

ESTABLISHMENT AND DISPERSAL OF THE EURASIAN COLLARED-DOVE IN FLORIDA

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Abstract.—The nonindigenous Eurasian Collared-Dove (*Streptopelia decaocto*) most likely invaded southeastern Florida from the Bahamas in the early 1980s and had established a breeding population in Dade County by 1982. In the decade after its arrival in Florida, the Eurasian Collared-Dove dispersed northward, initially along the Atlantic and Gulf coasts, and established local populations throughout the state. By 1996, the species was recorded at 46 (82%) of 56 localities surveyed on the Christmas Bird Count in Florida. The strong dispersal capability of the Eurasian Collared-Dove, which was documented during its colonization of Europe in the mid-1900s, suggests that rapid colonization of North America by the species is highly probable. Populations established in Texas and North Carolina during the early 1990s may be products of dispersal of doves from Florida. The species presents two potential biological threats to native avifauna: competition for resources and transmission of diseases.

ESTABLECIMIENTO Y COLONIZACIÓN DE LA TÓRTOLA EUROASIÁTICA (*STREPTOPELIA DECAOCTO*) EN LA FLORIDA

Sinopsis.—La tórtola euroasiática (*Streptopelia decaocto*), foránea a la Florida, probablemente invadió el sureste del estado a través de las Bahamas a principios de la década de 1980, estableciendo una colonia reproductiva en el Condado de Dade hacia el año 1982. Durante la década posterior, la tórtola euroasiática se propagó hacia el norte del estado, primero por las costas del Atlántico y del Golfo de México, dispersándose más tarde por el resto de la Florida. Para el año 1996, la especie ya había colonizado 46 (82%) de las 56 localidades reportadas en los Conteos Navideños de Pájaros en la Florida. Las poblaciones establecidas en Texas y Carolina del Norte a principios de la década de 1990 posiblemente tuvieron su origen en la Florida. La gran capacidad de difusión de esta paloma, documentada durante su propagación en Europa a mediados del siglo XX, sugiere que puede difundirse rápidamente por toda la América del Norte. La tórtola euroasiática representa dos amenazas biológicas potenciales a la avifauna nativa: la competencia por los recursos y la transmisión de enfermedades avícolas.

The Eurasian Collared-Dove (*Streptopelia decaocto*) recently has invaded the New World, as was predicted by Hudson (1972). The North American invasion most likely originated from a stock of Eurasian Collared-Doves that escaped from captivity in the Bahamas in 1974 and subsequently established a wild population (Smith 1987). The species probably arrived in Florida in the early 1980s (Smith 1987). The precise date of its arrival is uncertain due to the confusion in identity between the Eurasian Collared-Dove and the similar Ringed Turtle-Dove (*S. risoria*), which is a domesticated variety of the African Collared-Dove (*S. roseogrisea*). Until the Florida population of collared-doves was confirmed as *S. decaocto decaocto* by Smith and Kale (1986), all populations were believed to be *S. risoria*. Thus, the Eurasian Collared-Dove may have reached Florida as early as the late 1970s.

The Eurasian Collared-Dove is one of the most successful biological invaders among terrestrial vertebrates (Fisher 1953, Gorski 1993). The European range of the species was restricted to Turkey and the Balkans in the early 1930s (Hudson 1965). Over the next 30 years, the Eurasian Collared-Dove expanded its range to encompass most of Europe. Notably, the species colonized most of the land mass of the British Isles, and had surpassed the native Turtledove (*Streptopelia turtur*) in abundance in many areas of England, Scotland, and Ireland within the 10-yr period, 1955–1964 (Hudson 1965). In some areas of the British Isles, breeding densities reached about 20 pairs per km² (Hudson 1972). Invasions of Iceland, Portugal, and Egypt had occurred by 1971, 1974, and 1979, respectively (Cramp 1985). This phenomenal range expansion was facilitated by the ability of individual birds to disperse hundreds of kilometers in a single movement despite formidable geographic barriers such as mountain ranges and expanses of water (Fisher 1953, Kasperek 1996), and by the ability of dispersing birds to become viable breeders within 2 yr (Fisher 1953).

Although the biological basis underlying the range expansion of the Eurasian Collared-Dove in Europe is not well understood, possible factors include mutation of a favorable gene, successful adaptation to human-dominated habitats, and a high reproductive potential (Mayr 1963, Gibbons et al. 1993). With no obvious constraints on dispersal, the Eurasian Collared-Dove has the potential to spread across North America as it did Europe. This paper documents the dispersal of the Eurasian Collared-Dove in Florida from the mid-1980s to 1990s, compares the patterns of invasion of the species in Europe and Florida, and speculates as to its potential spread in North America.

METHODS

Data on the status of the Eurasian Collared-Dove in Florida were derived principally from the Christmas Bird Count (CBC), which is organized and published annually by the National Audubon Society. A bias may have existed in the CBC in the early 1980s due to the possible misidentification of the Eurasian Collared-Dove as the Ringed Turtle-Dove, both of which are found in Florida. The relative abundance of Eurasian Collared-Doves recorded at all the localities for each year was measured as the number of individuals counted divided by the total party hours. The information was used to compile the chronology and rate of colonization, from the time of the first record in 1986 through 1996.

RESULTS

The chronology of the invasion of Florida by Eurasian Collared-Dove is documented by 2-year intervals for the period 1986–1996. The numbers of CBC localities where the Eurasian Collared-Dove was recorded in Florida increased from 2 in 1986 to 46 in 1996 (Fig. 1). Concurrently, the relative abundance of the Eurasian Collared-Dove, as measured by the

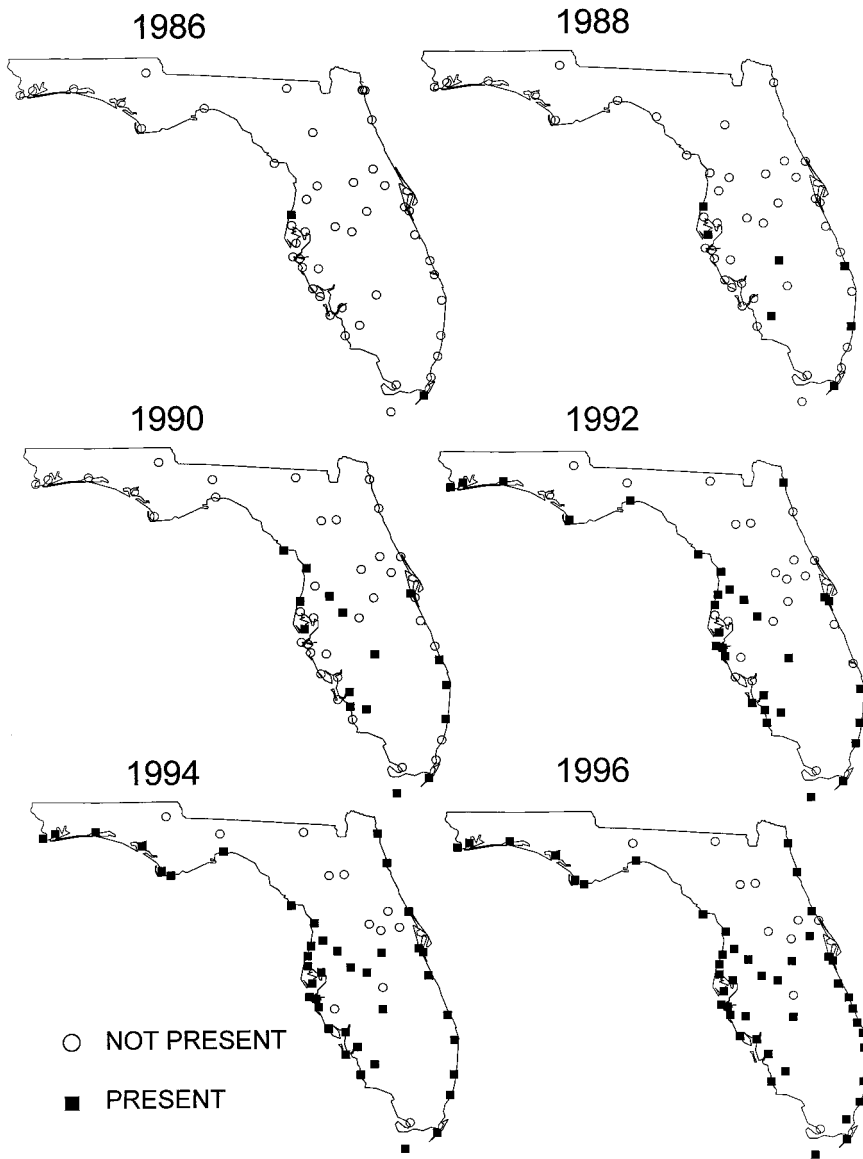


FIGURE 1. Geographic distribution of Eurasian Collared-Doves in Florida derived from the Christmas Bird Count (CBC) by 2-year intervals, 1986–1996. Solid squares denote CBC sites where the species was observed; open circles denote CBC sites where the species was not observed.

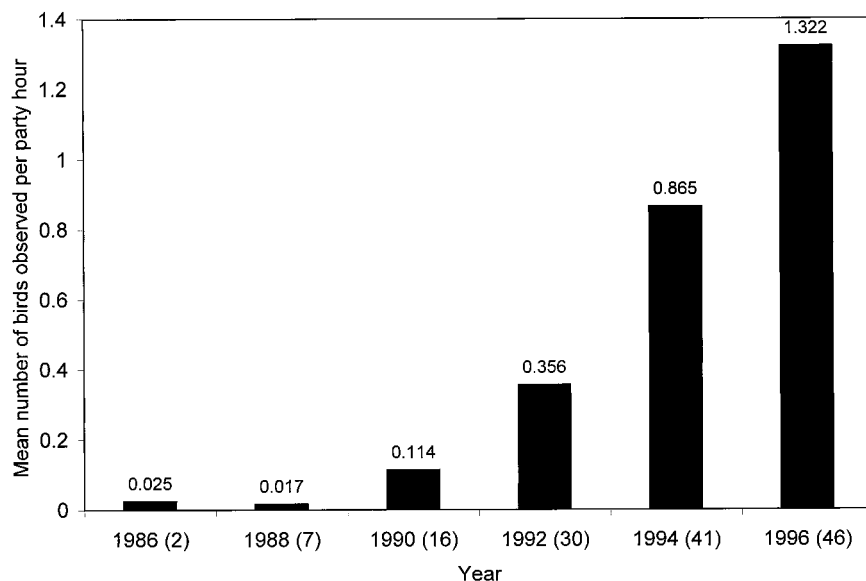


FIGURE 2. Relative abundance of Eurasian-Collared Doves in Florida depicted by the mean number of birds per party hour; the number within parentheses indicates the number of CBC localities where Eurasian Collared-Doves were sighted.

total number of birds recorded per CBC party-hour at localities where the species was sighted, increased from 0.025 in 1986 to 1.322 in 1996 (Fig. 2). This documented spread of the species is conservative because it is based only on sites where the CBC was conducted.

In 1986, the year that the species was first identified correctly as *Streptopelia decaocto*, it was recorded at 2 (4%) of 48 CBC sites: Key Largo Plantation Key and New Port Richey.

In 1988, Eurasian Collared-Doves were recorded at 7 (14%) of 50 CBC sites. Three of the new sites were located in coastal areas near already established sites in south Florida. Two others were located inland near Lake Placid and Corkscrew Swamp Sanctuary.

In 1990, the Eurasian Collared-Dove was recorded at 16 (31%) of 52 CBC sites. The dove invaded peninsular Florida as far north as Cedar Key on the Gulf coast and Merritt Island National Wildlife Refuge on the Atlantic coast.

By 1992, Eurasian Collared-Doves were observed at 30 (58%) of the 52 CBC localities, including three new sites in the Panhandle. The westernmost CBC reporting the species was at Perdido Bay on the Florida-Alabama border and the northernmost near Jacksonville on the Atlantic coast.

In 1994, the Eurasian Collared-Dove was present at 41 (77%) of the 53 CBC localities. The two largest concentrations, numbering 750–1000 individuals, were located at St. Petersburg and on Key Largo–Plantation Key.

In 1996, the Eurasian Collared-Dove was recorded on 46 (82%) of 56 CBCs. Three of five new localities were located on river systems (Myakka, Wekiva, and Econlockhatchee).

DISCUSSION

The Eurasian Collared-Dove dispersed northwesterly throughout both peninsular and panhandle Florida in little more than a decade following its arrival in the early 1980s. In the early 1990s, the largest established breeding populations were located in southeastern Florida (Kale et al. 1992), where the initial invasion occurred. Expansion initially was most prevalent along both the Gulf and Atlantic coasts, followed by “backfilling” of inland areas. This pattern of dispersal, described as “jump” dispersal and subsequent population coalescence (Pielou 1979), was similar to that observed for the species during its invasion of Europe (Hudson 1972).

Many of the factors associated with the rapid range expansion of the Eurasian Collared-Dove in Europe may have contributed to the rapid dispersal of the species in Florida: genetic alteration, emigration unrelated to population density, high adaptability to human inhabitation, broad diet, and high reproductive output. Mayr (1950) speculated that the expansion in Europe was initiated by a genetic alteration of peripheral populations; this same mutation also may be present in Florida’s source population. Dispersal of the species from the Balkans/western Turkey (Kasperek 1996) and from southern Florida occurred when population abundance was low, which rules out density-dependent dispersal.

Successful colonization by nonindigenous species seems to be correlated with the tolerance of human presence (Temple 1992). In Europe, Eurasian Collared-Doves are invariably associated with human settlements, both urban and rural, where food is plentiful (Coombs et al. 1981, Gorski 1993). The species is now substantially dependent on humans for food resources in its native range of India (Cramp 1985). The rapid expansion of the species in Florida appears to have been accelerated by its broad diet (Goodwin 1970), especially when that diet is augmented by food associated with human habitation (Stevenson and Anderson 1994). Also, the availability of ample food may be the most important factor affecting the timing of the Eurasian Collared-Dove’s breeding season (Robertson 1990). In Florida, mild climatic conditions and a year-round food supply in areas of human habitation allows the Eurasian Collared-Dove, a multiple-brooder (Robertson 1990), the opportunity to enhance annual productivity. Winter breeding of Eurasian Collared-Doves has been documented in Florida (McNair 1997). If food is abundant, Eurasian Collared-Doves frequently will start a new clutch while still attending dependent fledglings, and sometimes while young still are in the nest (Robertson 1990).

Given its historic range expansion throughout Europe (Fisher 1953, Hudson 1965) and its rapid invasion of Florida (Smith 1987, Hengeveld 1993, this study), the Eurasian Collared-Dove probably will colonize all of

North America within the next few decades. Breeding populations already have been reported in disjunct locations such as Texas (Greg Lasley, pers. comm.), Montana (Terry McEneaney, pers. comm.) and Illinois (Bohlen 1998), although it is not known whether these populations are a product of dispersal from Florida or local releases.

Once established in the wild, nonindigenous birds become part of the local biotic community, and although sometimes benign in their effects (Roughgarden 1986), usually exert both economic and biological impacts (Temple 1992). Observed interactions between Eurasian Collared-Doves and other species in Florida, such as the Mourning Dove (*Zenaida macroura*), White-Winged Dove (*Zenaida asiatica*), Northern Cardinal (*Cardinalis cardinalis*), and Painted Bunting (*Passerina ciris*), suggest that the Eurasian Collared-Dove is behaviorally dominant (pers. obs.). The Mourning Dove, which is an important game species in the United States (e.g., approximately 2.4 million hunters harvested 46 million doves annually during the 1980s; Sadler 1993), may be negatively affected by competition with the Eurasian Collared-Dove. Other North American columbids that may be affected are the White-Winged Dove, Common Ground Dove (*Columbina passerina*) and Band-Tailed Pigeon (*Columba fasciata*). However, Moulton and Pimm (1983) suggested that it is difficult to predict which species might interact when nonindigenous species are introduced.

It has been documented that the Eurasian Collared-Dove has been infected with *Trichomonas gallinae* in Europe (Cornelius 1972) and in Florida (M. Spalding, unpubl. data), which is perhaps the most important disease agent with respect of the health of Mourning Dove populations throughout North America (Conti 1993). The Eurasian Collared-Dove has been reported to carry pathogenic strains of *T. gallinae* (Cornelius 1972). The potential for high densities of breeding Eurasian Collared-Doves may enhance the possibility of disease transmission to native columbids. Further studies should be conducted to determine if the Eurasian Collared-Dove will exacerbate the probability of disease epizootics caused by virulent strains of this protozoan in the indigenous Mourning Dove.

In summary, the Eurasian Collared-Dove, as reflected by the documented invasions of Europe and Florida, probably will colonize much of North America within the next few decades. The species presents two potential biological threats: competition for resources with native avifauna, and transmission of diseases. The invasion of North America by the Eurasian Collared-Dove demands attention to potential primary, secondary and tertiary impacts on native avifauna.

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