The Tropical Monitoring Avian Productivity and Survivorship (TMAPS) Program on Saipan, Commonwealth of the Northern Mariana Islands: 2009 Report

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EXECUTIVE SUMMARY

Few data exist on the ecology, population status, and conservation needs of landbirds of Saipan. In an effort to improve our understanding of this insular avifauna and to provide baseline population data for these species, we initiated the Tropical Monitoring Avian Productivity and Survivorship (TMAPS) program on the island in 2008. Long-term goals of this project are to: (1) provide annual indices of adult population size and post-fledging productivity (from constant-effort capture data); (2) provide annual estimates of adult population size, adult survival rates, proportions of residents, and recruitment into the adult population (from capture-recapture data); (3) relate avian demographic data to weather and habitat; (4) identify proximate and ultimate causes of population change; (5) use monitoring data to inform management; and (6) assess the success of management actions in an adaptive management framework. Here we provide a summary of captures and indices of population size (capture rates) and productivity for TMAPS stations operated during 2009, provide average values of these indices over 2008 and 2009, and compare 2008 and 2009 results.

We established six TMAPS stations in habitats typically used by landbirds of Saipan. Five of these stations (Bird Island Conservation Area, Laderan Tangke, Kingfisher, Mount Tapochau, and Obyan) were in forested habitats, which included tangantangan (*Leucaena leucocephala*) forest, tangantangan mixed with other evergreen forest types, and non-tangantangan evergreen forest. The sixth station, Sabana Talofofo, was in *Casuarina* savannah mixed with swordgrass thicket. Each station consisted of a sampling area of about 20 ha, within the central 8 ha of which we established 10 fixed mist-net sites. Mist nets were operated at these sites for approximately 6 morning hours on 10 days (per station) between 13 April and 17 July 2008 and between 11 April and 15 July 2009. With few exceptions, all birds captured during the operation of stations were identified to species, age, and sex and, if unbanded, were banded with numbered aluminum leg bands. Band numbers of all recaptures were recorded. We also recorded the breeding status of all birds seen, heard, or banded at these monitoring stations.

We recorded 1,238 captures of 13 bird species during the 2009 TMAPS season on Saipan, of which 827 (66.8%) were newly banded birds, 393 (31.7%) were recaptures, and 18 (1.5%) were birds released unbanded. The capture rate of adult birds (all species and stations combined) was 180.7 individuals/600 net-hours, and among stations it was highest at Laderan, followed by Bird Island, Obyan, Tapochau, Kingfisher, and Talofofo. The most commonly captured indigenous species were (in descending order) Rufous Fantail, Bridled White-eye, Golden White-eye, Micronesian Honeyeater, Collared Kingfisher, White-throated Ground-Dove, Micronesian Starling, Nightingale Reed-Warbler, and Mariana Fruit-Dove. Productivity (number of young per adult captured of all species combined) in 2009 was 0.09 for all six stations combined and was highest at Bird Island, followed by Talofofo, Tapochau, Laderan, Kingfisher, and Obyan.

Constant-effort comparisons between 2008 and 2009 indicated that adult population size for all species and stations combined increased substantially and significantly between 2008 and 2009, by an average of +36.9%. Significant ($P < 0.05$) increases in adult capture rate between 2008 and 2009 were recorded for White-throated Ground-Dove (+81.8%) and Rufous Fantail (+140.3%) whereas significant or near-significant ($0.05 \leq P < 0.10$) decreases were recorded for Collared Kingfisher (-46.2%) and Golden White-eye (-41.2%). Mean productivity (all species

and stations pooled) significantly declined by -0.299 (from 0.387 to 0.088) between 2008 and 2009. In contrast to the change in adult captures, productivity of Rufous Fantail significantly declined (-1.020), while productivity of Golden White-eye significantly increased (+0.186) between years. This sort of alternating dynamic – adult population size inversely related to productivity – is frequently observed in MAPS data (especially at stations with consistent weather across years), and may reflect density-dependent population dynamics. Although productivity increased for Golden White-eye between years, overall numbers of young birds captured remained relatively low. Thus, overall low productivity may be cause for concern for this endemic species and we will have to closely monitor its population dynamics during the next few years of TMAPS data collection.

To provide context to the adult capture rate and productivity values obtained at the Saipan TMAPS stations, we can compare them to values obtained by the MAPS program in North America. Based on all species and stations pooled, the mean capture rate for the two years (2008 and 2009) of data from the six Saipan TMAPS stations was 159.4 adults per 600 net-hours, and the reproductive index for these stations over the two years was 0.23 young/adult. These values were high and low, respectively, compared to values typically observed in the MAPS program. For example, the mean adult capture rate was higher than values reported for seven of eight MAPS locations (clusters of stations) operated by IBP in 2008, while the mean reproductive index was lower than seven of eight locations. Furthermore, the mean reproductive index from the Saipan TMAPS stations was lower than annual values reported at the MAPS program-wide scale between 1992 and 2006 (mean = 0.57; range = 0.43-0.70). It will be interesting to see if these comparisons hold, and how they relate to differences between temperate (including many migratory) and tropical (entirely resident) suites of landbird species.

Continuation of the current TMAPS sampling protocol will yield critical data on the survival, recruitment, and population growth rates for these birds. However, we continue to urge for additional mist-netting and banding throughout the year to enable us to better assess the annual cycle of resident landbirds and the optimal timing and extent of future TMAPS sampling. For example, between-year differences reported here may at least partly reflect shifts in the breeding season, rather than true differences in population status and/or productivity. Continued monitoring and realization of TMAPS goals will aid identification of conservation needs and formulation of management plans for landbirds of Saipan. The need for such plans is pressing, given the many threats to the persistence of these populations, and the vulnerability of several endemic taxa.

INTRODUCTION

Birds are sensitive indicators of environmental quality and ecosystem health (Morrison 1986, Hutto 1998), and they are the focus of many regional and continental scale monitoring efforts (Gregory et al. 2005, Sauer et al. 2008). Most broad-scale bird monitoring has focused on counts of birds with the principal goal of estimating trends (Bart 2005). Monitoring of demographic rates (productivity, recruitment, and survival) lends critical additional insight by providing data on causes of population changes (DeSante et al. 2005). Because demographic rates are directly affected by environmental stressors or management actions, they should more accurately (compared to abundance) and sensitively reflect short-term and local environmental changes (Temple and Wiens 1989, DeSante and George 1994). In addition, demographic data can be used to identify stages of the life cycle that are most important for limiting bird populations (Green 1999, Peach et al. 1999, DeSante et al. 2001, Holmes 2007, Saracco et al. 2008a). Finally, demographic data can be modeled as functions of environmental variables and incorporated into predictive population models to assess the viability of populations (Noon and Sauer 1992).

Application of standardized constant-effort mist netting and modern capture-recapture analytical techniques is an effective means of monitoring demographic rates of many landbird species (DeSante et al. 2005). Such an effort was initiated in North America by The Institute for Bird Populations (IBP) in 1989 with the establishment of the Monitoring Avian Productivity and Survivorship (MAPS) program (DeSante 1992), a cooperative network of nearly 500 constant-effort mist-netting stations operated across North America each summer, that provides demographic data for > 180 landbird species (DeSante and Kaschube 2007). Similar programs exist in Europe, where they are central components of national and international bird-monitoring efforts (e.g., Peach et al. 2004). The MAPS program was endorsed in 1991 by the Monitoring Working Group of Partners in Flight (PIF) and the USDI Bird Banding Laboratory, and has attracted participation from many U.S. agencies, including the National Park Service, Department of Defense, Texas Army National Guard, USDA Forest Service, and Fish and Wildlife Service, as well as hundreds of independent banding-station operators.

IBP, in collaboration with the Division of Fish and Wildlife of the Commonwealth of the Northern Mariana Islands, established and operated the first six "Tropical MAPS" (TMAPS) stations on the island of Saipan in spring/summer 2008 and continued operation of all six stations in 2009. The overall goal of this effort is to provide baseline data on trends, vital rates, and habitat associations for up to nine populations of bird species indigenous to Saipan, upon which to base a sound foundation for developing informed conservation strategies for this insular avifauna. Long-term goals of the TMAPS program on Saipan are to: (1) provide annual indices of adult population size and post-fledging productivity (from constant-effort capture data); (2) provide annual estimates of adult population size, survival rates, proportions of residents, and recruitment into the population (from capture-recapture data); (3) relate avian demographic data to weather and habitat; (4) identify population trends and proximate and ultimate causes of population change; (5) use these data to inform management; and (6) assess the success of management actions in an adaptive management framework. Saracco et al. (2008b) provided a summary of the first year of TMAPS operation on Saipan. Here we provide a summary of captures and indices of population size (capture rates) and productivity for TMAPS stations operated during 2009, provide average values of these indices over 2008 and 2009, and compare 2008 and 2009 results.

STUDY AREAS AND METHODS

In April 2008 we established six TMAPS stations in typical habitats utilized by landbirds on Saipan (Table 1; Fig. 1). We operated the six stations in April-July 2008 and again, in the exact same locations in which they were established in April-July 2009. One station name was changed just after the 2008 season, from Naftan Point to Obyan, but the location remained the same in both years. Each station consisted of a sampling area of about 20 ha. Within the central 8 ha of each station, ten 12-m long, 30-mm mesh, 4-tier nylon mist nets were erected at fixed net sites, in the exact same positions each year.

Stations were operated according to the standardized protocol established by The Institute for Bird Populations for use in the MAPS Program (DeSante et al. 2009). We operated each station on 10 days (separated by about 10 days) between 13 April and 17 July 2008 and between 11 April and 15 July 2009 (Table 1). Mist-netting effort data (i.e., the number and timing of net-hours on each day of operation) were collected in a standardized manner by recording opening and closing times (to the nearest 10 min) for nets, as well as the time at which each net check commenced. We aimed to operate nets for six morning hours per day beginning 15 minutes after sunrise (on or near 05:30 AST). Inclement weather (mostly high sun and wind exposure) and very high capture rates at some sites, however, resulted in variable effort among stations (Table 1). Station operation was carried out by ALC and JJ, who were experienced MAPS-station operators and were trained in TMAPS protocols, including molt patterns and ageing criteria of indigenous species of Saipan, by PP and IBP staff biologist Mary Chambers.

With few exceptions, all birds captured were identified to species, age, and sex based on criteria outlined by Pyle et al. (2008) and, if unbanded, they were banded with USGS/BRD numbered aluminum leg bands. Birds were released immediately upon capture and before being banded or processed if situations arose where bird safety would be compromised. The following data were taken on all birds captured, including recaptures, according to MAPS guidelines (DeSante et al. 2008):

- capture code (newly banded, recaptured, band changed, unbanded)
- band number
- species
- age and how aged
- sex (if possible to determine) and how sexed (if applicable)
- extent of skull pneumaticization
- breeding condition of adults (i.e., extent of cloacal protuberance or brood patch)
- extent of juvenal plumage in young birds
- extent of body and flight-feather molt
- extent of primary-feather wear
- presence of molt limits and plumage characteristics
- wing chord
- fat class and body mass

- date and time of capture (net-run time)
- station and net site where captured
- any pertinent notes

Breeding (summer residency) status (confirmed breeder, likely breeder, non-breeder) of each species seen, heard, or captured at each TMAPS station on each day of operation was recorded using techniques similar to those employed for breeding bird atlas projects (see Appendix I). We used these data to classify each species at each station according to three residency categories: breeder, migrant, or transient (Appendix I). Habitat data were collected following Nott et al. (2003a), and using the vegetation classification system of Viereck et al. (1992). John W. Shipman of Zoological Data Processing, Socorro, NM, entered banding data. IBP staff biologists entered effort data and proofed and verified digitized banding data. Verification of banding data involved running all records through a series of specialized computer programs. These programs included:

- Clean-up programs to check the validity of all codes entered and the ranges of all numerical data.
- Cross-check programs to compare station, date, and net fields from the banding data with those from the effort and breeding status data.
- Cross-check programs to compare species, age, and sex determinations against degree of skull pneumaticization, breeding condition (extent of cloacal protuberance and brood patch), extent of juvenal plumage, extent of body and flight-feather molt, extent of primary-feather wear, and presence of molt limits and plumage characteristics.
- Screening programs which allow identification of unusual or duplicate band numbers or unusual band sizes for each species.
- Verification programs to screen banding and recapture data for inconsistent species, age, or sex determinations for each band number. Discrepancies or suspicious data identified by these programs were corrected if necessary. We used wing chord, body mass, fat content, date and station of capture, and pertinent notes as supplementary information for the correct determination of species, age, and sex.

In addition, digital images of the wing upper-surface were obtained for many captures to further refine our knowledge on molt patterns and ageing criteria for these species (see Pyle 2008). All digital images of open wings were also compared with banding data during the verification process to improve the accuracy of age and sex designations.

For each species and for all species pooled at each location, we calculated (1) numbers of newly banded birds, recaptured birds, and birds released unbanded; (2) numbers and capture rates (per 600 net-hours) of first captures (in each year) for individual adult and young birds; and (3) the ratio of young to adult birds (“reproductive index”; Peach et al. 1996). For each station, we also calculated percent changes between 2008 and 2009 in the numbers of adult and young birds captured, and actual changes in the reproductive index. These between-year comparisons were made in a "constant-effort" manner by means of a specially designed analysis program that used net-run (capture) times and net-opening and -closing times on a net-by-net and period-by-period basis to exclude captures that occurred in a given net in a given period in one year during the time when that net was not operated in that period in the other year. We determined the statistical significance of between-year changes in the indices of adult population size and post-fledging productivity according to methods developed by the BTO in their CES scheme (Peach et al. 1996), by using confidence intervals derived from the standard errors of the mean percentage changes of all six stations. The statistical significance of the overall change at a given station was inferred from a one-sided binomial test on the proportion of species at that station that increased (or decreased). Throughout this report, we use an alpha level of 0.05 for statistical significance, and we use the term ‘near-significant’ or ‘nearly significant’ to report results of analyses for which $0.05 < P < 0.10$.

To facilitate comparison of landbird dynamics among stations and to values obtained by the MAPS program in North America, we also calculated two-year means for the numbers of adult and young birds captured per 600 net hours and the reproductive index for each individual species and for all species pooled at each of the six stations and for all six stations combined.

RESULTS

We recorded 1,238 captures of 13 species of birds during the 2009 TMAPS season on Saipan (Table 2). Of these, 827 (66.8%) were of newly banded birds, 393 (31.7%) were of recaptures, and 18 (1.5%) were of birds released unbanded (primarily due to escape before processing). Six species were captured in sufficient quantity to perform robust analyses. The most commonly captured species was Rufous Fantail (see Appendix I for scientific names), of which 672 captures were recorded, representing 54.2% of all captures. This was followed by Bridled White-eye (210 captures), Golden White-eye (168), Micronesian Honeyeater (71), Collared Kingfisher (35), and White-throated Ground-Dove (27). All six of these landbird species are indigenous to Saipan. Two additional indigenous species, Micronesian Starling (14 captures) and Nightingale Reed-Warbler (13 captures), were captured in sufficient quantity to perform some analyses. The remaining five species consisted of one indigenous landbird species (Mariana Fruit-Dove), three naturalized species (Philippine Turtle-Dove, Orange-cheeked Waxbill, and Eurasian Tree-Sparrow) and one waterbird species (Pacific Reef-Heron), an individual of which was captured at the coastal Bird Island Conservation Area station. Between one and 14 captures were recorded for these five species (Table 2).

Among the six stations (Table 3) the greatest number of captures occurred at the Bird Island Conservation Area station (346 captures), followed by Laderan Tangke (330), Obyan (264), Mount Tapochau (118), Kingfisher (115), and Sabana Talofofo (65). Species richness was highest at Bird Island and Laderan (10 species each) and lowest at Obyan (7 species). In order to standardize the number of captures with respect to variation in mist-netting effort (see Table 1), we present capture rates (per 600 net-hours) of individual adult and young birds, as well as the reproductive index (young captured per adult), for each species and for all species pooled at each station (Table 4). These capture indices suggest that the total adult population size in 2009 was greatest at Laderan (263.1 adults/600 net hours), followed by Bird Island (252.9), Obyan (221.9), Tapochau (118.7), Kingfisher (112.0), and Talofofo (69.9).

The capture rate of adults at the six stations combined was 180.7 per 600 net-hours (Table 2). The most abundant indigenous breeding landbird at the six Saipan TMAPS stations in 2009, as determined by adult capture rate, was Rufous Fantail (92.9 per 600 net-hours), followed in descending order by Bridled White-eye (35.7), Golden White-eye (23.4), Micronesian Honeyeater (10.7), Collared Kingfisher (4.6), White-throated Ground-Dove (4.4), Micronesian Starling (2.4), Nightingale Reed-Warbler (1.4), and Marianas Fruit-Dove (0.4). The following is a list of the common indigenous and naturalized breeding species (captured at a rate of at least 4.0 adults per 600 net-hours), in decreasing order, at each station in 2008 (see Table 4):

Bird Island Conservation Area
Rufous Fantail
Golden White-eye
Bridled White-eye
Micronesian Honeyeater
White-throated Ground-Dove

Laderan Tangke
Rufous Fantail
Bridled White-eye
Golden White-eye
Collared Kingfisher
Micronesian Honeyeater

Sabana Talofofo
Micronesian Honeyeater
Rufous Fantail
Bridled White-eye
Orange-cheeked Waxbill
Eurasian Tree Sparrow
Micronesian Starling

Kingfisher
Rufous Fantail
Golden White-eye
White-throated Ground-Dove
Micronesian Honeyeater
Collared Kingfisher
Bridled White-eye

Mount Tapochau
Rufous Fantail
Golden White-eye
Bridled White-eye
Micronesian Honeyeater

Obyan
Rufous Fantail
Bridled White-eye
Orange-cheeked Waxbill
Golden White-eye

Captures of young of all species pooled (Table 4) showed a somewhat similar order to captures of adults, being highest at Bird Island (34.5 young/600 net hours), followed by Laderan (21.8) Tapochau (10.4), Kingfisher (9.3), Talofofo (8.4), and Obyan (6.6). The reproductive index in 2009, as determined by the number of young per adult, was 0.09 when all six stations were combined (Table 2). The reproductive index was highest at Bird Island (0.14), followed by Talofofo (0.12), Tapochau (0.09), Laderan and Kingfisher (0.08), and Obyan (0.03).

Comparisons between 2008 and 2009

Constant-effort comparisons between 2008 and 2009 were undertaken for all six Saipan stations, for numbers of adult birds captured (index of adult population size; Table 5), numbers of young birds captured (Table 6), and number of young per adult (reproductive index; Table 7).

Adult population size, for all species pooled and at all six stations combined, increased substantially and significantly between 2008 and 2009, by +36.9% (Table 5). Increases were recorded for 9 of 12 species (0.75), a proportion near-significantly greater than would be expected by chance (0.50). The number of adults captured of all species pooled increased at each of the six stations, by amounts ranging from +9.5% at Talafofo to +66.4% at Obyan. At the station scale, the proportion of increasing species (0.78) was near-significantly greater than 0.50

at Tapochau. Significant increases in adult capture rates between 2008 and 2009 were recorded for White-throated Ground-Dove (+81.8%) and Rufous Fantail (+140.3%), whereas significant or near-significant decreases were recorded for Collared Kingfisher (-46.2%) and Golden White-eye (-41.2%).

The number of young birds captured, of all species pooled and for all six stations combined, decreased by a highly significant -6.8% between 2008 and 2009 (Table 6). Decreases between 2008 and 2009 were recorded for 4 of 8 species. Young captured for all species pooled decreased at five of the six stations, by amounts ranging from -56.6% at Bird Island to -87.8% at Tapochau, and it remained unchanged at Talofofo. The proportion of decreasing or increasing species was not significantly different from 0.50 at any of the six stations. The number of young Rufous Fantails captured decreased by a highly significant -89.9% across stations and the number of young Golden White-eyes increased by +300% and at 4 of 5 stations but this increase was not significant.

Given the significant increase in adults and decrease in young captured, reproductive index (the number of young per adult) showed a highly significant decrease in absolute value of -0.299, from 0.387 in 2008 to 0.088 in 2009, for all species pooled and all six stations combined (Table 7). Decreases in productivity (reproductive index) were recorded for 4 of 11 species (0.36), a proportion not significantly less than 0.50. Productivity decreased at all six stations, by amounts ranging from -0.010 at Talofofo to -0.540 at Tapachou. The proportion of increasing or decreasing species was, however, not significantly greater than 0.50 for any station. Productivity of Rufous Fantail significantly declined (by -1.020), while productivity of Golden White-eye significantly increased (by +0.186) between years.

In summary, breeding population size as reflected by adult capture rates increased and productivity as measured by reproductive index (young/adult) decreased between 2008 and 2009. Changes were consistent across all six stations, but were not consistent among species. The two species with the most substantial changes showed opposite population dynamics: Rufous Fantail showed a dramatic increase in adult population size and an equally dramatic decrease in productivity, whereas Golden White-eye showed the opposite pattern, decreasing significantly in population size but increasing significantly in productivity.

Two-year mean population size and productivity values as compared with those of MAPS
Mean numbers of individual adults (an index of adult population size) and young captured per 600 net-hours, and productivity (reproductive index), averaged over the two-year period 2008-2009, are presented in Table 8 for each station and for all six stations combined. Values for all species pooled indicate that the largest breeding populations (adult captures) occurred at Laderan, followed by Bird Island, Obyan, Tapachou, Kingfisher, and Talafofo. This is identical to the order based on 2009 data only (Table 4). Productivity over the two years was highest at Tapachou, followed by Bird Island, Kingfisher, Laderan, Obyan, and Talafofo. In contrast to adult captures, the order of the averaged productivity values differed substantially from the order based on 2009 only (Table 4 and see above).

Stations with the highest capture rates during 2008-2009 for each of the indigenous landbird species were: White-throated Ground-Dove at Laderan, Mariana Fruit-Dove at Talapopo, Collared Kingfisher at Laderan, Micronesian Honeyeater at Bird Island, Rufous Fantail at Laderan and Obyan, Nightingale Reed-Warbler at Bird Island, Bridled White-eye at Obyan and Laderan, Golden White-eye at Bird Island, and Micronesian Starling at Talafofo. These station-species totals were similar to those recorded based on 2008 data only. For all six stations combined, the two-year capture rate was 159.4 adults per 600 net-hours and the reproductive index over the two years was 0.23 young/adults.

DISCUSSION

The first two field seasons of the Tropical Monitoring Avian Productivity and Survivorship (TMAPS) program on Saipan have been highly successful. Specifically, we have (1) established six monitoring stations, representing a range of terrestrial habitats typical of the region, across the length of the island; (2) met mist-netting effort goals for all stations in both years of station operation; and (3) registered over 2,000 captures of birds over the 2-year period. These first two field seasons have also enabled us to collect extensive data on molt, plumage, breeding condition, skull pneumaticization, and morphometrics; and have provided a foundation for developing criteria for determining age and sex in these birds (Pyle et al. 2008).

The two northern sites, Bird Island Conservation Area and Laderan Tangke, continued to have higher capture rates (adult and young birds of all species combined) than the other four TMAPS stations, while the one station in savannah/swordgrass habitat, Sabana Talofofo, continued to have the lowest capture rates. In general, productivity declined substantially at all sites, with the exception of the station, Sabana Talafofo, which had similarly low productivity values in both years (0.11 in 2008 and 0.12 in 2009). For individual species, ranking of sites with respect to breeding population size was similar between the two years, reflecting habitat associations at or near the stations (Saracco et al. 2008b), whereas rankings of stations based on overall productivity differed between 2008 and 2009.

Despite observed patterns in productivity, however, it must be noted that ratios of young to adult birds during the limited time period sampled by TMAPS may not be the best indicator of annual reproductive success, and this is reflected by the widely differing values recorded during the two years of the study. Many landbird species on Saipan, including all species commonly captured at TMAPS stations, can breed at any time of the year (Baker 1951, Marshall 1949, Craig 1996, Pyle et al. 2008), and the potential lack of a single breeding peak suggests that the ‘snapshot’ provided by TMAPS may not accurately represent productivity. For this reason we recommend expanding the dates of coverage for the TMAPS program in Saipan, ideally to year-round but at least for an extended timeframe from February-September, which may capture most of the breeding season according to published sources and molt and breeding data collected during the first two years of this study (Pyle et al. 2008).

The collection of a second season of data allowed us to make between-year comparisons of our population size and productivity indices. Notable changes between 2008 and 2009 were an increase in adult population size but decrease in productivity for Rufous Fantail, and a decrease in adult population size but increase in productivity for Golden White-eye. This sort of alternating dynamic has frequently been observed at MAPS stations, especially those without major variation in year-to-year climate, and reflects a density-dependant dynamic. High density breeding populations in a given year can result in lower reproductive success (and survivorship) due to competition for nest sites and food; while small populations may suffer less intra-specific competition and experience relatively high productivity and survival. Other indigenous species that showed this dynamic in 2008-2009 included White-throated Ground-Dove, Collared Kingfisher, and Bridled White-eye. Although productivity increased for Golden White-eye between years, the two-year value (0.12) remained relatively low. Thus, overall low productivity may be cause for concern for this endemic species, which is ranked as "critically endangered" by BirdLife International (2009) and may be suffering a long-term population decline (Camp et al. 2009). We will have to closely monitor the population dynamics of this species during the next few years of TMAPS data collection.

Given the dearth of data on Micronesian landbirds (Rodda et al. 1998, Mosher and Fancy 2002, Sachtleben et al. 2006, Camp et al. 2009), establishment of the TMAPS program on Saipan represents a significant advance in improving our understanding of this insular avifauna. Continuation of the current sampling protocol will yield critical data on the survival, recruitment, and population growth rates of several indigenous species or subspecies, such as Golden White-eye, Rufous Fantail, and Bridled White-eye. Following a third year of data collection in 2010 we will be able to obtain preliminary survival-rate estimates.

Although we are pleased with the results of the first two TMAPS seasons on Saipan, we continue to urge regular mist-netting throughout the year, which would better enable us to assess (1) the annual cycle of resident landbirds and (2) the optimal timing and extent of future TMAPS sampling efforts. For example, the between-year differences we report here may have as much or more to do with shifts in breeding season dynamics as in true differences in population status and/or productivity. More extensive sampling would also improve our ability to accurately age and sex birds (Pyle et al. 2008). Accurate age and sex data are critical for identifying demographic structure in populations and estimating age- and sex-specific demographic rates. Continued monitoring at the TMAPS stations and the realization of TMAPS goals will aid identification of conservation needs and formulation of management plans for landbirds of Saipan, including the critically endangered Golden White-eye. The need for such plans is pressing given the many threats to the persistence of these populations such as those associated with habitat loss the potential introduction of brown treesnake *Boiga irregularis* (Rodda et al. 1998; Camp et al. 2009), and the general vulnerability of insular endemic landbird taxa. We look forward to continuing this important work in the coming years.

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Table 1. Summary of the 2009 TMAPS program on the island of Saipan, Commonwealth of the Northern Marianas Islands (CNMI), Micronesia.

Station					2009 operation		
Name	Code	Major Habitat Type	Latitude-longitude	Avg Elev. (m)	Total number of net-hours[1]	No. of periods	Inclusive dates
Bird Island Conservation Area	BICA	Lowland tropical evergreen tangantangan forest	15°15'45"N,145°48'50"E	30	574.2 (549.8)	10	04/12 – 07/11
Laderan Tangke	LATA	Lowland tropical evergreen tangantangan forest and lowland tropical rainforest	15°15'10"N,145°47'54"E	207	522.2 (458.5)	10	04/15 – 07/14
Sabana Talofofo	SATA	Tropical *Casuarina* savannah with dense swordgrass thicket	15°13'07"N,145°45'44"E	161	429.0 (380.7)	10	04/14 – 07/13
Kingfisher	KIFI	Lowland tropical broad-leaf evergreen rainforest with riparian zone	15°13'02"N,145°46'37"E	23	450.0 (392.7)	10	04/11 – 07/10
Mount Tapochau	MTAP	Submontane tropical mixed broad-leaf evergreen rainforest	15°11'01"N,145°44'04"E	274	460.0 (389.7)	10	04/16 – 07/15
Obyan	OBYA	Lowland tropical evergreen tangantangan forest	15°06'31"N,145°43'49"E	1	543.5 (510.2)	10	04/13 – 07/12
ALL STATIONS					2978.8(2681.5)	10	04/11 – 07/15

[1] Total net-hours in 2009. Net-hours in 2009 that could be compared in a constant-effort manner to 2008 are shown in parentheses.

Table 2. Summary of combined results for all six Saipan TMAPS stations operated in 2009.

	Birds captured			Birds/600 net-hours		
Species[1]	Newly banded	Un-banded	Recap-tured	Adults	Young	Prop. Young
Pacific Reef Heron		1				
Philippine Turtle-Dove	4	1		0.8	0.0	0.00
White-throated Ground-Dove	22	1	4	4.4	0.0	0.00
Mariana Fruit-Dove	2			0.4	0.0	0.00
Collared Kingfisher	24		11	4.6	1.2	0.26
Micronesian Honeyeater	56	1	14	10.7	1.8	0.17
Rufous Fantail	373	8	291	92.9	4.0	0.04
Nightingale Reed-Warbler	10		3	1.6	0.4	0.25
Bridled White-eye	184	3	23	35.7	3.0	0.08
Golden White-eye	119	3	46	23.4	5.0	0.22
Micronesian Starling	14			2.4	0.4	0.17
Orange-cheeked Waxbill	13		1	2.6	0.0	0.00
Eurasian Tree Sparrow	6			1.2	0.0	0.00
ALL SPECIES POOLED	827	18	393	180.7	15.9	0.09
Total Number of Captures		1238				
Number of Species	12	7	8	12	7	
Total Number of Species		13			12	

[1] Scientific names given in Appendix.

Table 3. Capture summary for the six individual TMAPS stations operated on the island of Saipan, Commonwealth of the Northern Marianas Islands (CNMI), Micronesia, in 2009. N = Newly banded, U = Unbanded, R = Recaptures of banded birds.

	Bird Island Cons. Area			Laderan Tangke			Sabana Talofofo			Kingfisher			Mount Tapochau			Obyan		
Species[1]	N	U	R	N	U	R	N	U	R	N	U	R	N	U	R	N	U	R
Pacific Reef Heron		1																
Philippine Turtle-Dove				2						1				1		1		
White-throated Ground-Dove	8	1		2			1			10		4	1					
Mariana Fruit-Dove	1			1														
Collared Kingfisher	4		1	7		6				5		2	3		1	5		1
Micronesian Honeyeater	11		4	7			9	1	6	11		1	16		3	2		
Rufous Fantail	95	1	74	122	4	99	12		2	27	1	26	24	1	21	93	1	69
Nightingale Reed-Warbler	5		1	2		1	2		1				1					
Bridled White-eye	44		5	43		6	9		1	5			17	1	3	66	2	8
Golden White-eye	57	1	30	24		3	3		1	10	1	7	19		4	6	1	1
Micronesian Starling	2			1			5			4			2					
Orange-cheeked Waxbill							6									7		1
Eurasian Tree Sparrow							6											
ALL SPECIES POOLED	227	4	115	211	4	115	53	1	11	73	2	40	83	3	32	180	4	80
Total Number of Captures		346			330			65			115			118			264	
Number of Species	9	4	6	10	1	5	9	1	5	8	2	5	8	3	5	7	3	5
Total Number of Species		10			10			9			8			9			7	

[1] Scientific names given in Appendix.

Table 4. Numbers of aged individual birds captured per 600 net-hours and proportion of young in the catch at the six individual TMAPS stations operated on the island of Saipan, Commonwealth of the Northern Marianas Islands (CNMI), Micronesia, in 2009.

	Bird Island Cons. Area			Laderan Tangke			Sabana Talofofo			Kingfisher			Mount Tapochau			Obyan		
Species[1]	Ad.	Yg.	Prop. Yg.	Ad.	Yg.	Prop. Yg.	Ad.	Yg.	Prop. Yg.	Ad.	Yg.	Prop. Yg.	Ad.	Yg.	Prop. Yg.	Ad.	Yg.	Prop. Yg.
Philippine Turtle-Dove				2.3	0.0	0.00				1.3	0.0	0.00				1.1	0.0	0.00
White-throated Ground-Dove	8.4	0.0	0.00	2.3	0.0	0.00	1.4	0.0	0.00	13.3	0.0	0.00	1.3	0.0	0.00			
Mariana Fruit-Dove	1.0	0.0	0.00	1.1	0.0	0.00												
Collared Kingfisher	3.1	2.1	0.67	9.2	1.1	0.13				6.7	1.3	0.20	5.2	0.0	0.00	3.3	2.2	0.67
Micronesian Honeyeater	13.6	1.0	0.08	4.6	3.4	0.75	16.8	0.0	0.00	13.3	1.3	0.10	15.7	5.2	0.33	2.2	0.0	0.00
Rufous Fantail	122.3	10.5	0.08	170.1	4.6	0.03	15.4	1.4	0.09	49.3	2.7	0.05	41.7	2.6	0.06	128.1	1.1	0.01
Nightingale Reed-Warbler	5.2	0.0	0.00	1.1	1.1	1.00	1.4	1.4	1.00				1.3	0.0	0.00			
Bridled White-eye	39.7	6.3	0.16	49.4	3.4	0.07	8.4	5.6	0.67	6.7	0.0	0.00	24.8	0.0	0.00	72.9	2.2	0.03
Golden White-eye	57.5	14.6	0.26	21.8	8.0	0.37	2.8	0.0	0.00	18.7	1.3	0.07	26.1	2.6	0.10	6.6	1.1	0.17
Micronesian Starling	2.1	0.0	0.00	1.1	0.0	0.00	7.0	0.0	0.00	2.7	2.7	1.00	2.6	0.0	0.00			
Orange-cheeked Waxbill							8.4	0.0	0.00							7.7	0.0	0.00
Eurasian Tree Sparrow							8.4	0.0	0.00									
ALL SPECIES POOLED	252.9	34.5	0.14	263.1	21.8	0.08	69.9	8.4	0.12	112.0	9.3	0.08	118.7	10.4	0.09	221.9	6.6	0.03
Number of Species	9	5		10	6		9	3		8	5		8	3		7	4	
Total Number of Species		9			10			9			8			8			7	

[1] Scientific names given in Appendix.

Table 5. Percentage changes between 2008 and 2009 in the numbers of individual ADULT birds captured at six constant-effort TMAPS stations operated on the island of Saipan, Commonwealth of the Northern Marianas Islands (CNMI), Micronesia.

Species	Bird Island Cons. Area	Laderan Tagke	Sabana Talofofo	King-fisher	Mount Tapochau	Obyan	All six stations combined: n[1]	Number of adults: 2008	Number of adults: 2009	Percent change	SE[2]	
Philippine Turtle-Dove	-100.0	++++[3]		++++[3]	-100.0	++++[3]	5	2	3	50.0	153.1	
White-throated Grd.-Dove	60.0	100.0	++++[3]	100.0	++++[3]	-100.0	6	11	20	81.8	26.5	**
Mariana Fruit-Dove	++++[3]	++++	-100.0				3	1	2	100.0	300.0	
Collared Kingfisher	-78.6	-50.0		-50.0	100.0	200.0	5	39	21	-46.2	17.1	*
Micronesian Honeyeater	-40.9	-40.0	-45.0	400.0	300.0	0.0	6	53	47	-11.3	29.0	
Rufous Fantail	210.8	150.0	83.3	300.0	107.1	81.3	6	186	447	140.3	28.7	***
Nightingale Reed-Warbler	++++	-50.0	-50.0		++++		4	4	8	100.0	191.5	
Bridled White-eye	81.0	-11.1	-37.5	300.0	13.3	53.7	6	131	167	27.5	20.2	
Golden White-eye	-33.3	-48.6	-50.0	-44.0	-50.0	-33.3	6	187	110	-41.2	4.4	***
Micronesian Starling	0.0	-100.0	300.0	0.0	++++	-100.0	6	8	10	25.0	61.0	
Orange-cheeked Waxbill		-100.0	++++			++++	3	1	12	1100.0	1808.3	
Eurasian Tree Sparrow			++++				1	0	6	++++[3]		
ALL SPECIES POOLED	31.7	31.3	9.5	54.9	16.2	66.4	6	623	853	36.9	7.5	***
No. species that increased[4]	5(2)	4(2)	5(3)	5(1)	7(3)	5(2)				9 (1)		
No. species that decreased[5]	4(1)	7(2)	5(1)	2(0)	2(1)	3(2)				3 (0)		
No. species remained same	1	0	0	1	0	1				0		
Total Number of Species	10	11	10	8	9	9				12		
Proportion of increasing (decreasing) species	0.500	0.364	0.500	0.625	0.778	0.556				0.750		
Sig. of increase (decrease)[6]	0.623	0.887	0.623	0.363	0.090	0.500				0.073		
					*					*		

[1] Number of stations at which at least one adult bird was captured in either year.
[2] Standard error of the % change in the number of adult birds captured.
[3] Increase indeterminate (infinite) because no adult was captured during 2008.
[4] No. of species for which adults were captured in 2009 but not in 2008 are in parentheses.
[5] No. of species for which adults were captured in 2008 but not in 2009 are in parentheses.
[6] Statistical significance of the one-sided binomial test that the proportion of increasing (decreasing) species is not greater than 0.50.
*** $P < 0.01$; ** $0.01 \le P < 0.05$; * $0.05 \le P < 0.10$.

Table 6. Percentage changes between 2008 and 2009 in the numbers of individual YOUNG birds captured at six constant-effort TMAPS stations operated on the island of Saipan, Commonwealth of the Northern Marianas Islands (CNMI), Micronesia.

							All six stations combined					
								Number of young				
Species	Bird Island Cons. Area	Laderan Tagke	Sabana Talofofo	King-fisher	Mount Tapochau	Obyan	n[1]	2008	2009	Percent change	SE[2]	
Philippine Turtle-Dove							0	0	0			
White-throated Grd.-Dove	-100.0					-100.0	2	4	0	-100.0	88.9	
Mariana Fruit-Dove							0	0	0			
Collared Kingfisher	++++[3]	-50.0		++++[3]		++++[3]	4	2	6	200.0	336.7	
Micronesian Honeyeater	-50.0	++++[3]	-100.0	++++	100.0	-100.0	6	9	7	-22.2	59.5	
Rufous Fantail	-85.3	-92.0	0.0	-89.5	-93.1	-96.8	6	198	20	-89.9	2.3	***
Nightingale Reed-Warbler		++++	++++[3]				2	0	2	++++[3]		
Bridled White-eye	200.0	50.0	++++		-100.0	-80.0	5	22	14	-36.4	45.3	
Golden White-eye	1300.0	250.0		++++	-66.7	++++	5	6	24	300.0	278.9	
Micronesian Starling				++++			1	0	2	++++		
Orange-cheeked Waxbill							0	0	0			
Eurasian Tree Sparrow							0	0	0			
ALL SPECIES POOLED	-56.6	-66.1	0.0	-63.2	-87.8	-86.4	6	241	75	-68.9	6.8	***
No. species that increased[4]	3(1)	4(2)	2(2)	4(4)	1(0)	2(2)				4 (2)		
No. species that decreased[5]	3(1)	2(0)	1(1)	1(0)	3(1)	4(2)				4 (1)		
No. species remained same	0	0	1	0	0	0				0		
Total Number of Species	6	6	4	5	4	6				8		
Proportion of increasing (decreasing) species	(0.500)	(0.333)	0.500	(0.200)	(0.750)	(0.667)				(0.500)		
Sig. of increase (decrease)[6]	(0.656)	(0.891)	0.688	(0.969)	(0.313)	(0.344)				(0.637)		

[1] Number of stations at which at least one young bird was captured in either year.
[2] Standard error of the % change in the number of young birds captured.
[3] Increase indeterminate (infinite) because no young were captured during 2008.
[4] No. of species for which young were captured in 2009 but not in 2008 are in parentheses.
[5] No. of species for which young were captured in 2008 but not in 2009 are in parentheses.
[6] Statistical significance of the one-sided binomial test that the proportion of increasing (decreasing) species is not greater than 0.50.
*** $P < 0.01$; ** $0.01 \le P < 0.05$; * $0.05 \le P < 0.10$.

Table 7. Absolute changes between 2008 and 2009 in the PROPORTION OF YOUNG in the catch at six constant-effort TMAPS stations operated on the island of Saipan, Commonwealth of the Northern Marianas Islands (CNMI), Micronesia.

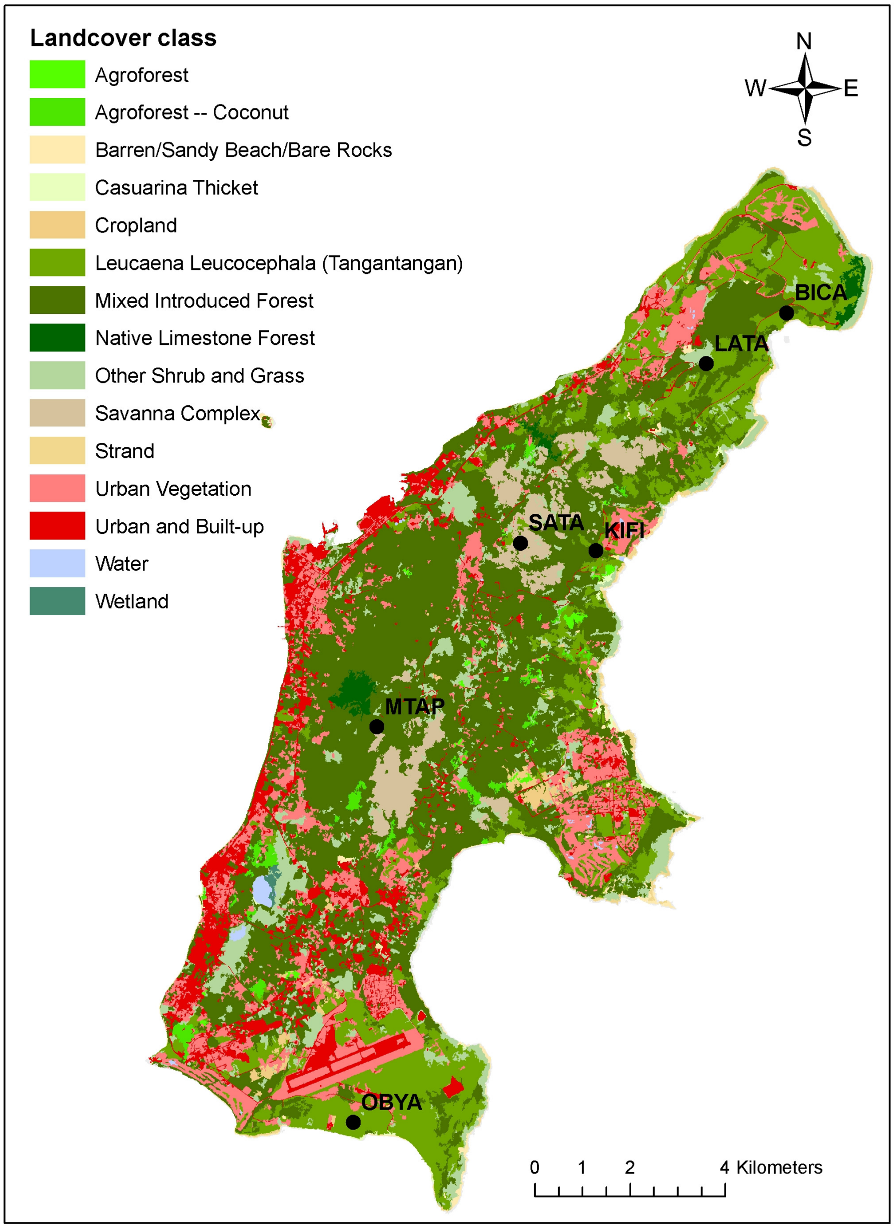
							All six stations combined					
								Reproductive Index				
Species	Bird Island Cons. Area	Laderan Tagke	Sabana Talofofo	King-fisher	Mount Tapochau	Obyan	n[1]	2008	2009	Absol. Change	SE[2]	
Philippine Turtle-Dove	nc.[3]	nc.[3]		nc.[3]	nc.[3]	nc.[3]	5	0.000	0.000	0.000	0.000	
White-throated Grd.-Dove	-0.600	0.000	nc.[3]	0.000	nc.	nc.	6	0.364	0.000	-0.364	0.200	
Mariana Fruit-Dove	nc.	nc.	nc.				3	0.000	0.000	0.000	0.000	
Collared Kingfisher	0.667	0.000		0.250	0.000	0.667	5	0.051	0.286	0.234	0.126	
Micronesian Honeyeater	-0.014	1.000	-0.200	0.100	-0.250	-1.000	6	0.170	0.149	-0.021	0.096	
Rufous Fantail	-1.751	-0.864	-0.076	-2.056	-2.002	-0.476	6	1.065	0.045	-1.020	0.301	**
Nightingale Reed-Warbler	nc.	1.000	1.000		nc.		4	0.000	0.250	0.250	0.239	
Bridled White-eye	0.063	0.031	0.600	0.000	-0.533	-0.212	6	0.168	0.084	-0.084	0.080	
Golden White-eye	0.256	0.314	0.000	0.071	-0.029	0.167	6	0.032	0.218	0.186	0.054	**
Micronesian Starling	0.000	nc.	0.000	1.000	nc.	nc.	6	0.000	0.200	0.200	0.206	
Orange-cheeked Waxbill		nc.	nc.			nc.	3	0.000	0.000	0.000	0.000	
Eurasian Tree Sparrow			nc.				1	------[4]	0.000	nc.[3]		
ALL SPECIES POOLED	-0.283	-0.255	-0.010	-0.284	-0.540	-0.339	6	0.387	0.088	-0.299	0.043	***
No. species that increased	3	4	2	4	0	2				4		
No. species that decreased	3	1	2	1	4	3				4		
No. species remained same	1	2	2	2	1	0				3		
Total Number of Species[5]	7	7	6	7	5	5				11		
Proportion of increasing (decreasing) species	(0.429)	(0.143)	(0.333)	(0.143)	(0.800)	(0.600)				(0.364)		
Sig. of increase (decrease)[6]	(0.773)	(0.992)	(0.891)	(0.992)	(0.188)	(0.500)				(0.887)		

[1] Number of stations at which at least one aged bird was captured in either year.
[2] Standard error of the change in the proportion of young.
[3] The change in the proportion of young is undefined at this station because no aged individual of the species was captured in one of the two years.
[4] Proportion of young not given because no aged individual of the species was captured in the year shown.
[5] Species for which the change in the proportion of young is undefined are not included.
[6] Statistical significance of the one-sided binomial test that the proportion of increasing (decreasing) species is not greater than 0.50.
*** $P < 0.01$; ** $0.01 \leq P < 0.05$; * $0.05 \leq P < 0.10$

Table 8. Mean numbers of aged individual birds captured per 600 net-hours and reproductive index at the six individual MAPS stations operated the island of Saipan, Commonwealth of the Northern Marianas Islands (CNMI), Micronesia, averaged over the two years, 2008 and 2009.

	Bird Island Cons. Area			Laderan Tangke			Sabana Talofofo			Kingfisher			Mount Tapochau			Obyan			All stations pooled		
Species	Ad.	Yg.	Repr. Ind.	Ad.	Yg.	Repr. Ind.	Ad.	Yg.	Repr. Ind.	Ad.	Yg.	Repr. Ind.	Ad.	Yg.	Repr. Ind.	Ad.	Yg.	Repr. Ind.	Ad.	Yg.	Repr. Ind.[2]
Philippine Turtle-Dove	0.5	0.0	0.00	2.3	0.0	0.00				0.7	0.0	0.00	0.7	0.0	0.00	0.6	0.0	0.00	0.8	0.0	0.00
White-thrtd. Grd.-Dove	6.8	1.6	0.30	1.7	0.0	0.00	0.7	0.0	0.00	9.6	0.0	0.00	0.7	0.0	0.00	0.5	0.5	1.00	3.4	0.4	0.18
Mariana Fruit-Dove	0.5	0.0	0.00	0.6	0.0	0.00	1.4	0.0	0.00										0.4	0.0	0.00
Collared Kingfisher	10.0	1.0	0.33	14.4	1.7	0.12				10.7	0.7	0.10	4.0	0.0	0.00	2.2	1.1	0.33	7.1	0.8	0.15
Micronesian Honeyeater	18.8	1.6	0.08	5.8	1.7	0.38	24.3	2.9	0.09	8.1	0.7	0.05	9.2	3.3	0.42	2.2	1.1	0.50	11.2	1.8	0.16
Rufous Fantail	81.1	43.0	0.99	123.1	32.8	0.42	12.0	1.4	0.13	32.8	16.1	0.94	31.5	21.9	1.00	99.8	17.7	0.24	67.4	23.5	0.53
Nightingale Reed-Warb.	2.6	0.0	0.00	1.7	0.6	0.50	2.1	0.7	0.50				0.7	0.0	0.00				1.2	0.2	0.13
Bridled White-eye	33.0	4.2	0.12	50.6	2.9	0.06	10.7	2.8	0.33	4.1	0.0	0.00	23.1	5.7	0.27	58.9	6.4	0.13	32.0	3.8	0.12
Golden White-eye	70.1	7.8	0.13	34.5	5.2	0.21	4.3	0.0	0.00	27.8	0.7	0.04	37.2	3.4	0.09	8.7	0.6	0.08	31.7	3.1	0.12
Micronesian Starling	2.1	0.0	0.00	1.7	0.0	0.00	4.9	0.0	0.00	2.8	1.3	0.50	1.3	0.0	0.00	0.5	0.0	0.00	2.1	0.2	0.08
Orange-cheeked Waxbill				0.6	0.0	0.00	4.2	0.0	0.00							3.9	0.0	0.00	1.4	0.0	0.00
Eurasian Tree Sparrow							4.2	0.0	0.00										0.6	0.0	0.00
ALL SPECIES POOLED	225.5	59.2	0.28	237.0	44.9	0.20	69.0	7.8	0.11	96.6	19.4	0.22	108.4	34.4	0.34	177.2	27.4	0.20	159.4	33.8	0.23
Number of Species	10	6		11	6		10	4		8	5		9	4		9	6		12	8	
Total Number of Species		10			11			10			8			9			9			12	

Figure 1. Locations of the six Tropical Monitoring Avian Productivity and Survivorship (TMAPS) stations operated during 2009 on Saipan, Commonwealth of the Northern Mariana Islands, and distribution of land cover classes on the island. Station codes are listed in Table 1. Land cover data were obtained from the US Forest Service (for detail on methodology, see: http://www.fs.fed.us/r5/spf/fhp/fhm/landcover/islands/CNMI_Report.pdf).



Appendix I. Numerical listing (in AOU checklist order) of species sequence numbers, species alpha codes, and species names for birds banded or encountered during the first two years (2008-2009) of the TMAPS Program at the six stations on Saipan, Commonwealth of the Northern Marianas Islands (CNMI), Micronesia.

Cumulative breeding status for all years in which each station was operated are also included (B = Regular Breeder (all years); U = Usual Breeder (>½, not all, years); O = Occasional Breeder (<½ years); T = Transient; M = Migrant; ? = Uncertain Species ID

NUMB	SPEC	SPECIES COMMON NAME	GENUS SPECIES	Bird Island Cons. Area (BICA)	Laderan Tangke (LATA)	Sabana Talofofo (SATA)	Kingfisher (KIFI)	Mount Tapochau (MTAP)	Obyan (OBYA)
00730	WTTR	White-tailed Tropicbird	*Phaethon lepturus*	T			T		
00960	YEBI	Yellow Bittern	*Ixobrychus sinensis*	O	B	B	O		O
99080	PRHE	Pacific Reef Heron	*Egretta sacra*	T		T	T		
02900	REJU	Red Junglefowl	*Gallus gallus*	O	O		O	O	O
05090	BRNO	Brown Noddy	*Anous stolidus*	T		T			T
05100	BLNO	Black Noddy	*Anous minutus*			T		T	T
05120	WHTT	White Tern	*Gygis alba*	O	O	B	O	O	B
99007	PHTD	Philippine Turtle-Dove	*Streptopelia bitorquata*	B	B	B	B	B	B
99073	WTGD	White-throated Ground-Dove	*Gallicolumba xanthonura*	B	B	B	B	B	B
99006	MAFD	Mariana Fruit-Dove	*Ptilinopus roseicapilla*	B	B	B	B	B	B
07490	MASW	Mariana Swiftlet	*Aerodramus bartschi*	T	T	T	T	O	T
99057	COLK	Collared Kingfisher	*Todiramphus chloris*	B	B	B	B	B	B
99062	MIHO	Micronesian Honeyeater	*Myzomela rubratra*	B	B	B	B	B	B
99063	RUFA	Rufous Fantail	*Rhipidura rufifrons*	B	B	B	B	B	B
99053	NIRW	Nightingale Reed-Warbler	*Acrocephalus luscinia*	B	B	B	B	B	B
99064	BRWE	Bridled White-eye	*Zosterops conspicillatus*	B	B	B	B	B	B
99065	GOWE	Golden White-eye	*Cleptornis marchei*	B	B	B	B	B	B
99066	MIST	Micronesian Starling	*Aplonis opaca*	B	B	B	B	B	B
19990	OCHW	Orange-cheeked Waxbill	*Estrilda melpoda*		B	B	B	B	B
19930	ETSP	Eurasian Tree Sparrow	*Passer montanus*			B			