population grew by 20.3 percent. During the same time, the U.S. population grew by 8.5 percent (Greater San Antonio Chamber of Commerce 1989). In Hays County, the population increased 47 percent from 1970 to 1980, and 66 percent from 1980 to 1989 (Hays County Water Development Board 1989).

Population growth and resulting loss and fragmentation of warbler habitat in

these counties are major threats to the largest contiguous areas of preferred warbler habitat. Population projections show that human population growth will likely continue and that the growth is largely independent of the economic boom of the late 1970's and early 1980's. Factors that contribute to greater than expected population growth in these counties include the scenic beauty of the Balcones Escarpment, the continued "sunbelt" development despite an economic recession, and proximity to (and immigration from) Mexico.

Highway construction has destroyed warbler habitat in Texas, and planned future construction would destroy and fragment additional warbler habitat. From 1989 to 2009, the number of lane miles in the State is projected to increase from 183,495 to 241,363, and the number of vehicles registered is projected to increase from 13,970,000 to 17,183,100. Over the next twenty years, the Texas State Department of Highways and Transportation (1989) plans to spend over sixty billion dollars on highway construction. Several commenters provided information on specific proposed highway projects that, if constructed, would destroy warbler habitat.

Numerous proposed reservoirs and water delivery systems will destroy or fragment thousands of acres of warbler habitat if constructed as planned. Of 44 reservoirs planned in Texas and analyzed by Frye and Curtis (1990), 17 will have a potential impact on warbler habitat. One of the proposed reservoirs would destroy over 1200 hectares (3000 acres) of oak-juniper woods (Frye and Curtis 1990).

Certain proposed private developments would also destroy and fragment warbler habitat. Interstate 35 connects San Antonio, New Braunfels, San Marcos, and Austin, and parallels the eastern edge of the warbler's range. It has been designated as the Greater San Antonio-Austin Corridor by the local business community, and intense development is planned there. Commenters provided descriptions of private developments that threaten several thousand acres of remaining warbler habitat. For example, the Woodland Hills Development of Cielo Vista properties surrounds Friedrich Wilderness Park near San Antonio. There are plans for 520 hectares (1,300 acres) of dense housing and suburban development, including single family homes, garden homes, apartments, offices, hotels, and other commercial enterprises, in the midst of excellent warbler habitat (Schnapf, Bexar Audubon Society, *in transcript*).

The Travis Audubon Society reported that over the last 10 years, they have observed over 60 development projects on a total of over 8900 hectares (22,000 acres) in western Travis County that were submitted to the City of Austin for approval. In the last year, they observed additional development projects that were submitted involving 2150 hectares (5,300 acres) with significant amounts of warbler habitat (Hale, Travis Audubon Society, in transcript). They also stated that as of July 1990, there were at least 72 known development projects in western Travis County that had been brought to the City of Austin for approval. Of the project areas known to contain warbler habitat, a total of 3700 hectares (9,100 acres) out of 12,000 hectares (27,500 acres) (33 percent) was estimated to be warbler habitat (Hale, *in litt.*).

At Dead Man's Creek near Austin, there are eight warbler territories. The area has been purchased by a group that plans to develop 76 hectares (190 acres) with 38 lots and a golf course. The area around the mouth of the creek was cleared a year ago for development (Hale, in transcript). The Wild Basin Wilderness Preserve west of Austin once had a viable population of warblers. The Preserve is now surrounded by development, and the warbler population has been virtually lost (Barth, University of Texas at Austin, *in litt.*).

Several local chapters of the National Audubon Society mentioned during the public hearing and in comment letters that warblers had become much more difficult to find in areas with increasing development, and that population declines were evident.

The warbler's winter habitat in pine-oak forest highlands of southern Mexico, Guatemala, Honduras, and Nicaragua is experiencing similar rates of loss and degradation. From 1970 to 1980, 11 percent, 17 percent, and 30 percent of the remaining forest was lost in Guatemala, Honduras, and Nicaragua, respectively. Current annual loss of what forest was left in 1983 is about 2.3 percent in Guatemala, 3.6 percent in Honduras, and 3.7 percent in Nicaragua. Human populations of Guatemala and Honduras are expected to double by 2008, and in Nicaragua by 2006. If current trends of forest loss continue, most of the highland forests of Mexico and Central America will be gone by 2008 (Lyons, in transcript). The countries of Guatemala and Honduras mentioned deforestation as a major threat to the warbler in their country. No golden-cheeked warblers have been seen in Belize since 1986.

B. Over-utilization for commercial, recreational, scientific, or educational purposes. None known at this time.

C. Disease or predation. Several species have been named as nest predators for golden-cheeked warblers, including scrub jays, blue jays, crows, grackles, feral cats and dogs, rat snakes, raccoons, opossums, and squirrels (Barth, *in litt.*, Pease and Gingerich 1989, Pulich 1976). The difficulty in observing golden-cheeked warbler nests makes it difficult to assess the extent of nest predation (Wahl *et al.* 1990). However, Pease and Gingerich (1989) discuss increased nest predation rates in edge habitats and state that feral cats and dogs, fire ants, and scrub jays are likely to be more abundant in urban than rural habitats.

Fire ants could become a threat to young golden-cheeked warblers. Fire ants have increased at an Audubon Sanctuary in Travis County (Meyers, Travis Audubon Wildlife Sanctuary, in transcript). Pulich (*in litt.*) has observed an extremely high number of fire ant mounds in golden-cheeked warbler habitat in Travis County. He also has observed fully feathered young Eastern bluebirds reduced to feathers and bones by fire ants, and suggested that it could happen to warblers as well.

D. The inadequacy of existing regulatory mechanisms. The golden-cheeked warbler is subject to the Migratory Bird Treaty Act (16 U.S.C. 703 *et seq.*). Under this Act, a Federal permit is required to take, capture, band, or otherwise handle the nest, eggs, or individuals of migratory bird species.

The Texas Parks and Wildlife Department lists the golden-cheeked warbler as a threatened species. Departmental regulations make it illegal to shoot or physically harm, possess, sell, or transport golden-cheeked warblers without a permit. However, there is not provision for protection of habitat in these regulations. The City of Austin has limited power to protect warbler habitat. Listing this species under the Act would provide additional protection, especially for habitat, and encourage active management through the "Available Conservation Measures" discussed below.

E. Other natural or manmade factors affecting its continued existence. Habitat destruction that causes habitat fragmentation is an immediate threat to the golden-cheeked warbler. Habitat fragmentation increases the degree of isolation between patches of suitable habitat and breaks available habitat into smaller pieces (Pease and Gingerich 1989). Habitat quality is affected by habitat patch size, distance between

patches, configuration of patches (ratio of edge to area), corridor availability, and adjacent land use (Shaw 1989). Fragmentation in urban counties has limited the number of what may be suitable size habitat patches to between 16-46 percent of the total vegetation structurally suitable for warbler use, and in rural areas the values range from 11-44 percent (Wahl *et al.* 1990). In Travis County, less than 47 percent of the total golden-cheeked warbler habitat is in patches of 50 hectares (124 acres) or more (Wahl *et al.* 1990). Whether this represents what is minimum habitat patch size is uncertain.

An increased ratio of edge/area in small patches of suitable habitat has an impact on breeding bird species because of increased levels of nest predation, brood parasitism, and interspecific competition in edge habitats (Pease and Gingerich 1989).

Brown-headed cowbirds are abundant throughout the golden-cheeked warbler's breeding range, and threaten other species often associated with warblers. Cowbirds have experienced an enormous range extension and population increase as a result of land clearing for agriculture and livestock raising. Habitat patch size and proximity to high cowbird densities (e.g., near livestock, corrals, urban areas, fields) are the primary determinants of degree of threat to the warblers from cowbirds (Wahl *et al.* 1990). The effects of cowbird parasitism increase with increasing edge or habitat fragmentation. As an interior forest bird, the warbler has been increasingly exposed to cowbird parasitism because of habitat fragmentation. Golden-cheeked warblers occasionally are able to produce at least one fledgling from a parasitized nest. However, as the golden-cheeked warbler population continues to decline and habitat fragmentation increases, the relative threat of cowbird parasitism is likely to increase (Wahl *et al.* 1990).

The Fort Worth Audubon Society observed a decline in the nesting population of warblers at Dinosaur Valley State Park in Somervell County. From 1984 to 1990, the number of warblers recorded during a bird checklist project went from a high of 12 in 1985 to a low of 3 in 1988 and 4 in 1990. Because the nesting habitat was intact, they suggested cowbird parasitism as the cause of the decline (Haynie and Risdon, Fort Worth Audubon Society, *in litt.*).

Tazik (Department of the Army, *in litt.*) reported that Fort Hood in Killeen, Texas, has substantial warbler habitat, and also has a substantial number of

cowbirds during the breeding season. Studies on black-capped vireo nests found parasitism rates of over 90 percent. Tazik (*in litt.*) suggested that warbler nests might experience similarly high rates of parasitism, and that cowbird control efforts in use on the Fort will be of limited value to the warbler.

In the mature Ashe juniper-mixed oak forests of the Balcones Canyonland sub-region of the Edwards Plateau, deciduous species generally are not well represented within the younger age classes. In most of these areas, long-term successional changes are leading toward evergreen woodlands dominated by Ashe juniper. These areas are not suitable for golden-cheeked warblers because they lack deciduous oaks for foraging. Lack of reproduction of deciduous trees may be caused by browsing by unnaturally high populations of white-tailed deer, introduced feral ungulates, including feral and domestic goats, or by an oak wilt fungus (*Ceratocystis fagacearum*) that kills the trees (Wahl *et al.* 1990). The U.S. Forest Service has conducted a cooperative oak wilt suppression project for the last two years, which has included the following central Texas counties. Bandera, Bexar, Erath, Gillespie, Hays, Hood, Kendall, Kerr, Tarrant, and Travis (Alcock, U.S. Forest Service, *in litt.*). Suppression methods for oak wilt are aimed at 1) eliminating local spread of the fungus to adjacent healthy trees in individual infection centers, and 2) reducing opportunities for long-distance spread of the fungus by insect vectors (Miles, Texas Forest Service, *in litt.*). The project will run for at least another two years.

The Service has carefully assessed the best scientific and commercial information available regarding the past, present, and future threats faced by this species in determining to make this rule final. Based on this evaluation, the preferred action is to list the golden-cheeked warbler as endangered. The species has experienced severe habitat declines throughout its range. Because of its narrow habitat requirements, and its habit of returning to the same area every year, habitat destruction leads to elimination of populations. Urban development is accelerating in the most important part of the golden-cheeked warbler's range. This species is vulnerable to increased threats of nest parasitism and predation as habitat becomes more fragmented. Threatened status would not accurately reflect the population decline and imminent threats to this species. Critical habitat is not

being proposed for the reasons discussed below.

Critical Habitat

Section 4(a)(3) of the Act requires, to the maximum extent prudent and determinable, that the Secretary designate critical habitat at the time a species is determined to be endangered or threatened. The Service finds that designation of critical habitat is not presently determinable for this species. The Service's regulations (50 CFR 424.12(a)(2)) state that critical habitat is not determinable if information sufficient to perform required analyses of the impacts of the designation is lacking or if the biological needs of the species are not sufficiently well known to permit identification of the area as critical habitat. Much of the golden-cheeked warbler's habitat has been fragmented by land clearing activities. Some of the remaining habitat patches may be too small or isolated to support viable subpopulations of the species. The minimum patch size requirements of the golden-cheeked warbler are not known at this time. The Service is presently funding a study to determine minimum patch size requirements for this species. The Service must designate critical habitat within two years of the publication date of the original proposed rule (May 4, 1990), unless it determines designation is not prudent.

Available Conservation Measures

Conservation measures provided to species listed as endangered or threatened under the Endangered Species Act include recognition, recovery actions, requirements for Federal protection, and prohibitions against certain practices. Recognition through listing encourages and results in conservation actions by Federal, State, and private agencies, groups, and individuals. The Endangered Species Act provides for possible land acquisition and cooperation with the States and requires that recovery actions be carried out for all listed species. The protection required of Federal agencies and the prohibitions against taking and harm are discussed, in part, below.

Section 7(a) of the Act, as amended, requires Federal agencies to evaluate their actions with respect to any species that is proposed or listed as endangered or threatened and with respect to its critical habitat, if any is being designated. Regulations implementing this interagency cooperation provision of the Act are codified at 50 CFR part 402. Section 7(a)(2) requires Federal agencies to ensure that activities they authorize, fund, or carry out are not

likely to jeopardize the continued existence of a listed species or to destroy or adversely modify its critical habitat. If a Federal action may affect a listed species or its critical habitat, the responsible Federal agency must enter into formal consultation with the Service. Actions authorized, funded, or carried out by the Federal Highway Administration that may affect the golden-cheeked warbler, such as clearing of golden-cheeked warbler habitat, and activities on military installations that contain golden-cheeked warbler habitat are subject to section 7 consultation. Programs sponsored by the Soil Conservation Service that encourage landowners to clear warbler habitat are also subject to section 7 consultation.

The Act and implementing regulations found at 50 CFR 17.21 set forth a series of general prohibitions and exceptions that apply to all endangered wildlife. These prohibitions, in part, make it illegal for any person subject to the jurisdiction of the United States to take (includes harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, or collect, or to attempt any of these), import or export, ship in interstate commerce in the course of a commercial activity, or sell or offer for sale in interstate or foreign commerce any listed species. It also is illegal to possess, sell, deliver, carry, transport, or ship any such wildlife that has been taken illegally. Certain exceptions apply to agents of the Service and State conservation agencies.

Permits may be issued to carry out otherwise prohibited activities involving endangered wildlife species under certain circumstances. Regulations governing permits are at 50 CFR 17.22 and 17.23. Such permits are available for scientific purposes, to enhance the propagation or survival of the species, and/or for incidental take in connection with otherwise lawful activities.

National Environmental Policy Act

The Fish and Wildlife Service has determined that an Environmental Assessment, as defined under the authority of the National Environmental Policy Act of 1969, need not be prepared in connection with regulations adopted pursuant to section 4(a) of the Endangered Species Act of 1973, as amended. A notice outlining the Service's reasons for this determination was published in the *Federal Register* on October 25, 1983 (48 FR 49244).

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Author

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List of Subjects in 50 CFR Part 17

Endangered and threatened species, Exports, Imports, Reporting and record-

keeping requirements, and Transportation.

Regulation Promulgation

PART 17—[AMENDED]

Accordingly, part 17, subchapter B of chapter I, title 50 of the Code of Federal Regulations, is amended as set forth below:

1. The authority citation for part 17 continues to read as follows:

Authority: 16 U.S.C. 1361-1407; 16 U.S.C. 1531-1544; 16 U.S.C. 4201-4245; Pub. L. 99-625, 100 Stat. 3500; unless otherwise noted.

2. Amend § 17.11(h) by adding the following, in alphabetical order under "Birds," to the List of Endangered and Threatened Wildlife:

§ 17.11 Endangered and threatened wildlife.

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(h) * * *

Species		Historic range	Vertebrate population where endangered or threatened	Status	When listed	Critical habitat	Special rules
Common name	Scientific name						
BIRDS							
Warbler, golden-cheeked	<i>Dendroica chrysoparia</i>	Entire	U.S.A. (TX), Mexico, Guatemala, Honduras, Nicaragua, Belize.	E	387E, 411	NA	NA

Dated: December 19, 1990.
 Richard N. Smith,
 Acting Director, Fish and Wildlife Service.
 [FR Doc. 90-30257 Filed 12-26-90; 8:45 am]
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