Orangutan (*Pongo pygmaeus + Pongo abelii*)

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**Projected zoo & aquarium population status in 100 years**

**Bornean Population Status**
- 84 orangutans (33 males, 51 females) are housed at 25 AZA institutions  
- The population has increased at 0.6% annual growth over the last decade, with an average of ~3 births/year  
- 97% of the founding gene diversity (GD) has been retained  
- Average inbreeding (F) is 0.0004  
- IUCN status: Endangered

**Sumatran Population Status**
- 85 orangutans (36 males, 48 females, 1 unknown) are housed at 28 institutions  
- The population has decreased at -0.4% annual growth over the last decade, with an average of ~3 births/year  
- 98% of the founding gene diversity (GD) has been retained  
- Average inbreeding value (F) is 0.0056  
- IUCN status: Endangered

**Program Challenges**
- Managers intend to move toward a standard of parent rearing with a minimum of 8-year interbirth intervals among females, which allows for proper social development of offspring but lowers the breeding potential of each population

**Model Results**

**Projected Status WITHOUT Potential Changes**
- If the Bornean population continues its current breeding rate, it would have a 4% chance of extinction or ~16 individuals in 100 years  
- 84.4% (± 8.8%) gene diversity and low inbreeding (F: 0.055 ± 0.003) would be maintained  
- Status: Vulnerable in zoos in 100 years  
- For additional details, see page 10 in the main report

**Projected Status WITH Potential Changes**
- The Bornean population could fill available spaces if the breeding rate is increased to ~5 births/year  
- High gene diversity (GD: 95.1% ± 0.2%) and low inbreeding (F: 0.039 ± 0.007) would be maintained  
- Status: Low Risk in institutions in 100 years  
- For additional details, see pages 11-12 (scenario D) in main report

**Projected Status WITHOUT Potential Changes**
- If the Sumatran population continues its current breeding rate, it would have decline to ~50 individuals in the next 100 years  
- High gene diversity (GD: 92.2% ± 2.1%) and low inbreeding (F: 0.049 ± 0.015) would be maintained  
- Status: Low Risk in zoos in 100 years  
- For additional details, see page 17 in the main report

**Projected Status WITH Potential Changes**
- The Sumatran population could fill available spaces if the breeding rate is increased to ~5 births/year  
- High gene diversity (GD: 95.3% ± 0.2%) and low inbreeding (F: 0.040 ± 0.008) would be maintained  
- Status: Low Risk in institutions in 100 years  
- For additional details, see page 18-19 (scenario G) in main report

**Essential Management Actions**
- Re-allocate spaces currently occupied by hybrids as they become available over the next 32 years  
- Increasing breeding rates to produce ~5 births/year in each population to fill spaces as they become available

**How Institutions Can Help**
- Pursue breeding recommendations given to your institution  
- Report breeding challenges and successes to the Program Leader

*Please see the 2014 Orangutan AZA Animal Programs full PVA report on the AZA website for further details.*  
*Contact Brent Johnson at bjohnson@lpzoo.org with questions*
EXECUTIVE SUMMARY

Population Viability Analyses (PVA) are being conducted by Lincoln Park Zoo and Population Management Center researchers through funding from the Institute of Museum and Library Services (IMLS). The project team uses ZooRisk 3.80 (Earnhardt et al. 2008), a PVA modeling software, to examine what would happen to AZA populations if current conditions remain the same (the baseline scenario), and then assess the impact of changes in reproductive rates, space availability, imports/exports, and other potential management actions (alternate scenarios). Model scenarios for this population were developed with members of the Association of Zoos and Aquarium (AZA) Ape Taxon Advisory Group (TAG) during summer of 2014.

POPULATION HISTORY/CURRENT STATUS

Bornean orangutans (*Pongo pygmaeus*) have been consistently held in AZA institutions since 1940. Through a combination of importations of animals from outside of AZA and zoo births, the population grew to a size near 75 individuals by 1969. The population currently includes 84 individuals. In the past 10 years, the population has had an average of 2.7 births/year. Current gene diversity is high (97.2%) and inbreeding is low (average inbreeding coefficient of 0.0004).

Sumatran orangutans (*Pongo abelii*) have been consistently housed in North American institutions since 1928, although the population size remained low (<30 individuals) until 1960. After that year, the population grew through a combination of importations of animals from outside of the formally managed population and zoo births to a peak size of 105 individuals in 1997. The population averaged 2.8 births/year in the past 10 years and currently includes 85 individuals. At present, the Sumatran orangutan population has high gene diversity (97.6%) and low inbreeding (average inbreeding coefficient of 0.0056).

For each orangutan population, managers have been moving toward a standard of parent rearing and more prolonged time that offspring spend with their mother. They intend to maintain a minimum of 8-year interbirth intervals among females (except when infant mortalities occur) to allow them to fully raise their young.

PVA RESULTS

Model results indicate that hybrid orangutans will age out of AZA institutions in approximately 32 years, which could increase spaces for the other orangutan populations. If the AZA Bornean orangutan population continues its current breeding rate (2.7 births/year in the past 10 years), it is expected to have a 4% chance of extinction or approximately 16 individuals remaining in 100 years. However, increasing breeding is predicted to allow the AZA Bornean orangutan population to remain stable over the next 100 years. For the population to maintain its current size, it would need to produce an average of ~4 births per year over the next 10 years. If the population produces ~5 births/year, it could fill 115 potential spaces (including half of those currently occupied by hybrids) in approximately 32 years.

Under its current breeding rate (2.8 births/year in the past 10 years), the formally managed Sumatran orangutan population is predicted to decline to an average of 50 individuals over the next 100 years. Increasing breeding is predicted to also allow the Sumatran orangutan population to remain stable over the next 100 years. To maintain its current size, the population should produce an average of ~4 births per year over the next 10 years. By producing ~4 births/year over the next decade and ~5 births every following year, the population could fill 115 potential spaces in approximately 33 years. Increasing breeding rates (to either maintain the current population size or fill potential spaces) is also expected to maintain the genetic health of each orangutan population over the next century.

MANAGEMENT ACTIONS

The AZA Orangutan Animal Programs should consider the following changes to current management strategies:

- **Re-allocate spaces currently occupied by hybrids as they become available:** Because spaces are expected to become available as hybrid orangutans age out of AZA institutions, managers should ensure that these spaces are allocated to Bornean and Sumatran orangutans to maintain each of these populations at a larger, stable size with the best possible genetic health.

- **Increase breeding rates:** For each orangutan population, breeding should be increased from ~3 births per year to a minimum of ~4 births each year to maintain the current population size. To fill spaces currently occupied by hybrid orangutans as they become available, the Bornean population should produce ~5 births per year. The Sumatran population, however, should produce ~4 births each year for the next decade and ~5 births every following year in order to do so. To achieve these higher breeding rates, it may not be possible to immediately implement the recommended 8-year interbirth intervals. If higher breeding rates could be maintained, each population may become demographically stable and maintain its genetic health.

Please see the 2014 Orangutan AZA Animal Programs full PVA report on the AZA website for further details.

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