

# Captive Management, Stress, and Reproduction in the Guam Micronesian Kingfisher

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# Research Questions

- **How do conditions differ among breeding institutions?**
- **How does captivity affect stress?**
- **Does stress in captive kingfishers compare to wild birds?**
- **Is stress related to reproduction?**
- **Which husbandry techniques are best for breeding?**
- **How can we best prepare birds for release?**

# Stress Analyses

- Molted feathers from captive Guam Micronesian kingfishers
- Feathers from wild kingfishers
- Radioimmunoassay
  - *Measure corticosterone (CORT) from feathers*



# Captive Breeding Conditions



- **Environmental conditions**
  - *temperature, humidity, sound, light*
- **Enclosure design**
  - *size, shape, and availability of enrichment*
- **Keeper proximity**
- **Breeding pair maintenance**
- **Egg/chick management**
- **Nutrition**

# Project Status - Data

- **Environmental data from 21 institutions**
  - *>500,000 data points*
- **Husbandry surveys for 83 adult birds**
- **Feather samples from 90 captive individuals**
  - *15 adult Pohnpei kingfishers*

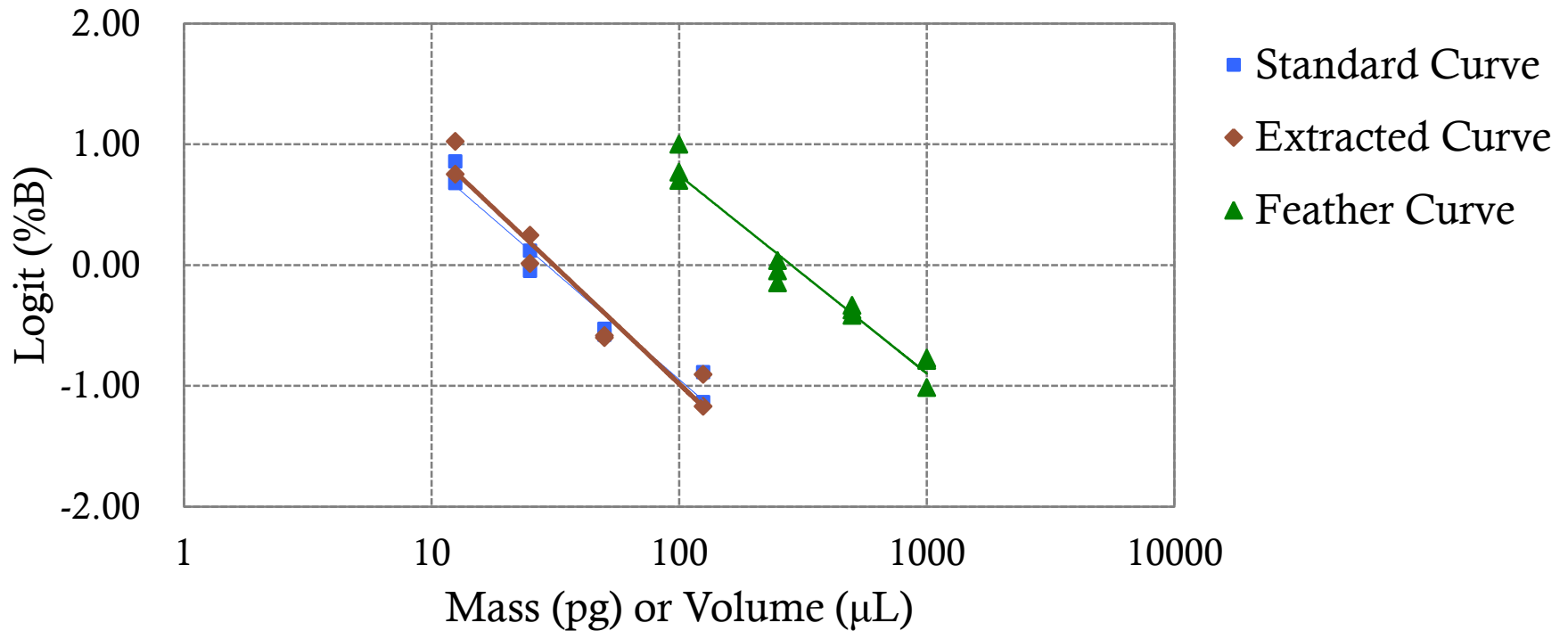


# Project Status - Methods

- **Novel procedures for CORT extraction**
  - *Improved extraction efficiency*
- **Validation and adaptation of serum RIA kit for feathers**
  - *Utility of kit tripled*
  - *Sensitivity extended*



# Assay Validation



# Next Steps



- **Complete analyses**
  - *Results by end of year*
- **Additional sample collections from the Commonwealth of the Northern Mariana Islands**
- **Publications**



# Expected Outcomes



- **Identify best practices**
- **Standardize husbandry**
  - *Expansion of breeding program*
- **Accelerate population growth**
  - *Bolster genetic viability*
  - *Prepare for future releases*
- **Stimulate questions for further research**
- **Evaluation and improvement of avian captive breeding programs**

# Thank You!

U.S. Fish & Wildlife Service  
Guam DAWR  
CNMI Division of Fish & Wildlife  
Beth Bahner, Species Coordinator  
Brian Lynch, College of Micronesia  
Pablo Oleiro, University of Missouri  
Albuquerque Biological Park  
Aquarium of the Pacific  
Bronx Zoo  
Brookfield Zoo  
Busch Gardens Tampa  
Cincinnati Zoo  
Denver Zoo  
Disney's Animal Kingdom

Houston Zoo  
Lincoln Park Zoo  
Memphis Zoo  
Milwaukee County Zoo  
National Aviary  
Smithsonian Conservation Biology Institute  
Smithsonian National Zoo  
Philadelphia Zoo  
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San Antonio Zoo  
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San Diego Zoo Safari Park  
Sea World San Diego  
Zoo Miami

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