Our hope is to identify conditions most likely to reduce stress, and, therefore, increase the birds’ reproductive potential. To date, environmental data have been collected from all 23 facility participants in the Association of Zoos and Aquariums Species Survival Plan® (SSP) breeding program. We developed and implemented a protocol to monitor stress levels, as evidenced by corticosterone in kingfisher feathers, and are comparing those measures to managed conditions and breeding success.

We have obtained and analyzed feather samples from more than 90 percent of the current adult population, with samples representative of each facility housing the birds. Feathers from wild congeneric relatives of the Guam Micronesian kingfisher, including collared kingfishers and Pohnpei kingfishers, were also collected to serve as a marker for stress in wild birds.

We are now working to evaluate the effect of facility conditions on feather corticosterone concentrations. Our preliminary results suggest that variation in sound levels may be associated with corticosterone. Moreover, we used clutch data obtained in partnership with the SSP to compare breeding success from the 2013 season with corticosterone concentrations of feathers collected from those pairs. Preliminary results suggest linkages between reproduction and stress, including indications that birds that did not lay eggs had higher corticosterone than birds that laid. We are now working to finalize the dataset with clutch information from the 2014 season. Upon project completion in spring 2015, we intend to recommend management techniques most likely to minimize stress and maximize breeding success in captive Guam Micronesian kingfishers.

We hope that this research will accelerate population growth, bolster genetic viability and lead to standardization of husbandry techniques. Application of our results will be critical for program expansion and in preparing the population for future releases to the wild.

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