

Population Analysis and Breeding and Transfer Recommendations

Sunbittern (*Eurypyga helias*) AZA Population Management Plan Program



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PMC

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Executive Summary

Sunbittern (*Eurypyga helias*) Population Management Plan

The Gruiformes TAG Regional Collection Plan has recommended that the Sunbittern population be managed as a PMP and have set the AZA target size as 150 in their 2009-2012 Regional Collection Plan. At the time of analysis, AZA institutions hold 111 birds (58 males, 47 females, 6 unknown sex) across 48 institutions. One female was then reported dead and two chicks were hatched during the draft period.

The current gene diversity is over 92%, however the potential gene diversity could be as high as 95%. Projections of gene diversity (based on current statistics, a target size of 150 and a growth rate of 3%) indicate 90% GD in 22 years, and 83% GD remaining at 100 years from present. Careful breeding practices are important to maintain the genetic variation within the population. This can be done by equalizing the founder representation by breeding birds with low mean kinships.

| DEMOGRAPHY | |
|---|----------------|
| AZA Population Size at time of analysis | 111 (58..47.6) |
| Birds excluded from genetics | 2 (0.2) |
| Population size after exclusions | 109 (58.45.6) |
| Target Population Size | 150 |
| Mean Generation Time (years) | 7.97 |
| Historic / Projected Population Growth Rate (λ) | 1.062 / 1.03 |

| GENETICS | | |
|---|---------------|------------------|
| (based on an analytical studbook with assumptions) | | |
| | Actual | Potential |
| Founders | 14 | 0 |
| Founder Genome Equivalents (FGE) | 6.54 | 10.24 |
| Gene Diversity Retained (%GD) | 92.35 | 95.12 |
| Population Mean Kinship (MK) | 0.0765 | -- |
| Mean Inbreeding (F) | 0.0373 | -- |
| % Pedigree Known before assumptions/exclusions | 88.2 | -- |
| % Pedigree Known after assumptions/exclusions | 95.9 | -- |
| Effective population size/census size ratio (N_e / N) | 0.4132 | -- |
| Years to 90% Gene Diversity | 22 | -- |
| Years to 10% Loss in GD | 113 | -- |
| Diversity at 100 Years (%) | 83 | -- |

* 2010 projections are based on a target size of 150 and a growth rate of 3% ($\lambda=1.03$).

As with most SSPs and PMPs, pairings recommended are prioritized to maintain or increase gene diversity through considerations of mean kinship, avoidance of inbreeding, differences in sire and dam mean kinships, and the degree of uncertainty within a pedigree. The number of pairings recommended is intended to grow the population to the RCP target size of 150 birds in approximately 10 years.

Summary Actions: The PMP recommended 35 females to breed, and 24 transfers to create new breeding pairs and meet institutions' needs.

Table of Contents

| | |
|--|----|
| Executive Summary | 1 |
| I. Description of Population Status | 3 |
| Demography | 3 |
| Genetics | 4 |
| Management Strategy | 5 |
| II. Recommendations | |
| Summary Recommendations | 6 |
| ASHEBORO, AUDUBON, BALTIM AQ, BIODOME, BIRMINGHM, BLOOMINGT | 9 |
| BUFFALO, BUSCH TAM, CENTRALPK, CHICAGOBR, CHICAGOLP, CINCINNAT | 10 |
| COLUMBIA, DALLAS, DALLAS WA, DENVER, DES MOINE, DETROIT | 11 |
| DREHER PA, FRANKLINP, FRESNO, HOUSTON, JACKSONVL | 12 |
| LOSANGELE, LOUISVILL, LOWRY, MADISON, METROZOO, MILWAUKEE | 13 |
| NY BRONX, NZP-WASH, OMAHA, ORLANDO, PHILADELP | 14 |
| PITTS CA, PROVIDNCE, PUEBLO, RIO GRAND, SAN ANTON, SANDIEGOZ | 15 |
| SANTA ANA, SD-WAP, SEATTLE, SEDGWICK, ST AUGUST | 16 |
| ST LOUIS, ST PAUL, STATEN IS, TOLEDO, TORONTO, TRACY AV | 17 |
| TULSA | 18 |
| III. Appendices | |
| A. Assumptions | 19 |
| B. Summary of Data Exports | 19 |
| C. Birds Excluded from Genetic Analysis | 20 |
| D. Life Tables | 20 |
| E. Ordered Mean Kinship | 22 |
| F. Definitions | 23 |
| G. Directory or Institutional Representatives | 25 |

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Description of Population Status

Introduction: The Gruiformes TAG Regional Collection Plan has recommended that the Sunbittern population be managed as a PMP and have set the AZA target size as 150 in their 2009-2012 Regional Collection Plan. At the time of analysis, the PMP consists of 111 birds (58 males, 47 females, 6 unknown sex) across 48 AZA institutions.

Comprehensive genetic and demographic analyses of the population were performed in April 2010 resulting in this current Population Management Plan. Analyses were performed on the Sunbittern Regional Studbook (current to 22 March 2010) using PopLink 2.1 and PM2000 1.213. Recommendations contained in this Population Management Plan represent the results of these analyses. The goal of these recommendations is to help insure the genetic and demographic health of this population. Recommendations proposed in a Population Management Plan are non-binding; participation is voluntary.

Analytical Population: An analytical studbook was created to address some unknown parentage birds within the pedigree. Prior to assumptions, the pedigree was 88.2% known. Assumptions incorporated into the analytical studbook are outlined in Appendix A.

The total population at the time of analysis is 111 (58.47.6) birds. Two individuals were excluded from the potentially breeding population due to their age or behavior. These exclusions are listed in Appendix C.

After assumptions and exclusions, the population has a pedigree that is 95.9% known and a potentially breeding population of 109 (58.45.6) birds.

One female was then reported dead and two chicks were hatched during the draft period.

Demography: While the first zoo Sunbittern hatch in AZA was in 1950 according to the studbook, zoo propagation only became consistently successful in the late 1960s – 1970s, after which the dependence on wild imports decreased (Figure 1). Consistently high positive growth (annual lambda ranged between 1.02 – 1.2) was seen from the mid-80s to the mid-90s after which the population appeared to level off somewhat. Over the last five years, positive growth has resumed at a mean growth rate of 2% (lambda=1.021).

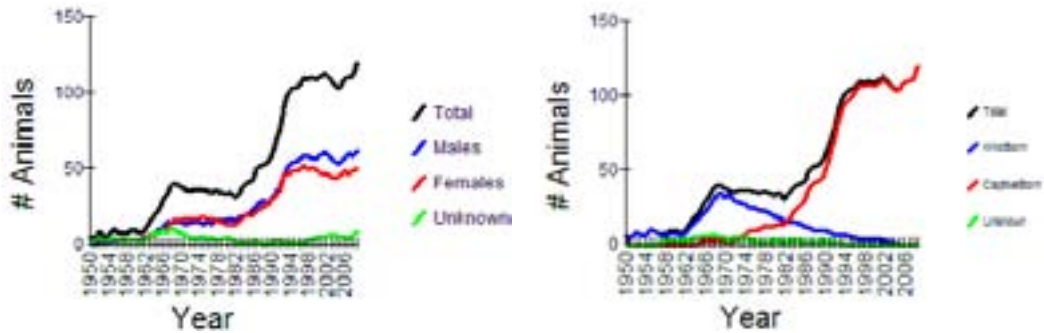


Figure 1. Census of Sunbitterns in AZA by sex, and by hatch type. Census taken on 31st December each year.

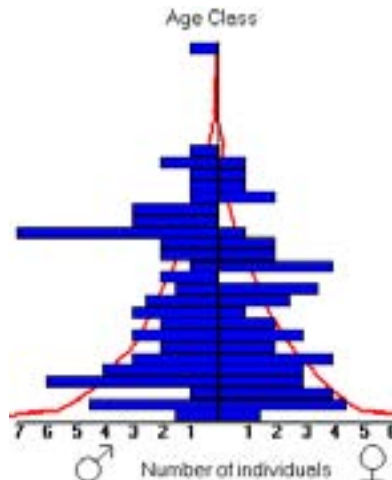


Figure 2. Age distribution of the current AZA potentially breeding population.

The age structure of the AZA population (Figure 2) approximates a stable distribution with a broader base of juveniles and consistent breeding occurring each year. While there is a slight male bias, in recent years it has begun to even out. The 32 year old male outlier is an accurate record who bred as recently as 2008.

Studbook records have the oldest male Sunbittern currently living at 32, though females have lived only as long as 25 years. Both males and females have reproduced as early as one year. Males have bred up until 29 (this same male is still exhibiting breeding behavior at 32); females have bred up until 21 years. Clutches are usually one egg, though two are possible. First year mortality is high at 50% for males and 48% for females.

Genetics: The Sunbittern PMP population is descended from 14 founders and no potential founders remain. Gene diversity in the population is over 92%, but has the potential to be higher (95%). Projections of gene diversity (based on current statistics, a target size of 150 and a growth rate of 3%) indicate 90% GD in 22 years, and 83% GD remaining at 100 years from present. When gene diversity falls below 90% of that in the founding population, it is expected that reproduction will be increasingly compromised by, among other factors, lower hatch weights and greater neonatal mortality. The potential gene diversity is high and gene diversity retention could be extended through management, by equalizing founder representation (Figure 3).

| Genetic Summary (based on an analytical studbook with assumptions) | | | |
|---|--------|--------|-----------|
| | 2006 | 2010 | |
| | Actual | Actual | Potential |
| Founders | 14 | 14 | 0 |
| Founder Genome Equivalent (FGE) | 6.96 | 6.54 | 10.24 |
| Gene Diversity Retained (%GD) | 92.8 | 92.35 | 95.12 |
| Population Mean Kinship (MK) | 0.072 | 0.0765 | -- |
| Mean Inbreeding (F) | 0.017 | 0.0373 | -- |
| % Pedigree Known before assumptions/exclusions | 95 | 88.2 | -- |
| % Pedigree Known after assumptions/exclusions | N/A | 95.9 | -- |
| Effective population size/census size ratio (N_e / N) | 0.33 | 0.4132 | -- |
| Years to 90% Gene Diversity | -- | 22 | -- |
| Years to 10% Loss in GD | -- | 113 | -- |
| Diversity at 100 Years (%) | -- | 83 | -- |

* 2010 projections are based on a target size of 150 and a growth rate of 3% ($\lambda=1.03$).

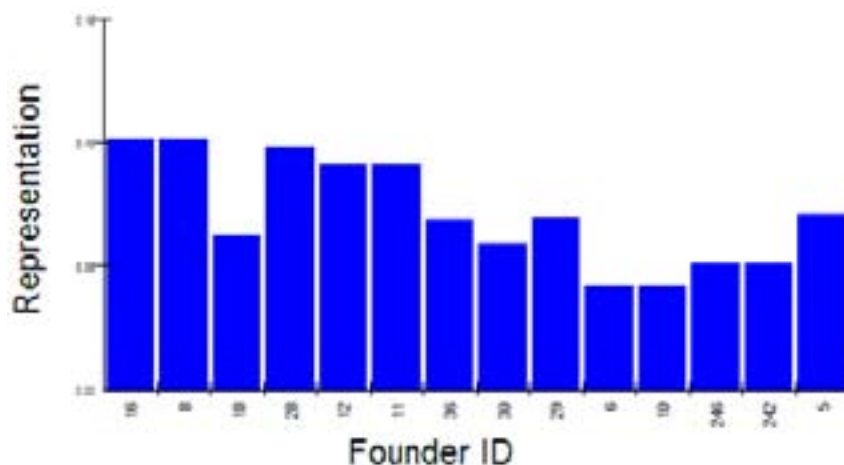


Figure 3. Founder representation graph illustrating the unequal distribution of various founder lines in the living Sunbittern AZA population.

Management Strategy: Demographic analyses indicate that the current population size will be maintained with approximately 13-15 hatches per year. To grow to 150 in 10 years, between 17 and 22 hatches are required this year ($\lambda=1.032$). Currently the demand for birds is high and new participating institutions are being recruited. Thirty-five females have been recommended for breeding. Pairings were recommended to maintain or increase gene diversity through considerations of mean kinship, avoidance of inbreeding, differences in sire and dam mean kinships, and the degree of uncertainty within a pedigree.

1. Recommend 35 breeding females.
2. Recommend 24 transfers to meet institutional needs and to create new breeding pairs.
3. Breeding institutions should be able to hold offspring for about one year before placement.

Summary of Breeding and Transfer Recommendations

| ID | Location | Sex | Age | Disposition | Location | Breeding | With | Notes |
|-----|-----------|-----|-----|-------------|-----------|--------------|----------|---|
| 236 | ASHEBORO | M | 18 | HOLD | ASHEBORO | BREED WITH | 606 | Female could breed with either of two males but 236 is the priority breeder |
| 556 | ASHEBORO | F | 4 | SEND TO | DES MOINE | BREED WITH | 477 | |
| 557 | ASHEBORO | M | 4 | HOLD | ASHEBORO | BREED WITH | 606 | Female 606 could breed with either of two males but 236 is the priority breeder |
| 182 | AUDUBON | F | 20 | HOLD | AUDUBON | BREED WITH | 211 | |
| 211 | AUDUBON | M | 19 | HOLD | AUDUBON | BREED WITH | 182 | |
| 446 | BALTIM AQ | M | 13 | HOLD | BALTIM AQ | DO NOT BREED | | |
| 122 | BALTIM AQ | F | 23 | HOLD | BALTIM AQ | DO NOT BREED | | Excluded |
| 288 | BIODOME | M | 16 | HOLD | BIODOME | BREED WITH | 465 | |
| 465 | BIODOME | F | 11 | HOLD | BIODOME | BREED WITH | 288 | |
| 153 | BIRMINGHM | M | 22 | HOLD | BIRMINGHM | BREED WITH | 195 | |
| 195 | BIRMINGHM | F | 19 | HOLD | BIRMINGHM | BREED WITH | 153 | |
| 559 | BUFFALO | F | 3 | HOLD | BUFFALO | BREED WITH | 550 | |
| 589 | BUSCH TAM | F | 2 | HOLD | BUSCH TAM | BREED WITH | 578 | |
| 399 | CENTRALPK | F | 14 | HOLD | CENTRALPK | BREED WITH | 500 | |
| 500 | CENTRALPK | M | 9 | HOLD | CENTRALPK | BREED WITH | 399 | |
| 527 | CHICAGOBR | F | 7 | SEND TO | CINCINNAT | BREED WITH | 549 | |
| 473 | CHICAGOLP | F | 9 | HOLD | CHICAGOLP | BREED WITH | 570 | New chick reported during draft period |
| 570 | CHICAGOLP | M | 5 | HOLD | CHICAGOLP | BREED WITH | 473 | |
| 606 | CHICAGOLP | F | 1 | SEND TO | ASHEBORO | BREED WITH | 236, 557 | Could breed with either but 236 is the priority breeder |
| 293 | CINCINNAT | M | 16 | HOLD | CINCINNAT | DO NOT BREED | | |
| 549 | CINCINNAT | M | 5 | HOLD | CINCINNAT | BREED WITH | 527 | |
| 550 | CINCINNAT | M | 5 | SEND TO | BUFFALO | BREED WITH | 559 | |
| 464 | COLUMBIA | M | 11 | HOLD | COLUMBIA | DO NOT BREED | | |
| 554 | COLUMBIA | F | 5 | HOLD | COLUMBIA | DO NOT BREED | | |
| 170 | DALLAS | M | 21 | SEND TO | FRANKLINP | BREED WITH | 555 | |
| 289 | DALLAS WA | M | 16 | HOLD | DALLAS WA | DO NOT BREED | | |
| 547 | DALLAS WA | M | 4 | HOLD | DALLAS WA | DO NOT BREED | | |
| 587 | DALLAS WA | F | 4 | HOLD | DALLAS WA | DO NOT BREED | | |
| 588 | DALLAS WA | M | 3 | HOLD | DALLAS WA | DO NOT BREED | | |
| 591 | DALLAS WA | F | 1 | HOLD | DALLAS WA | DO NOT BREED | | |
| 427 | DENVER | F | 13 | HOLD | DENVER | DO NOT BREED | | |
| 584 | DENVER | M | 7 | HOLD | DENVER | DO NOT BREED | | |
| 477 | DES MOINE | M | 10 | HOLD | DES MOINE | BREED WITH | 556 | |
| 538 | DES MOINE | F | 5 | SEND TO | SAN ANTON | BREED WITH | 306 | |
| 296 | DETROIT | F | 16 | SEND TO | MILWAUKEE | BREED WITH | 183, 543 | |
| 543 | DETROIT | M | 4 | SEND TO | MILWAUKEE | BREED WITH | 296 | |
| 564 | DREHER PA | M | 3 | HOLD | DREHER PA | BREED WITH | 605 | |
| 560 | DREHER PA | M | 3 | SEND TO | SD-WAP | BREED WITH | 545 | |
| 158 | FRANKLINP | F | 21 | SEND TO | PHILADELP | BREED WITH | 123 | Pre-arranged transfer |
| 369 | FRESNO | F | 15 | HOLD | FRESNO | BREED WITH | 511 | |

| ID | Location | Sex | Age | Disposition | Location | Breeding | With | Notes |
|-----|-----------|-----|-----|-------------|-----------|--------------|------|-------------------------------------|
| 511 | FRESNO | M | 8 | HOLD | FRESNO | BREED WITH | 369 | |
| 423 | HOUSTON | M | 14 | HOLD | HOUSTON | DO NOT BREED | | |
| 521 | HOUSTON | M | 7 | HOLD | HOUSTON | BREED WITH | 586 | |
| 586 | HOUSTON | F | 6 | HOLD | HOUSTON | BREED WITH | 521 | |
| 596 | HOUSTON | M | 1 | SEND TO | BLOOMINGT | DO NOT BREED | | |
| 597 | HOUSTON | U | 0 | SEND TO | ST PAUL | DO NOT BREED | | |
| 512 | JACKSONVL | M | 8 | HOLD | JACKSONVL | BREED WITH | 522 | |
| 522 | JACKSONVL | F | 7 | HOLD | JACKSONVL | BREED WITH | 512 | |
| 356 | LOSANGELE | M | 15 | HOLD | LOSANGELE | DO NOT BREED | | |
| 561 | LOUISVILL | M | 4 | SEND TO | ORLANDO | BREED WITH | 562 | |
| 562 | LOUISVILL | F | 3 | SEND TO | ORLANDO | BREED WITH | 561 | |
| 578 | LOUISVILL | M | 3 | SEND TO | BUSCH TAM | BREED WITH | 589 | |
| 532 | LOWRY | M | 6 | HOLD | LOWRY | BREED WITH | 567 | |
| 563 | METROZOO | M | 3 | HOLD | METROZOO | BREED WITH | 580 | |
| 580 | METROZOO | F | 3 | HOLD | METROZOO | BREED WITH | 563 | |
| 608 | TRACY AV | M | 1 | HOLD | TRACY AV | DO NOT BREED | | |
| 183 | MILWAUKEE | M | 20 | HOLD | MILWAUKEE | BREED WITH | 296 | |
| 555 | MILWAUKEE | F | 4 | SEND TO | FRANKLINP | BREED WITH | 170 | |
| 213 | NY BRONX | M | 18 | HOLD | NY BRONX | BREED WITH | 537 | |
| 537 | NY BRONX | F | 5 | HOLD | NY BRONX | BREED WITH | 213 | |
| 605 | NY BRONX | F | 1 | SEND TO | DREHER PA | BREED WITH | 564 | |
| 56 | NZP-WASH | M | 32 | HOLD | NZP-WASH | BREED WITH | 542 | |
| 235 | NZP-WASH | M | 18 | HOLD | NZP-WASH | BREED WITH | 481 | |
| 481 | NZP-WASH | F | 11 | HOLD | NZP-WASH | BREED WITH | 235 | |
| 542 | NZP-WASH | F | 5 | HOLD | NZP-WASH | BREED WITH | 56 | |
| 567 | NZP-WASH | F | 2 | SEND TO | LOWRY | BREED WITH | 532 | |
| 259 | OMAHA | M | 17 | HOLD | OMAHA | DO NOT BREED | | |
| 463 | OMAHA | U | 11 | HOLD | OMAHA | DO NOT BREED | | |
| 485 | OMAHA | U | 10 | HOLD | OMAHA | DO NOT BREED | | |
| 602 | OMAHA | U | 1 | HOLD | OMAHA | DO NOT BREED | | |
| 604 | OMAHA | U | 0 | HOLD | OMAHA | DO NOT BREED | | |
| 283 | ORLANDO | M | 16 | HOLD | ORLANDO | DO NOT BREED | | |
| 482 | ORLANDO | F | 10 | HOLD | ORLANDO | DO NOT BREED | | |
| 483 | ORLANDO | M | 10 | HOLD | ORLANDO | DO NOT BREED | | |
| 518 | ORLANDO | M | 9 | HOLD | ORLANDO | DO NOT BREED | | |
| 123 | PHILADELP | M | 23 | HOLD | PHILADELP | BREED WITH | 158 | |
| 404 | PITTS CA | F | 14 | HOLD | PITTS CA | BREED WITH | 475 | |
| 475 | PITTS CA | M | 9 | HOLD | PITTS CA | BREED WITH | 404 | |
| 590 | PITTS CA | M | 2 | SEND TO | TORONTO | BREED WITH | 420 | |
| 285 | PROVIDNCE | M | 16 | HOLD | PROVIDNCE | BREED WITH | 351 | |
| 351 | PROVIDNCE | F | 15 | HOLD | PROVIDNCE | BREED WITH | 285 | |
| 139 | RIO GRAND | M | 22 | HOLD | RIO GRAND | DO NOT BREED | | |
| 306 | SAN ANTON | M | 16 | HOLD | SAN ANTON | BREED WITH | 538 | |
| 365 | SAN ANTON | M | 15 | HOLD | SAN ANTON | BREED WITH | 474 | |
| 474 | SAN ANTON | F | 11 | HOLD | SAN ANTON | BREED WITH | 365 | |
| 442 | SANDIEGOZ | F | 13 | HOLD | SANDIEGOZ | DO NOT BREED | | Reported dead during comment period |
| 441 | SANDIEGOZ | M | 12 | HOLD | SANDIEGOZ | BREED WITH | 583 | |

| ID | Location | Sex | Age | Disposition | Location | Breeding | With | Notes |
|-----|-----------|-----|-----|-------------|-----------|--------------|----------|---|
| 506 | SANTA ANA | F | 8 | HOLD | SANTA ANA | DO NOT BREED | | |
| 507 | SANTA ANA | F | 8 | HOLD | SANTA ANA | DO NOT BREED | | |
| 140 | SD-WAP | F | 22 | HOLD | SD-WAP | DO NOT BREED | | |
| 544 | SD-WAP | M | 6 | HOLD | SD-WAP | DO NOT BREED | | |
| 545 | SD-WAP | F | 6 | HOLD | SD-WAP | BREED WITH | 560 | |
| 612 | SD-WAP | F | 2 | SEND TO | PUEBLO | DO NOT BREED | | |
| 613 | SD-WAP | M | 1 | HOLD | SD-WAP | DO NOT BREED | | |
| 614 | SD-WAP | U | 0 | SEND TO | PUEBLO | DO NOT BREED | | |
| 279 | SEATTLE | M | 17 | HOLD | SEATTLE | BREED WITH | 609 | |
| 303 | SEATTLE | M | 16 | HOLD | SEATTLE | BREED WITH | 609 | |
| 438 | SEDGWICK | M | 12 | HOLD | SEDGWICK | BREED WITH | 479 | |
| 479 | SEDGWICK | F | 10 | HOLD | SEDGWICK | BREED WITH | 438 | New chick reported during draft period |
| 609 | SEDGWICK | F | 1 | SEND TO | SEATTLE | BREED WITH | 279, 303 | Could breed with either male |
| 524 | ST AUGUST | M | 7 | HOLD | ST AUGUST | DO NOT BREED | | Seeking a compatible female for this male |
| 583 | ST AUGUST | F | 7 | SEND TO | SANDIEGOZ | BREED WITH | 441 | |
| 610 | ST AUGUST | M | 1 | SEND TO | MADISON | DO NOT BREED | | |
| 585 | ST LOUIS | M | 3 | HOLD | ST LOUIS | BREED WITH | 617 | |
| 617 | ST LOUIS | F | 2 | HOLD | ST LOUIS | BREED WITH | 585 | |
| 186 | STATEN IS | F | 20 | HOLD | STATEN IS | DO NOT BREED | | Excluded |
| 205 | TOLEDO | F | 19 | HOLD | TOLEDO | BREED WITH | 370 | |
| 370 | TOLEDO | M | 14 | HOLD | TOLEDO | BREED WITH | 205 | |
| 420 | TORONTO | F | 13 | HOLD | TORONTO | BREED WITH | 590 | |
| 424 | TORONTO | F | 13 | SEND TO | TULSA | BREED WITH | 262 | |
| 262 | TULSA | M | 17 | HOLD | TULSA | BREED WITH | 424 | |

ASHEBORO

North Carolina Zoological Park
Asheboro, NC

| ID | Local ID | Sex | Age | Disposition | Location | Breeding | With | Notes |
|-----|----------|-----|-----|--------------|-----------|------------|----------|---|
| 236 | 22635 | M | 18 | HOLD | ASHEBORO | BREED WITH | 606 | |
| 556 | 23174 | F | 4 | SEND TO | DES MOINE | BREED WITH | 477 | |
| 557 | 23202 | M | 4 | HOLD | ASHEBORO | BREED WITH | 606 | |
| 606 | 22381 | F | 1 | RECEIVE FROM | CHICAGOLP | BREED WITH | 236, 557 | Female could breed with either male but 236 is the priority breeder |

AUDUBON

Audubon Zoo
New Orleans, LA

| ID | Local ID | Sex | Age | Disposition | Location | Breeding | With | Notes |
|-----|----------|-----|-----|-------------|----------|------------|------|-------|
| 182 | 1834 | F | 20 | HOLD | AUDUBON | BREED WITH | 211 | |
| 211 | 100094 | M | 19 | HOLD | AUDUBON | BREED WITH | 182 | |

BALTIM AQ

National Aquarium in Baltimore Inc
Baltimore, MD

| ID | Local ID | Sex | Age | Disposition | Location | Breeding | With | Notes |
|-----|----------|-----|-----|-------------|-----------|--------------|------|----------|
| 122 | 880307 | F | 23 | HOLD | BALTIM AQ | DO NOT BREED | | Excluded |
| 446 | 102024 | M | 13 | HOLD | BALTIM AQ | DO NOT BREED | | |

BIODOME

Biodome de Montreal
Montreal, Quebec

| ID | Local ID | Sex | Age | Disposition | Location | Breeding | With | Notes |
|-----|----------|-----|-----|-------------|----------|------------|------|-------|
| 288 | 1029 | M | 16 | HOLD | BIODOME | BREED WITH | 465 | |
| 465 | 1593 | F | 11 | HOLD | BIODOME | BREED WITH | 288 | |

BIRMINGHM

Birmingham Zoo
Birmingham, AL

| ID | Local ID | Sex | Age | Disposition | Location | Breeding | With | Notes |
|-----|----------|-----|-----|-------------|-----------|------------|------|---------------------------|
| 153 | 1770 | M | 22 | HOLD | BIRMINGHM | BREED WITH | 195 | Genetically valuable pair |
| 195 | 2189 | F | 19 | HOLD | BIRMINGHM | BREED WITH | 153 | |

BLOOMINGT

Miller Park Zoo
Bloomington, IL

| ID | Local ID | Sex | Age | Disposition | Location | Breeding | With | Notes |
|-----|----------|-----|-----|--------------|----------|--------------|------|-------|
| 596 | 24957 | M | 1 | RECEIVE FROM | HOUSTON | DO NOT BREED | | |

BUFFALO

Buffalo Zoological Gardens
Buffalo, NY

| ID | Local ID | Sex | Age | Disposition | Location | Breeding | With | Notes |
|-----|----------|-----|-----|--------------|-----------|------------|------|-------|
| 559 | B08012 | F | 3 | HOLD | BUFFALO | BREED WITH | 550 | |
| 550 | 205058 | M | 5 | RECEIVE FROM | CINCINNAT | BREED WITH | 559 | |

BUSCH TAM

Busch Gardens
Tampa, FL

| ID | Local ID | Sex | Age | Disposition | Location | Breeding | With | Notes |
|-----|----------|-----|-----|--------------|-----------|------------|------|------------------|
| 589 | 64240 | F | 2 | HOLD | BUSCH TAM | BREED WITH | 578 | Demographic pair |
| 578 | 202306 | M | 3 | RECEIVE FROM | LOUISVILL | BREED WITH | 589 | |

CENTRALPK

Central Park Zoo
Bronx, NY

| ID | Local ID | Sex | Age | Disposition | Location | Breeding | With | Notes |
|-----|----------|-----|-----|-------------|-----------|------------|------|---------------------------|
| 399 | C01011 | F | 14 | HOLD | CENTRALPK | BREED WITH | 500 | Genetically valuable pair |
| 500 | C01106 | M | 9 | HOLD | CENTRALPK | BREED WITH | 399 | |

CHICAGOBR

Chicago Zoological Park
Brookfield, IL

| ID | Local ID | Sex | Age | Disposition | Location | Breeding | With | Notes |
|-----|----------|-----|-----|-------------|-----------|------------|------|-------|
| 527 | 2267 | F | 7 | SEND TO | CINCINNAT | BREED WITH | 549 | |

CHICAGOLP

Lincoln Park Zoological Gardens
Chicago, IL

| ID | Local ID | Sex | Age | Disposition | Location | Breeding | With | Notes |
|-----|----------|-----|-----|-------------|-----------|------------|----------|--|
| 473 | 21309 | F | 9 | HOLD | CHICAGOLP | BREED WITH | 570 | New chick was reported during draft period |
| 570 | 22079 | M | 5 | HOLD | CHICAGOLP | BREED WITH | 473 | |
| 606 | 22381 | F | 1 | SEND TO | ASHEBORO | BREED WITH | 236, 557 | |

CINCINNAT

Cincinnati Zoo & Botanical Garden
Cincinnati, OH

| ID | Local ID | Sex | Age | Disposition | Location | Breeding | With | Notes |
|-----|----------|-----|-----|--------------|-----------|--------------|------|-------|
| 527 | 2267 | F | 7 | RECEIVE FROM | CHICAGOBR | BREED WITH | 549 | |
| 293 | 295258 | M | 16 | HOLD | CINCINNAT | DO NOT BREED | | |
| 549 | 205020 | M | 5 | HOLD | CINCINNAT | BREED WITH | 527 | |
| 550 | 205058 | M | 5 | SEND TO | BUFFALO | BREED WITH | 559 | |

COLUMBIA

Riverbanks Zoological Park
Columbia, SC

| ID | Local ID | Sex | Age | Disposition | Location | Breeding | With | Notes |
|-----|----------|-----|-----|-------------|----------|--------------|------|--|
| 464 | 6803 | M | 11 | HOLD | COLUMBIA | DO NOT BREED | | High inbreeding. If you would like to switch out birds in the future please contact the Population Manager |
| 554 | 8990 | F | 5 | HOLD | COLUMBIA | DO NOT BREED | | |

DALLAS

Dallas Zoo
Dallas, TX

| ID | Local ID | Sex | Age | Disposition | Location | Breeding | With | Notes |
|-----|----------|-----|-----|-------------|-----------|------------|------|---------------------------|
| 170 | 906764 | M | 21 | SEND TO | FRANKLINP | BREED WITH | 555 | Genetically valuable pair |

DALLAS WA

Dallas World Aquarium
Dallas, TX

| ID | Local ID | Sex | Age | Disposition | Location | Breeding | With | Notes |
|-----|----------|-----|-----|-------------|-----------|--------------|------|-------|
| 289 | 1A0097 | M | 16 | HOLD | DALLAS WA | DO NOT BREED | | |
| 547 | 7A024 | M | 4 | HOLD | DALLAS WA | DO NOT BREED | | |
| 587 | 6A035 | F | 4 | HOLD | DALLAS WA | DO NOT BREED | | |
| 588 | 7A025 | M | 3 | HOLD | DALLAS WA | DO NOT BREED | | |
| 591 | 9AB034 | F | 1 | HOLD | DALLAS WA | DO NOT BREED | | |

DENVER

Denver Zoological Gardens
Denver, CO

| ID | Local ID | Sex | Age | Disposition | Location | Breeding | With | Notes |
|-----|----------|-----|-----|-------------|----------|--------------|------|-------|
| 427 | A08358 | F | 13 | HOLD | DENVER | DO NOT BREED | | |
| 584 | A05465 | M | 7 | HOLD | DENVER | DO NOT BREED | | |

DES MOINE

Blank Park Zoo of Des Moines
Des Moines, IA

| ID | Local ID | Sex | Age | Disposition | Location | Breeding | With | Notes |
|-----|----------|-----|-----|--------------|-----------|------------|------|-------|
| 556 | 23174 | F | 4 | RECEIVE FROM | ASHEBORO | BREED WITH | 477 | |
| 477 | 1395 | M | 10 | HOLD | DES MOINE | BREED WITH | 556 | |
| 538 | 1779 | F | 5 | SEND TO | SAN ANTON | BREED WITH | 306 | |

DETROIT

Detroit Zoological Institute
Royal Oak, MI

| ID | Local ID | Sex | Age | Disposition | Location | Breeding | With | Notes |
|-----|----------|-----|-----|-------------|-----------|------------|----------|------------------------------|
| 296 | 4262 | F | 16 | SEND TO | MILWAUKEE | BREED WITH | 183, 543 | Could breed with either male |
| 543 | 11793 | M | 4 | SEND TO | MILWAUKEE | BREED WITH | 296 | |

DREHER PA

Palm Beach Zoo at Dreher Park
West Palm Beach, FL

| ID | Local ID | Sex | Age | Disposition | Location | Breeding | With | Notes |
|-----|----------|-----|-----|--------------|-----------|------------|------|------------------|
| 560 | 208194 | M | 3 | SEND TO | SD-WAP | BREED WITH | 545 | Demographic rec. |
| 564 | 208118 | M | 3 | HOLD | DREHER PA | BREED WITH | 605 | |
| 605 | B09032 | F | 1 | RECEIVE FROM | NY BRONX | BREED WITH | 564 | |

FRANKLINP

Zoo New England / Franklin Park Zoo
Boston, MA

| ID | Local ID | Sex | Age | Disposition | Location | Breeding | With | Notes |
|-----|----------|-----|-----|--------------|-----------|------------|------|---------------------------|
| 170 | 906764 | M | 21 | RECEIVE FROM | DALLAS | BREED WITH | 555 | Genetically valuable pair |
| 158 | 89A935 | F | 21 | SEND TO | PHILADELP | BREED WITH | 123 | Pre-arranged transfer |
| 555 | B4346 | F | 4 | RECEIVE FROM | MILWAUKEE | BREED WITH | 170 | Genetically valuable pair |

FRESNO

Fresno Chaffee Zoo
Fresno, CA

| ID | Local ID | Sex | Age | Disposition | Location | Breeding | With | Notes |
|-----|----------|-----|-----|-------------|----------|------------|------|-------|
| 369 | 280122 | F | 15 | HOLD | FRESNO | BREED WITH | 511 | |
| 511 | 220090 | M | 8 | HOLD | FRESNO | BREED WITH | 369 | |

HOUSTON

Houston Zoo, Inc.
Houston, TX

| ID | Local ID | Sex | Age | Disposition | Location | Breeding | With | Notes |
|-----|----------|-----|-----|-------------|-----------|--------------|------|---|
| 423 | 24433 | M | 14 | HOLD | HOUSTON | DO NOT BREED | | |
| 521 | 23328 | M | 7 | HOLD | HOUSTON | BREED WITH | 586 | Over-represented pair; breed one more time only |
| 586 | 21650 | F | 6 | HOLD | HOUSTON | BREED WITH | 521 | |
| 596 | 24957 | M | 1 | SEND TO | BLOOMINGT | DO NOT BREED | | |
| 597 | 25174 | U | 0 | SEND TO | ST PAUL | DO NOT BREED | | |

JACKSONVL

Jacksonville Zoo and Gardens
Jacksonville, FL

| ID | Local ID | Sex | Age | Disposition | Location | Breeding | With | Notes |
|-----|----------|-----|-----|-------------|-----------|------------|------|---|
| 512 | 603349 | M | 8 | HOLD | JACKSONVL | BREED WITH | 522 | Over-represented pair; breed one more time only |
| 522 | 606377 | F | 7 | HOLD | JACKSONVL | BREED WITH | 512 | |

LOSANGELE

Los Angeles Zoo & Botanical Gardens
Los Angeles, CA

| ID | Local ID | Sex | Age | Disposition | Location | Breeding | With | Notes |
|-----|----------|-----|-----|-------------|-----------|--------------|------|-------|
| 356 | 96379 | M | 15 | HOLD | LOSANGELE | DO NOT BREED | | |

LOUISVILL

Louisville Zoological Garden
Louisville, KY

| ID | Local ID | Sex | Age | Disposition | Location | Breeding | With | Notes |
|-----|----------|-----|-----|-------------|-----------|------------|------|--------------|
| 561 | 202242 | M | 4 | SEND TO | ORLANDO | BREED WITH | 562 | Pre-arranged |
| 562 | 202241 | F | 3 | SEND TO | ORLANDO | BREED WITH | 561 | Pre-arranged |
| 578 | 202306 | M | 3 | SEND TO | BUSCH TAM | BREED WITH | 589 | |

LOWRY

Tampa's Lowry Park Zoo
Tampa, FL

| ID | Local ID | Sex | Age | Disposition | Location | Breeding | With | Notes |
|-----|----------|-----|-----|--------------|----------|------------|------|-------|
| 532 | 205396 | M | 6 | HOLD | LOWRY | BREED WITH | 567 | |
| 567 | 215716 | F | 2 | RECEIVE FROM | NZP-WASH | BREED WITH | 532 | |

MADISON

Henry Vilas Park Zoo
Madison, WI

| ID | Local ID | Sex | Age | Disposition | Location | Breeding | With | Notes |
|-----|----------|-----|-----|--------------|-----------|--------------|------|-------|
| 610 | A0921 | M | 1 | RECEIVE FROM | ST AUGUST | DO NOT BREED | | |

METROZOO

Miami Metrozoo
Miami, FL

| ID | Local ID | Sex | Age | Disposition | Location | Breeding | With | Notes |
|-----|----------|-----|-----|-------------|----------|------------|------|------------------|
| 563 | B70153 | M | 3 | HOLD | METROZOO | BREED WITH | 580 | Demographic pair |
| 580 | B80022 | F | 3 | HOLD | METROZOO | BREED WITH | 563 | |

MILWAUKEE

Milwaukee County Zoological Gardens
Milwaukee, WI

| ID | Local ID | Sex | Age | Disposition | Location | Breeding | With | Notes |
|-----|----------|-----|-----|--------------|-----------|------------|----------|-------|
| 296 | 4262 | F | 16 | RECEIVE FROM | DETROIT | BREED WITH | 183, 543 | |
| 543 | 11793 | M | 4 | RECEIVE FROM | DETROIT | BREED WITH | 296 | |
| 183 | B2386 | M | 20 | HOLD | MILWAUKEE | BREED WITH | 296 | |
| 555 | B4346 | F | 4 | SEND TO | FRANKLINP | BREED WITH | 170 | |

NY BRONX

Bronx Zoo/Wildlife Conservation Societ
Bronx, NY

| ID | Local ID | Sex | Age | Disposition | Location | Breeding | With | Notes |
|-----|----------|-----|-----|-------------|-----------|------------|------|-------|
| 213 | 922242 | M | 18 | HOLD | NY BRONX | BREED WITH | 537 | |
| 537 | B06034 | F | 5 | HOLD | NY BRONX | BREED WITH | 213 | |
| 605 | B09032 | F | 1 | SEND TO | DREHER PA | BREED WITH | 564 | |

NZP-WASH

Smithsonian National Zoological Park
Washington, DC

| ID | Local ID | Sex | Age | Disposition | Location | Breeding | With | Notes |
|-----|----------|-----|-----|-------------|----------|------------|------|---------------|
| 56 | 205380 | M | 32 | HOLD | NZP-WASH | BREED WITH | 542 | Existing pair |
| 235 | 212763 | M | 18 | HOLD | NZP-WASH | BREED WITH | 481 | Existing pair |
| 481 | 215524 | F | 11 | HOLD | NZP-WASH | BREED WITH | 235 | Existing pair |
| 542 | 215505 | F | 5 | HOLD | NZP-WASH | BREED WITH | 56 | Existing pair |
| 567 | 215716 | F | 2 | SEND TO | LOWRY | BREED WITH | 532 | |

OMAHA

Omaha's Henry Doorly Zoo
Omaha, NE

| ID | Local ID | Sex | Age | Disposition | Location | Breeding | With | Notes |
|-----|----------|-----|-----|-------------|----------|--------------|------|----------------------------------|
| 259 | 7864 | M | 17 | HOLD | OMAHA | DO NOT BREED | | |
| 463 | 10921 | U | 11 | HOLD | OMAHA | DO NOT BREED | | Unknown pedigree and unknown sex |
| 485 | 11823 | U | 10 | HOLD | OMAHA | DO NOT BREED | | Unknown pedigree and unknown sex |
| 602 | 19261 | U | 1 | HOLD | OMAHA | DO NOT BREED | | Unknown pedigree and unknown sex |
| 604 | 19621 | U | 0 | HOLD | OMAHA | DO NOT BREED | | Unknown pedigree and unknown sex |

ORLANDO

Sea World Orlando
Orlando, FL

| ID | Local ID | Sex | Age | Disposition | Location | Breeding | With | Notes |
|-----|----------|-----|-----|--------------|-----------|--------------|------|---|
| 283 | SB2502 | M | 16 | HOLD | ORLANDO | DO NOT BREED | | |
| 482 | SB2509 | F | 10 | HOLD | ORLANDO | DO NOT BREED | | |
| 483 | SB2510 | M | 10 | HOLD | ORLANDO | DO NOT BREED | | |
| 518 | SB2513 | M | 9 | HOLD | ORLANDO | DO NOT BREED | | |
| 561 | 202242 | M | 4 | RECEIVE FROM | LOUISVILL | BREED WITH | 562 | Pre-arranged. Breed for demographic purposes only |
| 562 | 202241 | F | 3 | RECEIVE FROM | LOUISVILL | BREED WITH | 561 | |

PHILADELP

The Philadelphia Zoo
Philadelphia, PA

| ID | Local ID | Sex | Age | Disposition | Location | Breeding | With | Notes |
|-----|----------|-----|-----|--------------|-----------|------------|------|-------------------|
| 158 | 89A935 | F | 21 | RECEIVE FROM | FRANKLINP | BREED WITH | 123 | Good genetic pair |
| 123 | 203560 | M | 23 | HOLD | PHILADELP | BREED WITH | 158 | |

PITTS CA

National Aviary in Pittsburgh
Pittsburgh, PA

| ID | Local ID | Sex | Age | Disposition | Location | Breeding | With | Notes |
|-----|----------|-----|-----|-------------|----------|------------|------|-------|
| 404 | 4653 | F | 14 | HOLD | PITTS CA | BREED WITH | 475 | |
| 475 | 6474 | M | 9 | HOLD | PITTS CA | BREED WITH | 404 | |
| 590 | 7668 | M | 2 | SEND TO | TORONTO | BREED WITH | 420 | |

PROVIDNCE

Roger Williams Park Zoo
Providence, RI

| ID | Local ID | Sex | Age | Disposition | Location | Breeding | With | Notes |
|-----|----------|-----|-----|-------------|-----------|------------|------|-------|
| 285 | 942074 | M | 16 | HOLD | PROVIDNCE | BREED WITH | 351 | |
| 351 | 200163 | F | 15 | HOLD | PROVIDNCE | BREED WITH | 285 | |

PUEBLO

Pueblo Zoo
Pueblo, CO

| ID | Local ID | Sex | Age | Disposition | Location | Breeding | With | Notes |
|-----|----------|-----|-----|--------------|----------|--------------|------|-------|
| 612 | 808174 | F | 2 | RECEIVE FROM | SD-WAP | DO NOT BREED | | |
| 614 | 809354 | U | 0 | RECEIVE FROM | SD-WAP | DO NOT BREED | | |

RIO GRAND

Albuquerque Biological Park
Albuquerque, NM

| ID | Local ID | Sex | Age | Disposition | Location | Breeding | With | Notes |
|-----|----------|-----|-----|-------------|-----------|--------------|------|-------|
| 139 | B21782 | M | 22 | HOLD | RIO GRAND | DO NOT BREED | | |

SAN ANTON

San Antonio Zoological Gardens & Aqua
San Antonio, TX

| ID | Local ID | Sex | Age | Disposition | Location | Breeding | With | Notes |
|-----|----------|-----|-----|--------------|-----------|------------|------|-------|
| 538 | 1779 | F | 5 | RECEIVE FROM | DES MOINE | BREED WITH | 306 | |
| 306 | 940743 | M | 16 | HOLD | SAN ANTON | BREED WITH | 538 | |
| 365 | 950933 | M | 15 | HOLD | SAN ANTON | BREED WITH | 474 | |
| 474 | A00043 | F | 11 | HOLD | SAN ANTON | BREED WITH | 365 | |

SANDIEGOZ

Zoological Society of San Diego
San Diego, CA

| ID | Local ID | Sex | Age | Disposition | Location | Breeding | With | Notes |
|-----|----------|-----|-----|--------------|-----------|--------------|------|-------------------------------------|
| 412 | 897446 | F | 13 | HOLD | SANDIEGOZ | DO NOT BREED | | Reported dead during comment period |
| 441 | 399128 | M | 12 | HOLD | SANDIEGOZ | DO NOT BREED | 583 | |
| 583 | A0709 | F | 7 | RECEIVE FROM | ST AUGUST | BREED WITH | 441 | |

SANTA ANA

Santa Ana Zoo
Santa Ana, CA

| ID | Local ID | Sex | Age | Disposition | Location | Breeding | With | Notes |
|-----|----------|-----|-----|-------------|-----------|--------------|------|-------|
| 506 | B01015 | F | 8 | HOLD | SANTA ANA | DO NOT BREED | | |
| 507 | B02061 | F | 8 | HOLD | SANTA ANA | DO NOT BREED | | |

SD-WAP

San Diego Wild Animal Park
Escondido, CA

| ID | Local ID | Sex | Age | Disposition | Location | Breeding | With | Notes |
|-----|----------|-----|-----|--------------|-----------|--------------|------|------------------|
| 140 | 488495 | F | 22 | HOLD | SD-WAP | DO NOT BREED | | |
| 544 | 805062 | M | 6 | HOLD | SD-WAP | DO NOT BREED | | |
| 545 | 805063 | F | 6 | HOLD | SD-WAP | BREED WITH | 560 | Demographic pair |
| 612 | 808174 | F | 2 | SEND TO | PUEBLO | DO NOT BREED | | |
| 613 | 809299 | M | 1 | HOLD | SD-WAP | DO NOT BREED | | |
| 614 | 809354 | U | 0 | SEND TO | PUEBLO | DO NOT BREED | | |
| 560 | 208194 | M | 3 | RECEIVE FROM | DREHER PA | BREED WITH | 545 | Demographic pair |

SEATTLE

Woodland Park Zoological Gardens
Seattle, WA

| ID | Local ID | Sex | Age | Disposition | Location | Breeding | With | Notes |
|-----|----------|-----|-----|--------------|----------|------------|----------|-------|
| 279 | 940143 | M | 17 | HOLD | SEATTLE | BREED WITH | 609 | |
| 303 | 200332 | M | 16 | HOLD | SEATTLE | BREED WITH | 609 | |
| 609 | 12541 | F | 1 | RECEIVE FROM | SEDGWICK | BREED WITH | 279, 303 | |

SEDGWICK

Sedgwick County Zoo
Wichita, KS

| ID | Local ID | Sex | Age | Disposition | Location | Breeding | With | Notes |
|-----|----------|-----|-----|-------------|----------|------------|----------|--|
| 438 | 8958 | M | 12 | HOLD | SEDGWICK | BREED WITH | 479 | |
| 479 | 9635 | F | 10 | HOLD | SEDGWICK | BREED WITH | 438 | New chick was reported during draft period |
| 609 | 12541 | F | 1 | SEND TO | SEATTLE | BREED WITH | 279, 303 | |

ST AUGUST

St. Augustine Alligator Farm
St Augustine, FL

| ID | Local ID | Sex | Age | Disposition | Location | Breeding | With | Notes |
|-----|----------|-----|-----|-------------|-----------|--------------|------|--|
| 524 | A0706 | M | 7 | HOLD | ST AUGUST | DO NOT BREED | | The PMP is seeking a compatible female for this male |
| 583 | A0709 | F | 7 | SEND TO | SANDIEGOZ | BREED WITH | 441 | |
| 610 | A0921 | M | 1 | SEND TO | MADISON | DO NOT BREED | | |

ST LOUIS

Saint Louis Zoological Park
St. Louis, MO

| ID | Local ID | Sex | Age | Disposition | Location | Breeding | With | Notes |
|-----|----------|-----|-----|-------------|----------|------------|------|-------|
| 585 | 105703 | M | 3 | HOLD | ST LOUIS | BREED WITH | 617 | |
| 617 | 106837 | F | 2 | HOLD | ST LOUIS | BREED WITH | 585 | |

ST PAUL

Como Zoo
St. Paul, MN

| ID | Local ID | Sex | Age | Disposition | Location | Breeding | With | Notes |
|-----|----------|-----|-----|--------------|----------|--------------|------|-------|
| 597 | 25174 | U | 0 | RECEIVE FROM | HOUSTON | DO NOT BREED | | |

STATEN IS

Staten Island Zoo
Staten Island, NY

| ID | Local ID | Sex | Age | Disposition | Location | Breeding | With | Notes |
|-----|----------|-----|-----|-------------|-----------|--------------|------|----------|
| 186 | 010601 | F | 20 | HOLD | STATEN IS | DO NOT BREED | | Excluded |

TOLEDO

Toledo Zoological Gardens
Toledo, OH

| ID | Local ID | Sex | Age | Disposition | Location | Breeding | With | Notes |
|-----|----------|-----|-----|-------------|----------|------------|------|-------|
| 205 | 911622 | F | 19 | HOLD | TOLEDO | BREED WITH | 370 | |
| 370 | 1284 | M | 14 | HOLD | TOLEDO | BREED WITH | 205 | |

TORONTO

Toronto Zoo
Scarborough, Ontario

| ID | Local ID | Sex | Age | Disposition | Location | Breeding | With | Notes |
|-----|----------|-----|-----|--------------|----------|------------|------|-------|
| 590 | 7668 | M | 2 | RECEIVE FROM | PITTS CA | BREED WITH | 420 | |
| 420 | 33071 | F | 13 | HOLD | TORONTO | BREED WITH | 590 | |
| 424 | 33072 | F | 13 | SEND TO | TULSA | BREED WITH | 262 | |

TRACY AV

Tracy Aviary
Salt Lake City, UT

| ID | Local ID | Sex | Age | Disposition | Location | Breeding | With | Notes |
|-----|----------|-----|-----|-------------|----------|--------------|------|-------|
| 608 | B90237 | M | 1 | HOLD | TRACY AV | DO NOT BREED | | |

TULSA

Tulsa Zoo & Living Museum

Tulsa, OK

| ID | Local ID | Sex | Age | Disposition | Location | Breeding | With | Notes |
|-----|----------|-----|-----|--------------|----------|------------|------|-------|
| 424 | 33072 | F | 13 | RECEIVE FROM | TORONTO | BREED WITH | 262 | |
| 262 | 11018 | M | 17 | HOLD | TULSA | BREED WITH | 424 | |

Appendix A Assumptions

HYPOTHETICAL SPECIMENS

| Studbook ID | Sire | Dam | Notes |
|-------------|------|-----|---|
| HYP1 | 469 | 472 | A combination of the two potential sires at Vokaty at the time of hatch |
| HYP2 | 467 | 470 | A combination of the two potential dams at Vokaty at the time of hatch |

ANALYTICAL DATA FOR TRUE SPECIMENS

| Studbook ID | Field | True | Overlay | Notes |
|-------------|-------|------|---------|---|
| 544 | Dam | UNK | HYP2 | |
| | Sire | UNK | HYP1 | |
| 545 | Dam | UNK | HYP2 | |
| | Sire | UNK | HYP1 | |
| 583 | Dam | UNK | HYP2 | |
| | Sire | UNK | HYP1 | |
| 584 | Dam | UNK | HYP2 | |
| | Sire | UNK | HYP1 | |
| 585 | Sire | UNK | 408 | Assumed sire is 408 due to him being the only potential sire at COLO P at the time of hatch |
| 587 | Dam | UNK | HYP2 | |
| | Sire | UNK | HYP1 | |

Appendix B Summary of Data Exports

Project: Sunbittern

Report compiled under Population Management 2000, version 1.213

10:40:24 AM, 16 Apr 2010

Comments: 2010 planning

Date to be used for calculations: 16 Apr 2010

Demographic data from: C:\Documents and Settings\cgroome\My Documents\PopLink 2.1\PopLink Databases\Sunbittern\mXXSunbittern.prn and C:\Documents and Settings\cgroome\My Documents\PopLink 2.1\PopLink Databases\Sunbittern\fXXSunbittern.prn

Genetic data from: C:\Documents and Settings\cgroome\My Documents\PopLink 2.1\PopLink Databases\Sunbittern\XXSunbittern.ped

Studbook information:

Data exported on: 16 Apr 2010

Data compiled by: Jeannine Correa

Contact info: Jeannine Correa jcorrea@wcs.org

Data current thru: 22 Mar 2010

Scope of data: Regional

Demographic filter conditions:

Association = AZA.fed During 1 Jan 1970 – 16 Apr 2010 Status = Living

Genetic filter conditions:

Association = AZA.fed, As of 16 Apr 2010, Status = Living

Appendix C

Birds excluded from the Genetic Analyses

| SB ID# | Location | Sex | Age | Reason for Exclusion |
|--------|-----------|-----|-----|---------------------------|
| 122 | BALTIM AQ | F | 23 | Imprinted, age |
| 186 | STATEN IS | F | 20 | 20 yrs old and never bred |

Appendix D

Life Tables

Males

| Age (x) | Qx | Px | lx | Mx | Vx | Ex | Risk (Qx) | Risk (Mx) |
|---------|------|------|-------|------|-------|--------|-----------|-----------|
| 0 | 0.5 | 0.5 | 1 | 0 | 1.333 | 10.428 | 250.6 | 133.7 |
| 1 | 0.1 | 0.9 | 0.5 | 0.06 | 2.229 | 14.886 | 109.9 | 104.3 |
| 2 | 0.06 | 0.94 | 0.45 | 0.19 | 2.5 | 15.111 | 96.4 | 93.4 |
| 3 | 0.06 | 0.94 | 0.423 | 0.28 | 2.602 | 15.011 | 84.8 | 80.9 |
| 4 | 0.01 | 0.99 | 0.398 | 0.3 | 2.55 | 14.531 | 76.1 | 75.7 |
| 5 | 0.04 | 0.96 | 0.394 | 0.43 | 2.444 | 13.877 | 73 | 71.9 |
| 6 | 0.09 | 0.91 | 0.378 | 0.33 | 2.28 | 13.765 | 67.7 | 65.1 |
| 7 | 0.02 | 0.98 | 0.344 | 0.36 | 2.189 | 13.531 | 61 | 60.2 |
| 8 | 0.02 | 0.98 | 0.337 | 0.22 | 1.976 | 12.787 | 57.8 | 57.2 |
| 9 | 0.04 | 0.96 | 0.33 | 0.37 | 1.917 | 12.15 | 53.9 | 52.9 |
| 10 | 0 | 1 | 0.317 | 0.26 | 1.672 | 11.383 | 48.5 | 48.5 |
| 11 | 0.06 | 0.94 | 0.317 | 0.3 | 1.542 | 10.704 | 47.1 | 44.7 |
| 12 | 0.05 | 0.95 | 0.298 | 0.18 | 1.392 | 10.27 | 42 | 41.3 |
| 13 | 0.03 | 0.97 | 0.283 | 0.19 | 1.337 | 9.659 | 38.8 | 38.7 |
| 14 | 0.03 | 0.97 | 0.275 | 0.28 | 1.252 | 8.927 | 36 | 35.8 |
| 15 | 0.03 | 0.97 | 0.266 | 0.11 | 1.061 | 8.172 | 31.8 | 31.8 |
| 16 | 0.12 | 0.88 | 0.258 | 0.12 | 1.088 | 7.748 | 24.5 | 23.2 |
| 17 | 0.11 | 0.89 | 0.227 | 0.16 | 1.159 | 7.627 | 18.3 | 17.2 |
| 18 | 0.07 | 0.93 | 0.202 | 0.29 | 1.164 | 7.292 | 14.1 | 13.8 |
| 19 | 0.17 | 0.83 | 0.188 | 0.13 | 1.049 | 7.135 | 11.9 | 10.5 |
| 20 | 0 | 1 | 0.156 | 0 | 1.073 | 6.764 | 8.7 | 8.7 |
| 21 | 0 | 1 | 0.156 | 0 | 1.137 | 5.764 | 7.6 | 7.6 |
| 22 | 0.17 | 0.83 | 0.156 | 0 | 1.315 | 5.206 | 6 | 5.9 |
| 23 | 0 | 1 | 0.13 | 0.33 | 1.536 | 4.637 | 4.1 | 4.1 |
| 24 | 0.25 | 0.75 | 0.13 | 0.67 | 1.459 | 4.156 | 4 | 3 |
| 25 | 0.33 | 0.67 | 0.097 | 0.29 | 1.167 | 4.41 | 3 | 2.3 |
| 26 | 0 | 1 | 0.065 | 0 | 1.158 | 4.25 | 2 | 2 |
| 27 | 0.5 | 0.5 | 0.065 | 0 | 1.635 | 4.333 | 2 | 1.5 |
| 28 | 0 | 1 | 0.033 | 0.68 | 2.597 | 5 | 1 | 1 |
| 29 | 0 | 1 | 0.033 | 2.03 | 2.03 | 4 | 1 | 1 |
| 30 | 0 | 1 | 0.033 | 0 | 0 | 3 | 1 | 1 |
| 31 | 0 | 1 | 0.033 | 0 | 0 | 2 | 0.9 | 0.9 |
| 32 | 1 | 0 | 0.033 | 0 | 0 | 1 | 0 | 0 |

$r = 0.0573$

$\lambda = 1.0590$

$T = 8.39$

$N = 61.00$

$N(\text{at } 20 \text{ yrs}) = 191.82$

Females

| Age (x) | Qx | Px | lx | Mx | Vx | Ex | Risk (Qx) | Risk (Mx) |
|---------|------|------|-------|------|-------|--------|-----------|-----------|
| 0 | 0.48 | 0.52 | 1 | 0 | 1.316 | 8.971 | 239.8 | 130.1 |
| 1 | 0.1 | 0.9 | 0.52 | 0.07 | 2.156 | 12.263 | 109.5 | 102.8 |
| 2 | 0.03 | 0.97 | 0.468 | 0.19 | 2.38 | 12.069 | 92.1 | 91 |
| 3 | 0.09 | 0.91 | 0.454 | 0.28 | 2.48 | 11.77 | 86.5 | 83.7 |
| 4 | 0.01 | 0.99 | 0.413 | 0.3 | 2.472 | 11.36 | 77 | 76 |
| 5 | 0.04 | 0.96 | 0.409 | 0.37 | 2.372 | 10.624 | 71.5 | 70.4 |
| 6 | 0.09 | 0.91 | 0.393 | 0.38 | 2.279 | 10.288 | 66.3 | 63.7 |
| 7 | 0.03 | 0.97 | 0.357 | 0.39 | 2.154 | 9.896 | 57.2 | 56.4 |
| 8 | 0.09 | 0.91 | 0.347 | 0.4 | 1.998 | 9.459 | 54.3 | 53.2 |
| 9 | 0.04 | 0.96 | 0.315 | 0.29 | 1.822 | 9.058 | 48.8 | 47.3 |
| 10 | 0.05 | 0.95 | 0.303 | 0.28 | 1.709 | 8.437 | 44.3 | 43.2 |
| 11 | 0.05 | 0.95 | 0.288 | 0.36 | 1.601 | 7.828 | 39.6 | 38.5 |
| 12 | 0.08 | 0.92 | 0.273 | 0.45 | 1.413 | 7.3 | 36.8 | 35.1 |
| 13 | 0.03 | 0.97 | 0.251 | 0.3 | 1.087 | 6.674 | 30.1 | 29.3 |
| 14 | 0.08 | 0.92 | 0.244 | 0.25 | 0.886 | 6.002 | 26 | 25.3 |
| 15 | 0.23 | 0.77 | 0.224 | 0.09 | 0.799 | 5.898 | 22.1 | 20.6 |
| 16 | 0.06 | 0.94 | 0.173 | 0.08 | 0.895 | 5.803 | 16.3 | 15.4 |
| 17 | 0.13 | 0.87 | 0.162 | 0.14 | 0.958 | 5.301 | 15 | 13.9 |
| 18 | 0.15 | 0.85 | 0.141 | 0.21 | 1.012 | 4.997 | 12.9 | 11.8 |
| 19 | 0.23 | 0.77 | 0.12 | 0.39 | 1.05 | 4.915 | 8.8 | 8 |
| 20 | 0.2 | 0.8 | 0.092 | 0.28 | 0.898 | 5 | 5 | 4.5 |
| 21 | 0 | 1 | 0.074 | 0.74 | 0.74 | 4.5 | 3.4 | 3.4 |
| 22 | 0 | 1 | 0.074 | 0 | 0 | 3.5 | 2 | 2 |
| 23 | 0 | 1 | 0.074 | 0 | 0 | 2.5 | 1.2 | 1.2 |
| 24 | 0 | 1 | 0.074 | 0 | 0 | 1.5 | 1 | 1 |
| 25 | 1 | 0 | 0.074 | 0 | 0 | 1 | 1 | 0.2 |
| 26 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |

$r = 0.0629$
 $\lambda = 1.0650$
 $T = 7.54$
 $N = 48.00$
 $N(\text{at } 20 \text{ yrs}) = 169.01$

Appendix E

Ordered Mean Kinship

Note: This list is based on data current to 22nd March 2010. Values are subject to change with any hatch, death, import, export, inclusion, or exclusion. Average Population MK = 0.0765

| Males | | | | | Females | | | | |
|-------|-------|--------|-----|-----------|---------|-------|--------|-----|-------------|
| SB# | MK | %Known | Age | Location | SB# | MK | %Known | Age | Location |
| 183 | 0.054 | 100.0 | 20 | MILWAUKEE | 555 | 0.055 | 100.0 | 4 | MILWAUKEE |
| 170 | 0.055 | 100.0 | 21 | DALLAS | 158 | 0.059 | 100.0 | 21 | FRANKLINP |
| 543 | 0.055 | 100.0 | 4 | DETROIT | 399 | 0.062 | 100.0 | 14 | CENTRALPK |
| 56 | 0.057 | 100.0 | 32 | NZP-WASH | 473 | 0.063 | 100.0 | 9 | CHICAGOLP |
| 139 | 0.057 | 100.0 | 22 | RIO GRAND | 195 | 0.070 | 100.0 | 19 | BIRMINGHM |
| 153 | 0.057 | 100.0 | 22 | BIRMINGHM | 369 | 0.070 | 100.0 | 15 | FRESNO |
| 500 | 0.059 | 100.0 | 9 | CENTRALPK | 420 | 0.071 | 100.0 | 13 | TORONTO |
| 306 | 0.063 | 100.0 | 16 | SAN ANTON | 424 | 0.071 | 100.0 | 13 | TORONTO |
| 365 | 0.063 | 100.0 | 15 | SAN ANTON | 182 | 0.072 | 100.0 | 20 | AUDUBON |
| 475 | 0.063 | 100.0 | 9 | PITTS CA | 296 | 0.072 | 100.0 | 16 | DETROIT |
| 259 | 0.064 | 100.0 | 17 | OMAHA | 351 | 0.072 | 100.0 | 15 | PROVIDNCE |
| 285 | 0.064 | 100.0 | 16 | PROVIDNCE | 562 | 0.073 | 100.0 | 3 | LOUISVILL |
| 356 | 0.064 | 100.0 | 15 | LOSANGELE | 567 | 0.073 | 100.0 | 2 | NZP-WASH |
| 423 | 0.066 | 100.0 | 14 | HOUSTON | 606 | 0.073 | 100.0 | 1 | CHICAGOLP |
| 370 | 0.067 | 100.0 | 14 | TOLEDO | 605 | 0.074 | 100.0 | 1 | NY BRONX |
| 438 | 0.067 | 100.0 | 12 | SEDGWICK | 527 | 0.075 | 100.0 | 7 | CHICAGOBR |
| 532 | 0.067 | 100.0 | 6 | LOWRY | 538 | 0.075 | 100.0 | 5 | DES MOINE |
| 213 | 0.068 | 100.0 | 18 | NY BRONX | 537 | 0.076 | 100.0 | 5 | NY BRONX |
| 236 | 0.069 | 100.0 | 18 | ASHEBORO | 554 | 0.077 | 100.0 | 5 | COLUMBIA |
| 123 | 0.072 | 100.0 | 23 | PHILADELP | 609 | 0.077 | 100.0 | 1 | SEDGWICK |
| 262 | 0.072 | 100.0 | 17 | TULSA | 205 | 0.078 | 100.0 | 19 | TOLEDO |
| 279 | 0.072 | 100.0 | 17 | SEATTLE | 556 | 0.078 | 100.0 | 4 | ASHEBORO |
| 288 | 0.072 | 100.0 | 16 | BIODOME | 586 | 0.079 | 100.0 | 6 | HOUSTON |
| 441 | 0.072 | 100.0 | 12 | SANDIEGOZ | 559 | 0.081 | 100.0 | 3 | BUFFALO |
| 564 | 0.073 | 100.0 | 3 | DREHER PA | 617 | 0.081 | 100.0 | 2 | ST LOUIS |
| 235 | 0.075 | 100.0 | 18 | NZP-WASH | 479 | 0.082 | 100.0 | 10 | SEDGWICK |
| 578 | 0.075 | 100.0 | 3 | LOUISVILL | 506 | 0.082 | 100.0 | 8 | SANTA ANA |
| 211 | 0.076 | 100.0 | 19 | AUDUBON | 507 | 0.082 | 100.0 | 8 | SANTA ANA |
| 585 | 0.076 | 50.0 | 3 | ST LOUIS | 597 | 0.082 | 100.0 | U0 | HOUSTON |
| 511 | 0.077 | 100.0 | 8 | FRESNO | 427 | 0.083 | 100.0 | 13 | DENVER |
| 590 | 0.077 | 100.0 | 2 | PITTS CA | 465 | 0.083 | 100.0 | 11 | BIODOME |
| 557 | 0.078 | 100.0 | 4 | ASHEBORO | 474 | 0.083 | 100.0 | 11 | SAN ANTON |
| 570 | 0.078 | 100.0 | 5 | CHICAGOLP | 482 | 0.083 | 100.0 | 10 | ORLANDO |
| 303 | 0.079 | 100.0 | 16 | SEATTLE | 580 | 0.083 | 100.0 | 3 | METROZOO |
| 464 | 0.079 | 100.0 | 11 | COLUMBIA | 140 | 0.084 | 100.0 | 22 | SD-WAP |
| 524 | 0.079 | 100.0 | 7 | ST AUGUST | 522 | 0.084 | 100.0 | 7 | JACKSONVL |
| 549 | 0.079 | 100.0 | 5 | CINCINNAT | 542 | 0.085 | 100.0 | 5 | NZP-WASH |
| 550 | 0.079 | 100.0 | 5 | CINCINNAT | 404 | 0.086 | 100.0 | 14 | PITTS CA |
| 477 | 0.081 | 100.0 | 10 | DES MOINE | 412 | 0.086 | 100.0 | 13 | SANDIEGOZ * |
| 521 | 0.081 | 100.0 | 7 | HOUSTON | 481 | 0.086 | 100.0 | 11 | NZP-WASH |
| 446 | 0.082 | 100.0 | 13 | BALTIM AQ | 589 | 0.087 | 100.0 | 2 | BUSCH TAM |
| 596 | 0.082 | 100.0 | 1 | HOUSTON | 545 | 0.088 | 100.0 | 6 | SD-WAP |
| 597 | 0.082 | 100.0 | U0 | HOUSTON | 587 | 0.089 | 100.0 | 4 | DALLAS WA |
| 483 | 0.083 | 100.0 | 10 | ORLANDO | 583 | 0.090 | 100.0 | 7 | ST AUGUST |
| 512 | 0.083 | 100.0 | 8 | JACKSONVL | 591 | 0.091 | 100.0 | 1 | DALLAS WA |
| 518 | 0.083 | 100.0 | 9 | ORLANDO | 612 | 0.091 | 100.0 | 2 | SD-WAP |
| 561 | 0.083 | 100.0 | 4 | LOUISVILL | 614 | 0.091 | 100.0 | U0 | SD-WAP |
| 563 | 0.084 | 100.0 | 3 | METROZOO | 463 | 0.500 | 0.0 | U11 | OMAHA |
| 560 | 0.086 | 100.0 | 3 | DREHERPA | 485 | 0.500 | 0.0 | U10 | OMAHA |
| 608 | 0.086 | 100.0 | 1 | METROZOO | 602 | 0.500 | 0.0 | U1 | OMAHA |
| 610 | 0.087 | 100.0 | 1 | ST AUGUST | 604 | 0.500 | 0.0 | U0 | OMAHA |
| 293 | 0.088 | 100.0 | 16 | CINCINNAT | | | | | |
| 584 | 0.088 | 100.0 | 7 | DENVER | | | | | |
| 289 | 0.090 | 100.0 | 16 | DALLAS WA | | | | | |
| 283 | 0.091 | 100.0 | 16 | ORLANDO | | | | | |
| 547 | 0.091 | 100.0 | 4 | DALLAS WA | | | | | |
| 588 | 0.091 | 100.0 | 3 | DALLAS WA | | | | | |
| 613 | 0.091 | 100.0 | 1 | SD-WAP | | | | | |
| 614 | 0.091 | 100.0 | U0 | SD-WAP | | | | | |
| 544 | 0.093 | 100.0 | 6 | SD-WAP | | | | | |
| 463 | 0.500 | 0.0 | U11 | OMAHA | | | | | |
| 485 | 0.500 | 0.0 | U10 | OMAHA | | | | | |
| 602 | 0.500 | 0.0 | U1 | OMAHA | | | | | |
| 604 | 0.500 | 0.0 | U0 | OMAHA | | | | | |

* Reported dead during draft period

Appendix F

Definitions

Management Terms

SSP Master Plan – A document that provides complete breeding and transfer recommendations for a Species Survival Plan (SSP®) population. The document is based on genetic and demographic analyses with consideration of behavioral, social, and institutional wants and needs. A draft of the Master Plan must be published in the Members Only section of the AZA Web site for a 30-day comment period. After the Coordinator incorporates/responds to institutional comments, a final version of the Master Plan must be published in the Members Only section of the AZA Web site. SSP Participation by AZA institutions is required.

Full Participation – AZA policy stating that all AZA accredited institutions and certified related facilities having an SSP animal in their collection are required to participate in the SSP partnership process and abide by the recommendations of the SSP.

Population Management Plan (PMP)– A document that provides complete breeding and transfer recommendations for a PMP population. The document is based on genetic and demographic analyses with consideration of behavioral, social, and institutional wants and needs. A draft of the PMP must be published in the Members Only section of the AZA Web site for a 30-day comment period. After the PMP Manager incorporates/responds to institutional comments, a final version of the PMP must be published in the Members Only section of the AZA Web site. PMP Participation by AZA institutions is voluntary.

Demographic Terms

Age Distribution – A two-way classification showing the numbers or percentages of individuals in various age and sex classes.

Ex, Life Expectancy – Average years of further life for an animal in age class x .

Lambda (λ) or Population Growth Rate – The proportional change in population size from one year to the next. Lambda can be based on life-table calculations (the expected lambda) or from observed changes in population size from year to year. A lambda of 1.11 means a 11% per year increase; lambda of .97 means a 3% decline in size per year.

lx, Age-Specific Survivorship – The probability that a new individual (e.g., age 0) is alive at the *beginning* of age x . Alternatively, the proportion of individuals which survive from birth to the beginning of a specific age class.

Mx, Fecundity – The average number of same-sexed young born to animals in that age class. Because SPARKS is typically using relatively small sample sizes, SPARKS calculates Mx as 1/2 the average number of young born to animals in that age class. This provides a somewhat less "noisy" estimate of Mx, though it does not allow for unusual sex ratios. The fecundity rates provide information on the age of first, last, and maximum reproduction.

Px, Age-Specific Survival – The probability that an individual of age x survives one time period; is conditional on an individual being alive at the beginning of the time period. Alternatively, the proportion of individuals which survive from the beginning of one age class to the next.

Qx, Mortality – Probability that an individual of age x dies during time period. $Qx = 1 - Px$

Risk (Qx or Mx) – The number of individuals that have lived during an age class. The number at risk is used to calculate Mx and Qx by dividing the number of births and deaths that occurred during an age class by the number of animals at risk of dying and reproducing during that age class.

The proportion of individuals that die during an age class. It is calculated from the number of animals that die during an age class divided by the number of animals that were alive at the beginning of the age class (i.e. "at risk").

Vx, Reproductive Value – The expected number of offspring produced this year and in future years by an animal of age x .

Genetic Terms

Allele Retention – The probability that a gene present in a founder individual exists in the living, descendant population.

Current Gene Diversity (GD) -- The proportional gene diversity (as a proportion of the source population) is the probability that two alleles from the same locus sampled at random from the population will not be identical by descent. Gene diversity is calculated from allele frequencies, and is the heterozygosity expected in progeny produced by random mating, and if the population were in Hardy-Weinberg equilibrium.

Effective Population Size (Inbreeding N_e) -- The size of a randomly mating population of constant size with equal sex ratio and a Poisson distribution of family sizes that would (a) result in the same mean rate of inbreeding as that observed in the population, or (b) would result in the same rate of random change in gene frequencies (genetic drift) as observed in the population. These two definitions are identical only if the population is demographically stable (because the rate of inbreeding depends on the distribution of alleles in the parental generation, whereas the rate of gene frequency drift is measured in the current generation).

FOKE, First Order Kin Equivalents – The number of first-order kin (siblings or offspring) that would contain the number of copies of an individual's alleles (identical by descent) as are present in the zoo-born population. Thus an offspring or sib contributes 1 to FOKE; each grand-offspring contributes 1/2 to FOKE; each cousin contributes 1/4 to FOKE. $FOKE = 4 * N * MK$, in which N is the number of living animals in the zoo population.

Founder – An individual obtained from a source population (often the wild) that has no known relationship to any individuals in the derived population (except for its own descendants).

Founder Contribution -- Number of copies of a founder's genome that are present in the living descendants. Each offspring contributes 0.5, each grand-offspring contributes 0.25, etc.

Founder Genome Equivalents (FGE) – The number wild-caught individuals (founders) that would produce the same amount of gene diversity as does the population under study. The gene diversity of a population is $1 - 1 / (2 * FGE)$.

Founder Genome Surviving – The sum of allelic retentions of the individual founders (i.e., the product of the mean allelic retention and the number of founders).

Founder Representation -- Proportion of the genes in the living, descendant population that are derived from that founder. I.e., proportional Founder Contribution.

GU, Genome Uniqueness – Probability that an allele sampled at random from an individual is not present, identical by descent, in any other living individual in the population. GU-all is the genome uniqueness relative to the entire population. GU-Desc is the genome uniqueness relative to the living non-founder, descendants.

Inbreeding Coefficient (F) -- Probability that the two alleles at a genetic locus are identical by descent from an ancestor common to both parents. The mean inbreeding coefficient of a population will be the proportional decrease in observed heterozygosity relative to the expected heterozygosity of the founder population.

Kinship Value (KV) – The weighted mean kinship of an animal, with the weights being the reproductive values of each of the kin. The mean kinship value of a population predicts the loss of gene diversity expected in the subsequent generation if all animals were to mate randomly and all were to produce the numbers of offspring expected for animals of their age.

Mean Generation Time (T) – The average time elapsing from reproduction in one generation to the time the next generation reproduces. Also, the average age at which a female (or male) produces offspring. It is not the age of first reproduction. Males and females often have different generation times.

Mean Kinship (MK) – The mean kinship coefficient between an animal and all animals (including itself) in the living, zoo-born population. The mean kinship of a population is equal to the proportional loss of gene diversity of the descendant (zoo-born) population relative to the founders and is also the mean inbreeding coefficient of progeny produced by random mating. Mean kinship is also the reciprocal of two times the founder genome equivalents: $MK = 1 / (2 * FGE)$. $MK = 1 - GD$.

Percent Known – Percent of an animal's genome that is traceable to known Founders. Thus, if an animal has an UNK sire, the % Known = 50. If it has an UNK grandparent, % Known = 75.

Prob Lost – Probability that a random allele from the individual will be lost from the population in the next generation, because neither this individual nor any of its relatives pass on the allele to an offspring. Assumes that each individual will produce a number of future offspring equal to its reproductive value, V_x .

Appendix G

Directory of Institutional Representatives

| Contact Name (IR) | Title/Position | Institution | Email |
|---------------------|--|--|--|
| Debbie Zombeck | Curator of Birds | ASHEBORO - North Carolina Zoological Park, Asheboro, NC | debbie.zombeck@nczoo.org |
| Shelly Collinsworth | Assistant Curator/Birds | AUDUBON - Audubon Zoo, New Orleans, LA | scolinsworth@audoboninstitute.org |
| Lori Smith | IR/Senior Aviculturist | BALTIM AQ - National Aquarium in Baltimore Inc, Baltimore, MD | lsmith@aquaria.org |
| Serge Pepin | Curator of Animal Collections | BIODOME - Biodome de Montreal, Montreal, Quebec | spepin@ville.montreal.qc.ca |
| Cindy Pinger | Curator of Birds | BIRMINGHM - Birmingham Zoo, Birmingham, AL | cpinger@birminghamzoo.com |
| Jay Tetzloff | Zoo Superintendent | BLOOMINGT - Miller Park Zoo, Bloomington, IL | jtetzloff@cityblm.org |
| Jerry Aqualina | Curator | BUFFALO - Buffalo Zoological Gardens, Buffalo, NY | GDAquolina@aol.com |
| Phil Hillary | Manager - Zoological | BUSCH TAM - Busch Gardens, Tampa, FL | philip.hillary@buschgardens.com |
| Jeff Sailer | Director | CENTRALPK - Central Park Zoo, Bronx, NY | jsailer@wcs.org |
| Tim Snyder | Curator of Birds | CHICAGOBR - Chicago Zoological Park, Brookfield, IL | tim.snyder@czs.org |
| Colleen Lynch | Curator of Birds | CHICAGOLP - Lincoln Park Zoological Gardens, Chicago, IL | clynch@lpzoo.org |
| Steve Malowski | Aviculture Superintendent | CINCINNAT - Cincinnati Zoo & Botanical Garden, Cincinnati, OH | steve.malowski@cincinnati-zoo.org |
| Martin Vince | Curator of Birds | COLUMBIA - Riverbanks Zoological Park, Columbia, SC | mvince@riverbanks.org |
| Chris Brown | Curator of Birds | DALLAS - Dallas Zoo, Dallas, TX | chris.brown@dallaszoo.com |
| Daryl Richardson | Director | DALLAS WA - Dallas World Aquarium, Dallas, TX | daryl@dwazoo.com |
| John Azua | Curator of Birds | DENVER - Denver Zoological Gardens, Denver, CO | jazua@denverzoo.org |
| Chad Comer | Animal Curator | DES MOINE - Blank Park Zoo of Des Moines, Des Moines, IA | cjcomer@blankparkzoo.org |
| Tom Schneider | Curator of Birds | DETROIT - Detroit Zoological Institute, Royal Oak, MI | tschneider@dzs.org |
| Gwen Lovett | Curator of Animal Programs | DREHER PA - Palm Beach Zoo at Dreher Park, West Palm Beach, FL | glovett@palmbeachzoo.org |
| Fred Beall | General Curator | FRANKLINP - Zoo New England / Franklin Park Zoo, Boston, MA | fbeall@zoonewengland.com |
| Andy Snider | Director of Animal Care and Conservation | FRESNO - Fresno Chaffee Zoo, Fresno, CA | asnider@fresnochaffeezoo.com |
| Hannah Bailey | Curator of Birds | HOUSTON - Houston Zoo, Inc., Houston, TX | hbailey@houstonzoo.org |
| Donna Bear-Hull | Curator of Birds | JACKSONVL - Jacksonville Zoo and Gardens, Jacksonville, FL | bear-hulld@jacksonvillezoo.org |
| Susie Kasielke | Curator of Birds | LOSANGELE - Los Angeles Zoo & Botanical Gardens, Los Angeles, CA | susie.kasielke@lacity.org |
| Gary Michael | Curator of Birds | LOUISVILL - Louisville Zoological Garden, Louisville, KY | gary.michael@louisvilleky.gov |
| Julie Tomita | Assistant Curator | LOWRY - Tampa's Lowry Park Zoo, Tampa, FL | julie.tomita@lowryparkzoo.com |
| Jeff Stafford | Curator | MADISON - Henry Vilas Zoo, Madison, WI | stafford@co.dane.wi.us |
| Jim Dunster | Curator of Birds | METROZOO - Miami Metrozoo, Miami, FL | jdun@miamidade.gov |
| Alex Waier | Curator of Birds | MILWAUKEE - Milwaukee County Zoological Gardens, Milwaukee, WI | alex.waier@milwcnty.com |
| Nancy Clum | Curator of Birds | NY BRONX - Bronx Zoo/Wildlife Conservation Societ, Bronx, NY | nclum@wcs.org |
| Dan Boritt | Curator | NZP-WASH - Smithsonian National Zoological Park, Washington, DC | borittd@si.edu |
| Stephanie Huettner | Curator | OMAHA - Omaha's Henry Doorly Zoo, Omaha, NE | registrar@omahazoo.com |
| Sherry Branch | Curator of Birds | ORLANDO - Sea World Orlando, Orlando, FL | sherry.branch@seaworld.com |
| Aliza Baltz | Curator of Birds | PHILADELP - The Philadelphia Zoo, Philadelphia, PA | baltz.aliza@phillyzoo.org |
| Steve Sarro | Director of Animal Programs | PITTS CA - National Aviary in Pittsburgh, Pittsburgh, PA | steve.sarro@aviary.org |

| Contact Name (IR) | Title/Position | Institution | Email |
|-------------------|------------------|--|--|
| Pat Sharkey | General Curator | PROVIDENCE - Roger Williams Park Zoo, Providence, RI | psharkey@rwpzoo.org |
| Marilyn McBirney | Curator | PUEBLO - Pueblo Zoo, Pueblo, CO | curator@pueblozoo.org |
| Peter Shannon | Curator of Birds | RIO GRAND - Albuquerque Biological Park, Albuquerque, NM | pshannon@cabq.gov |
| Josef San Miguel | Curator of Birds | SAN ANTON - San Antonio Zoological Gardens & Aqua, San Antonio, TX | curbirds@sazoo-aq.org |
| Dave Rimlinger | Curator | SANDIEGOZ - Zoological Society of San Diego, San Diego, CA | drimlinger@sandiegozoo.org |
| Suzanne Merner | Curator | SANTA ANA - Santa Ana Zoo, Santa Ana, CA | smerner@santa-ana.org |
| Michael Mace | Curator of Birds | SD-WAP - San Diego Wild Animal Park, Escondido, CA | mmace@sandiegozoo.org |
| Mark Myers | Curator | SEATTLE - Woodland Park Zoological Gardens, Seattle, WA | mark.myers@zoo.org |
| Joe Barkowski | Curator of Birds | SEDGWICK - Sedgwick County Zoo, Wichita, KS | jcbksi@aol.com |
| Gen Anderson | General Curator | ST AUGUST - St. Augustine Alligator Farm, St Augustine, FL | ganderson@alligatorfarm.com |
| Michael Macek | Curator of Birds | ST LOUIS - Saint Louis Zoological Park, St. Louis, MO | macek@stlzoo.org |
| John Dee | Curator | ST PAUL - St. Paul's Como Zoo, St Paul, MN | john.dee@ci.stpaul.mn.us |
| Peter Laline | General Curator | STATEN IS - Staten Island Zoo, Staten Island, NY | plalinesizoo@aol.com |
| Robert Webster | Curator of Birds | TOLEDO - Toledo Zoological Gardens, Toledo, OH | robert.webster@toledofoo.org |
| Tom Mason | Curator of Birds | TORONTO - Toronto Zoo, Scarborough, Ontario | tmason@torontozoo.ca |
| Roger Sweeney | Curator | TRACY AV - Tracy Aviary, Salt Lake City, UT | rogers@tracyaviary.org |
| Chris Ashley | Lead Bird Keeper | TULSA - Tulsa Zoo & Living Museum, Tulsa, OK | anneashley@cityoftulsa.org |