

*This rare dove is confined to Grenada, West Indies, where there is an extremely vulnerable and much reduced population of about 100 individuals that is still threatened by habitat alteration and destruction.*

**DISTRIBUTION** The Grenada Dove, here treated as a full species (following Blockstein and Hardy 1989, and *contra* AOU 1983), is endemic to the island of Grenada, West Indies, where records come from two disjunct areas (see distribution maps and historical records listed in Blockstein 1988, 1991). In the north-east, the species was historically reported from: Green Island (Bond 1956b); near Levera Pond (Blockstein 1988, Johnson 1988); and from “islets just off the coast” (Blockstein 1988), possibly referring to the Levera archipelago. However, most records come from the west coast and the south-west peninsula, the localities involved including: (on the west coast) Halifax Harbour (the lower hillsides, including those along the Salle and Douce rivers: Blockstein 1991); Beausejour estate (Blockstein 1991); Fontenoy (Lawrence 1884); (and on the south-west peninsula) on the golf course between Grand Anse and Saint Georges (Johnson 1988); Mont Tout (Blockstein 1988); Petit Bouc (Blockstein 1988); Mount Hartman estate, whence come the majority of records (Blockstein 1988, 1991: see Remarks); Grand Anse estate (Blockstein 1988); Point Salines (Blockstein 1988); and Glover’s Island, where the species was collected in May 1886 (Wells 1886).

**POPULATION** Until the late 1980s, the status of this species was essentially unknown owing to the paucity of records (e.g. there were no records between 1905 and 1929, and then none again until 1961; see Blockstein 1988). The Grenada Dove has long been considered rare (see Blockstein 1991), although Clark (1905) suggested that it was very numerous on some islets. In 1987, 49 singing males were located in a 500 ha area in the south-east corner of the south-west peninsula (Blockstein 1988). The majority of these birds (80%) were on the hills of the Mount Hartman estate and adjacent government farm, the others being at Petit Bouc, Mont Tout, and Grand Anse estate; the total population was estimated at c.100 individuals (Blockstein 1988). Between December 1989 and January 1990, 25 to 30 singing males were located on the south-west peninsula, with 23 to 28 of them being on the Mount Hartman estate (c.90% were concentrated on 1 km of the main ridge) (Blockstein 1991), and a similar survey in July 1991 finding 24-27 singing males there (B. Rusk *per* D. E. Blockstein *in litt.* 1992). Also during the 1989-1990 survey, 10 males were found at Halifax Harbour, and three at Beausejour estate, giving a total of 38 to 43 singing males and an estimated total population of 75-85 individual birds (Blockstein 1991). The Grenada Dove has not been recorded from the Levera area (including the offshore islands) since the period 1960-1977, and following a thorough search in 1989-1990 it has been suggested that this north-eastern population is now extinct (Blockstein 1991). The overall population of Grenada Doves declined substantially (c.40-50%, allowing for the inclusion of two small groups not located in 1987) between 1987 and 1990, with a loss of individuals at Mount Hartman estate and the virtual disappearance of satellite populations on the south-west peninsula outside Mount Hartman estate (Blockstein 1991). The 10 males at Halifax Harbour constitute an important buffer to the Mount Hartman population (from which they have probably been distinct throughout historical times), although the small (three males in 1989-1990, but just one in 1991) population at Beausejour appears to be doomed (Blockstein 1991, B. Rusk *per* D. E. Blockstein *in litt.* 1992: see Threats).

**ECOLOGY** The Grenada Dove inhabits lowland (up to c.150 m) dry-scrub woods, including those on abandoned agricultural land (e.g. sugar plantations: Blockstein 1988, 1991). At Mount Hartman estate this secondary vegetation has grown into deciduous thorn-scrub thickets, with a canopy 6-8 m high, and consists mostly of *Acacia* spp., *Bauhinia unguolata*, and *Randia mitis* with occasional emergent trees, especially *Bursera simaruba* (Blockstein 1988), Johnson (1988) adding *Gliricidia* sp., *Pithecellobium* sp., *Tabebuia* sp. and *Tecoma* sp. to a more general list of secondary dry-scrub wood species. Blockstein (1991) noted that areas containing Grenada Doves were characterized by a fairly closed canopy, large areas of bare ground, and a substantial shrub component. The leguminous sapling *Haematoxylum campechianum* was found to be the dominant species in such woods (Blockstein 1991). During surveys in 1987 and 1989-1990, no Grenada Doves were seen outside the forest although some were observed foraging near the edge of clearings (Blockstein 1991). Territorial males sing from branches 1-6 m above the ground, although the species forages exclusively on the ground and is generally a terrestrial bird (Blockstein 1988, 1991). Food is as yet unrecorded, although birds probably take seeds (Blockstein 1991).

The breeding season is unclear: males were singing and holding territories during late July 1987 at Mount Hartman estate (Blockstein 1988), and single nests were found there in July 1988 (Blockstein 1991) and July 1991 (B. Rusk *per* D. E. Blockstein *in litt.* 1992). However, during surveys from December 1989 to January 1990, males were found singing and noted to be holding territories: a nest was found (on a palm frond, 4 m above the ground) in January at Halifax Harbour, which by mid-February had a nestling (Blockstein 1991). It is likely that the breeding season is longer on the wetter west coast than in the drier south-west peninsula (the seasonally deciduous south-west shrub woodlands had lost their leaves by mid-January); singing by the doves was very intense throughout December–January on the west coast, but became sporadic in the south-west by late December (Blockstein 1991).

**THREATS** The Grenada Dove is threatened primarily by habitat destruction, but is probably also affected by a number of other factors. Much of the native vegetation of Grenada has been altered (the vegetation in the dry zone is almost entirely secondary), and of the remaining habitat suitable for the species, over 10% was recently (early 1980s) destroyed for the construction of the Point Salines airport (Blockstein 1988). To add to this, the rest of the south-west peninsula has been fragmented by roads and is rapidly being developed for homes and tourist facilities (Blockstein 1988). Building of luxury homes, especially along ridge-tops, is a serious threat (building on ridge-tops is illegal, but continues unabated), the Grand Anse estate area being a major area of construction (Blockstein 1988).

During much of the past century, areas in the south-west peninsula were cleared for planting or pasture and then abandoned, subsequently growing back into dense thorn-scrub: the government-owned Mount Hartman estate is the prime example, being an abandoned sugarcane plantation that is currently the only large area of undeveloped land (Blockstein 1988). Since the 1970s, land use has become more intensive with more clearing resulting in fewer wooded areas (Blockstein 1988): the lower slopes of the Mount Hartman estate, in July 1987, were being bulldozed for a government-subsidized sugarcane plantation, and by 1989 essentially all of the lowlands at Mount Hartman had been planted in cane (Blockstein 1991). This clearance has had the further effect of pushing subsistence farmers onto lower slopes that had been shrubland in 1987, and of forcing people who cut saplings and brush for charcoal production to cut higher onto the hillside: thus, the habitat quantity and quality have deteriorated (Blockstein 1991). A plan for a new development on Hog Island, which may include a golf course on the adjacent lowlands of Mount Hartman estate, could (if the golf course goes ahead) lead to the dove's extinction (D. E. Blockstein *in litt.* 1992: see Measures Taken).

The virtual disappearance of the satellite populations in the south-west peninsula (outside Mount Hartman) may be due to several factors: some habitat destruction has occurred along Mont Tout, but there appear to have been no major changes since 1987, and it is possible that the decline of this subpopulation is simply due to stochastic events in the population (Blockstein 1991). The small population along the west coast at Halifax Harbour may persist, but the birds at Beausejour appear to be doomed: the three males and two females at Beausejour are in a small patch of habitat (the only piece of second-growth saplings in the area), and clearing for a new housing development was taking place next to this patch in 1990 (Blockstein 1991): only a single bird was located there in 1991 (see Population). Overgrazing and loss of vegetation is apparently responsible for the extinction of this species from the offshore islets (Blockstein 1988). Introduced mongooses *Herpestes auro-punctatus* occur in high density on the south-west peninsula, and may at least occasionally prey on Grenada Dove fledglings (Blockstein 1988). It has been suggested (Bond 1956b) that the increasing Violet-eared Dove *Zenaida auriculata* may be outcompeting the Grenada Dove for food, and therefore contributing to its rarity: however, D. E. Blockstein (*in litt.* 1992) found no evidence of sympatry between the two species.

**MEASURES TAKEN** Initial population and ecological surveys of this species have been undertaken (Blockstein 1988, 1991, D. E. Blockstein *in litt.* 1992), although this needs to be part of a long-term monitoring effort (see below). The Grenada Dove has been given legal protection from hunting and egg collecting, but the threats to the bird from these activities are insignificant (Blockstein 1988). The problem of development is great (see above), and there is currently a moratorium against building on ridge-tops in the south-west peninsula; however, this law is not enforced and as a result building continues unabated (Blockstein 1988, 1991). There are no protected areas within the current distribution of this species (i.e. the west coast and south-west peninsula), although the Levera National Park “protects” the area where doves were present until the 1970s (Blockstein 1991). Although the government has decided to proceed

with the development of Hog Island, it has at least temporarily turned down the plan to build the golf course on the Mount Hartman estate, and is apparently “committed to do its best to conserve the bird's habitat” (*Grenadian Voice* 21 December 1991: 3). In October 1991 RARE Center started a one-year educational campaign featuring the Grenada Dove, using the species to highlight concern for all Grenadian wildlife and to increase pride in their one unique (and recently designated national) bird (D. E. Blockstein *in litt.* 1992).

**MEASURES PROPOSED** Recommendations for the conservation of this species were made by Blockstein (1988) after his initial survey. These proposals had not been implemented by the time he published the results of a second survey (Blockstein 1991), and consequently a restated but refined set of recommendations were made, as follows: (1) designation of the Mount Hartman estate as a national critical conservation area and natural landmark, involving (a) the leasing of wooded ridges to a group such as the Grenada National Trust, (b) prohibition of additional clearing of wooded hillsides and brush at Mount Hartman, (c) authorization of the government forestry department to work in lowland dry forests such as Mount Hartman, including reforestation of trees for charcoal and cattle browse, community forestry and extension work, (d) appointment of a warden to enforce (b); (2) similar designation of the hills around Halifax Harbour as a national critical area; (3) strict enforcement of the moratorium against building on ridge-tops in the south-west peninsula; (4) stationing of a conservation biologist in Grenada to continue research and conduct a public education programme regarding native wildlife, especially endangered species; (5) updating wildlife laws in Grenada; (6) appointment of a government wildlife conservation and management officer; (7) continued census and monitoring of the dove and other bird species; (8) restoration of degraded drylands in and around Levera National Park, with the ultimate aim of restoring populations of Grenada Dove to the area (Blockstein 1991).

**REMARKS** The records in Bond (1961, 1963) and Schwartz and Klinikowski (1963), from 4 km south of Saint Georges on the road between Grand Anse and Point Salines, presumably refer to birds in the Mount Hartman estate.