

# The Puerto Rican Parrot: new directions



*Warren B. King*



*Photo/Marc Bosch, U.S. Forest Service.*

**Recovery efforts of the past twenty years have helped this Endangered Species, but a renewed government commitment is necessary.**



**T**HE PUERTO RICAN PARROT (*Amazona vittata*) is a handsome, emerald green parrot with white spectacles and a ruby forehead. It is the last species of native parrot remaining on United States territory, restricted to Puerto Rico and formerly to nearby Mona, Culebra and Vieques islands. Abundant when Columbus discovered Puerto Rico in 1493, the parrot declined precipitously thereafter as year by year the forests that once covered Puerto Rico were cleared for agriculture. By 1912, less than one percent of the island's forests remained unaltered (Snyder *et al.* 1987).

The Puerto Rican Parrot depends on mature trees with natural cavities for nest holes. Early surveys saw it become increasingly restricted to the last few

birds remained (Table 1). Subsequent observations in 1963 and 1966 gave evidence of further declines. When the first United States Fish and Wildlife Service endangered species biologist took up residence in Luquillo Forest in 1968, only 24 birds could be found. The decline apparently bottomed out in 1975 at 13 birds. Since 1968 intensive management of the population by a team of U.S. Fish & Wildlife Service, U.S. Forest Service, and Puerto Rico Department of Natural Resources biologists and technicians, involving manipulation of nests, eggs and young, has brought the wild population up to 31 birds (Snyder *et al.* 1987). This increase appears to have given the species some breathing room, if it were not for the fact that only four pairs are breeding in

curs, several factors relating to multiple use management of the National Forest System have seriously compromised the integrity of the Caribbean National Forest as parrot habitat. Selective cutting of mature Palo Colorado (*Cyrilla racemiflora*), the tree in which most parrots have nested historically, took place between 1945 and 1950 for production of charcoal and for improvement of stands of more valuable timber species. This came at a time when other fuels were in strong demand for the war effort. This harvest took place in or adjacent to traditional nesting areas. Elsewhere in the forest, various species have been logged, including some that are important to foraging parrots (Wiley 1985a).

Annual recreational visits have ex-



Photo/Marc Bosch, U.S. Forest Service.

patches of mature forest, and finally to the Luquillo Mountains of eastern Puerto Rico, where a remnant 7000 hectare block of rain forest offered it a last refuge. This area came into United States government hands in 1903 as the Luquillo Forest Reserve, and in 1935 it was renamed the Caribbean National Forest, which now includes the Luquillo Experimental Forest.

The first census, undertaken in October 1954, revealed that a scant 200

the wild. Lack of recruitment of new pairs into the breeding population is the single most distressing aspect of the recovery effort for the Puerto Rican Parrot, one that still affords no satisfactory solution.

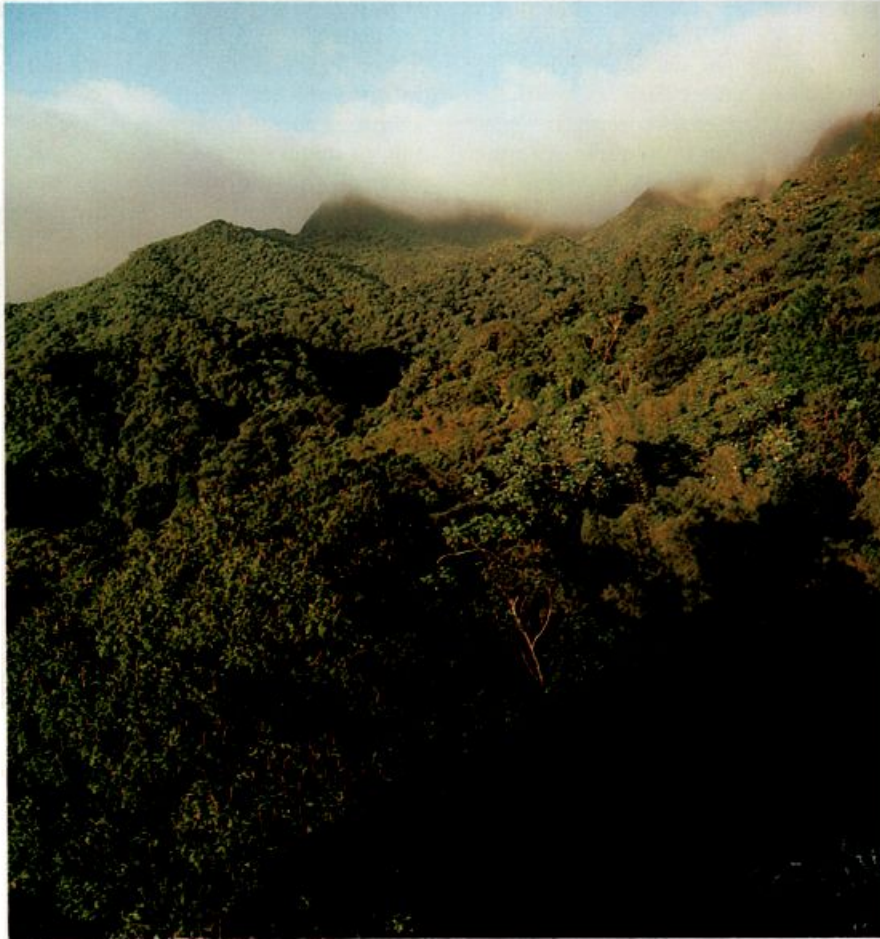
#### Causes of decline

In spite of federal U.S. ownership of the land on which the parrot now oc-

panded enormously from 65,000 in 1955 to 2 million in 1985. Associated with heavy recreational use have come, not surprisingly, new roads that cut across the heart of the parrot range as well as extensive recreational facilities (U.S. Fish & Wildlife Service 1986).

The species' historic decline was accelerated between the 1930s and the 1960s by systematic nest robbing (Wiley 1985b). Few nestlings fledged into the wild during this period. This abuse has





Vandalism and threatened violence in this remote mountain area plagues the parrot recovery staff and hampers efforts. The Caribbean National Forest's 10-year Land and Management Plan calling for commercial harvest of up to one-fifth of the forest has been withdrawn. A new plan has not yet been released. Photo/Chris Wille.

now been controlled through stepped-up security, but a spirit of lawlessness in the form of repeated break-ins, thefts, vandalism and threatened violence persists in this isolated mountainous retreat and plagues the staff of the parrot recovery effort.

The meagre but significant recovery that has taken place thus far has been achieved by identifying and eliminating factors that have reduced productivity

of wild pairs. These efforts have raised nesting success from 11–26% prior to 1973, to a recent 70% average success rate (Wiley 1985b).

A nest shortage was not suspected until pairs were seen fighting for known nest sites. Systematic searches of more than 1200 trees in traditional nesting areas revealed that almost all suitable cavities were already being used (Snyder *et al.* 1987, Wiley 1985a). In these nest-

ing areas about 50 trees have now been fitted with made-over nest holes or artificial holes of plastic pipe made to resemble natural cavities. Evidence suggests that made-over holes do attract nesting parrots and that they have good success in them (Wiley 1985a).

The Pearly-eyed Thrasher (*Margarops fuscatus*) has invaded the Luquillo Mountains in recent years and has become a ubiquitous competitor with parrots for nest sites and a frequent predator on eggs and young chicks. Experiments with nest boxes revealed a deep, recessed box design that parrots accepted but thrashers would not (Snyder and Taapken 1977). Most artificial parrot nests now conform to this design. Thrasher pairs have been encouraged to nest near existing parrot nests in boxes provided for them. These pairs defend territories from other thrashers, reducing the likelihood that parrot nests will be invaded.

Introduced honey bees (*Apis mellifera*) compete with parrots for nest cavities (Wiley 1985a). Cavities are covered following use by parrots to exclude bees, and bees that do establish swarms in parrot nests are removed.

Maggots of warble flies (*Philornis pici*) and soldier flies (*Hermetia illucens*) sometimes infest parrot chicks (Snyder *et al.* 1987). These maggots must be surgically removed if they occur in numbers or they affect essential organs or muscles.

Red-tailed Hawks (*Buteo jamaicensis*) prey on adult parrots and have been observed entering cavities to take nestlings (Wiley 1980). A program of selective control, proposed but not yet tested, would eliminate certain adult territorial Red-tailed Hawks from territories that include parrot nest areas. The adult Red-taileds would be removed just before the parrots fledge, so that young parrots would only have to contend with less experienced Red-taileds, ones that had not yet keyed into the location of parrot nests.

Roof rats (*Rattus rattus*) abound in Luquillo Forest. Anticoagulant bait is distributed near parrot nests just before and during breeding in the hope of reducing rat populations locally (Wiley 1985b).

Frequent harsh storms in the Luquillo Mountains have taken their toll of parrots, even though no hurricane has directly struck the Luquillo Forest since 1932. This habitat is probably far

Table 1. Estimated numbers of Puerto Rican Parrots in the wild and in captivity (after U.S.F.W.S. 1986).

Year	Number in Wild	Number in Captivity
1954	200	—
1963	130	3
1966	70	3
1968	24	3
1971	16	3
1975	13	12
1980	19	15
1982	29	15
1985	35	32
1986	31	37





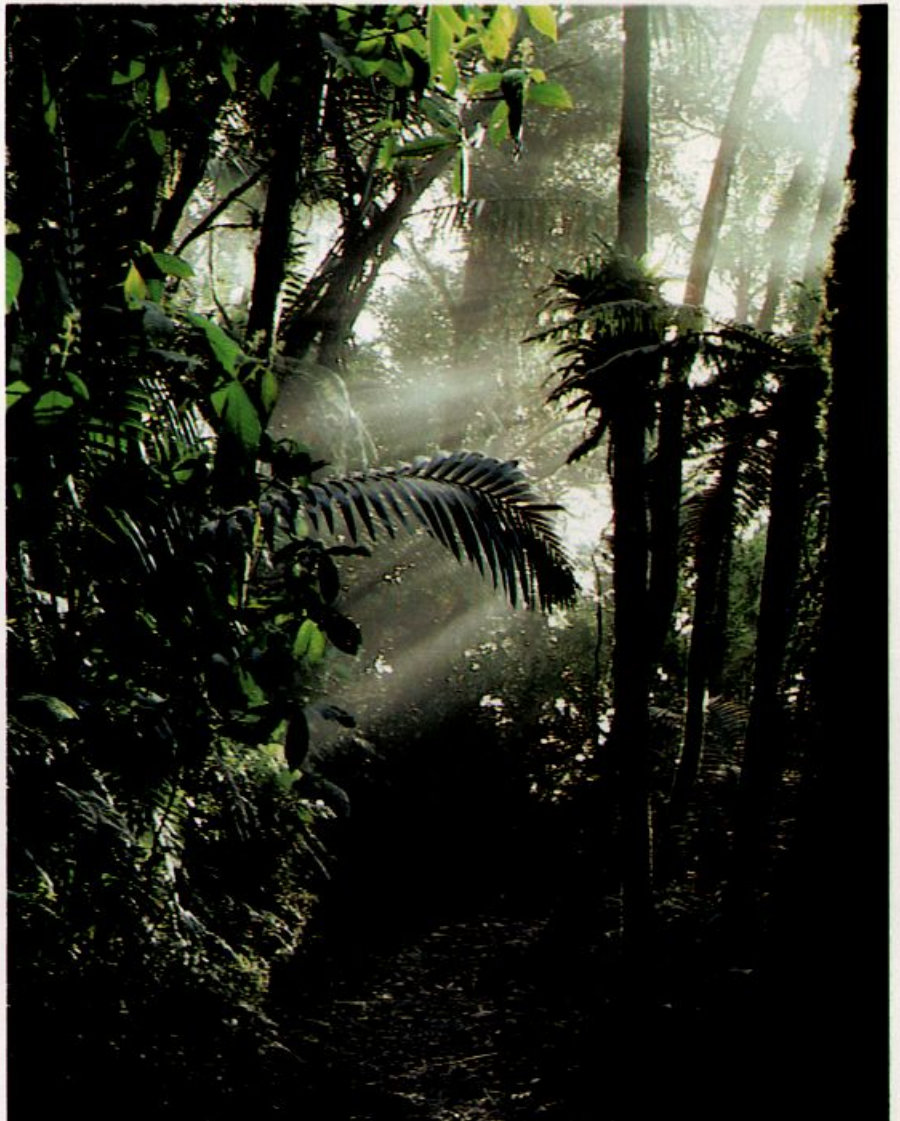
Navigating through the steep hills and dense vegetation of the Caribbean National Forest would be impossible without manmade trails like the one below. Photos/Chris Wille.

from optimal, perhaps even marginal, for the species (J. Wiley *pers. comm.*).

#### **Captive breeding and the revised Recovery Plan**

A captive population has been established since 1973, initially by taking healthy birds or eggs from the wild, but more recently by retaining nestlings impaired in their development and unable to fledge successfully from nests in the wild (Table 1). The captive population currently numbers 37 birds, females outnumbering males 10 to 6 among adults (J. Wiley *pers. comm.*). Learning to breed Puerto Rican Parrots in captivity has been a slow process, in spite of noted success at the Luquillo aviary in breeding the Hispaniolan Parrot (*Amazona ventralis*), which has served usefully as the surrogate for the Puerto Rican Parrot. Problems with infertility of eggs have plagued production of captive birds. Although all of the adult females lay eggs, only two lay fertile eggs. Artificial insemination holds promise in correcting this infertility bottleneck, but this species has thus far proved relatively intractable in insemination trials (Wiley 1985b, Snyder *et al.* 1987). Recent artificial insemination work with surrogate Hispaniolan Parrots gives hope for the future, however.

The recent release of a draft revised Recovery Plan for the Puerto Rican Parrot (U.S. Fish & Wildlife Service







The Pearly-eyed Thrasher competes with the Puerto Rican Parrot for available nest sites, and preys on the parrots eggs and young. The introduction of thrasher nesting boxes like the one shown above near parrot nest sites has alleviated the problem. Photo/Chris Wille.

1986), the disbanding of the recovery team in 1986, and the reassignment to California of Dr. James Wiley, who headed the recovery effort in Puerto Rico for the last decade, all point to major new directions for the recovery effort. Within the U.S. Fish & Wildlife

Service, the Patuxent Wildlife Research Center shares the Interior Department's responsibility for the species' recovery with the Southeast Regional Office. Theoretically, the latter is concerned with management, the former with research. Wiley's replacement, when selected, will be expected to do more managing and less research than his predecessor, and yet, as anyone who has dealt with endangered species in the field can attest, the dividing line between management and research is tenuous, often blurred. To separate responsibility for these activities is surely counterproductive. For example, nest monitoring is a crucial component of the recovery effort. Monitoring is essential in fostering young into nests and intervention by monitors can save birds. Monitoring provides much of the data from which our understanding of the parrot's problems arises. To assign monitoring a research or management function alone is to ignore half of that activity's value.

The revised Recovery Plan calls for a significantly increased emphasis on captive breeding. A new facility, which would house aviaries as well as office and maintenance facilities, is envisioned for the lower margin of the National Forest. The estimated cost is \$750,000 over the next three years. Security problems, already a concern in the mountainous core of the National Forest, will intensify with this projected move to a more accessible area.

A second breeding facility, presently under construction at Rio Abajo State

Forest, will be administered by the Puerto Rico Department of Natural Resources. Rio Abajo Forest, in northwestern Puerto Rico, is destined to be the release site for establishment of a second parrot population. The captive flock will be divided between the two breeding facilities, with frequent swaps as necessary to promote successful pairings and to maximize genetic diversity. Each facility will house a number of surrogate Hispaniolan Parrots as well.

This new emphasis on captive breeding may be premature in view of the existing limitations on expansion of the captive flock imposed by only two productive females. It makes little sense to populate Rio Abajo solely with the offspring of two founder pairs. Twenty one captive-bred parrots have successfully been released to the wild. With one exception, all involved the fostering of captive-bred nestlings into nests in the wild (J. Wiley *pers. comm.*). The exception was one of three birds released as free-flying birds in 1985. Two of these were killed by predators within one week of release, but the third integrated successfully into the wild flock. Although placing nestlings in nests in the wild has successfully augmented the output of the four wild nesting pairs, labor-intensive nest monitoring is required to determine the appropriate timing of chick introductions and to intervene at a moment's notice when a nest is threatened. This release method is slow, limited in its potential, and costly, but it works. Practical considerations, on the other hand, argue strongly for attempting additional releases of free-flying birds when the captive flock becomes self-sustaining.

The problem at Rio Abajo will be one of introducing parrots into habitat not presently occupied by parrots. The trees there are small diameter second growth, not capable of producing nest cavities big enough for parrots for many years. Historically, parrots at Rio Abajo occasionally nested in limestone pot holes (Snyder *et al.* 1987). The trick will be to predispose parrots to select these pot holes for nesting.

The Caribbean National Forest 10-year Land and Resource Management Plan, which called for commercial harvest of up to one-fifth of the forest, has been withdrawn following massive local protest. The revised plan has not yet been released. At Rio Abajo State Forest



The Parrot Recovery Team uses plastic sewer pipe to fashion parrot nest sites. The pipe is covered with glue, paint, moss and sawdust so that it blends with the jungle around it. Photo/Chris Wille.



a management plan is in preparation which will affect the extent and nature of timber harvest. It is anticipated that the Department of Natural Resources will not ignore forestry interests in its management plan. Whether habitat requirements of the Puerto Rican Parrot will be compromised by the management plan remains to be seen. In any case the decision to captive breed, and ultimately to release Puerto Rican Parrots at Rio Abajo has already been made.

The draft Recovery Plan fails to address the problem of lack of recruitment to the breeding population at Luquillo. This is the most important limiting factor at present, yet the kind of field work that will eventually shed light on this sort of problem is unlikely to be done, for it will take long hours of observation. What is known about the Puerto Rican Parrot to date was gleaned by just such hours of observation.

### Recommendations

Several concerns require attention if further progress is to be made in the recovery of the Puerto Rican Parrot:

1. The responsible agencies should reconfirm their commitment to maintaining and expanding the wild population by providing adequate numbers of qualified, experienced staff to monitor all nests at present and to examine causes of lack of recruitment to the breeding population. This most important consideration is scarcely addressed in the draft revised Recovery Plan.

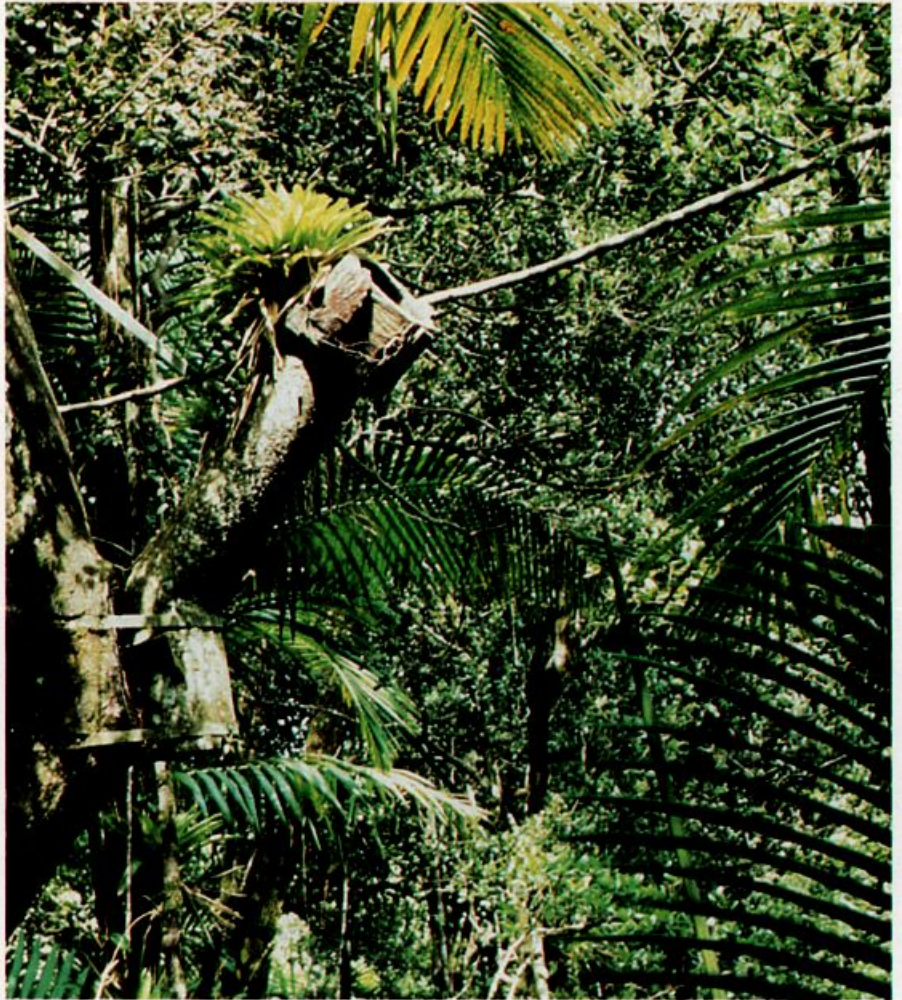
2. The proposed commitment to massive outlays of funds to construct two new aviaries should be reviewed in light of the present technical constraints and bottlenecks relating to the captive population. Successful artificial insemination and/or establishment of additional productive captive pairs should be the first priority for the captive flock.

3. The decision to use Rio Abajo State Forest as the site for development of a second parrot population should be reviewed following release of the Rio Abajo Management Plan. Responsibility must be assigned for research associated with establishment of a second flock at Rio Abajo, if it is to take place there.

4. The recruitment of volunteers to undertake monitoring and other management functions, recommended by the draft Recovery Plan and being ini-



*The entrance to the nest, where the parrots often perch, is covered with real wood, which the parrots love to chew. Photo/Marc Bosch, U.S. Forest Service.*



*The parrots nest in the short vertical tube about ten feet below the entrance. Chicken wire is used to line the pipe so that young birds can climb up from the nest cavity to the entrance. Photo/Marc Bosch, U.S. Forest Service.*



tiated energetically by the National Audubon Society, should be predicated on a commitment from the United States Fish and Wildlife Service and United States Forest Service to fund adequate logistic support for these volunteers.

The Puerto Rican Parrot recovery effort has entailed 20 years of work to reverse the population decline and to increase productivity of nests in the wild. The outlook for the parrot is good, given the appropriate support and commitment by the responsible agencies. We must hope that new directions proposed for the program will not undo the exemplary work accomplished thus far. The biology of the species should dictate actions, not chains of command.

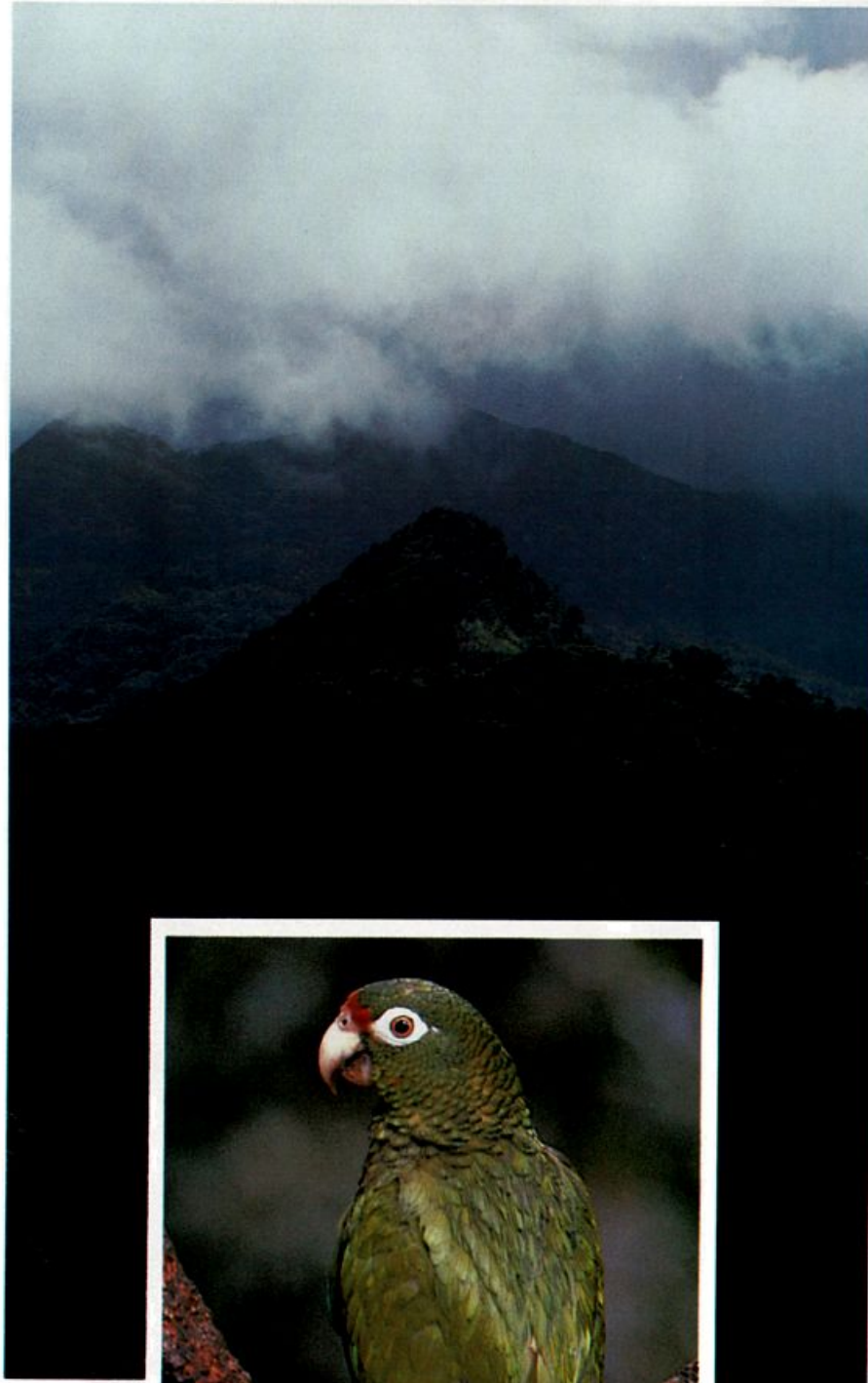
#### ACKNOWLEDGMENTS

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Photo/  
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Photo/James Wiley.