

**FEDERAL AID IN WILDLIFE RESTORATION ACT.**

**ORIGINAL**

**AMERICAN SAMOA WILDLIFE INVESTIGATIONS**

**ANNUAL RPORT**

**FY 96.**

**DEPARTMENT OF MARINE &  
WILDLIFE RESOURCES  
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**ORIGINAL**

**Department of Marine and Wildlife Resources  
American Samoa Government  
P.O. Box 3730, Pago Pago, American Samoa 96799**

**December 1996.**

**PROJECT:** Wildlife Investigations  
**STUDY:** Bird Studies  
**JOB:** Abundance and Distribution

**PROJECT:** W-1-R-8  
**STUDY:** 2  
**JOB:** 1

**PERIOD COVERED:** October 1, 1995 to September 30, 1996

## **SUMMARY**

Surveys of native forest bird species were conducted monthly at four on Tutuila (25 stations/month) during FY 96. No hurricanes or other natural disasters struck the islands during this period, and slight increases and decreases were observed among native land bird populations. However, populations of almost all land birds remain far below the levels documented before Hurricanes Ofa and Val (1990 and 1991). In particular, populations of the Purple-Capped Fruit-Dove (*Ptilinopus porphyraceus*) remain very low (16% of their 1986 level, Table 1), and the Many-Colored Fruit-Dove (*P. perousii*) probably numbers less than 50 individuals in all of American Samoa. The Pacific Pigeon (*Ducula pacifica*) appears to have recovered well, with a population level 99% of its 1986 value (Table 1). It is evident that recovery to pre-hurricane levels will take many years for most species.

## **BACKGROUND**

The first rigorous survey of forest bird populations in American Samoa was conducted in 1986 (Engbring and Ramsey 1989). This survey took place at the end of a 20-year period without a major hurricane in the Samoan archipelago, and of a 100-year period without a catastrophic hurricane. In March 1987, the Manu'a Islands in the eastern part of American Samoa were devastated by Hurricane Tusi. In February 1990 the entire archipelago was struck by another very severe storm, Hurricane Ofa, and in December 1991 the most damaging hurricane on record, Hurricane Val, caused catastrophic destruction throughout Western and American Samoa.

The American Samoa Department of Marine and Wildlife Resources (DMWR) began monitoring forest bird populations during the period between Hurricanes Ofa and Val in 1991. A more extensive monitoring program was begun in 1992, following Hurricane Val. This program is ongoing. These surveys reveal severe declines from pre-hurricane levels among virtually all species of native forest birds in American Samoa. In contrast to post-hurricane declines in other regions (e.g. following Hurricane Hugo in Puerto Rico), all ecological classes of birds were affected: frugivores, insectivores, nectarivores, and omnivores. The reason for these general declines appears to be the very long duration (3-5 days) of both Hurricanes Ofa and Val, which may have caused much mortality through starvation. In response to these declines, the Governor of American Samoa declared a 3-year ban on all hunting of birds or fruit bats, effective April 1, 1992.

No severe storms struck American Samoa during the 1995-96 hurricane season. Populations of most species of forest birds increased during this period, except for the many-colored fruit-dove. In most cases, however, the increase was slight. It appears that a long period will be needed before forest bird populations in American Samoa return to pre-hurricane levels.

## OBJECTIVE

To monitor the seasonal and interannual status of American Samoan forest birds, particularly of the Pacific Pigeon (*Ducula pacifica*), the Purple-Capped Fruit-Dove (*Ptilinopus porphyraceus*), and the Many-Colored Fruit-Dove (*P. perousii*).

## PROCEDURES

1. Conduct monthly surveys of forest bird distribution and abundance on Tutuila, American Samoa. The methodology is a variable-circular plot design, with stations located 150m apart in areas of continuous native forest. All birds identified by sight or sound during an 8-minute count period are recorded, and their distance from the observer is estimated. This methodology is directly comparable with the 1986 survey (Engbring and Ramsey 1989), which in turn was modeled on the Hawaii Native Forest Bird Survey Program (Scott et al. 1986).

2. Conduct monthly visual surveys of Pacific Pigeons at six sites around Tutuila. The methodology consists of four 20-minute counts separated by 10-minute intervals. As with VCP surveys, every effort is made to count individual birds only once.

3. Record information on the status and distribution of Manu'a birds during visits to those islands. Species of particular interest are those that do not regularly occur on Tutuila: the Blue-crowned Lory (*Vini australis*), Friendly Ground-Dove (*Gallicolumba stairii*), Spotless Crake (*Porzana tabuensis*), and Fiji Shrikebill (*Clytorhynchus vitiensis*).

## RESULTS/DISCUSSION

### 1. Variable Circular Plot Surveys

#### a. Interannual trends in Forest Bird Populations on Tutuila

Figure 1 summarizes the available data on the relative abundance of eight species of native forest birds in areas surveyed on Tutuila since 1986. These are all the species for which the variable-circular plot forest surveys are an appropriate census technique. Other native species are not accurately detected by this method; for example White-rumped Swiftlets (*Collocalia spodiopygius*) are usually above the canopy and not accurately counted from within the forest, and the Banded Rail (*Gallirallus philippensis*) and Purple Swamphen (*Porphyrio porphyrio*) are primarily birds of agroforest and forest edge, not forest interiors.

All species declined sharply following Hurricane Ofa (February 1991), as shown by the 1991 values (Fig. 1), which are based on surveys from July-November 1991. Most species showed further declines following Hurricane Val in December 1991, as shown by the 1992 values (surveys from September-December 1992)(Fig. 1, Table 1). The apparent exceptions were the Collared Kingfisher and the Wattled Honeyeater, both of which increased slightly. However, all increases were modest, and four of the eight species remained at less than half the abundance recorded in 1986.

The hiatus from severe storms has continued through December 1996, as has the hunting ban. All species have shown some increase since 1995, except the many-colored fruit dove, which declined slightly by .01 birds per eight-minute count. Many-colored fruit dove numbers are still higher than in 1986. Given the small numbers of birds recored on the monthly counts, very little can be deduced from this miniscule decrease. Many-colored fruit doves are usually associated with a fruiting *Ficus prolixa* or *Ficus obliqua*, thus their numbers from the VCP counts are influenced by these sporadic events. Wattled honeyeates show the greatest absolute increase since 1995, followed by Samoan starlings. In these meager increases and decreases we may be witnessing stochastic, interannual fluctuations that are not significant to long-term population trends. Continued monitoring will reveal whether these 1996 changes are indicative of anomalies or trends.

In sum, of the eight species monitored with VCP censuses, two appear to have reached their 1986 benchmarks (Collared Kingfishers and Pacific Pigeons at 102% and 99% of 1986 figures, respectively) and one is over half-way there (Wattled Honeyeaters at 67%). These optimistic figures must be interpreted with caution. Seasonal variation in detection of some species may lead to artificially inflated annual averages. We do not have sufficient information about the life history and behavior of Samoan birds to be certain that the increases in means since 1992 are real. However, it is important that no species shows a sustained decline during this period.

The overall picture shows clearly that recovery from catastrophic events (such as hurricanes Ofa and Val) is a slow process for most Samoan forest birds. Many species remain at less than half their 1986 recorded abundance (the Purple-Capped Fruit-Dove (16% of 1986 value); the Cardinal Honeyeater (30%); the Polynesian Starling (27%), and the Samoan Starling (46%). Populations of most forest birds are still highly sensitive to disturbance. Hunting pressure or another severe storm could take some species' numbers below viable levels. Continuous protection from those disturbances we can influence (hunting, forest clearing) will give avian populations time to recover to former (pre-hurricane) levels.

#### **b. Seasonal Variation (Purple-Capped Fruit-Doves)**

We have now collected four years of continuous monthly census data from the 25 VCP stations in forest habitat on Tutuila Island. These data enable us to identify seasonal peaks in the detection of some forest bird species. These peaks in turn inform analysis and interpretation of interannual patterns. Seasonal peaks are most apparent for the Purple-



Capped Fruit-Dove (Fig. 2) and the Pacific Pigeon, although better census data on the latter species have been collected through visual censuses (see below).

Figure 2 shows that seasonal peaks in Purple-Capped Fruit-Dove detection were restricted to a single month in 1993 (June) and 1994 (July). In 1995, however, the peak was sustained from May through August, with the typically distinct drop taking place in September. In 1996, the peak months were limited to July and August. Interpretation of these peaks in terms of population trends is difficult because we have little concrete behavioral or breeding phenology information about this species. Nevertheless, observations of birds carrying nesting material, of actual nests and of juvenile birds coincide seasonally with peak vocalizations, thus supporting the conclusion that this peak detection corresponds with breeding activity.

More information about the purple-capped fruit-dove and other species' behavior and life history is needed in order to properly interpret the census data and long-term trends. This last is a critical point for natural resource managers trying to systematically monitor non-migrant forest bird populations. To identify this seasonal variation as a systematic component rather than an anomaly in our censusing required three years of continuous monthly monitoring -- a considerable effort. In many areas where forest bird surveys are conducted for management purposes, surveys with substantial sample sizes are rarely taken so frequently. Often, surveys are conducted quarterly, annually, opportunistically, or whole islands or archipelagos are surveyed once over a period of years.

A sampling scheme that does not recognize seasonal variation in detection (or, perhaps, abundance), cannot be used to assess the status of forest bird populations. When density estimation is included in the survey methodology and population estimates are extrapolated from such sporadic or short-term data, there is little chance that these estimates reflect even ballpark numbers. Further, it is not possible to set up a temporally adequate monitoring program without first knowing what the intra-annual, cyclic variation in detection is for various species. In this respect, the monthly forest bird survey in American Samoa stands as a unique example in the Pacific region of long-term, fine-scale sampling in order to detect seasonality as well as interannual trends. We hope this may serve as a model for other monitoring surveys in the Pacific region.

## **2. Visual Surveys of Pacific Pigeons**

Since February 1995 we have conducted visual surveys of Pacific Pigeons at six sites around Tutuila. We detect greater numbers of pigeons for our effort using this method than we have using the VCP method (Fig. 4). The Pacific pigeon is a moderately vocal species, more often seen than heard. It is most conspicuous flying over the canopy of well-developed forest. These data document population trends or fluctuations in this species more reliably than VCP data.

Almost two years of data are represented in Figure 5a. Seasonal peaks are evident during the months of September and October. Pigeon data collected opportunistically during bat surveys from 1992 to 1994 (Figure 5b.) also indicate seasonal peaks during these months. Mean numbers consistently drop off during the last few months of the year. Though the data sets from 1992-1994 and 1995-1996 are not directly comparable due to differences in the survey methodology, they do reveal an increasing trend in the Pacific pigeon population on Tutuila since the hurricanes. Counts from 1996 have slightly lower numbers than in 1995, although this decrease is minute. Most importantly, the data shows consistent seasonal peaks in the population from both years. Information of this type is crucial should a management plan for the species be implemented in the future.

### 3. Status of Manu'a Birds

While limited time and personnel precluded a quantitative survey of Manu'a birds, several field trips made during the last fiscal year have yielded important information on several of the rarer species found in American Samoa:

#### Forest Birds

A single shy ground dove (*Gallicolumba starii*) was seen at approx. 300 m while hiking to the summit of Mt. Piumafua, Olosega. Based on DMWR records, this is the first documented sighting of this species on the island of Olosega. Engbring (1989) speculated that this bird is probably found there, but their surveys did not record any. The bird was perched quietly in the understory close to the ground of well-developed ridge forest. This habitat type is different from the rocky talus surfaces of Ofu where most of the previous sightings have occurred.

The Fiji shrikebill (*Clytorychus vitiensis powelli*) is an endemic subspecies found only in the Manu'a islands. Two birds were seen and one was heard close to where the shy ground dove was seen. We heard the one Fiji shrikebill at a slightly higher elevation (approx. 400 m) as the others. The birds seen were found within the understory of a well developed (though hurricane damaged) ridge forest.

Blue-crowned lorries (*Vini australis*) were fairly abundant on all the islands of the Manu'a group. This species appears most common around village lands, and was frequently seen in flowering *Cocos nucifera* and *Erythrina variegata*. Lorries were seen at the summit of Mt. Lata, Ta'u feeding on the flowers of *Astronidium pickeringii*.

#### Seabirds

Near the summit of Mt. Lata, Ta'u island, there is a large nesting colony of Procellarids. Though heavy fog prevented us from estimating numbers, many birds were heard calling throughout the night. Two Tahiti petrels were identified and many more were heard calling.

### **Literature Cited**

Engbring, J. and Ramsey, F.L. 1989. A 1986 survey of the forest birds of American Samoa. U.S. Fish and Wildlife Service.

Scott, J.M., Mountainspring, S., Ramsey, F.L, and Kepler, C.B. 1986. Forest bird communities of the Hawaiian Islands: their dynamics, ecology, and conservation. *Studies in Avian Biology* No. 9.

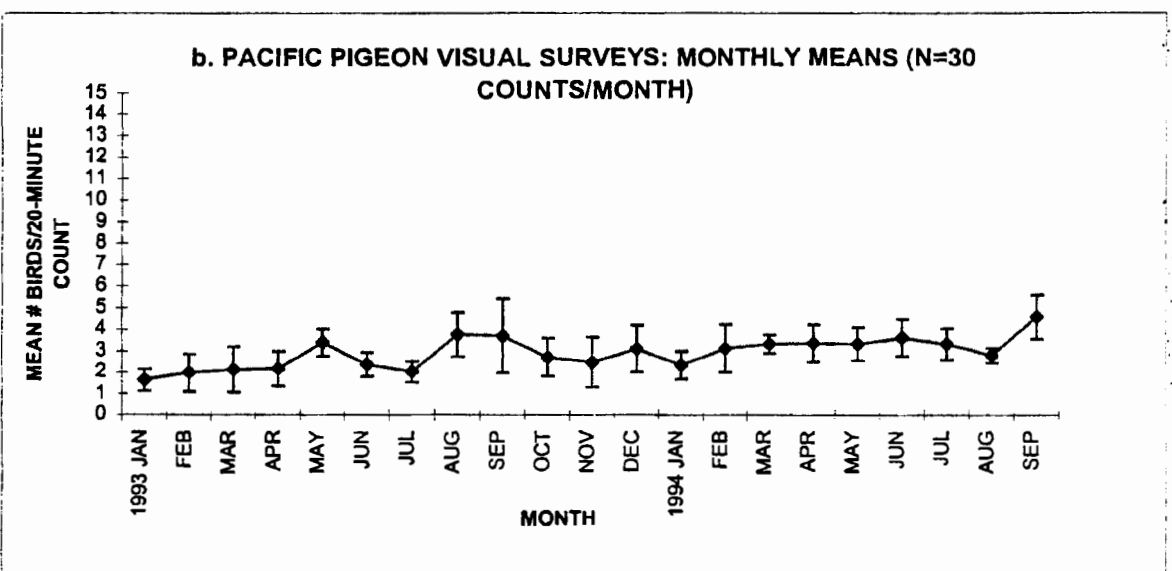
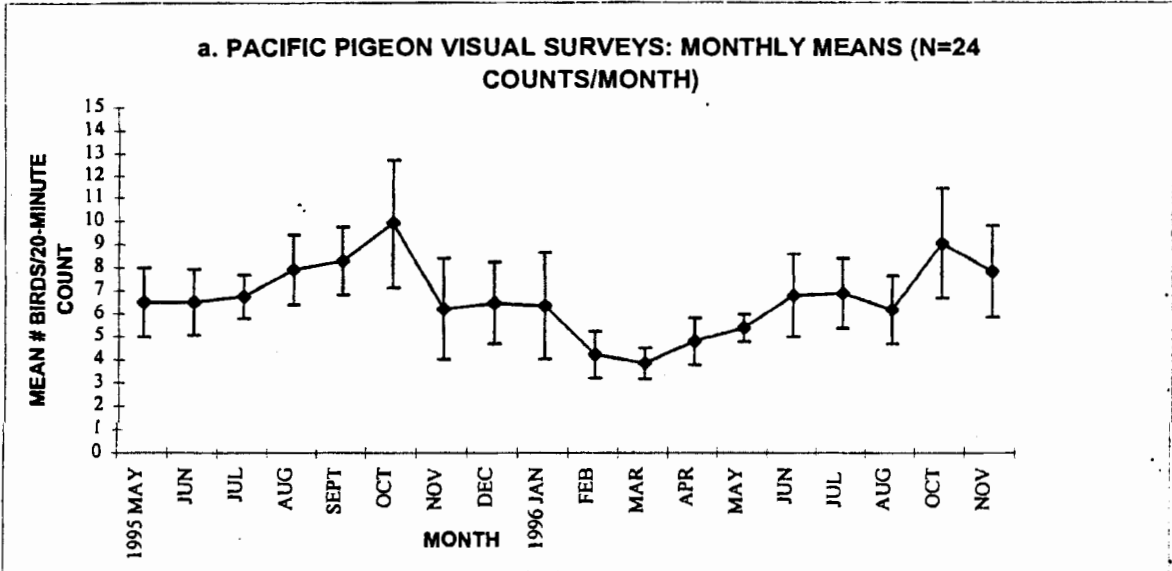


Figure 5. Comparison of Pacific pigeon data for (a) 1995-1996 and (b) 1993-1994. Note: September 1996 data missing.

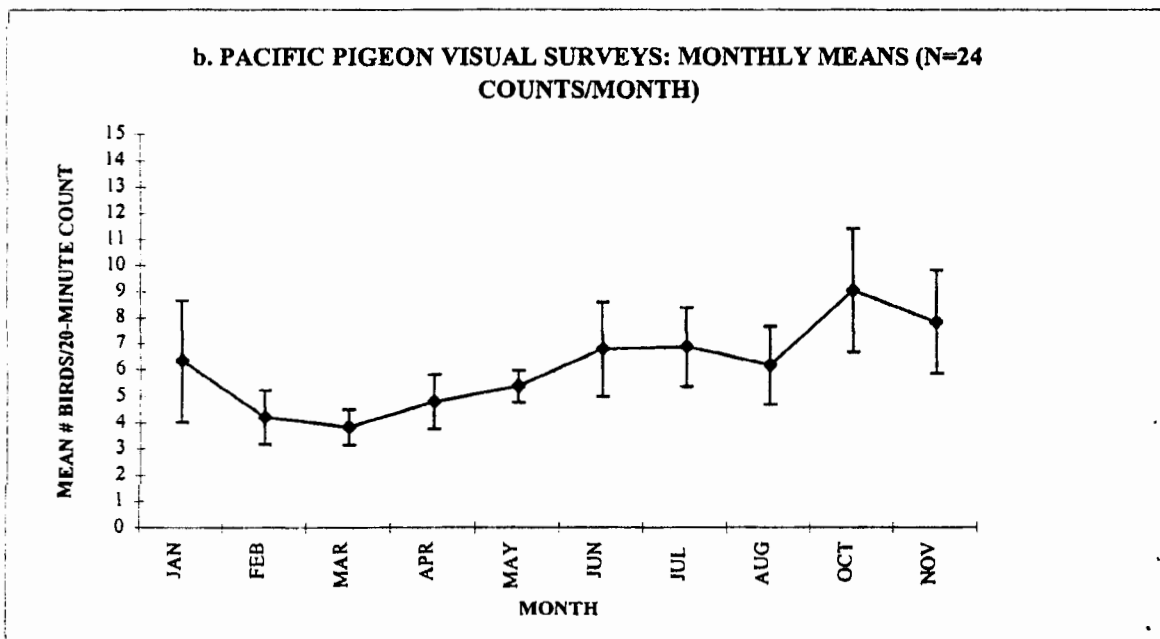
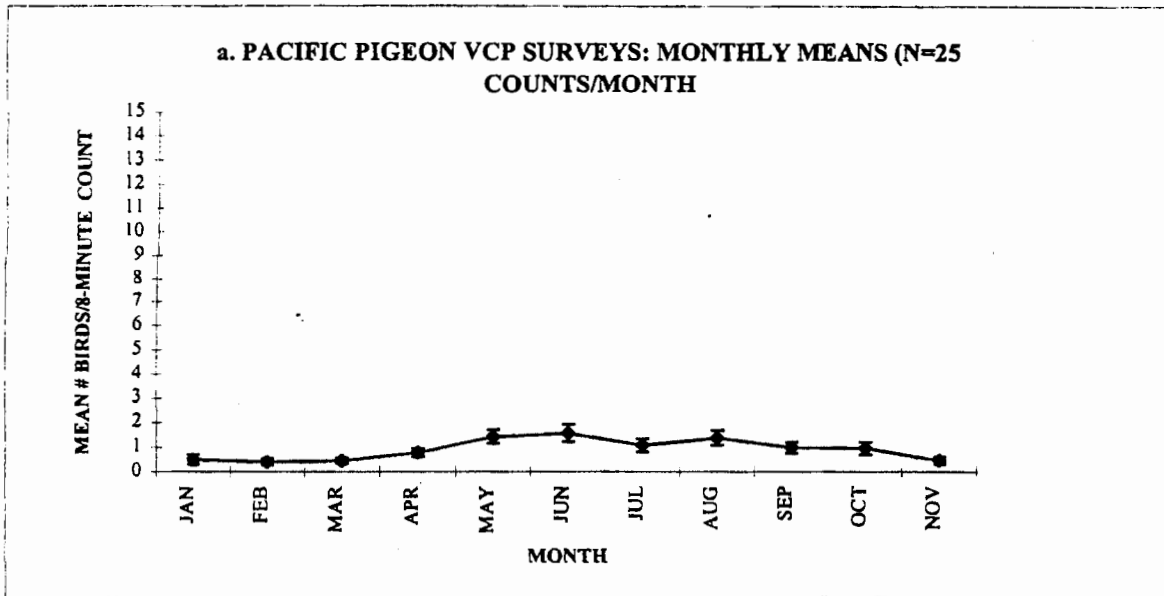
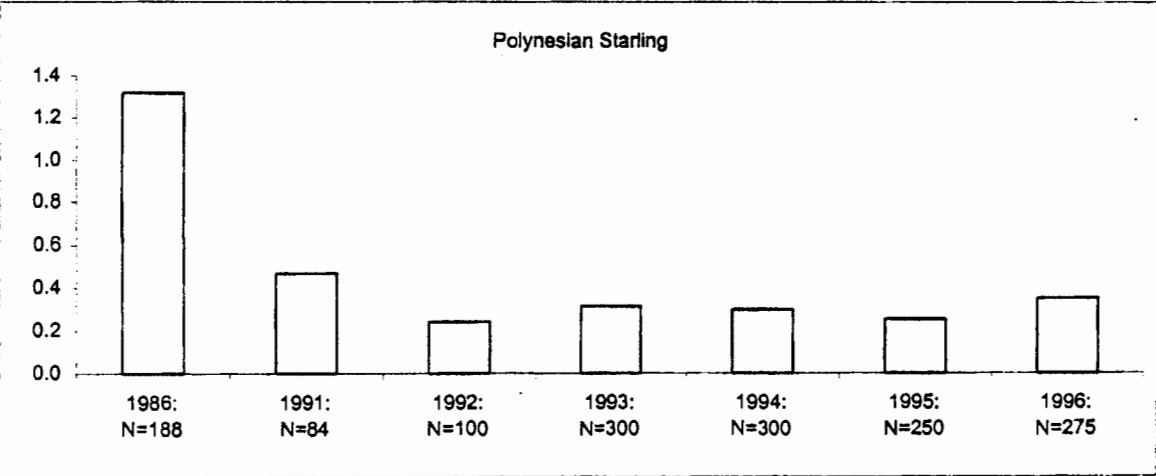
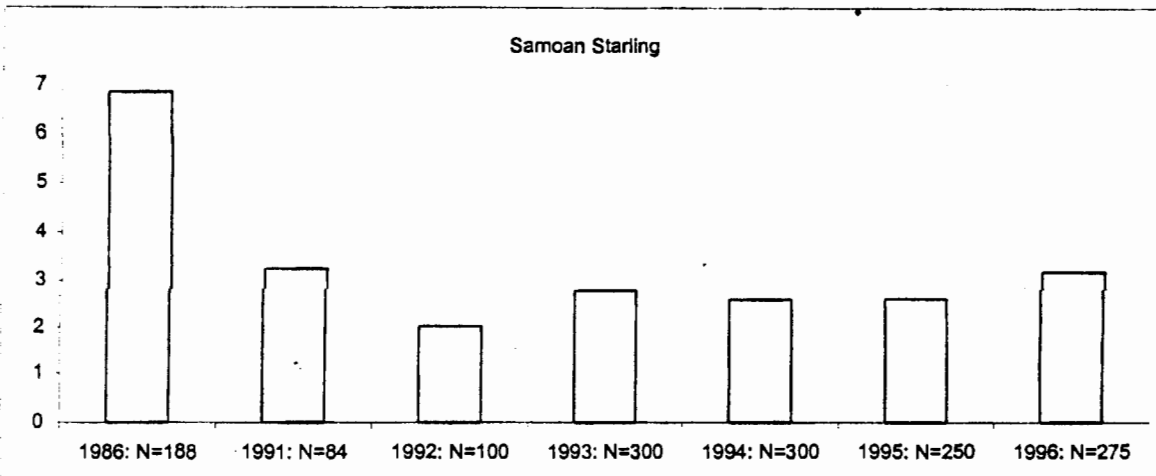


Figure 4. Comparison of variable circular plot data (a) and visual census data (b) for Pacific pigeons, January-November 1996.

Table 1. Mean numbers of birds recorded per eight-minute count in 1986 (Engbring and Ramsey), from 1991 to 1996. "1992-96 CHANGE" is the difference between 1992 and 1996 data for each species. This time period represents the span of continuous monthly censusing. "1996 % of 1986" is the proportion of 1986 number recorded in 1996 for each species.

SPECIES	1986	1991	1992	1993	1994	1995	1996	1992-96	
								CHANGE	1996% of 86
Many-Colored Fruit-Dove	0	0	0	0	0	0	0	0	127
Purple-Capped Fruit-Dove	14	3	1	2	2	2	2	1	16
Pacific Pigeon	1	1	1	1	1	1	1	0	99
Collared Kingfisher	1	0	1	1	0	1	1	0	102
Wattled Honeyeater	16	6	7	10	9	9	11	4	67
Cardinal Honeyeater	2	1	0	0	0	0	0	0	30
Polynesian Starling	1	0	0	0	0	0	0	0	27
Samoan Starling	7	3	2	3	3	3	3	1	46



*Figure 1, continued.*

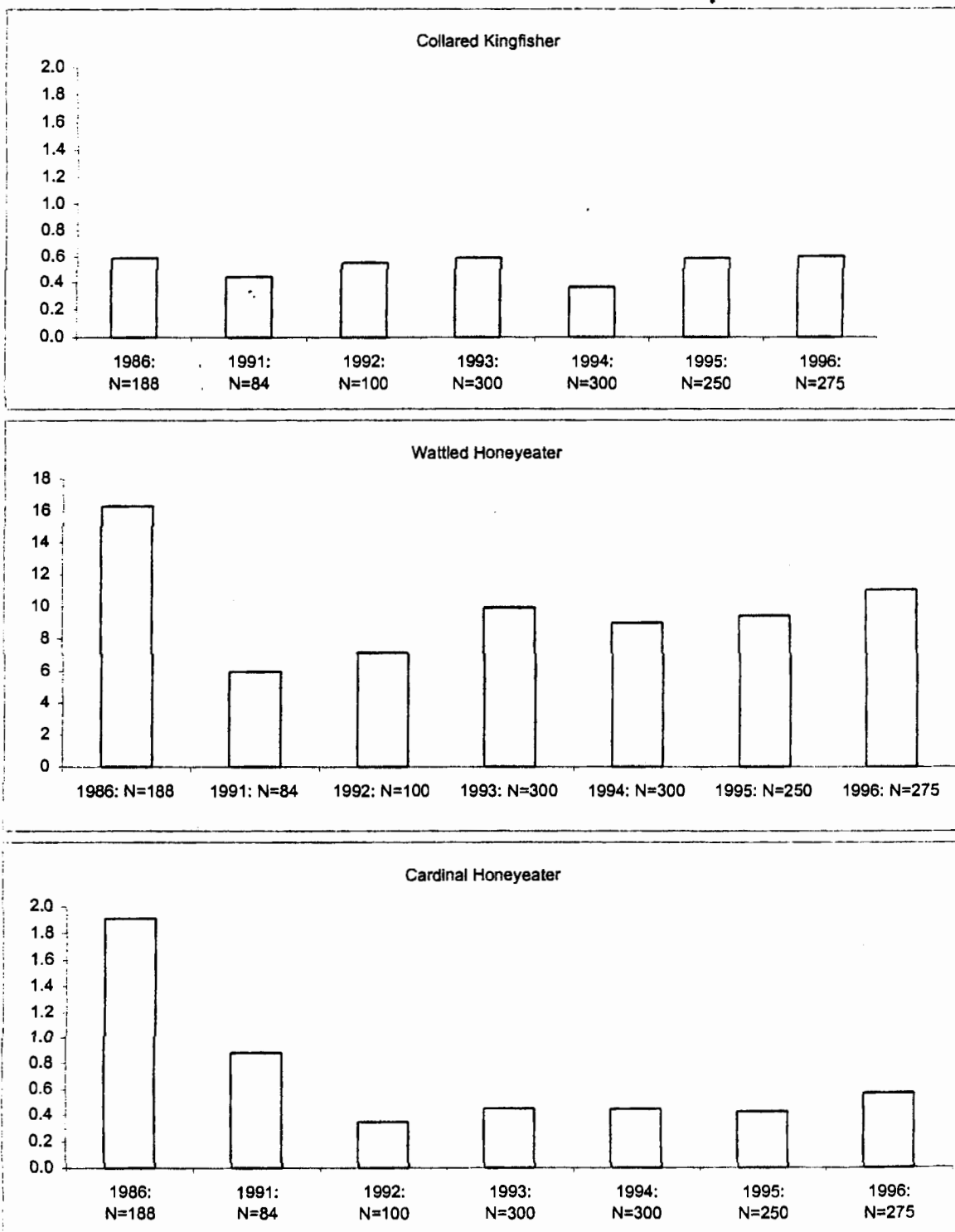


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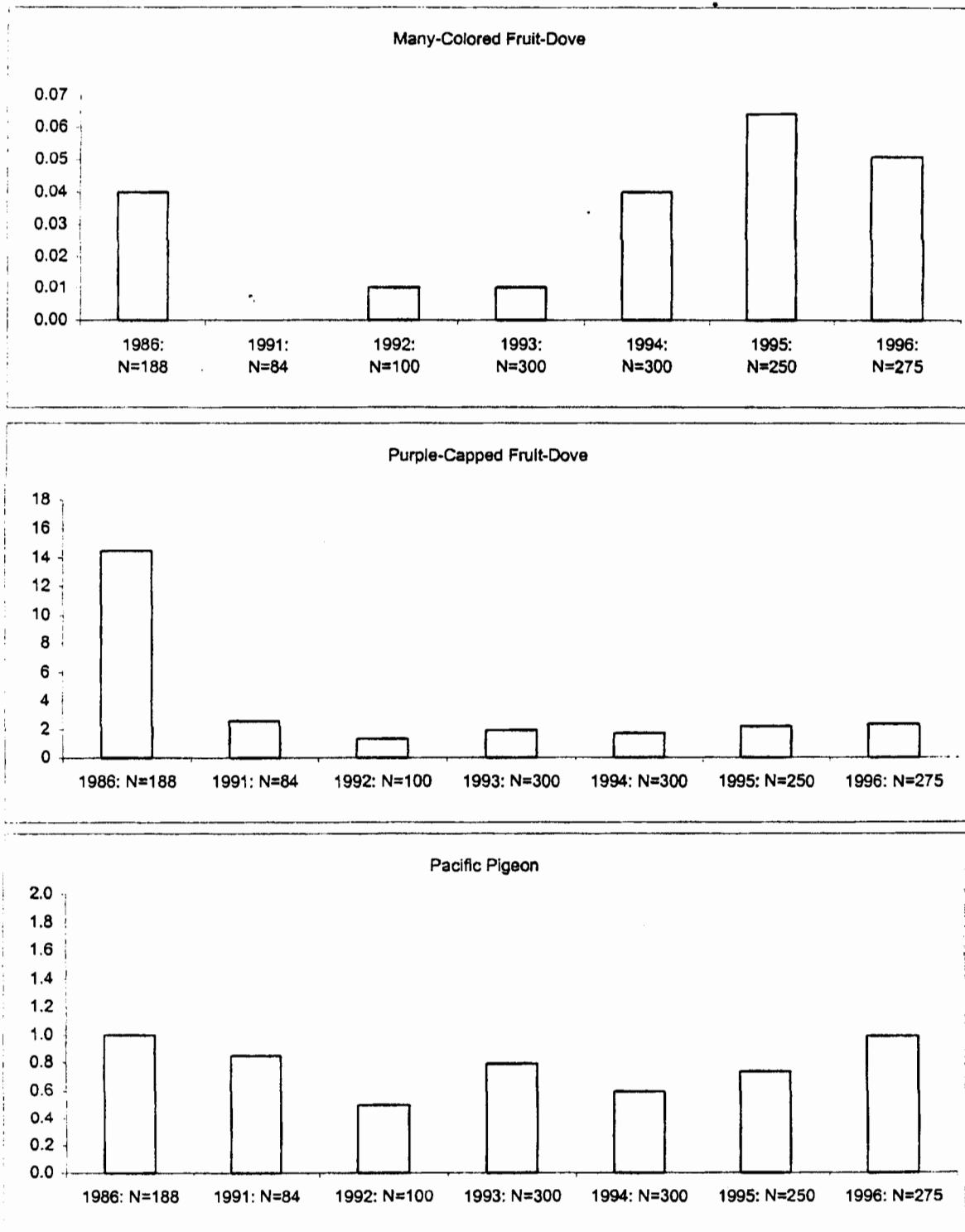


Figure 1. Summary of available data on relative abundance of forest birds from variable circular plot surveys on Tutuila Island. N=number of eight-minute censuses.