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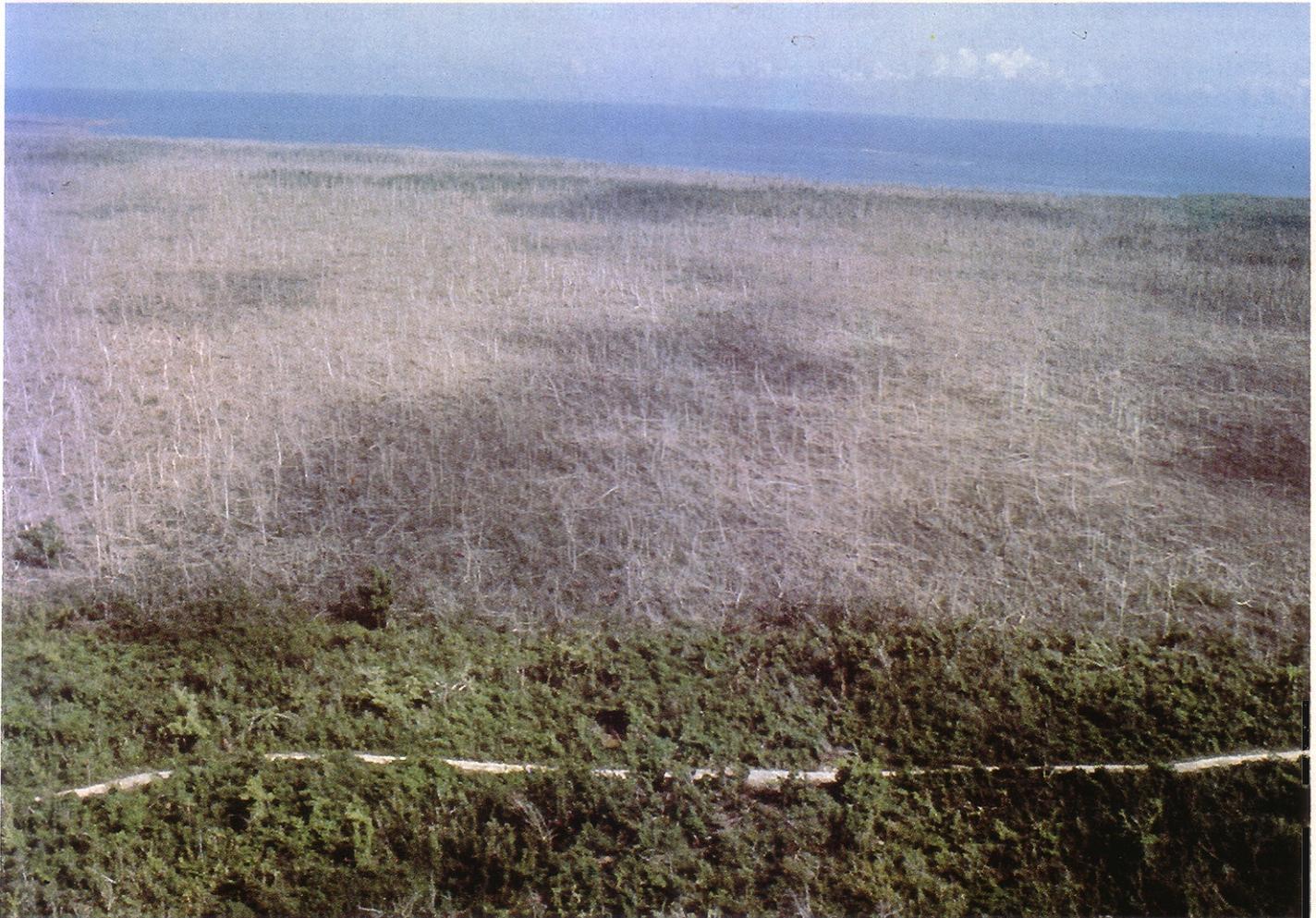
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EFFECTS OF HURRICANE GILBERT ON BIRD POPULATIONS IN JAMAICA

reviewed by Ivan Goodbody

Centre for Marine Sciences, University of the West Indies, Mona Jamaica



Thousands of acres of prime woodlands destroyed by Hurricane Gilbert.

Photo: Peter Vogel

A recent report entitled "Short Term Effects of Hurricane Gilbert on Terrestrial Bird Populations on Jamaica" by Joseph Wunderle, Jean Lodge and Robert Waide, provides us with useful and interesting information about the way in which bird populations may be affected by tropical storms and hurricanes. The authors made a survey of bird populations in ten habitats in Jamaica in December 1987 which fortuitously provided a

baseline position on which comparisons could be made in January and February 1989, shortly after the passage of hurricane Gilbert. The vegetation types included three montane habitats (cloud forest, pine and coffee) and seven lowland habitats (wet limestone, dry limestone, dry limestone ruinate, secondary forest, pasture, coffee and mangrove). For each habitat the vegetation is described in terms of 0.02 hectare plots in which foliage cover, tree diameter

and life form or species is compared before and after the hurricane. The study shows that the most severe damage occurred in montane environments and mangroves and that in lowland areas damage was variable, second growth habitats being least affected and flat areas with deep soil being more severely damaged. Foliage recovery was more rapid in lowland areas than in montane areas.

Bird populations were assessed by a point count method in the plots in each habitat type, supplemented by mist netting data. For purposes of the report, birds are classified taxonomically and according to diet type (i.e. nectarivores, seed and fruit eaters, and insectivores). Of sixty-six species of bird recorded fifty species were observed both before and after the hurricane. The sixteen species recorded only before or after the storm are mostly rare species and do not affect the overall conclusions of the study.

The composition of bird communities in each habitat changed markedly after the hurricane, some species being no longer present while others had newly appeared. This turnover of species was most marked in lowland coffee and limestone ruinate and in montane cloud forest and pine forest. Such changes in species composition may indicate movement between habitats as a result of the hurricane.

Eighteen species showed significant or suggestive declines in the mean number of individuals in point counts in one or more habitats, and fifteen species showed increase in one or more habitats. These changes might be due to mortality, physical movement of birds between habitats (as suggested above) or the changes might be an artifact due to changes in detectability of birds as a result of vegetational changes. An analysis of the data by the authors shows that although some changes in detectability occurred these were unlikely to bias the data and do not explain the observed pattern of changes in population composition.

Bird populations in montane areas suffered more than those in lowland habitats. Mist nets captured over three times less bird individuals per unit time in montane cloud forests after the hurricane; species number decreased by 30%. Similar strong declines occurred in montane coffee. In

lowland areas both the number of bird individuals and species either remained constant or increased.

Within the montane areas, nectar feeders and fruit and seed eaters suffered significantly more than did insectivorous species. The most affected among the common species were the Streamertail Hummingbird, Black-faced Grassquit, Bananaquit and the Orangequit though the latter three increased in some of the lowland habitats. The Streamertail was the only resident species showing highly significant declines in both the mountains and the lowlands. Similar trends (but not statistically significant) occurred in the less common Jamaican Mango Hummingbird, while the Vervain Hummingbird was only observed before the hurricane. Overall, it seems that the hummingbirds were the most seriously affected species group.

The most dramatic effect of the hurricane on bird populations was not direct mortality during the storm but was a delayed effect in which food supplies dwindled and those species depending on plants (i.e. nectarivores and fruit/seed eaters) were deprived of nourishment and had to either disperse or die. Insect populations are less vulnerable to storm damage than are plants since many species survive as larvae or pupae underground, in leaf litter, in bark or in crevices and the rate of turnover is such that populations (and hence food resources for insectivorous birds) recover quickly.

While post-hurricane food loss explains most of the observed population decline after the hurricane, changes in vegetation structure were probably also a contributing factor for a number of species. Examples are quoted for Black and White Warbler (dependent on high canopy foraging substrates) and Ovenbird (dependent on low canopy cover on the forest floor). On the other hand increase in the density of Yellow Warblers in mangroves is attributed to a compression of populations into the surviving parts of the habitat whose high productivity permits rapid recovery

of their insect food resources.

Wunderle, Lodge and Waide have made a significant contribution to our understanding of the effects of hurricanes on island avifaunas and it is fortunate that they already had a pre-hurricane data base for later comparison with the post-hurricane situation. Their paper makes difficult reading because of the need to introduce much statistical analyses. Perhaps the paper could have been simplified if it had concentrated only on the passerine species of bird, since the numbers of non-passerines involved are so small as to make little significant impact on the overall study.

REFERENCES

- Wunderle, J.M. Jr., K. J. Lodge and R.B. Waide 1990. Short-term effects of Hurricane Gilbert on terrestrial bird populations on Jamaica.

NOTE: J.M. Wunderle Jr. is attached to the Institute of Tropical Forestry, P.R. and Dept. of Biology, University of Puerto Rico.