Report to:
Chinese Association of Zoological Gardens (CAZG)
Giant Panda Office, Department of Wildlife Conservation, State Forestry Administration
Giant Panda Conservation Foundation (GPCF)

2019 Breeding and Management Recommendations and Summary of the Status of the Giant Panda *Ex Situ* Population

8 - 9 November 2018
Chengdu, China

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Executive Summary

This is a report on the meeting held 8-9 November 2018 in Chengdu, China to update the analysis of the *ex situ* population of giant pandas and develop breeding recommendations for the 2019 breeding season. This is the 17th annual set of genetic management recommendations developed for giant pandas.

The current *ex situ* population of giant pandas consists of 548 animals (249 males, 299 females) located in 93 institutions worldwide. As of 8 November181 animals were transferred in 2018, including 4 from China to institutions outside of China and 4 between institutions in Canada. The genetic status of the population is currently healthy (gene diversity = 97.59%), with 58 founders represented and another 4 that could be genetically represented if they were to produce living offspring. There are 9 living inbred animals with estimated inbreeding coefficients > 6% and another 39 animals with lower levels of inbreeding.

There are 66 giant pandas in the studbook that are living or have living descendants with sires that are uncertain (due to natural mating and/or artificial insemination with multiple males). Most of these (n=46) are young pandas that were born in 2017 or later; however, the remaining 20 pandas with uncertain paternity are responsible for 53% of the uncertainty in the global pedigree. The result of these uncertain sires is that ~10% of the gene pool of the *ex situ* population is derived from uncertain ancestry. **Five individuals account for much of this uncertainty: the sire of SB# 455 is a very important animal to resolve (accounts for about 20% of all uncertainty in the global pedigree), although this panda is now dead; SB#s 439, 495, 532, and 557 are living pandas that are also high priority for paternity verification.**

Molecular genetic analyses must continue to be used to confirm the parentage of these pandas as well as each year's new cubs before the next set of breeding recommendations is made. This report contains the list of giant pandas that need to have their paternity verified (see Appendix B). Plans should continue to resolve as many of these uncertainties within the next year as possible.

The current population goal for the giant panda *ex situ* population is **to maintain a target population of ~ 600 giant pandas that retains at least 90% gene diversity of the wild population for 200 years**. A population of this size and genetic composition should be able to provide animals for reintroduction efforts if needed in the future.

Population growth in 2018 was 5.4%, which is a (desired) decrease in growth from 2017. Growth will need to be slowed even more as the population reaches its target size and capacity. The short-term demographic goal is to grow the population at ~3% per year for the next 3 years to reach target *N* of 600. This means that significantly fewer litters will be needed than in the past. Over the next three years, only 34 litters are needed per year. Breeding pairs should be limited to those pairings with a MSI value less than 4.

The development of a Genome Resource Bank strategy for the systematic collection, storage and use of sperm and other biosamples is recommended to maximize long-term population viability.

Development of an integrated conservation plan that includes conservation goals and actions for both the wild and captive giant panda populations is recommended to promote effective long-term conservation of this species.

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Ex Situ Giant Panda Management Program

Introduction

This is a report on the technical meeting held 8-9 November 2018 in Chengdu, China to update the analysis and breeding plan of the *ex situ* population of giant pandas. Workshop participants updated the studbook, identified priority pandas for breeding and recommended mates, and discussed breeding strategies to meet the demographic and genetic needs of the program. The annual conference was hosted by the National Forestry and Grassland Administration, National Park Administration, and the Sichuan, Gansu and Shaanxi Provincial People's Governments, and was organized by the Chinese Association of Zoological Gardens (CAZG), China Wildlife Conservation Association (CWCA), , Chengdu Research Base for Giant Panda Breeding, and China Conservation and Research. The technical workshop was facilitated by the IUCN SSC Conservation Planning Specialist Group (CPSG).

The goals of the technical workshop were to:

- update the demographic and genetic analyses of the *ex situ* population;
- update *ex situ* program goals and management strategies; and
- formulate recommendations for breeding and management to promote program goals.

Population Goals

In 2009 the Technical Committee approved the program goal to maintain at least 90% gene diversity for 200 years with a target population size of about 600 giant pandas. This timeline was adopted due to the uncertainty surrounding the possible significant threats of climate change and habitat destruction. The *ex situ* population has grown rapidly since that time, and the current population of 548 giant pandas is approaching this target population size (Figure 1). The rate of growth needs to be reduced significantly and immediately, and more effort should be placed in genetic management and promoting natural reproductive and parental behaviors conducive to effective release. Genetic management based on mean kinship is the most effective method of maintaining a genetically viable *ex situ* population capable of supporting a wild panda population (see *Program Review and Recommendations* for further discussion of Goals).

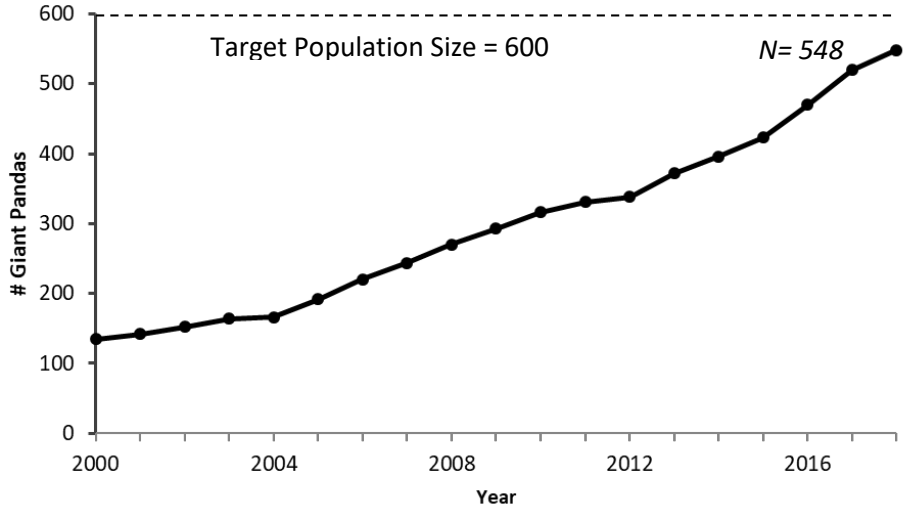

Figure 1. Growth of the *ex situ* giant panda population from 2000 to 2018.

Status of Captive Population

Data Analysis and Pedigree Assumptions

Data were taken from the 8 November 2018 version of the *International Giant Panda Studbook* compiled by Xie Zhong, CAZG, using the Species360 Single Population Analysis and Record Keeping System (SPARKS) v1.67 software program. PMx v1.5 software (Ballou, Lacy and Pollak) was used to conduct both demographic and genetic analyses. Data were current through the day of the workshop, as the studbook was updated during the workshop by institutional representatives.

Paternity is uncertain for many animals in the studbook. For many of these cases, females were first mated naturally and were then artificially inseminated (AI), or multiple males were used for natural mating or AI. In others, lack of record-keeping in the early studbook years resulted in uncertainty about which males sired which cubs. Although molecular analyses have successfully identified the paternity of many pandas, there are still 66 pandas with uncertain paternity that affect the living gene pool. Most of these (n = 46) are young pandas that were born in 2017 or later; however, the remaining 20 pandas with uncertain paternity are responsible for 53% of the uncertainty in the global pedigree (listed in Appendix B). The result of these uncertain sires is that ~10% of the gene pool of the *ex situ* population is derived from uncertain ancestry. An additional 10 pandas have undocumented determination of previously uncertain sires and require follow up (either molecular analysis or more complete documentation).

SPARKS v1.66 provides the option to list the studbook numbers of the potential sires along with the probability of each of them being the real sire. These uncertain sires can then be exported to PMx, where the pedigree analysis will take into consideration the uncertainties and calculate the kinships based on the estimated paternity across the uncertain sires (see Lacy *et al.* 2011 for the methods).

While the ability to include such uncertainty in the analyses are useful, and even necessary to proceed with developing breeding recommendations, **the genetic analyses for this *ex situ* population will not be completely accurate until the paternities are known for certain** through molecular genetic analyses. Accurate paternity verification will affect both population genetic measures (e.g., gene diversity, number of founders) as well as individual genetic measures (mean kinship, MSI scores) and therefore breeding recommendations and genetic management.

Molecular analyses are needed to resolve the paternity of these 66-76 pandas as soon as possible since genetic management recommendations will not be accurate with unknowns in the pedigree. High priority pandas for paternity verification are 455, 439, 495, 532 and 557.

Demographic Status

The current *ex situ* population of giant pandas consists of 548 animals (249 males, 299 females) located in 93 institutions worldwide. In 2018 there were 48 births and 17 deaths as of the time of the workshop.

Efforts to grow the population in recent years resulted in an annual population increase of 9-15% during 2005 to 2010. Growth rates were intentionally lower from 2011 to 2013 due to the increased focus on producing genetically valuable animals rather than large numbers ("quality over quantity"). More recently growth rate has been increased to accommodate the needs of a developing release and reintroduction program. However, the actual release rate has been low in comparison to reproduction, leading to 7% growth in 2014 and 2015, 11% in 2016, 17% in 2017 and 6% in 2018. The age structure of the living population is healthy and indicative of a population that would be expected to continue to grow (Figure 2).

Females are generally reproductive from 4-20 years of age, while male fertility can continue into the 20s. Generation time for the population is 11.2 years. Litters consist of 1-2 cubs with almost equal frequency (six litters of triplets have been observed), producing a mean litter size of 1.5 cubs. About 50% of males survive to age 14, 25% survive to age 23, and only about 10% survive to age 28. Female survivorship is slightly better, with about 50% reaching age 18, 25% surviving to age 26, and 10% surviving to age 33. These values include wild-caught pandas whose ages are estimated.

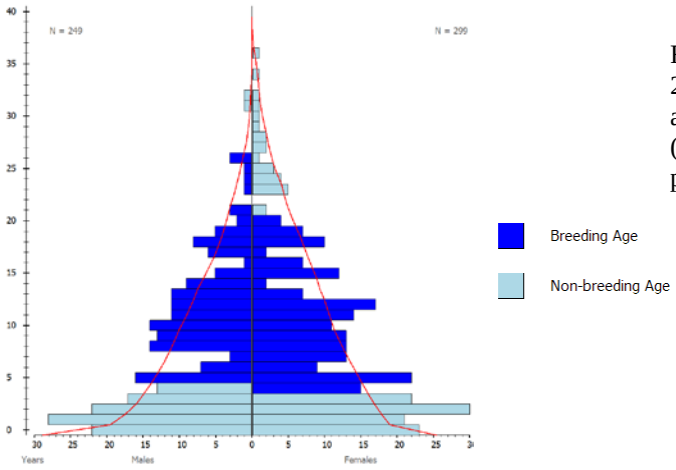

Figure 2. Age and sex structure of the 2018 population. Dark blue are breeding age individuals; light blue are immature (at bottom) or post-reproductive (at top) pandas.

Genetic Status

The *ex situ* giant panda population has descended from 58 wild-acquired founders (founders are defined as animals obtained from the wild that have successfully produced offspring or descendants in the current population). There are an additional 4 wild-acquired pandas that have yet to produce living offspring but have not been excluded due to age or poor health (these are potential founders). The population theoretically contains 97.59% of the genetic diversity of the wild population. This level of gene diversity has a founder genome equivalent (*FGE*) of 20.7, which means that the population has the same level of genetic diversity as a population newly established with 20.7 unrelated founders. The genetic contribution of founders is highly skewed, with 24% of the gene pool derived from only 4 founders (Figure 3); ideally 14 founders would be represented in 24% if all 58 founders contributed equally to the gene pool. The level of genetic diversity in the population could be increased to 99% if the population was ideally managed and the genes from the additional 4 potential founders fully incorporated into the population. The population would then have a founder genome equivalent of ~51 (potential *FGE*) (Table 1). Managing the population to minimize average kinship has been shown to be the optimal method for retaining genetic diversity. Breeding using MK values will automatically identify descendants from the under-represented founders as priority breeders and inhibit the breeding of over-represented founders.

# Founders	58
# Potential (additional)	4
Gene Diversity Retained	0.9759
Potential Gene Diversity Retained	0.9902
Founder Genome Equivalents (*FGE*)	20.73
Potential *FGE*	51.17
Mean Inbreeding	0.0028

Table 1. Genetic summary of the 2018 giant panda *ex situ* population.

Current inbreeding levels in the population are relatively low, with 9 living inbred animals with inbreeding coefficients over 6% (i.e., parents more closely related than cousins). Two from half-sib matings and 6 from first cousin matings) and another 39 animals with lower levels of inbreeding. While the current population is genetically healthy, pandas within institutions are closely related and it is becoming increasingly more difficult to identify non-related pairings within institutions. Of the 67 inbred animals in the studbook, 35 (54%) were born in the last three years (2016-2018). While these recent inbred births had relatively low levels of inbreeding, inbreeding will increase as captive breeding increases and the influx of new founders from the wild remains proportionally low. This will be especially true for pairings within institutions or partner institutions, making the transfer of individuals among institutions for breeding more important in the future as a way to minimize inbreeding and the loss of gene diversity. In the near future, giant pandas, or their sperm, will need to be transferred among institutions to increase the number of genetically favorable breeding options in the primary breeding centers. This process is beginning, with many transfers of giant pandas between Chinese institutions having occurred since 2014.

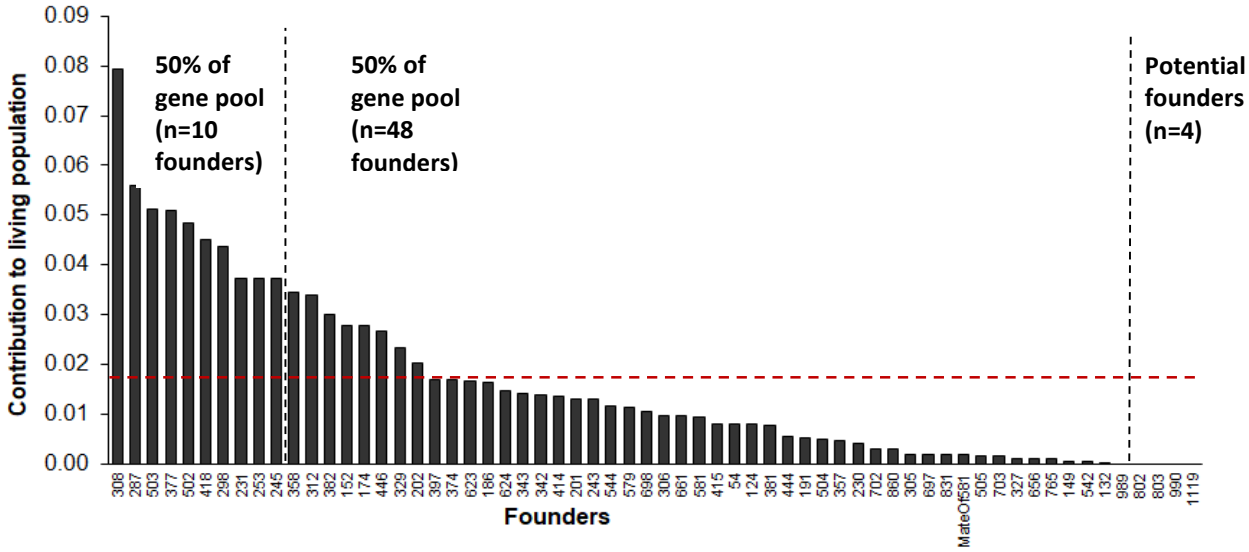

Figure 3. Genetic contribution of the 58 founders to the *ex situ* population gene pool. Each bar shows the contribution of a single founder. About 14% of the gene pool derives from only two founders (the left-most founders: 308 and 287). About 50% derives from only 10 founders. Red dashed line indicates ideal (equal) representation for each founder and potential founder (1.7%).

Program Review and 2019 Recommendations

January 2019 marks 17 years since the establishment of a formal cooperative management program for the *ex situ* giant panda population that bases its breeding strategy and annual breeding plan on global studbook data analysis. Much progress has been made during this time to improve the demographic and genetic status of the global *ex situ* giant panda population.

Program Goals

The conservation goal of the giant panda *ex situ* population is "the maintenance of a sustainable *ex situ* giant panda population that is genetically and demographically viable and can provide animals for release to support the wild population".

The identified conservation roles of the *ex situ* population and related contributions of the *ex situ* community to giant panda conservation are to provide:

- Source of giant pandas for reintroduction needs
- Insurance population against population decline or loss in the wild
- Research opportunities (e.g., disease prevention)
- Resource for developing techniques that can support wild panda conservation in China (e.g., population census, health status)
- Economic and political benefits to support wild population conservation
- Resource for public education and public awareness

To serve these roles and maintain a healthy, viable *ex situ* population, a quantitative goal has been set to maintain a target population that retains at least 90% gene diversity (GD) of the wild population for 200 years. The intensity of genetic management determines the amount of gene diversity that is retained and the required population size. A population of 600 giant pandas will maintain 90% GD for 200 years under current conditions (*Ne/N* = 0.19). Genetic management will need to be more strictly applied (*Ne/N* = 0.23) to achieve the same result with a smaller population size of 500. Relaxation of genetic management will lead to more rapid loss of gene diversity and jeopardize the ability of the population to meets its goals and conservation roles.

Population Size and Reproductive Goals

Managed *ex situ* populations go through several developmental stages (Figure 4) and the giant panda population is now leaving its 'growth phase' and approaching a 'maintenance phase' at the desired target population size of 600.

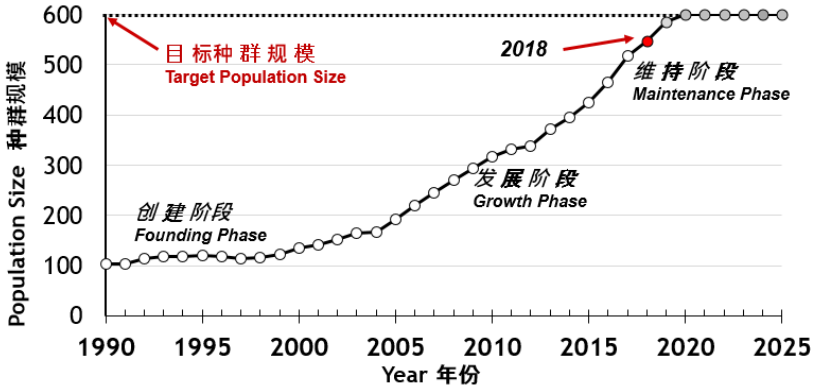

Figure 4. Phases in giant panda managed program development.

The short-term demographic goal is to grow the population at ~3% per year for the next 3 years to reach target *N* of 600. This means that significantly fewer litters will be needed than in the past. The Reproductive Planning utility of PMx was used to determine the level of reproduction needed to meet this goal. An additional 4-6 cubs are needed each year for release. Table 2 shows the number of births, litters and breeding recommendations needed over the next several years to accomplish these recommendations.

Table 2. Number of births, litters and breeding recommendations needed to achieve short- and long-term demographic goals.

Time Frame	Goal	Births Needed	Litters Needed [1]	Breeding Recommendations Needed [2]
Next 1-3 years	3% population growth	~ 50	~ 34	~68
3+ years	Maintain population size ~ 600	~ 30	~ 30	~ 60

[1]Average litter size = 1.5 cubs
[2]Assumes 50% of recommendations result in the birth of cub(s)

Breeding Strategy

Giant pandas are bred and offspring produced for two different purposes: 1) to maintain a genetically diverse, long-term breeding population; and 2) to produce animals for release. It is desirable to consider these goals separately when breeding pandas, as the number of cubs needed and characteristics of the selected breeders and breeding pairs are different between them.

A two-step process is suggested for developing breeding recommendations:

Step 1. Breeding plan for the insurance (captive breeding) population in China:

a. Calculate the desired growth rate and approximate number of litters needed. Consider the average success rate (# litters produced / # attempted pregnancies) to determine the number of breeding females needed for the next year.
b. Using the calculations above, limit the number of breedings to match the desired growth rate.
c. Identify priority breeders from the mean kinship list (males and females), including potential founders (see Appendix C).
d. Use the MSI table (Appendix D) to select genetically valuable pairs, giving priority to pairs with MSI $\leq$ 3.5 and avoiding any pairings with MSI = 4 or higher. Focus breeding attempts on genetic valuable pandas above the (population MK) line on the MK list and particularly on the priority animals at the top of the list.
e. Avoid using the same male (or his sperm) for too many breedings unless he is of high genetic value.

Step 2. Breeding plan for release:

a. Calculate the desired number of breeding females to produce offspring for release.
b. Identify candidate females based on appropriate criteria (e.g., behavior, health, location).
c. Identify acceptable male mates for the candidate females. Mates should be unrelated to the female and not heavily need for genetically valuable breedings for the *ex situ* population in Step 1.
d. In the initial phase of the release program, the genetic value of cubs for release is not a high priority.

e. If release training success rate is low and many of these cubs may be retained in captivity, then attention to genetic value is more important. It also may be necessary to produce fewer litters in Step 1 if it is likely that many cubs "for release" may need to be retained in captivity.

When choosing breeders and their mates, consider the following:

- Since the population is near capacity it is recommended to ***reduce growth*** and ***not*** attempt to breed all females. Breeding efforts should concentrate on genetically valuable females to produce cubs for the *ex situ* population. Additional females that are good candidates for producing offspring for release also can be bred to support reintroduction efforts.

- Recommended breeding pairs should have an MSI = 1 to 3.5, especially for institutions with pairing choices, as this will improve genetic diversity and reduce inbreeding. Overseas breeding pairs will be exempt from this limitation and may breed the pairs they currently hold.

- Efforts should be made to breed males and females with low mean kinship (MK) values. The average MK in the population is 0.0241. Animals with MK less than 0.0241 should be preferred breeders to maintain genetic diversity. The MK values are shown for each male and female on the MSI tables and on the mean kinship list (Appendix C).

- Priority efforts should be made to breed any wild-acquired pandas that have not produced surviving offspring, even if the MSI score = 3.5.

- Potential founders or other genetically valuable pandas should be bred with other high ranking pandas when possible (MSI $\leq$ 3). However, it is acceptable to breed potential founders with lower ranking pandas if this is the best or only option for successful reproduction for this highly valuable animal. To identify these special cases, MSI scores greater than 3 for pairs involving potential founders were changed to 3.5.

- AI should be restricted for use only for genetically valuable pairings that must be bred.

Genome Resource Bank Strategy

The successful use of artificial insemination (AI) has played an important role in the development of a healthy, growing giant panda *ex situ* population. As more emphasis is placed on fostering natural mating, it will become increasing important to develop a strategic plan for the collection, long-term storage, and use of sperm (and perhaps other biosamples). The selection of males for sperm collection and storage, and the use of those samples, will depend upon the purpose of the genome resource bank (GRB) and its role in supporting the living population. Tools are available to assist this process. Development of a GRB strategy is recommended for the giant panda *ex situ* program.

Comprehensive Conservation Plan

To promote the most effective conservation of the giant panda, a One Plan approach is recommended to develop one integrated conservation plan for the species. Such a plan would integrate management of the wild population, captive population, and biosample collection (GRB), and the interactions of these populations with each other, into a comprehensive meta-population strategy. Clear conservation goals and objectives for each population and their management will promote effective long-term conservation of the giant panda. Tools are available to assist this process.

2019 Breeding Recommendations

Since 2010, the focus on breeding has shifted from being concentrated on rapid demographic growth (high quantity breeding) to greater emphasis on genetic management (high quality breeding). This is increasing important as the population approaches its target size. Fewer cubs will be needed, and more emphasis can be placed on breeding individuals with low MK values (see Appendix C) and pairs with low MSI scores (see Appendix D) to promote retention of gene diversity in the population. The recommendation is to breed pairs with MSI scores of 3.5 or less. Greater emphasis should be placed on producing cubs from the 4 potential founders (wild-caught giant pandas) that have not yet reproduced as well as more genetically valuable (rare) lines.

Following discussions at the 2018 Chengdu technical meeting, potential breeding recommendations were made for 57 females in Chinese institutions (involving 53 different males, with each male potentially used for 1-16 females). These recommendations are shown in Tables 3a-b. The full MSI tables for all potential pairings are presented in Appendix D and can be used by other breeding institutions to determine best mates for their females, or evaluate the MSI scores of the pairs in their collection.

Note that the following table is for breeding recommendations in China. Additional pairs outside of China may be bred in 2019 but are not listed in this table and are not highlighted on the mean kinship list in Appendix C.

Table 3a. 2019 breeding recommendations for Chinese institutions identified following the 2018 technical meeting. MSI score given in parentheses ().

附：成都基地已经完成的配对				
序号	雌性个体（F）			雄性个体谱系号(MSI 值，所属单位) Male Stud# (MSI, Institution)
	谱系号 Stud#	呼名 Name	年龄（岁） Age	
中国保护大熊猫研究中心（Wolong）				
1	474	优优	20	719（2，中），613（2，中），488（2，中），502（2，中）
2	495	晔晔	19	719（2，中），592（2，兰），775（3，中），748（3，中）
3	505	张卡	18	661（1，中），579（1，中），886（1，中），989（1，中）
4	511	喜妹	18	674（3，中），719（3，中），613（3，中）
5	512	乐生	18	752（1，中），775（1，中），748（1，中），674（2，中） 905（2，中）
6	557	菊笑	16	674（3，中），719（3，中），613（3，中）； 雌性在番禺 (female in Panyu)
7	568	娜娜	15	719（2，中），592（2，兰），488（2，中），502（2，中）
8	596	苏琳	13	674（2，中），719（2，中），613（2，中），752（3，中）
9	625	思雪	12	748（3，中），674（3，中），613（3，中），563（3，中）
10	632	美欣	12	613（3，中）
11	650	芊芊	12	674（2，中），719（2，中），613（2，中），775（3，中）
12	651	朵朵	12	563（3，中）
13	691	文雨	11	609（1，中），775（1，中），582（1，中），674（2，中）
14	698	水秀	15	661（1，中），542（1，中），623（1，中），579（1，中）
15	702	汪佳	11	661（1，中），542（1，中），579（1，中），865（1，中）

16	739	阿灵	10	748（3，中），719（3，中），613（3，中）
17	740	林冰	9	748（3, 中），674（3, 中），719（3, 中），613（3, 中）
18	756	淑琴	9	592（2，兰），719（2，中），613（2，中），502（3，中）
19	759	姚蔓	9	719（2，中），592（2，兰），488（2，中），502（2，中） ,674（3，中）
20	791	阳花	8	752（1，中），775（1，中），905（1，中），623（2，中）
21	827	苏珊	7	661（1，中），579（1，中），905（1，中），886（1，中）
22	834	正正	6	719（3，中），674（3，中），613（3，中）
23	837	怡然	6	623（1，中），579（1，中），865（1，中），542（1，中）
24	838	怡畅	6	623（1，中），579（1，中），865（1，中），542（1，中）
25	846	嘉嘉	6	719（3，中），674（3，中），613（3，中）
26	862	鑫鑫	5	661（1，中），579（1，中），905（1，中），886（1，中） ,752（2，中）
27	897	宝宝	5	674（2，中），719（2，中），613（2，中），488（3，中）
陕西珍稀濒危野生动物抢救研究中心				
1	509	珠珠	18	802（3.5，陕），803（3.5，陕）
2	562	楼生	15	624（3，陕）,802（3.5，陕），803 二郎（3.5，陕）
3	872	明明	5	802（3.5,陕），803（3.5,陕）
4	908	秦秦	5	624（1,陕）,703（2,陕）,802（3.5,陕）,803（3.5,陕）
5	909	安安	5	802（3.5,陕），803（3.5 陕）
6	663	爱浜	12	713（4,陕）,715（4,陕）,802（3.5,陕）,803（3.5,陕） 用于保护教育 (for education)
7	757	丫丫	11	624（2,陕),715（4,陕）,802（3.5,陕）,803（3.5,陕） 用于保护教育 (for education)
成都大熊猫繁育研究基地 (Louguantai)				
1	1119	家园	13+	831（1，成），703（1，陕）
2	765	北川	13+	831（1，成），703（1，陕，803（1，陕）
3	990	昭美	9	831（1，成），703 阿宝（1，陕），803（1，陕）
4	680	星蓉	12	519（3，成），536（3，成），520（2，成）
5	801	阿宝	9	724（3，成），711（3，成）
6	823	二巧	8	736（2，成）
7	761	文莉	10	519（2，成），520（2，成）
8	762	雅莉	10	519 冰星（2，成） 520（2，成）
9	725	妮妮	11	731（3，成），519（3，成）， 520 冰点（3，成）
10	870	美仑	6	857（2，成），858（2，成），724（3，成），711（3，成）
11	871	美奂	6	858（2，成），857（2，成），711（3，成），724（3，成）
12	598	晶晶	14	519（2，成）， 520（3，成）
13	883	福禄	6	711（2，成），724（2，成）
14	681	星雅	12	532（2，成），**595（2，成）**
15	665	香冰	12	461（3，成）
16	480	蜀庆	20	461（3，成），386（3，成）

北京动物园 (Beijing Zoo)				
1	566	瑛华	15	748(3,中), 674(3,中), 563(3,中), 503(4,中), 502(4,中) 用于保护教育 (for education)
2	766	大白兔	8	503（4,中）,502（4,中）,747（4,中）,609（4,中） 用于保护教育 (for education)
重庆动物园 (Chongqing Zoo）				
1	548	兰香	16	674(4,中), 748(4,中), 751(4,中), 752(4,中), 719 (4,中) 用于保护教育 (for education)
2	829	莽仔	7	674(4,中), 747(4,中), 748(4,中), 751(4,中), 752(4,中) 用于保护教育 (for education)
3	493	娅娅	19	989(3.5,中), 542(3.5,中)
4	648	友友	12	989(3.5,中), 542(3.5, 中)
5	896	好奇	5	989(3.5,中), 542(3.5, 中)

1、2019 年的配对计划共有 59 对,

2、原则上每个配对的 MSI 值要求在 3 以内。考虑到单位的实际情况和保护教育的需要，陕西珍稀濒危野生动物抢救研究中心、重庆动物园和北京动物园 MSI 值放宽到 3.5，另再各给两个配额，MSI 放宽到 4，用于保护教育。

3、802、803、624、703 为陕西血统个体。

4、在配对计划发出之前，有些大熊猫已经发情配种，这些个体未列入计划中。

Table 3b. Recommended breeding pairs at CHENPANDA to produce juveniles for reintroduction research 用于野放研究 (experimental release program). MSI score given in parentheses ().

附：成都基地已经完成的配对				
序号	雌性个体（F）			雄性个体谱系号(MSI 值，所属单位) Male Stud# (MSI, Institution)
	谱系号 Stud#	呼名 Name	年龄（岁） Age	
1	523	成绩	19	532 福福（2），519 冰星（2），520 冰点（2）
2	561	圆圆	16	461 杨杨（2），515 亮亮（3），454 小双（3），575 庆仔（3）
3	522	成功	19	519 冰星（2），532 福福（2），536 小娇（3），520 冰点（2）
4	637	娅仔	13	532 福福（2），519 冰星（2），520 冰点（2）
5	824	成大	8	649 美兰（4），540 雄浜（4）
6	671	绩丽	12	536 小娇（4），649 美兰（4）
7	645	大娇	13	575 庆仔（4），724 迎迎（4），515 亮亮（4）
8	635	小丫头	13	614 幸浜（4），540 雄浜（4）
9	783	阳浜	9	717 蜀祥（4），649 美兰（4）

APPENDIX A: Assumptions about breeding population for analysis.
Data were taken from the 8 November 2018 version of the *International Giant Panda Studbook* compiled by Xie Zhong, CAZG, using the Species360 Single Population Analysis and Record Keeping System (SPARKS) v1.66 software. SPARKS v1.67 and PMx v1.5 software (Ballou, Lacy and Pollak) were used to conduct demographic and genetic analyses. Demographic characteristics of the population were analyzed for the period from 1 January 1990 to 8 November 2018. Genetic analysis was performed on the global living captive population. It is important to document the methods used in conducting the genetic analyses so that they can be repeated in future years.

This year 29 living pandas were excluded from the genetic analysis due to old age or chronic poor health (listed in the table below). These pandas were excluded because they are not considered to be able to produce offspring in the future and therefore can no longer contribute to the genetic diversity of the captive population. This left 519 pandas in the genetic population analysis.

Table A. List of permanent non-breeders excluded from the genetic analysis.

SB #	Location	Sex	Age	Reason excluded
253	CHONGQING	Female	~36	Too old
278	CHENPANDA	Female	34	Too old
314	CHENPANDA	Female	32	Too old
332	MEXICOCTY	Female	31	Too old
360	MEXICOCTY	Female	28	Too old
362	CHENGDU	Female	28	Too old
371	SANDIEGOZ	Female	27	Too old
374	FUCHOW	Female	~29	Too old
382	CCRCGP	Female	~27	Too old
387	CHENGDU	Female	26	Too old
394	BEIJING	Male	26	
399	CCRCGP	Male	25	
401	CHENPANDA	Female	25	Too old
403	BEIJING	Female	25	Too old
404	CCRCGP	Female	24	Too old
407	CCRCGP	Female	24	Too old
413	CCRCGP	Male	24	
416	CCRCGP	Female	~25	Too old
425	CHENPANDA	Female	23	Too old
432	CCRCGP	Female	23	Too old
434	KOBE PARK	Female	23	Too old
444	LOUGUANTA	Female	~30	Too old
480	CHENPANDA	Female	19	
524	CCRCGP	Male	18	Poor health
544	CCRCGP	Female	~24	Too old
554	TSINANWAW	Female	16	
660	LOUGUANTA	Female	~24	Too old
696	CCRCGP	Female	~23	Too old
701	CCRCGP	Female	~23	Too old

APPENDIX B: Giant pandas with uncertain paternity.

Assumptions about Paternity

Often in captivity female pandas are both naturally mated and artificially inseminated with two or more males to maximize the probability of conception. For animals with uncertain sires, all of the potential sires and the probability of each male being the true sire have been entered into the studbook. Except for a few historical exceptions, the probability that a potential sire was the true sire was based on the following rules:

1. When a female was mated with multiple males using only one mating method – either only by natural matings (NM) or only by artificial inseminations (AI), equal probabilities were assigned to all potential sires.
2. When a female was mated using both NM and AI: In past cases, molecular genetic analyses showed that the male that was used for NM in most cases was the confirmed sire. Each sire mated by AI was given a 2% chance of being the true sire.
3. In cases of both NM and AI breeding methods, all males within the same method were given the same probability of being the true sire.
4. The sum of all probabilities for all potential sires for an animal = 100%.
5. In some cases, different probabilities had been entered previously into the 2013 International Studbook prior to analysis based on additional information; these probabilities were kept for analysis.
6. For 7 animals that were born before 2002 when the first population analysis was conducted, there is no information available on mating method (NM or AI), but a male was selected as the sire. For these animals, this sire was kept for analysis.

Examples:

A: ♂ 201 (AI) and ♂ 202 (AI)
201 = 50%; 202 = 50%

B: ♂174 (NM) and ♂ 201 (AI)
174 = 98%; 201 = 2%

C: ♂ 201 (AI), ♂ 202 (AI) and ♂ 174 (NM)
201 = 2%; 202 = 2%; 174 = 96%

D: ♂ 174 (NM), ♂ 424 (NM) and ♂ 201 (AI)
174 = 49%; 424 = 49%; 201 = 2%

The following tables list those pandas with uncertain paternity and that contribute to the living population gene pool (because either they are still living and/or they have produced descendants that are alive. Animals with uncertain paternity but that died with no living descendants have been excluded).

It will be important to resolve these and any future uncertain paternities to accurately evaluate the genetic value of individuals, the relationship between mates, and the status of the population as a whole.

Table B1. Giant pandas with multiple sires listed in the 2018 International Studbook.
There are 66 pandas listed in the 2018 studbook with uncertain paternity and that contribute to the living *ex situ* gene pool (plus 1 animal that was released before paternity was identified). Most of these (n=46) are young pandas that were born in 2017 or later, and hopefully routine paternity testing is scheduled for these pandas. However, there are also 20 pandas born between 1996 and 2016 with uncertain paternity that are responsible for 53% of the uncertainty in the global pedigree. The result of these uncertain sires is that ~10% of the gene pool of the *ex situ* population is derived from uncertain ancestry. **Five individuals account for much of this uncertainty: SB# 455 is a very important animal to resolve (accounts for about 20% of all uncertainty in the global pedigree), although this panda is now dead; SB#s 439, 495, 532 and 557 are living pandas that are also high priority for paternity verification.**
# of living desc. = # living descendants; % Contrib to UNK = % of total pedigree uncertainty contributed by each panda.

SB#	Year born	# of living desc.	% Contrib to UNK in pedigree	Possible sires	Relevant notes and information from 2014 studbook	Sires used in analysis
455	1997 (dead)	48	20.4	308, 329 (NM)	Sire unresolved by 2001 analysis; 329 listed in 2013 SB; changed to MULT in 2014 SB	308 (50%); 329 (50%)
495	1999	13	6.0	308, 329 (NM)	2001 analysis indicated sire as 329 but sire of its twin 496 as 308; 329 listed in 2013 SB; changed to MULT in 2014 SB	308 (50%); 329 (50%)
439	1996 (dead)	9	3.5	308, 329 (NM); 298 (AI)	329 listed in 2013 SB; changed to MULT in 2014 SB	308 (49%); 329 (49%); 298 (2%)
557	2002	8	4.3	399 (NM); 327 (AI)	399 listed in 2013 SB; changed to MULT in 2014 SB	399 (98%); 327 (2%)
532	2001	8	5.0	377, 394, 399 (?)	No comments. 394 listed as sire; changed to MULT in 2014 SB (basis of probabilities unknown)	394 (60%); 399 (38%); 377 (2%)
548	2002	2	2.0	308, 394 (NM); 357 (AI)	394 listed in 2013 SB; changed to MULT in 2014 SB (basis of probabilities unknown)	394 (60%); 308 (38%); 357 (2%)
539	2001	1	2.3	308 (NM), 357 (AI)	Sire 308 in 2001 SB with 357 as AI; 308 listed in 2013 SB; changed to MULT in 2014 SB	308 (98%); 357 (2%)
437	1996 (dead)	4	2.0	308 (NM); 298 (AI)	Sire unresolved by 2001 analysis; 308 listed in 2013 SB; changed to MULT in 2014 SB	308 (98%); 298 (2%)
538	2001	8	1.0	308 (NM), 357 (AI)	Sire 308 in 2001 SB with 357 as AI; 308 listed in 2013 SB; changed to MULT in 2014 SB	308 (98%); 357 (2%)
877	2013	--	1.0	502, 503 (NM)		502 (50%); 503 (50%)
910	2014	--	1.0	502, 503 (?)		502 (50%); 503 (50%)
935	2014	--	1.0	502, 503 (NM)		502 (50%); 503 (50%)
936	2014	--	1.0	579, 623 (NM)		579 (50%); 623 (50%)
940	2014	--	1.0	540, 584 (?)		540 (50%); 584 (50%)
946	2015	--	1.0	503, 623 (NM)		503 (50%); 623 (50%)
987	2015	--	1.0	540, 574 (AI)		540 (50%); 574 (50%)
988	2015	--	1.0	540, 574 (AI)		540 (50%); 574 (50%)
1010	2016	--	1.0	743, 719 (?)		743 (98%); 719 (2%)
1041	2016	--	1.0	579, 661 (NM)		579 (50%); 661 (50%)
1046	2016	--	1.0	579, 719 (NM)		579 (50%); 719 (50%)

SB#	Year born	# of living desc.	% Contrib to UNK in pedigree	Possible sires	Relevant notes and information from 2014 studbook	Sires used in analysis
1058	2017	--	1.0	502, 719 (AI)		502 (50%); 719 (50%)
1059	2017	--	1.0	502, 719 (AI)		502 (50%); 719 (50%)
1064	2017	--	1.0	623, 719 (NM)		623 (50%); 719 (50%)
1067	2017	--	1.0	574, 624 (AI)		574 (50%); 624 (50%)
1073	2017	--	1.0	540, 649 (NM)		540 (50%); 649 (50%)
1074	2017	--	1.0	540, 649 (AI)		540 (50%); 649 (50%)
1075	2017	--	1.0	488, 502 (NM)		488 (50%); 502 (50%)
1076	2017	--	1.0	488, 502 (NM)		488 (50%); 502 (50%)
1077	2017	--	1.0	532 (AI), 624 (NM)		532 (2%), 624 (98%)
1084	2017	--	1.0	579 (NM), 586 (AI), 674 (AI)		579 (96%), 586 (2%), 674 (2%)
1089	2017	--	1.0	502, 503, 579, 743 (NM)		502 (25%), 503(25%), 579 (25%), 743 (25%)
1090	2017	--	1.0	502, 503, 579, 743 (NM)		502 (25%), 503(25%), 579 (25%), 743 (25%)
1092	2017	--	1.0	674 (NM), 719 (NM)		674 (50%), 719 (50%)
1093	2017	--	1.0	674, 719	Breeding method unknown	674 (50%), 719 (50%)
1098	2017	--	1.0	502 (NM), 743 (NM)		502 (50%), 743 (50%)
1099	2017	--	1.0	579 (NM), 661 (NM)		579 (50%), 661 (50%)
1101	2017	--	1.0	623 (NM), 752 (AI)		623 (98%), 752 (2%)
1102	2017	--	1.0	609 (AI), 743 (NM), 751 (NM)		609 (2%), 743 (49%), 751 (49%)
1103	2017	--	1.0	488 (NM), 743 (NM)		488 (50%), 743 (50%)
1104	2017	--	1.0	488 (NM), 743 (NM)		488 (50%), 743 (50%)
1105	2017	--	1.0	503 (NM), 743 (NM)		503 (50%), 743 (50%)
1106	2017	--	1.0	623 (NM), 743 (NM)		623 (50%), 743 (50%)
1109	2017	--	1.0	502 (NM), 743 (AI)		502 (98%), 743 (2%)
1113	2017	--	1.0	579 (NM), 623 (NM)		579 (50%), 623 (50%)
1114	2017	--	1.0	674 (NM), 743 (NM), 775 (NM)		674 (33.3%), 743 (33.3%), 775 (33.3%)
1115	2017	--	1.0	502, 743	Breeding method unknown	502 (50%), 743 (50%)
1116	2017	--	1.0	574 (AI), 703 (AI)		574 (50%), 703 (50%)
1118	2017	--	1.0	674 (NM), 743 (NM)	Breeding method unknown	674 (50%), 743 (50%)
1130	2018	--	1.0	503 (NM), 775 (NM)	Breeding method unknown	503 (50%), 775 (50%)
1135	2018	--	1.0	579 (NM), 674 (NM), 989 (AI)		579 (49%), 674 (49%), 989 (2%)
1137	2018	--	1.0	502 (AI), 592 (AI)		502 (50%), 592 (50%)
1139	2018	--	1.0	542 (AI), 592 (AI)		542 (50%), 592 (50%)

SB#	Year born	# of living desc.	% Contrib to UNK in pedigree	Possible sires	Relevant notes and information from 2014 studbook	Sires used in analysis
1144	2018	--	1.0	502 (AI), 592 (AI)		502 (50%), 592 (50%)
1146	2018	--	1.0	502 , 747	Breeding method unknown	502 (50%), 747 (50%)
1147	2018	--	1.0	502, 747	Breeding method unknown	502 (50%), 747 (50%)
1150	2018	--	1.0	668 (AI), 719 (NM)		668 (2%), 719 (98%)
1155	2018	--	1.0	488, 743	Breeding method unknown	488 (33.3%), 743 (33.3%), 743 (33.3%)
1157	2018	--	1.0	488, 719, 747	Breeding method unknown	488 (33.3%), 719 (33.3%), 747 (33.3%)
1158	2018	--	1.0	503 (NM), 592 (NM)		503 (50%), 592 (50%)
1159	2018	--	1.0	623, 661	Breeding method unknown	623 (50%), 661 (50%)
1160	2018	--	1.0	623, 661	Breeding method unknown	623 (50%), 661 (50%)
1161	2018	--	1.0	582 (AI), 586 (AI), 748 (NM)		582 (2%), 586 (2%), 748 (96%)
1163	2018	--	1.0	579, 719	Breeding method unknown	579 (50%), 719 (50%)
1164	2018	--	1.0	488 (NM), 592 (NM)		488 (50%), 592 (50%)
1165	2018	--	1.0	674, 751	Breeding method unknown	674 (50%), 751 (50%)
1166	2018	--	1.0	674, 751	Breeding method unknown	674 (50%), 751 (50%)

Table B2. Giant pandas with undocumented basis for sire identification.
These additional 10 giant pandas originally had uncertainty in their paternity in the studbook. At some point a sire was designated in the studbook; however, it is unclear whether the designated sire was determined based on molecular genetic analysis or if these were assumptions based on breeding methods or other factors. The sires of these 10 pandas represent 7% of the genetic pool of the 2016 living population, an increase from 2015. **These uncertainties regarding sire designation should be resolved and designated appropriately in the International Studbook**.

SB#	Year born	Current (last) location	Possible sires	Confirmed by molecular genetic analysis?	Relevant notes and information from 2014 studbook	Sires used in analysis
237	1981 (dead)	(BEIJING)	150, 186 (?)	No	No note of NM or AI; studbook entered 186 as the sire	186 [1]
278	1984	CHENGDU	174, 201 (?)	2001 analysis excluded 202 as possible sire	1991 note says may be 174, 201 or 202; 174 was entered as the sire. No note on which NM or AI.	174 [1]
297	1985 (dead)	(CHENPANDA)	174 (NM); 201, 202 (AI?)	??	2001 note used 174 as sire due to NM; 174 listed in 2014 studbook	174 [2]
314	1986	CHENPANDA	174, 201, 202 (AI?)	No	1991 note used 201 but says may be any of these. Note says this was the first successful use of frozen semen.	201 [1]
320	1986	BEIJING	135, 149 (?)	No	1991 note says sire may be 135 or 109, but likely typo indicating 149; 149 listed as sire.	149 [1]
323	1986	(BEIJING)	150, 186 (?)	No	Note says sire may be 150 or 186. 186 listed as the sire.	186 [1]
507	2000	MEMPHIS	345, 369 (?)	No	1999 studbook had 369	369 [1]
549	2002	TAIHU EP	308, 394 (NM); 357, 415 (AI)	??	394 listed in 2014 studbook	394 [2]
743	2009	YAAN BC	377, 621 (AI)	??	Both AI	377 [2]
772	2010	NANJING	623 (NM); 502 (NM, AI)	??	Need to verify methods	502 [2]

[1] Male was listed as the sire in earlier versions of the studbook; however, there is no note on how the male was confirmed as the sire.

[2] Male was listed as the sire in the 2014 studbook; need to confirm that this was based on molecular genetic analysis.

APPENDIX C: Ranked mean kinship (MK) list for giant panda captive population.

Individual giant pandas are listed in order of genetic value for breeding (males on the left; females on the right). Individuals at the top of the list have small mean kinship (MK) values because their genetic lines are under-represented and therefore are valuable breeders. Individuals with high MK values near the bottom of the list are over-represented in the population. The line in the middle of the list represents the average MK value for the population (0.0241); **animals above this line are underrepresented and are priority breeders to increase gene diversity in the population.**

Male			
Stbk#	MK	Age	Location
802	0	9	LOUGUANTA
803	0	9	LOUGUANTA
989	0	20	CCRCGP
542	0.0003	19	CCRCGP
327	0.0006	32	ABERDE HK
703	0.0008	11	CHENPANDA
831	0.0010	18	CHENPANDA
1142	0.0034	0	CCRCGP
938	0.0037	4	CCRCGP
415	0.0040	26	SANDIEGOZ
661	0.0048	12	CCRCGP
1031	0.0054	2	CCRCGP
579	0.0058	17	CCRCGP
1088	0.0058	1	CCRCGP
886	0.0060	5	CCRCGP
1159	0.0065	0	CCRCGP
1138	0.0068	0	CCRCGP
342	0.0069	31	CHENPANDA
865	0.0070	5	CCRCGP
624	0.0073	14	CHENPANDA
937	0.0073	4	CCRCGP
623	0.0083	14	CCRCGP
905	0.0104	5	CCRCGP
912	0.0119	4	LOUGUANTA
1110	0.0122	1	CCRCGP
963	0.0127	3	CHENPANDA
964	0.0127	3	CANGZHOU
752	0.0128	9	CCRCGP
787	0.0131	8	SHENZHEN
788	0.0131	8	CHENPANDA
609	0.0142	13	CCRCGP
975	0.0144	3	CCRCGP
582	0.0145	14	CCRCGP
711	0.0147	10	CHENPANDA

Female			
Stbk#	MK	Age	Location
990	0	8	CHENPANDA
1119	0	12	CHENPANDA
765	0.0005	12	CHENPANDA
505	0.0008	18	CCRCGP
1121	0.0011	0	CHENPANDA
702	0.0015	11	CCRCGP
860	0.0015	9	CCRCGP
1143	0.0034	0	CCRCGP
581	0.0047	16	CCRCGP
1113	0.0049	1	CCRCGP
698	0.0053	15	CCRCGP
827	0.0053	7	CCRCGP
1030	0.0054	2	CCRCGP
837	0.0058	6	CCRCGP
838	0.0058	6	CCRCGP
1087	0.0058	1	CCRCGP
1099	0.0059	1	CCRCGP
1160	0.0065	0	CCRCGP
936	0.0068	4	CCRCGP
1135	0.0071	0	CCRCGP
862	0.0078	5	CCRCGP
1046	0.0081	2	CCRCGP
507	0.0083	18	MEMPHIS
908	0.0090	5	LOUGUANTA
757	0.0103	9	LOUGUANTA
1040	0.0111	2	CCRCGP
911	0.0119	4	LOUGUANTA
1045	0.0120	2	CCRCGP
965	0.0124	3	CHENPANDA
966	0.0124	3	CANGZHOU
1084	0.0127	1	CCRCGP
791	0.0129	8	CCRCGP
1136	0.0130	0	CCRCGP
473	0.0136	20	NZP-WASH

Male			
Stbk#	MK	Age	Location
775	0.0155	8	CCRCGP
917	0.0156	4	HANGCHOW
1109	0.0156	1	CCRCGP
724	0.0157	10	CHENPANDA
748	0.0160	9	CCRCGP
1077	0.0160	1	CHENPANDA
1101	0.0164	1	CCRCGP
1126	0.0165	0	CHENPANDA
1127	0.0165	0	CHENPANDA
1067	0.0175	1	LOUGUANTA
1114	0.0175	1	CCRCGP
674	0.0177	11	CCRCGP
972	0.0179	3	CCRCGP
830	0.0181	7	HUAYING
1056	0.0181	1	CHENPANDA
1057	0.0181	1	CHENPANDA
510	0.0182	18	CHIANGMAI
563	0.0187	15	PANYU
749	0.0187	9	SHIH CHIA
842	0.0187	6	SANDIEGOZ
1023	0.0187	2	CCRCGP
606	0.0188	13	ABERDE HK
466	0.0192	20	MEMPHIS
1081	0.0197	1	CHENPANDA
461	0.0198	21	ATLANTA
595	0.0200	13	CCRCGP
613	0.0200	13	PANYU
978	0.0200	3	NZP-WASH
769	0.0201	8	BERLINZOO
586	0.0202	14	YUANSHAN
620	0.0202	13	ADELAIDE
607	0.0206	13	TAIAN R
520	0.0209	18	CHENGDU
719	0.0209	10	CCRCGP
1151	0.0209	0	CCRCGP
1165	0.0209	0	CCRCGP
1166	0.0209	0	CCRCGP
910	0.0211	4	TSINAN
1089	0.0212	1	CCRCGP
1090	0.0212	1	CCRCGP
685	0.0214	11	LANGZHONG

Female			
Stbk#	MK	Age	Location
691	0.0138	11	CCRCGP
976	0.0144	3	CCRCGP
947	0.0146	3	CHENPANDA
948	0.0146	3	CHENPANDA
512	0.0150	18	CCRCGP
562	0.0154	15	LOUGUANTA
997	0.0156	2	CHENPANDA
998	0.0156	2	CHENPANDA
1163	0.0163	0	CCRCGP
725	0.0165	10	CHENPANDA
883	0.0168	5	BEIJING
980	0.0169	3	CCRCGP
569	0.0172	15	EDINBURGH
1116	0.0174	1	LOUGUANTA
973	0.0179	3	CCRCGP
572	0.0181	15	CCRCGP
561	0.0183	15	CHENPANDA
509	0.0186	18	LOUGUANTA
650	0.0187	12	SHANGHAI
1024	0.0187	2	CCRCGP
654	0.0188	12	CCRCGP
596	0.0193	13	CCRCGP
1064	0.0193	1	CCRCGP
643	0.0195	12	CCRCGP
680	0.0195	11	CHENPANDA
1082	0.0197	1	CHENPANDA
694	0.0198	11	CCRCGP
897	0.0200	5	CCRCGP
601	0.0206	13	DEQING
755	0.0206	9	CCRCGP
678	0.0208	11	CHENPANDA
522	0.0209	18	CHENPANDA
756	0.0210	9	CCRCGP
760	0.0213	9	WENLING S
946	0.0213	3	BEIJING
1026	0.0214	2	VIENNA
801	0.0215	8	CHENPANDA
870	0.0215	5	CHENPANDA
871	0.0215	5	CHENPANDA
1043	0.0215	2	ATLANTA
1044	0.0215	2	ATLANTA

Male			
Stbk#	MK	Age	Location
789	0.0214	8	CCRCGP
887	0.0214	5	CCRCGP
1027	0.0214	2	VIENNA
1161	0.0218	0	CCRCGP
731	0.0220	10	CHENPANDA
951	0.0220	3	CCRCGP
952	0.0220	3	NANJING
713	0.0226	10	LOUGUANTA
736	0.0226	10	BEAUVAL
519	0.0227	18	MADRID Z
1148	0.0227	0	CHENPANDA
1106	0.0228	1	CCRCGP
518	0.0229	18	DAFENG
926	0.0229	4	QINGSHEN
1129	0.0229	0	CHENPANDA
1117	0.0232	1	SHANGHAI
1130	0.0234	0	CCRCGP
592	0.0235	14	CCRCGP
1093	0.0235	1	CCRCGP
792	0.0236	8	CHENPANDA
793	0.0236	8	HUAIAN
906	0.0236	5	KUEIYANG
874	0.0237	5	QINGSHEN
1115	0.0237	1	CCRCGP
1133	0.0237	0	CCRCGP
564	0.0238	15	EDINBURGH
1167	0.0238	0	CCRCGP
532	0.0240	17	CHENPANDA
778	0.0240	8	BOGOR
857	0.0240	6	CHANGSHA
858	0.0240	6	CHANGSHA
931	0.0240	4	SHENYANGW
1028	0.0240	2	CHENPANDA
1038	0.0240	2	CHENPANDA
488	0.0241	19	CCRCGP
770	0.0241	8	TSINANWAW
1125	0.0241	0	CHENPANDA
502	0.0242	19	CCRCGP
668	0.0243	11	CCRCGP
669	0.0243	11	CCRCGP
690	0.0243	11	SINGAPORE

Female			
Stbk#	MK	Age	Location
1118	0.0217	1	SHANGHAI
1139	0.0217	0	SHANGHAI
1145	0.0217	0	CHENPANDA
474	0.0218	20	CCRCGP
681	0.0218	11	CHENPANDA
759	0.0220	9	CCRCGP
941	0.0220	4	AHTARI
487	0.0221	19	CCRCGP
784	0.0221	8	CCRCGP
452	0.0222	21	ATLANTA
1037	0.0224	2	CCRCGP
1162	0.0224	0	CCRCGP
637	0.0226	12	CHENPANDA
1157	0.0226	0	CCRCGP
761	0.0227	9	CHENPANDA
568	0.0228	15	CCRCGP
762	0.0229	9	CHENPANDA
523	0.0230	18	CHENPANDA
796	0.0231	8	CHENPANDA
967	0.0232	3	LINYIZ
968	0.0232	3	EMEI EP
495	0.0233	19	CCRCGP
567	0.0233	15	CCRCGP
706	0.0233	10	SHENNONGJ
587	0.0234	14	TAIPEI
598	0.0234	13	CHENPANDA
1092	0.0235	1	CCRCGP
576	0.0236	15	MADRID Z
943	0.0236	4	EMEI EP
1019	0.0236	2	CCRCGP
1020	0.0236	2	HULIN
1042	0.0236	2	MADRID Z
1128	0.0236	0	CCRCGP
1134	0.0237	0	CCRCGP
565	0.0238	15	TAIHU EP
1158	0.0239	0	CCRCGP
740	0.0240	9	CCRCGP
932	0.0240	4	SHENYANGW
1029	0.0240	2	CHENPANDA
984	0.0241	3	NINGBO
1124	0.0241	0	CHENPANDA

Male			
Stbk#	MK	Age	Location
999	0.0244	2	CHENPANDA
536	0.0245	17	ANJI BAMB
689	0.0245	11	TAIAN R
747	0.0245	9	CCRCGP
714	0.0246	10	LIUGONGDA
746	0.0247	9	BAOX ECTR
902	0.0247	5	CCRCGP
1011	0.0247	2	CHONGQING
1076	0.0247	1	CCRCGP
390	0.0249	26	WAKAYAMA
745	0.0249	9	PAIRI DAI
758	0.0249	9	CCRCGP
852	0.0249	6	LINYIZ
994	0.0249	2	CHENPANDA
772	0.0250	8	LONGKOU
879	0.0252	5	RHENEN
458	0.0253	21	NZP-WASH
1072	0.0254	1	CCRCGP
1164	0.0254	0	CCRCGP
503	0.0255	19	CCRCGP
1058	0.0256	1	CCRCGP
751	0.0257	9	CCRCGP
954	0.0258	3	BEIJING
454	0.0260	21	FUCHOW
515	0.0260	18	HEFEI W
575	0.0260	15	ANJI BAMB
649	0.0260	12	CHENPANDA
1052	0.0260	2	SHANGHAI
841	0.0261	6	YONG IN
1147	0.0261	0	CCRCGP
867	0.0262	5	AHTARI
744	0.0263	9	PANYU
1144	0.0263	0	PANYU
1152	0.0263	0	CCRCGP
726	0.0264	10	SHIPAIWAN
599	0.0265	13	XIXIAKOU
786	0.0265	8	LONGKOU
992	0.0265	2	PAIRI DAI
538	0.0267	17	FUCHOW
890	0.0267	5	CCRCGP
1155	0.0267	0	CCRCGP

Female			
Stbk#	MK	Age	Location
929	0.0242	4	SHENYANGW
566	0.0243	15	CCRCGP
739	0.0243	10	CCRCGP
794	0.0243	8	BOGOR
823	0.0243	7	CHENPANDA
1150	0.0243	0	CCRCGP
625	0.0244	12	SHANGHAI
800	0.0244	8	CCRCGP
1000	0.0244	2	CHENPANDA
549	0.0246	16	TAIHU EP
652	0.0246	12	CHENPANDA
846	0.0246	6	CCRCGP
960	0.0246	3	BAOD AEP
811	0.0247	7	CHENPANDA
1012	0.0247	2	CHONGQING
1075	0.0247	1	CCRCGP
1083	0.0247	1	CHENPANDA
557	0.0248	16	PANYU
704	0.0248	10	CCRCGP
1149	0.0248	0	CCRCGP
734	0.0249	10	SINGAPORE
511	0.0250	18	CCRCGP
869	0.0252	5	YONG IN
880	0.0252	5	TIANMUHU
665	0.0254	11	CHENPANDA
735	0.0256	10	CCRCGP
877	0.0256	5	TIANJIN
995	0.0256	2	CCRCGP
1059	0.0256	1	CCRCGP
864	0.0257	5	TAIPEI
771	0.0258	8	CCRCGP
834	0.0258	6	CCRCGP
835	0.0258	6	LANGZHONG
1122	0.0258	0	CHENPANDA
1123	0.0258	0	CHENPANDA
1053	0.0260	2	SHANGHAI
1086	0.0260	1	CCRCGP
750	0.0261	9	CCRCGP
933	0.0261	4	SHENYANGW
1146	0.0261	0	CCRCGP
1153	0.0263	0	CCRCGP

Male			
Stbk#	MK	Age	Location
513	0.0268	18	CHONGQING
721	0.0268	10	SHENNONGJ
1103	0.0268	1	CCRCGP
589	0.0269	14	NANCHANG
619	0.0269	13	CCRCGP
496	0.0270	19	BEIJING
949	0.0270	3	BAOD AEP
950	0.0270	3	BAOD AEP
1098	0.0270	1	CCRCGP
529	0.0271	17	SHIH CHIA
530	0.0271	17	WENZHOU
588	0.0271	14	TAIPEI
573	0.0273	15	HUAIAN
614	0.0273	13	CHENPANDA
639	0.0273	12	KUALA LUM
662	0.0273	11	LIUCHOW
715	0.0273	10	LOUGUANTA
920	0.0273	4	HANGCHOW
839	0.0275	6	CHENPANDA
1054	0.0276	2	PANYU
1055	0.0276	2	PANYU
1102	0.0277	1	CCRCGP
742	0.0278	9	DEQING
1105	0.0278	1	CCRCGP
768	0.0281	8	DALIAN
899	0.0281	5	GUANGZH Z
900	0.0281	5	SHANGHAIZ
961	0.0282	3	LINGLING
962	0.0282	3	LINGLING
633	0.0283	12	HUAYING
636	0.0284	12	WENLING S
1013	0.0285	2	CHENPANDA
738	0.0286	10	CHENPANDA
782	0.0286	8	KUEIYANG
1021	0.0286	2	CCRCGP
1062	0.0286	1	CCRCGP
875	0.0288	5	CHENPANDA
1107	0.0289	1	CCRCGP
646	0.0290	12	FUCHOW
1003	0.0290	2	CHENPANDA
1137	0.0291	0	PANYU

Female			
Stbk#	MK	Age	Location
664	0.0265	11	CCRCGP
672	0.0265	11	CCRCGP
810	0.0265	7	CCRCGP
913	0.0265	4	DEZHOU
600	0.0267	13	TOKYOUENO
651	0.0267	12	CCRCGP
638	0.0268	12	ADELAIDE
774	0.0268	8	DALIAN
1104	0.0268	1	CCRCGP
641	0.0269	12	KUALA LUM
516	0.0270	18	CCRCGP
610	0.0270	13	ABERDE HK
632	0.0270	12	CCRCGP
953	0.0270	3	BAOD AEP
631	0.0271	12	SHANGHAI
741	0.0271	9	PAIRI DAI
537	0.0273	17	CHENPANDA
539	0.0273	17	CHIANGMAI
868	0.0273	5	BERLINZOO
476	0.0274	20	CCRCGP
618	0.0274	13	PANYU
453	0.0275	21	SUZHOU W
548	0.0275	16	CHONGQING
1005	0.0275	2	CHENPANDA
1006	0.0275	2	CHENPANDA
909	0.0276	5	LOUGUANTA
977	0.0276	3	CCRCGP
1120	0.0276	0	KUALA LUM
853	0.0277	6	CHENPANDA
663	0.0278	11	LOUGUANTA
763	0.0278	9	CHENPANDA
884	0.0278	5	RHENEN
983	0.0279	3	NINGBO
547	0.0280	16	PANYU
494	0.0281	19	LOUGUANTA
514	0.0281	18	VIENNA
935	0.0282	4	DEZHOU
1078	0.0282	1	CHENPANDA
555	0.0283	16	CHENPANDA
634	0.0283	12	YABULI
892	0.0284	5	DAQINGSH

Male			
Stbk#	MK	Age	Location
574	0.0292	15	SHENZHEN
743	0.0292	9	CCRCGP
707	0.0293	10	YABULI
904	0.0293	5	SHANGHAIZ
1094	0.0293	1	BEAUVAL
1001	0.0296	2	SHIPAIWAN
1002	0.0296	2	SHIPAIWAN
1132	0.0297	0	CHENPANDA
825	0.0298	7	YANCHENG
1025	0.0299	2	HAIZHILON
688	0.0301	11	DAFENG
1032	0.0303	2	CHENPANDA
670	0.0304	11	WENZHOU
732	0.0304	10	CALGARY
918	0.0304	4	YUNNAN Z
1017	0.0304	2	CHENPANDA
424	0.0306	23	CHONGQING
894	0.0306	5	BEIJING
895	0.0306	5	BEIJING
583	0.0310	14	SHANGHAI
988	0.0310	3	CALGARY
540	0.0312	16	CHENPANDA
612	0.0312	13	TOKYOUENO
922	0.0313	4	PANYU
923	0.0313	4	PANYU
666	0.0314	11	LIUCHOW
717	0.0314	10	CHENPANDA
985	0.0320	3	CHENPANDA
986	0.0320	3	CHENPANDA
1068	0.0322	1	LOUGUANTA
1069	0.0322	1	LOUGUANTA
605	0.0324	13	XIXIAKOU
915	0.0325	4	QUANZHOU
1016	0.0326	2	CHENPANDA
644	0.0327	12	XIANGSHI
957	0.0328	3	CHENPANDA
958	0.0328	3	CHENPANDA
851	0.0330	6	LONGTAN S
1036	0.0332	2	HAIZHILON
928	0.0341	4	YUNNAN Z
627	0.0347	12	WUXI

Female			
Stbk#	MK	Age	Location
924	0.0285	4	ERDOS LS
925	0.0285	4	ERDOS LS
1014	0.0285	2	CHENPANDA
570	0.0286	15	CHENPANDA
783	0.0286	8	CHENPANDA
832	0.0286	6	SUZHOU W
855	0.0286	6	CHENPANDA
944	0.0286	3	WAKAYAMA
945	0.0286	3	WAKAYAMA
1022	0.0286	2	HULIN
1047	0.0286	2	WAKAYAMA
1063	0.0286	1	CCRCGP
1154	0.0286	0	WAKAYAMA
493	0.0288	19	CHONGQING
737	0.0288	10	TANGSHAN
635	0.0289	12	CHENPANDA
1108	0.0289	1	CCRCGP
1004	0.0290	2	CHENPANDA
708	0.0293	10	CCRCGP
903	0.0293	5	GUANGZH Z
593	0.0294	14	CHENPANDA
813	0.0294	7	CHANGSHA
821	0.0294	7	GUIZHOU W
822	0.0294	7	GUIZHOU W
781	0.0295	8	DALIAN
907	0.0295	5	TIANMUHU
1070	0.0295	1	TOKYOUENO
645	0.0297	12	CHENPANDA
889	0.0297	5	DAQINGSH
1131	0.0297	0	CHENPANDA
818	0.0299	7	CHENPANDA
819	0.0299	7	TANGSHAN
709	0.0300	10	CHENPANDA
1073	0.0301	1	CHENPANDA
1074	0.0301	1	CHENPANDA
648	0.0302	12	CHONGQING
829	0.0302	7	CHONGQING
896	0.0302	5	CHONGQING
982	0.0302	3	CHONGQING
1049	0.0302	2	CHONGQING
477	0.0303	20	SHANGHAI

Male			
Stbk#	MK	Age	Location
628	0.0347	12	QINGDAO
629	0.0347	12	XIANGSHI
630	0.0347	12	CHENPANDA
780	0.0347	8	ANJI BAMB
815	0.0347	7	FUDE TJ
584	0.0357	14	CHENPANDA

Female			
Stbk#	MK	Age	Location
824	0.0303	7	CHENPANDA
1033	0.0303	2	CHENPANDA
919	0.0304	4	CHENPANDA
848	0.0306	6	LONGTAN S
676	0.0307	11	CALGARY
671	0.0309	11	CHENPANDA
611	0.0310	13	HANGZHOUW
682	0.0310	11	LIUGONGDA
987	0.0310	3	CALGARY
521	0.0312	18	WAKAYAMA
921	0.0313	4	PANYU
970	0.0313	3	NANJING
971	0.0313	3	NANJING
490	0.0314	19	CHENPANDA
491	0.0314	19	CHENPANDA
940	0.0314	4	LOUGUANTA
766	0.0315	8	CCRCGP
667	0.0319	11	SHIPAIWAN
571	0.0325	15	CCRCGP
820	0.0325	7	FUDE TJ
914	0.0325	4	QUANZHOU
969	0.0326	3	PANYU
764	0.0327	9	YANCHENG
991	0.0328	2	CHENPANDA
1085	0.0328	1	CHENPANDA
878	0.0332	5	PANYU
881	0.0332	5	CHENPANDA
882	0.0332	5	CHENGDU
872	0.0341	5	LOUGUANTA
1008	0.0341	2	CHENPANDA
1009	0.0341	2	CHENPANDA
722	0.0347	10	QINGDAO
779	0.0347	8	ANJI BAMB
814	0.0347	7	CHANGSHA
723	0.0349	10	BEAUVAL

APPENDIX D: Giant panda MSI values for mate selection during the 2019 breeding season (distributed at the meeting in Chengdu in November 2018).

This appendix provides the MSI tables for giant panda *ex situ* population for use in determining breeding pairs for the 2019 breeding season. Permanent non-breeders and dead pandas (including sperm samples) were excluded from the genetic analysis and therefore are not represented in this table. Mean kinship values and MSI scores change over time with births and deaths in the population, so a current MSI table should be calculated each year.

When choosing mates, consider the following:

- Growth rate should be reduced and therefore not all females should be bred. Breeding efforts should concentrate on genetically valuable females to produce cubs for the *ex situ* insurance population. Additional females that are good candidates for producing offspring for release also can be bred to support reintroduction efforts.

- Breeding pairs should have an MSI = 1 to 3.5, especially for institutions with pairing choices, as this will improve genetic diversity and reduce inbreeding. Overseas breeding pairs will be exempt from this limitation and may breed the pairs they currently hold.

- Efforts should be made to breed males and females with low mean kinship (MK) values. The average MK in the population is 0.0241. Animals with MK less than 0.0241 should be preferred breeders to maintain genetic diversity. The MK values are show for each male and female on the MSI tables and on the mean kinship list (Appendix C).

- Priority efforts should be made to breed any wild-acquired pandas that have not produced surviving offspring, even if the MSI score = 3.5.

- Potential founders or other genetically valuable pandas should be bred with other high ranking pandas when possible (MSI $\leq$ 3). However, it is acceptable to breed potential founders with lower ranking pandas if this is the best or only option for successful reproduction for this highly valuable animal. To identify these special cases, MSI scores greater than 3 for pairs involving potential founders were changed to 3.5.

- AI should be restricted for use only for genetically valuable pairings that must be bred.

The following MSI tables list one row for each male and one column for each female, in alphabetical order by institution. The intersecting cell for a male and female contains the MSI score for that pair. The MK value of each animal is given next to its studbook number. These MK values are color coded according to percentile, with dark green representing the most genetically valuable animals for breeding (low MK value), changing to light green and then yellow in the middle of the MK list, and finally to orange and then red for animals at the bottom of the MK list. Red indicates animals that are genetically overrepresented and should not be bred unless their cubs are needed for demographic reasons (e.g., for release).

MateRx listings

The PMx software includes the MateRx tool, which is designed and developed to be a genetic tool that will guide population management decisions. For every male/female pair in the population, MateRx calculates a single numeric index indicating the relative genetic benefit or detriment to the population of breeding that particular pair. This index, called the mate suitability index (or MSI), is calculated from considering each pair's mean kinship values, the difference in the male's and female's mean kinship, the inbreeding coefficient of the offspring produced, and the amount of unknown ancestry in the pair. MateRx is designed to simplify the decisions about which pairs should be bred by condensing all that we know about the genetics of a pair into a single number.

MSI values are labeled as beneficial (scores = 1, 2, or 3) or detrimental (scores = 4, 5, or 6) to the population. Beneficial MSIs denote no detrimental effects relative to the genetic values of that pair, and MSI values of 4, 5, or 6 indicate at least one detrimental effect.

MSI Score Definitions:

1 = very beneficial pair;
2 = moderately beneficial pair;
3 = slightly beneficial pair;

4 = slightly detrimental pair;
5 = detrimental pair, should only be used if demographically necessary;
6 = very detrimental pair, (should only be used if demographic considerations override preservation of genetic diversity, or if this is the only good option for breeding a very highly ranked individual).

"-" = so detrimental that the pair should never be bred

Note: When one of the animals in the pair is a potential founder (wild-caught animal with no living offspring or descendants) and therefore of high priority for breeding, MSI $\geq$ 4 were revised to prevent the situation where these animals are not bred because their only available mates were of relatively low genetic value (leading to a high MSI). In these cases, MSI = 3.5.

- Breeding by MSI values does not address demographics, behavior or logistics.

- MSI values are not intended for use with all captive managed species. Many species have unusual population histories and structures that require the expertise and attention of a trained population biologist. These populations may have characteristics such as few founders, many captive generations, extremely small numbers, or many unknown origins or parentage data that prohibit generic management.

- MSI values (and MK values) are time sensitive: the MSI rankings are only valid as long as there are no substantial changes in the population. These MSI tables should be considered invalid after one year following its date of creation.

For 2019 Breeding Season			Females >	610	638	452	883	868	794	474	476	487	495
Notes			MK	0.027	0.027	0.022	0.017	0.027	0.024	0.022	0.027	0.022	0.023
			Name	YING YING	FU NI	LUN LUN	FU LU	MENG MENG	HU CHUN	YOU YOU	XI XI	HUA MEI	YE YE
Males V	MK	Name	Location	ABERDE HK	ADELAIDE	ATLANTA	BEIJING	BERLINZOO	BOGOR	CCRCGP	CCRCGP	CCRCGP	CCRCGP
327	0.001	AN AN	ABERDE HK	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5
606	0.019	LE LE	ABERDE HK	3	3	3	4	4	3	3	4	3	3
620	0.020	WANG WAN	ADELAIDE	4	4	2	3	4	4	2	4	4	4
867	0.026	HUA BAO	AHTARI	-	4	4	4	4	4	4	-	4	4
536	0.025	XIAO JIAO	ANJI BAMB	4	4	-	3	4	4	4	4	2	4
575	0.026	QING ZAI	ANJI BAMB	4	4	4	4	4	4	4	4	4	4
461	0.020	YANG YANG	ATLANTA	3	3	2	3	4	3	2	3	2	3
746	0.025	XING RUI	BAOX ECTR	-	-	2	3	4	4	3	4	4	4
736	0.023	YUAN ZI	BEAUVAL	4	4	4	3	4	2	2	4	2	2
496	0.027	GU GU	BEIJING	4	4	4	4	4	6	4	-	4	-
769	0.020	JIAO QING	BERLINZOO	3	3	-	3	4	3	4	4	2	3
778	0.024	CAI TAO	BOGOR	4	4	2	3	4	4	2	4	4	4
488	0.024	YUAN YUAN	CCRCGP	4	4	2	3	4	4	2	4	2	4
502	0.024	WU GANG	CCRCGP	4	4	2	3	4	-	2	4	2	4
503	0.026	LU LU	CCRCGP	-	-	4	4	4	4	4	4	4	4
542	0.000	DAI LI	CCRCGP	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5
579	0.006	YANGYANG	CCRCGP	6	6	4	4	6	6	4	6	4	4
582	0.015	RONG RONG	CCRCGP	-	4	3	1	4	4	3	-	4	4
592	0.024	LAN ZI	CCRCGP	4	4	4	3	4	4	4	4	2	2
595	0.020	TAI SHAN	CCRCGP	4	4	4	3	3	4	4	-	4	4
609	0.014	HUI HUI	CCRCGP	4	4	3	1	4	4	3	4	4	4
619	0.027	WEI WEI	CCRCGP	4	4	4	4	4	4	4	4	-	4
623	0.008	BAI YANG	CCRCGP	6	6	4	-	6	4	4	6	4	4
661	0.005	YI BAO	CCRCGP	6	6	4	4	6	6	4	6	4	6
668	0.024	HUA LONG	CCRCGP	-	-	2	3	4	4	2	4	-	4
669	0.024	HUA AO	CCRCGP	-	-	2	3	4	4	2	4	-	4
674	0.018	XIANG GE	CCRCGP	4	4	3	2	4	-	3	4	3	3
719	0.021	AN AN	CCRCGP	4	4	2	4	4	3	2	4	2	2
747	0.025	XIANG LU	CCRCGP	-	-	4	4	4	4	-	4	2	4
748	0.016	XIANG LIN	CCRCGP	4	4	3	2	4	3	3	4	3	3
751	0.026	SHEN WEI	CCRCGP	4	4	4	4	4	4	4	4	4	4
752	0.013	ZI YAN	CCRCGP	4	4	4	2	4	4	4	4	4	4
758	0.025	LU LIN	CCRCGP	-	-	2	3	4	-	3	4	4	-
775	0.016	AO AO	CCRCGP	4	4	3	2	4	-	3	4	3	3
789	0.021	FU HU	CCRCGP	4	4	2	4	4	4	4	4	4	6
865	0.007	HUA HU	CCRCGP	6	6	4	-	6	4	4	6	4	4
886	0.006	HUA YANG	CCRCGP	6	6	4	4	6	6	4	6	4	4
887	0.021	FU BAO	CCRCGP	4	4	2	4	4	4	4	4	4	6
890	0.027	GONG GONG	CCRCGP	-	-	4	4	4	4	4	4	4	4
902	0.025	SHUN SHUN	CCRCGP	-	-	2	3	4	4	3	4	4	4
905	0.010	SEN SEN	CCRCGP	4	4	4	4	4	4	-	4	4	4
989	0.000	ZI JIN	CCRCGP	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5
857	0.024	CHENG SHU	CHANGSHA	4	4	2	3	4	4	2	4	4	4
858	0.024	CHENG DUI	CHANGSHA	4	4	2	3	4	4	2	4	4	4
520	0.021	BINGDIAN	CHENGDU	4	4	-	3	4	3	2	4	2	2
342	0.007	XIAO PINGPI	CHENPANDA	6	6	4	4	-	4	4	6	4	4

For 2019 Breeding Season			Females >	610	638	452	883	868	794	474	476	487	495
Notes			MK	0.027	0.027	0.022	0.017	0.027	0.024	0.022	0.027	0.022	0.023
			Name	YING YING	FU NI	LUN LUN	FU LU	MENG MENG	HU CHUN	YOU YOU	XI XI	HUA MEI	YE YE
Males V	**MK**	**Name**	**Location**	ABERDE HK	ADELAIDE	ATLANTA	BEIJING	BERLINZOO	BOGOR	CCRCGP	CCRCGP	CCRCGP	CCRCGP
532	0.024	FUFU	CHENPANDA	4	4	2	3	4	4	2	4	4	4
614	0.027	XINGBING	CHENPANDA	4	4	4	4	4	4	4	4	4	4
624	0.007	QIAO QIAO	CHENPANDA	6	6	4	4	6	4	4	6	4	4
649	0.026	MEI LAN	CHENPANDA	4	4	-	4	4	4	4	4	4	4
703	0.001	ABAO	CHENPANDA	6	6	6	4	6	6	6	6	6	6
711	0.015	GONG ZI	CHENPANDA	4	4	3	2	4	4	3	4	3	4
724	0.016	YING YING	CHENPANDA	4	4	3	2	4	4	3	4	3	3
731	0.022	XI LAN	CHENPANDA	4	4	-	3	4	2	4	4	2	2
788	0.013	YUAN LIN	CHENPANDA	4	4	4	2	4	4	4	4	4	4
792	0.024	DE DE	CHENPANDA	4	4	4	3	4	4	2	4	2	2
831	0.001	LONG LONG	CHENPANDA	6	6	6	4	6	6	6	6	6	6
839	0.028	AOLIAO	CHENPANDA	4	4	4	4	-	4	4	4	4	4
510	0.018	CHUANGCHU	CHIANGMAI	4	4	3	2	4	4	3	4	3	4
513	0.027	LIANG LIANG	CHONGQING	4	4	4	4	4	4	-	4	4	4
518	0.023	LONG SHEN	DAFENG	4	4	2	3	4	4	2	4	4	4
742	0.028	YUN YUN	DEQING	4	4	4	4	4	-	4	4	4	4
564	0.024	YANGGUANG	EDINBURGH	4	4	2	3	4	4	2	-	4	4
454	0.026	XIAO SHUAN	FUCHOW	4	4	4	4	4	4	4	4	4	4
538	0.027	LIN YANG	FUCHOW	4	4	4	4	4	6	4	6	4	-
515	0.026	LIANGLIANG	HEFEI W	4	4	4	4	4	4	4	4	4	4
573	0.027	LONGBING	HUAIAN	4	4	4	4	4	4	4	4	4	4
793	0.024	A BAO	HUAIAN	4	4	4	3	4	4	2	4	2	2
830	0.018	YUN TAO	HUAYING	4	4	3	-	4	4	3	-	4	4
639	0.027	FU WA	KUALA LUM	-	-	4	4	4	4	4	4	4	4
906	0.024	XING BAO	KUEIYANG	4	4	4	3	4	4	2	4	2	2
685	0.021	FU LONG	LANGZHONG	4	4	2	4	4	4	4	4	4	6
852	0.025	HAN HAN	LINYIZ	-	-	2	3	4	-	3	4	4	-
662	0.027	MINGBING	LIUCHOW	4	4	4	4	4	4	4	4	4	4
714	0.025	NING NING	LIUGONGDA	-	-	2	3	4	4	2	4	2	4
772	0.025	ZHAO YANG	LONGKOU	4	4	2	3	4	-	3	4	4	4
786	0.027	QING SHAN	LONGKOU	4	4	4	4	4	4	4	4	4	4
713	0.023	QIN CHUAN	LOUGUANTA	4	4	2	3	4	4	2	4	2	4
715	0.027	LELE	LOUGUANTA	4	4	4	4	4	4	4	4	4	4
802	0.000	QI ZAI	LOUGUANTA	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5
803	0.000	ER LANG	LOUGUANTA	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5
519	0.023	BINGXING	MADRID Z	4	4	-	3	4	2	2	4	2	2
466	0.019	LELE	MEMPHIS	3	3	3	4	4	3	2	3	3	3
589	0.027	MEI LING	NANCHANG	4	4	4	4	4	4	4	4	-	4
458	0.025	TIAN TIAN	NZP-WASH	-	4	4	4	4	4	3	-	4	4
745	0.025	XING HUI	PAIRI DAI	-	-	2	3	4	4	3	4	4	4
563	0.019	MEISHENG	PANYU	4	4	3	2	4	4	3	4	-	4
613	0.020	YOU YOU	PANYU	3	4	2	4	4	3	2	4	2	3
744	0.026	YIN KE	PANYU	-	-	4	4	4	4	4	4	4	4
874	0.024	HUA RONG	QINGSHEN	4	4	2	3	4	-	2	4	-	4
879	0.025	XING YA	RHENEN	4	4	4	3	4	4	3	4	4	4
415	0.004	GAOGAO	SANDIEGOZ	6	6	6	4	6	6	6	6	6	6

For 2019 Breeding Season			Females >	610	638	452	883	868	794	474	476	487	495
Notes			MK	0.027	0.027	0.022	0.017	0.027	0.024	0.022	0.027	0.022	0.023
			Name	YING YING	FU NI	LUN LUN	FU LU	MENG MENG	HU CHUN	YOU YOU	XI XI	HUA MEI	YE YE
Males V	**MK**	**Name**	**Location**	ABERDE HK	ADELAIDE	ATLANTA	BEIJING	BERLINZOO	BOGOR	CCRCGP	CCRCGP	CCRCGP	CCRCGP
842	0.019	XIAO LIWU	SANDIEGOZ	4	4	3	2	4	4	3	4	-	4
721	0.027	AO YUN	SHENNONGJ	-	-	4	4	4	4	4	-	4	4
787	0.013	YUAN ZHOU	SHENZHEN	4	4	4	2	4	4	4	4	4	4
529	0.027	YA XIANG	SHIH CHIA	4	4	4	4	4	4	4	4	4	4
749	0.019	YUN ZI	SHIH CHIA	4	4	3	2	4	4	3	4	-	4
726	0.026	KAI KAI	SHIPAIWAN	4	4	4	4	6	4	4	4	4	4
690	0.024	WU JIE	SINGAPORE	4	4	2	3	4	-	2	4	4	-
607	0.021	XI WANG	TAIAN R	4	-	2	3	4	4	2	4	4	4
689	0.025	WU JUN	TAIAN R	4	4	2	3	4	-	2	4	4	-
588	0.027	TUAN TUAN	TAIPEI	4	4	4	4	4	4	4	4	-	4
770	0.024	ER XI	TSINANWAW	4	4	4	3	-	4	4	4	2	4
390	0.025	YONGMING	WAKAYAMA	4	4	2	3	4	4	3	4	3	4
530	0.027	YA GUANG	WENZHOU	4	4	4	4	4	4	4	4	4	4
599	0.027	XIAN ZI	XIXIAKOU	4	4	4	4	4	4	-	4	4	4
841	0.026	YUAN XIN	YONG IN	4	-	4	4	4	4	4	4	4	4
586	0.020	TONG TONG	YUANSHAN	4	4	2	3	4	4	2	4	4	4

For 2019 Breeding Season			Females >	505	511	512	516	566	567	568	572	581	596
Notes			MK	0.001	0.025	0.015	0.027	0.024	0.023	0.023	0.018	0.005	0.019
			Name	ZHANG KA	XI MEI	LE SHENG	LONG XIN	YING HUA	YING MEI	NA NA	JUN ZHU	CAO CAO	SU LIN
Males V	MK	Name	Location	CCRCGP	CCRCGP	CCRCGP	CCRCGP	CCRCGP	CCRCGP	CCRCGP	CCRCGP	CCRCGP	CCRCGP
327	0.001	AN AN	ABERDE HK	1	3.5	3.5	3.5	3.5	3.5	3.5	3.5	1	3.5
606	0.019	LE LE	ABERDE HK	3.5	3	3	3	-	-	3	2	4	2
620	0.020	WANG WAN	ADELAIDE	3.5	4	4	4	3	3	4	2	4	4
867	0.026	HUA BAO	AHTARI	3.5	4	4	4	4	4	4	4	6	4
536	0.025	XIAO JIAO	ANJI BAMB	3.5	4	4	4	4	4	4	3	6	3
575	0.026	QING ZAI	ANJI BAMB	3.5	4	4	4	4	4	4	3	6	3
461	0.020	YANG YANG	ATLANTA	3.5	3	3	3	3	3	3	2	4	2
746	0.025	XING RUI	BAOX ECTR	3.5	4	4	6	4	4	-	4	6	4
736	0.023	YUAN ZI	BEAUVAL	3.5	4	3	4	2	2	2	3	6	3
496	0.027	GU GU	BEIJING	3.5	4	4	-	4	4	4	6	6	4
769	0.020	JIAO QING	BERLINZOO	3.5	3	3	3	3	3	2	2	4	2
778	0.024	CAI TAO	BOGOR	3.5	4	4	6	4	4	-	4	6	4
488	0.024	YUAN YUAN	CCRCGP	3.5	4	4	4	4	4	2	3	6	3
502	0.024	WU GANG	CCRCGP	3.5	4	4	4	4	4	2	3	6	3
503	0.026	LU LU	CCRCGP	3.5	4	4	4	4	4	4	3	6	3
542	0.000	DAI LI	CCRCGP	1	3.5	3.5	3.5	3.5	3.5	3.5	3.5	1	3.5
579	0.006	YANGYANG	CCRCGP	1	6	4	6	6	6	4	4	1	4
582	0.015	RONG RONG	CCRCGP	3.5	4	4	4	4	4	4	4	4	4
592	0.024	LAN ZI	CCRCGP	3.5	4	4	4	4	2	2	3	6	3
595	0.020	TAI SHAN	CCRCGP	3.5	4	4	4	3	3	4	4	4	4
609	0.014	HUI HUI	CCRCGP	3.5	-	4	4	4	4	4	-	4	4
619	0.027	WEI WEI	CCRCGP	3.5	4	4	4	-	-	4	4	6	4
623	0.008	BAI YANG	CCRCGP	2	4	3	6	4	4	4	4	1	4
661	0.005	YI BAO	CCRCGP	1	6	4	6	6	6	6	4	1	4
668	0.024	HUA LONG	CCRCGP	3.5	4	4	4	4	4	4	4	6	4
669	0.024	HUA AO	CCRCGP	3.5	4	4	4	4	4	4	4	6	4
674	0.018	XIANG GE	CCRCGP	3.5	3	2	4	3	3	3	2	4	2
719	0.021	AN AN	CCRCGP	3.5	3	3	4	-	-	2	3	-	2
747	0.025	XIANG LU	CCRCGP	3.5	4	4	4	4	4	4	3	6	3
748	0.016	XIANG LIN	CCRCGP	3.5	4	1	4	3	3	3	2	4	3
751	0.026	SHEN WEI	CCRCGP	3.5	4	4	4	4	4	-	4	6	4
752	0.013	ZI YAN	CCRCGP	3.5	4	1	4	4	4	4	2	3	3
758	0.025	LU LIN	CCRCGP	3.5	4	4	4	4	4	4	4	6	4
775	0.016	AO AO	CCRCGP	3.5	4	1	4	4	3	3	2	4	3
789	0.021	FU HU	CCRCGP	3.5	4	4	4	4	4	4	4	4	4
865	0.007	HUA HU	CCRCGP	2	6	3	6	4	4	4	4	-	4
886	0.006	HUA YANG	CCRCGP	1	6	4	6	6	4	4	4	1	4
887	0.021	FU BAO	CCRCGP	3.5	4	4	4	4	4	4	4	4	4
890	0.027	GONG GONG	CCRCGP	3.5	4	4	4	4	4	4	4	6	4
902	0.025	SHUN SHUN	CCRCGP	3.5	4	4	6	4	4	-	4	6	4
905	0.010	SEN SEN	CCRCGP	3.5	4	2	4	-	-	4	3	2	4
989	0.000	ZI JIN	CCRCGP	1	3.5	3.5	3.5	3.5	3.5	3.5	3.5	1	3.5
857	0.024	CHENG SHU	CHANGSHA	3.5	6	4	4	4	4	4	4	6	4
858	0.024	CHENG DUI	CHANGSHA	3.5	6	4	4	4	4	4	4	6	4
520	0.021	BINGDIAN	CHENGDU	3.5	3	3	4	3	2	2	3	4	2
342	0.007	XIAO PINGPI	CHENPANDA	2	6	3	6	4	4	4	4	1	4

For 2019 Breeding Season			Females >	505	511	512	516	566	567	568	572	581	596
Notes			MK	0.001	0.025	0.015	0.027	0.024	0.023	0.023	0.018	0.005	0.019
			Name	ZHANG KA	XI MEI	LE SHENG	LONG XIN	YING HUA	YING MEI	NA NA	JUN ZHU	CAO CAO	SU LIN
Males V	**MK**	**Name**	**Location**	CCRCGP	CCRCGP	CCRCGP	CCRCGP	CCRCGP	CCRCGP	CCRCGP	CCRCGP	CCRCGP	CCRCGP
532	0.024	FUFU	CHENPANDA	3.5	-	4	4	4	4	4	4	6	4
614	0.027	XINGBING	CHENPANDA	3.5	4	4	4	4	4	4	4	6	3
624	0.007	QIAO QIAO	CHENPANDA	2	6	3	6	4	4	4	4	1	4
649	0.026	MEI LAN	CHENPANDA	3.5	4	4	4	4	4	4	3	6	3
703	0.001	ABAO	CHENPANDA	1	6	4	6	6	6	6	4	1	6
711	0.015	GONG ZI	CHENPANDA	3.5	4	1	4	4	4	3	3	4	3
724	0.016	YING YING	CHENPANDA	3.5	4	1	4	4	3	3	2	4	3
731	0.022	XI LAN	CHENPANDA	3.5	3	3	4	2	2	2	3	4	2
788	0.013	YUAN LIN	CHENPANDA	3.5	4	1	4	4	4	4	2	3	3
792	0.024	DE DE	CHENPANDA	3.5	4	4	4	4	2	2	3	6	3
831	0.001	LONG LONG	CHENPANDA	1	6	4	6	6	6	6	4	1	6
839	0.028	AOLIAO	CHENPANDA	3.5	4	4	4	4	4	4	4	6	3
510	0.018	CHUANGCHU	CHIANGMAI	3.5	3	3	4	3	3	3	2	4	2
513	0.027	LIANG LIANG	CHONGQING	3.5	-	4	4	-	-	4	4	6	4
518	0.023	LONG SHEN	DAFENG	3.5	-	4	4	2	2	4	4	6	4
742	0.028	YUN YUN	DEQING	3.5	4	4	4	4	4	4	-	6	4
564	0.024	YANGGUANG	EDINBURGH	3.5	-	4	-	4	2	4	4	6	4
454	0.026	XIAO SHUAN	FUCHOW	3.5	4	4	4	4	4	4	3	6	3
538	0.027	LIN YANG	FUCHOW	3.5	4	4	6	4	4	4	6	6	4
515	0.026	LIANGLIANG	HEFEI W	3.5	4	4	4	4	4	4	3	6	3
573	0.027	LONGBING	HUAIAN	3.5	4	4	4	4	4	4	4	6	3
793	0.024	A BAO	HUAIAN	3.5	4	4	4	4	2	2	3	6	3
830	0.018	YUN TAO	HUAYING	3.5	4	-	4	3	3	4	4	4	4
639	0.027	FU WA	KUALA LUM	3.5	4	4	-	4	4	6	4	6	4
906	0.024	XING BAO	KUEIYANG	3.5	4	4	4	4	2	2	3	6	3
685	0.021	FU LONG	LANGZHONG	3.5	4	4	4	4	4	4	4	4	4
852	0.025	HAN HAN	LINYIZ	3.5	4	4	4	4	4	4	4	6	4
662	0.027	MINGBING	LIUCHOW	3.5	4	4	4	4	4	4	4	6	3
714	0.025	NING NING	LIUGONGDA	3.5	4	4	4	4	4	4	3	6	3
772	0.025	ZHAO YANG	LONGKOU	3.5	4	4	4	4	4	4	4	6	4
786	0.027	QING SHAN	LONGKOU	3.5	4	4	4	4	4	4	4	6	4
713	0.023	QIN CHUAN	LOUGUANTA	3.5	4	3	4	2	2	2	3	6	3
715	0.027	LELE	LOUGUANTA	3.5	4	4	4	4	4	4	4	6	3
802	0.000	QI ZAI	LOUGUANTA	1	3.5	3.5	3.5	3.5	3.5	3.5	3.5	1	3.5
803	0.000	ER LANG	LOUGUANTA	1	3.5	3.5	3.5	3.5	3.5	3.5	3.5	1	3.5
519	0.023	BINGXING	MADRID Z	3.5	4	3	4	2	2	2	3	6	3
466	0.019	LELE	MEMPHIS	3.5	3	3	3	-	-	3	2	4	2
589	0.027	MEI LING	NANCHANG	3.5	4	4	4	-	-	4	4	6	4
458	0.025	TIAN TIAN	NZP-WASH	3.5	4	-	-	4	4	4	4	6	4
745	0.025	XING HUI	PAIRI DAI	3.5	4	4	6	4	4	-	4	6	4
563	0.019	MEISHENG	PANYU	3.5	4	4	4	3	3	4	4	4	-
613	0.020	YOU YOU	PANYU	3.5	3	3	-	-	-	-	2	4	2
744	0.026	YIN KE	PANYU	3.5	-	4	4	4	4	4	4	6	4
874	0.024	HUA RONG	QINGSHEN	3.5	4	4	4	4	2	4	4	6	4
879	0.025	XING YA	RHENEN	3.5	4	4	4	4	4	4	3	6	3
415	0.004	GAOGAO	SANDIEGOZ	1	6	4	6	6	6	6	4	1	-

For 2019 Breeding Season			Females >	505	511	512	516	566	567	568	572	581	596
Notes			MK	0.001	0.025	0.015	0.027	0.024	0.023	0.023	0.018	0.005	0.019
			Name	ZHANG KA	XI MEI	LE SHENG	LONG XIN	YING HUA	YING MEI	NA NA	JUN ZHU	CAO CAO	SU LIN
Males V	MK	Name	Location	CCRCGP	CCRCGP	CCRCGP	CCRCGP	CCRCGP	CCRCGP	CCRCGP	CCRCGP	CCRCGP	CCRCGP
842	0.019	XIAO LIWU	SANDIEGOZ	3.5	4	4	4	3	3	4	4	4	-
721	0.027	AO YUN	SHENNONGJ	3.5	4	-	4	4	4	4	4	6	4
787	0.013	YUAN ZHOU	SHENZHEN	3.5	4	1	4	4	4	4	2	3	3
529	0.027	YA XIANG	SHIH CHIA	3.5	4	4	4	4	4	4	4	6	3
749	0.019	YUN ZI	SHIH CHIA	3.5	4	4	4	3	3	4	4	4	-
726	0.026	KAI KAI	SHIPAIWAN	3.5	4	4	4	4	4	4	3	6	3
690	0.024	WU JIE	SINGAPORE	3.5	4	4	4	4	4	4	4	6	4
607	0.021	XI WANG	TAIAN R	3.5	4	4	-	3	2	6	4	4	4
689	0.025	WU JUN	TAIAN R	3.5	4	4	4	4	4	4	4	6	4
588	0.027	TUAN TUAN	TAIPEI	3.5	4	4	4	-	-	4	4	6	4
770	0.024	ER XI	TSINANWAW	3.5	4	4	4	4	4	2	3	6	3
390	0.025	YONGMING	WAKAYAMA	3.5	4	4	4	4	4	4	3	6	3
530	0.027	YA GUANG	WENZHOU	3.5	4	4	4	4	4	4	4	6	3
599	0.027	XIAN ZI	XIXIAKOU	3.5	4	4	4	-	-	4	3	6	4
841	0.026	YUAN XIN	YONG IN	3.5	4	4	-	4	4	6	4	6	4
586	0.020	TONG TONG	YUANSHAN	3.5	-	4	4	3	3	-	4	4	4

For 2019 Breeding Season			Females >	632	643	651	654	664	672	691	694	698	702
Notes			MK	0.027	0.020	0.027	0.019	0.027	0.027	0.014	0.020	0.005	0.002
			Name	MEI XIN	CUI CUI	DUO DUO	XI DOU	QING QING	JIN XIN	WEN YU	ZHEN ZHEN	SHUI XIU	WANG JIA
Males V	MK	Name	Location	CCRCGP	CCRCGP	CCRCGP	CCRCGP	CCRCGP	CCRCGP	CCRCGP	CCRCGP	CCRCGP	CCRCGP
327	0.001	AN AN	ABERDE HK	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	1	1
606	0.019	LE LE	ABERDE HK	3	2	-	2	3	3	3	2	4	4
620	0.020	WANG WAN	ADELAIDE	4	4	3	-	4	4	-	4	4	6
867	0.026	HUA BAO	AHTARI	-	4	4	4	4	-	-	4	6	6
536	0.025	XIAO JIAO	ANJI BAMB	4	3	4	3	4	4	4	3	6	6
575	0.026	QING ZAI	ANJI BAMB	4	3	4	3	4	4	4	3	6	6
461	0.020	YANG YANG	ATLANTA	3	2	3	2	3	3	3	2	4	6
746	0.025	XING RUI	BAOX ECTR	-	3	4	4	4	4	4	4	6	6
736	0.023	YUAN ZI	BEAUVAL	4	3	4	3	4	4	4	3	4	6
496	0.027	GU GU	BEIJING	4	6	4	4	4	4	4	4	6	6
769	0.020	JIAO QING	BERLINZOO	3	2	4	2	3	3	3	2	4	6
778	0.024	CAI TAO	BOGOR	4	4	4	4	4	-	-	4	6	6
488	0.024	YUAN YUAN	CCRCGP	4	4	4	3	-	-	-	3	6	6
502	0.024	WU GANG	CCRCGP	4	3	4	3	4	4	4	3	6	6
503	0.026	LU LU	CCRCGP	-	3	4	3	4	4	4	3	6	6
542	0.000	DAI LI	CCRCGP	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	1	1
579	0.006	YANGYANG	CCRCGP	6	4	6	4	6	6	3	4	1	1
582	0.015	RONG RONG	CCRCGP	-	4	4	4	4	4	1	4	4	4
592	0.024	LAN ZI	CCRCGP	4	3	4	3	4	4	4	3	6	6
595	0.020	TAI SHAN	CCRCGP	4	4	4	4	4	4	3	4	4	6
609	0.014	HUI HUI	CCRCGP	4	3	4	4	4	4	1	4	4	4
619	0.027	WEI WEI	CCRCGP	4	3	-	4	4	4	4	4	6	6
623	0.008	BAI YANG	CCRCGP	6	4	6	4	6	6	2	4	1	2
661	0.005	YI BAO	CCRCGP	6	4	6	4	6	6	4	4	1	1
668	0.024	HUA LONG	CCRCGP	-	3	4	4	4	4	4	4	6	6
669	0.024	HUA AO	CCRCGP	-	3	4	4	4	4	4	4	6	6
674	0.018	XIANG GE	CCRCGP	4	2	4	2	4	4	2	2	4	4
719	0.021	AN AN	CCRCGP	4	2	-	2	4	4	3	2	4	6
747	0.025	XIANG LU	CCRCGP	-	3	-	3	4	4	4	3	6	6
748	0.016	XIANG LIN	CCRCGP	4	4	4	3	4	-	-	3	4	4
751	0.026	SHEN WEI	CCRCGP	4	6	4	4	4	4	4	4	6	6
752	0.013	ZI YAN	CCRCGP	4	4	4	3	4	-	-	3	3	4
758	0.025	LU LIN	CCRCGP	-	-	4	3	4	4	4	4	6	6
775	0.016	AO AO	CCRCGP	4	3	4	3	4	4	1	3	-	4
789	0.021	FU HU	CCRCGP	4	4	4	4	4	4	3	4	4	6
865	0.007	HUA HU	CCRCGP	6	4	6	4	6	6	3	4	1	1
886	0.006	HUA YANG	CCRCGP	6	4	6	4	6	6	3	4	-	1
887	0.021	FU BAO	CCRCGP	4	4	4	4	4	4	3	4	4	6
890	0.027	GONG GONG	CCRCGP	-	3	4	3	4	4	4	4	6	6
902	0.025	SHUN SHUN	CCRCGP	-	3	4	4	4	4	4	4	6	6
905	0.010	SEN SEN	CCRCGP	4	4	4	3	4	4	2	4	1	4
989	0.000	ZI JIN	CCRCGP	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	1	1
857	0.024	CHENG SHU	CHANGSHA	4	3	4	4	4	4	4	4	6	6
858	0.024	CHENG DUI	CHANGSHA	4	3	4	4	4	4	4	4	6	6
520	0.021	BINGDIAN	CHENGDU	4	2	4	2	4	4	3	2	4	6
342	0.007	XIAO PINGPI	CHENPANDA	6	4	6	4	6	6	3	4	1	1

For 2019 Breeding Season			Females >	632	643	651	654	664	672	691	694	698	702
Notes			MK	0.027	0.020	0.027	0.019	0.027	0.027	0.014	0.020	0.005	0.002
			Name	MEI XIN	CUI CUI	DUO DUO	XI DOU	QING QING	JIN XIN	WEN YU	ZHEN ZHEN	SHUI XIU	WANG JIA
Males V	**MK**	**Name**	**Location**	CCRCGP	CCRCGP	CCRCGP	CCRCGP	CCRCGP	CCRCGP	CCRCGP	CCRCGP	CCRCGP	CCRCGP
532	0.024	FUFU	CHENPANDA	4	4	4	4	4	4	4	4	6	6
614	0.027	XINGBING	CHENPANDA	4	4	4	3	4	4	4	3	6	6
624	0.007	QIAO QIAO	CHENPANDA	6	4	6	4	6	6	3	4	1	2
649	0.026	MEI LAN	CHENPANDA	4	3	4	3	4	4	4	3	6	6
703	0.001	ABAO	CHENPANDA	6	6	6	6	6	6	4	6	1	1
711	0.015	GONG ZI	CHENPANDA	4	3	4	3	4	4	1	3	4	4
724	0.016	YING YING	CHENPANDA	4	3	4	3	4	4	1	3	4	4
731	0.022	XI LAN	CHENPANDA	4	2	4	3	4	4	3	2	4	6
788	0.013	YUAN LIN	CHENPANDA	4	3	4	3	4	4	1	3	3	4
792	0.024	DE DE	CHENPANDA	4	3	4	3	4	4	4	3	6	6
831	0.001	LONG LONG	CHENPANDA	6	6	6	6	6	6	4	6	1	1
839	0.028	AOLIAO	CHENPANDA	4	3	4	4	4	4	4	3	6	6
510	0.018	CHUANGCHU	CHIANGMAI	4	4	4	4	4	3	3	2	4	4
513	0.027	LIANG LIANG	CHONGQING	4	4	4	4	4	4	4	4	6	6
518	0.023	LONG SHEN	DAFENG	4	4	4	4	4	4	4	4	6	6
742	0.028	YUN YUN	DEQING	4	4	4	4	4	4	4	4	6	6
564	0.024	YANGGUANG	EDINBURGH	4	4	4	4	4	4	4	4	6	6
454	0.026	XIAO SHUAN	FUCHOW	4	3	4	3	4	4	4	3	6	6
538	0.027	LIN YANG	FUCHOW	4	6	4	4	4	4	4	4	6	6
515	0.026	LIANGLIANG	HEFEI W	4	3	4	3	4	4	4	3	6	6
573	0.027	LONGBING	HUAIAN	4	4	4	3	4	4	4	3	6	6
793	0.024	A BAO	HUAIAN	4	3	4	3	4	4	4	3	6	6
830	0.018	YUN TAO	HUAYING	4	4	4	4	4	4	3	4	4	4
639	0.027	FU WA	KUALA LUM	-	4	4	4	4	4	4	4	6	6
906	0.024	XING BAO	KUEIYANG	4	3	4	3	4	4	4	3	6	6
685	0.021	FU LONG	LANGZHONG	4	4	4	4	4	4	3	4	4	6
852	0.025	HAN HAN	LINYIZ	-	-	4	3	4	4	4	4	6	6
662	0.027	MINGBING	LIUCHOW	4	4	4	3	4	4	4	3	6	6
714	0.025	NING NING	LIUGONGDA	-	3	4	4	4	4	4	3	6	6
772	0.025	ZHAO YANG	LONGKOU	4	4	4	4	4	4	4	4	6	6
786	0.027	QING SHAN	LONGKOU	4	4	4	4	6	-	-	4	6	6
713	0.023	QIN CHUAN	LOUGUANTA	4	4	4	4	4	4	4	2	4	6
715	0.027	LELE	LOUGUANTA	4	3	4	3	4	4	4	3	6	6
802	0.000	QI ZAI	LOUGUANTA	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	1	1
803	0.000	ER LANG	LOUGUANTA	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	1	1
519	0.023	BINGXING	MADRID Z	4	3	4	3	4	4	4	3	4	6
466	0.019	LELE	MEMPHIS	3	2	-	2	3	3	3	2	4	6
589	0.027	MEI LING	NANCHANG	4	3	-	4	4	4	4	4	6	6
458	0.025	TIAN TIAN	NZP-WASH	-	4	4	4	4	6	4	4	6	6
745	0.025	XING HUI	PAIRI DAI	-	3	4	4	4	4	4	4	6	6
563	0.019	MEISHENG	PANYU	4	4	3	4	4	4	3	-	4	4
613	0.020	YOU YOU	PANYU	3	2	-	2	3	3	3	2	4	6
744	0.026	YIN KE	PANYU	-	3	4	4	4	4	4	4	6	6
874	0.024	HUA RONG	QINGSHEN	4	3	4	4	4	4	4	4	6	6
879	0.025	XING YA	RHENEN	4	4	4	4	6	-	-	3	6	6
415	0.004	GAOGAO	SANDIEGOZ	6	4	6	4	6	6	4	-	1	1

For 2019 Breeding Season			Females >	632	643	651	654	664	672	691	694	698	702
Notes			MK	0.027	0.020	0.027	0.019	0.027	0.027	0.014	0.020	0.005	0.002
			Name	MEI XIN	CUI CUI	DUO DUO	XI DOU	QING QING	JIN XIN	WEN YU	ZHEN ZHEN	SHUI XIU	WANG JIA
Males V	MK	Name	Location	CCRCGP	CCRCGP	CCRCGP	CCRCGP	CCRCGP	CCRCGP	CCRCGP	CCRCGP	CCRCGP	CCRCGP
842	0.019	XIAO LIWU	SANDIEGOZ	4	4	3	4	4	4	3	-	4	4
721	0.027	AO YUN	SHENNONGJ	-	4	4	4	4	4	4	4	6	6
787	0.013	YUAN ZHOU	SHENZHEN	4	3	4	3	4	4	1	3	3	4
529	0.027	YA XIANG	SHIH CHIA	4	3	4	3	4	4	4	3	6	6
749	0.019	YUN ZI	SHIH CHIA	4	4	3	4	4	4	3	-	4	4
726	0.026	KAI KAI	SHIPAIWAN	4	3	4	3	4	4	4	3	6	6
690	0.024	WU JIE	SINGAPORE	4	-	4	3	4	4	4	4	6	6
607	0.021	XI WANG	TAIAN R	4	-	4	4	4	4	4	4	4	6
689	0.025	WU JUN	TAIAN R	4	-	4	3	4	4	4	4	6	6
588	0.027	TUAN TUAN	TAIPEI	4	3	-	4	4	4	4	4	6	6
770	0.024	ER XI	TSINANWAW	4	4	4	3	4	4	4	3	6	6
390	0.025	YONGMING	WAKAYAMA	4	4	4	3	-	-	-	3	6	6
530	0.027	YA GUANG	WENZHOU	4	3	4	3	4	4	4	3	6	6
599	0.027	XIAN ZI	XIXIAKOU	4	4	4	4	4	4	4	4	6	6
841	0.026	YUAN XIN	YONG IN	4	4	4	4	4	-	-	4	6	6
586	0.020	TONG TONG	YUANSHAN	4	4	3	4	4	4	3	4	4	6

For 2019 Breeding Season			Females >	704	735	739	740	750	755	756	759	771	784
Notes			MK	0.025	0.026	0.024	0.024	0.026	0.021	0.021	0.022	0.026	0.022
			Name	PING PING	MIN MIN	A LING	LIN BING	BO SI	SHEN BIN	SHU QIN	YAO MAN	CAI YUN	XIAO BAITU
Males V	MK	Name	Location	CCRCGP	CCRCGP	CCRCGP	CCRCGP	CCRCGP	CCRCGP	CCRCGP	CCRCGP	CCRCGP	CCRCGP
327	0.001	AN AN	ABERDE HK	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5
606	0.019	LE LE	ABERDE HK	3	3	3	3	3	2	2	3	3	3
620	0.020	WANG WAN	ADELAIDE	4	3	4	4	4	2	2	4	3	2
867	0.026	HUA BAO	AHTARI	4	-	4	4	4	4	3	4	4	4
536	0.025	XIAO JIAO	ANJI BAMB	4	4	4	4	4	3	3	2	4	2
575	0.026	QING ZAI	ANJI BAMB	4	4	4	4	4	3	3	4	4	4
461	0.020	YANG YANG	ATLANTA	3	3	3	3	3	2	2	2	3	2
746	0.025	XING RUI	BAOX ECTR	4	4	4	4	4	3	-	-	4	2
736	0.023	YUAN ZI	BEAUVAL	4	4	2	2	4	2	2	2	4	2
496	0.027	GU GU	BEIJING	4	4	6	6	4	4	4	4	6	4
769	0.020	JIAO QING	BERLINZOO	3	3	3	3	3	2	2	2	3	2
778	0.024	CAI TAO	BOGOR	4	-	4	4	6	3	3	2	4	4
488	0.024	YUAN YUAN	CCRCGP	4	-	4	4	6	3	3	2	4	-
502	0.024	WU GANG	CCRCGP	4	4	-	4	4	-	3	2	-	-
503	0.026	LU LU	CCRCGP	4	4	4	4	4	3	-	-	4	4
542	0.000	DAI LI	CCRCGP	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5
579	0.006	YANGYANG	CCRCGP	6	6	6	6	6	4	4	4	6	4
582	0.015	RONG RONG	CCRCGP	4	4	4	4	4	4	3	4	4	3
592	0.024	LAN ZI	CCRCGP	4	4	4	4	4	3	2	2	4	2
595	0.020	TAI SHAN	CCRCGP	4	4	4	4	4	4	2	4	4	2
609	0.014	HUI HUI	CCRCGP	4	4	4	4	4	3	3	3	4	3
619	0.027	WEI WEI	CCRCGP	4	4	4	4	4	4	4	4	4	4
623	0.008	BAI YANG	CCRCGP	4	4	4	4	6	4	4	4	4	4
661	0.005	YI BAO	CCRCGP	6	6	6	6	6	4	4	4	6	4
668	0.024	HUA LONG	CCRCGP	4	4	4	4	4	3	-	-	4	2
669	0.024	HUA AO	CCRCGP	4	4	4	4	4	3	-	-	4	2
674	0.018	XIANG GE	CCRCGP	3	3	-	3	3	-	3	3	-	-
719	0.021	AN AN	CCRCGP	3	3	3	3	3	2	2	2	3	2
747	0.025	XIANG LU	CCRCGP	4	4	4	4	4	3	-	-	4	2
748	0.016	XIANG LIN	CCRCGP	4	-	3	3	4	3	3	3	4	4
751	0.026	SHEN WEI	CCRCGP	4	4	4	4	-	4	3	4	4	4
752	0.013	ZI YAN	CCRCGP	4	-	4	4	4	3	3	4	4	4
758	0.025	LU LIN	CCRCGP	4	4	-	4	4	3	-	-	4	3
775	0.016	AO AO	CCRCGP	4	4	-	4	4	-	3	3	-	-
789	0.021	FU HU	CCRCGP	4	4	4	4	4	2	4	4	4	2
865	0.007	HUA HU	CCRCGP	6	6	4	4	6	4	4	4	6	4
886	0.006	HUA YANG	CCRCGP	6	6	6	6	6	4	4	4	6	4
887	0.021	FU BAO	CCRCGP	4	4	4	4	4	2	4	4	4	2
890	0.027	GONG GONG	CCRCGP	4	4	4	4	4	6	-	-	4	4
902	0.025	SHUN SHUN	CCRCGP	4	4	4	4	4	3	-	-	4	2
905	0.010	SEN SEN	CCRCGP	4	4	4	4	4	4	-	4	4	4
989	0.000	ZI JIN	CCRCGP	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5
857	0.024	CHENG SHU	CHANGSHA	4	4	4	4	4	3	3	2	4	2
858	0.024	CHENG DUI	CHANGSHA	4	4	4	4	4	3	3	2	4	2
520	0.021	BINGDIAN	CHENGDU	3	3	3	3	3	2	2	2	3	2
342	0.007	XIAO PINGPI	CHENPANDA	6	6	4	4	6	4	4	4	6	4

For 2019 Breeding Season			Females >	704	735	739	740	750	755	756	759	771	784
Notes			MK	0.025	0.026	0.024	0.024	0.026	0.021	0.021	0.022	0.026	0.022
			Name	PING PING	MIN MIN	A LING	LIN BING	BO SI	SHEN BIN	SHU QIN	YAO MAN	CAI YUN	XIAO BAITU
Males V	**MK**	**Name**	**Location**	CCRCGP	CCRCGP	CCRCGP	CCRCGP	CCRCGP	CCRCGP	CCRCGP	CCRCGP	CCRCGP	CCRCGP
532	0.024	FUFU	CHENPANDA	4	4	4	4	4	4	3	4	4	2
614	0.027	XINGBING	CHENPANDA	4	4	4	4	4	4	4	4	4	4
624	0.007	QIAO QIAO	CHENPANDA	4	6	4	4	6	4	4	4	6	4
649	0.026	MEI LAN	CHENPANDA	4	4	4	4	4	3	3	4	4	4
703	0.001	ABAO	CHENPANDA	6	6	6	6	6	6	6	6	6	6
711	0.015	GONG ZI	CHENPANDA	4	4	4	4	4	3	3	3	4	3
724	0.016	YING YING	CHENPANDA	4	4	4	3	4	3	3	3	4	3
731	0.022	XI LAN	CHENPANDA	2	4	2	2	4	2	2	2	4	2
788	0.013	YUAN LIN	CHENPANDA	4	4	4	4	4	3	3	4	4	4
792	0.024	DE DE	CHENPANDA	4	4	4	4	4	3	2	2	4	2
831	0.001	LONG LONG	CHENPANDA	6	6	6	6	6	6	6	6	6	6
839	0.028	AOLIAO	CHENPANDA	4	4	4	4	4	4	4	4	4	4
510	0.018	CHUANGCHU	CHIANGMAI	6	3	4	-	3	2	2	4	3	3
513	0.027	LIANG LIANG	CHONGQING	4	4	4	4	4	4	-	4	4	4
518	0.023	LONG SHEN	DAFENG	6	4	4	4	4	4	2	4	4	2
742	0.028	YUN YUN	DEQING	4	4	-	4	4	-	4	4	-	-
564	0.024	YANGGUANG	EDINBURGH	4	4	4	4	4	4	2	4	4	2
454	0.026	XIAO SHUAN	FUCHOW	4	4	4	4	4	3	3	4	4	4
538	0.027	LIN YANG	FUCHOW	4	4	6	6	4	4	4	4	6	4
515	0.026	LIANGLIANG	HEFEI W	4	4	4	4	4	3	3	4	4	4
573	0.027	LONGBING	HUAIAN	4	4	4	4	4	4	4	4	4	4
793	0.024	A BAO	HUAIAN	4	4	4	4	4	3	2	2	4	2
830	0.018	YUN TAO	HUAYING	4	4	4	4	4	4	3	4	4	3
639	0.027	FU WA	KUALA LUM	4	4	4	4	4	4	-	-	4	4
906	0.024	XING BAO	KUEIYANG	4	4	4	4	4	3	2	2	4	2
685	0.021	FU LONG	LANGZHONG	4	4	4	4	4	2	4	4	4	2
852	0.025	HAN HAN	LINYIZ	4	4	-	4	4	3	-	-	4	3
662	0.027	MINGBING	LIUCHOW	4	4	4	4	4	4	4	4	4	4
714	0.025	NING NING	LIUGONGDA	4	4	4	4	4	3	-	-	4	2
772	0.025	ZHAO YANG	LONGKOU	4	4	-	4	4	-	3	3	-	-
786	0.027	QING SHAN	LONGKOU	4	-	4	4	4	3	4	4	4	4
713	0.023	QIN CHUAN	LOUGUANTA	4	4	4	4	4	2	2	4	4	2
715	0.027	LELE	LOUGUANTA	4	4	4	4	4	4	4	4	4	4
802	0.000	QI ZAI	LOUGUANTA	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5
803	0.000	ER LANG	LOUGUANTA	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5
519	0.023	BINGXING	MADRID Z	4	4	2	2	4	2	2	2	4	2
466	0.019	LELE	MEMPHIS	3	3	3	3	3	2	2	3	3	3
589	0.027	MEI LING	NANCHANG	4	4	4	4	4	4	4	4	4	4
458	0.025	TIAN TIAN	NZP-WASH	4	4	4	4	4	4	3	4	4	4
745	0.025	XING HUI	PAIRI DAI	4	4	4	4	4	3	-	-	4	3
563	0.019	MEISHENG	PANYU	4	4	4	4	4	4	2	4	4	3
613	0.020	YOU YOU	PANYU	3	4	3	3	3	2	2	2	3	2
744	0.026	YIN KE	PANYU	4	4	4	4	4	3	-	-	4	4
874	0.024	HUA RONG	QINGSHEN	4	4	-	4	4	-	2	2	-	-
879	0.025	XING YA	RHENEN	4	-	4	4	4	3	4	4	4	4
415	0.004	GAOGAO	SANDIEGOZ	6	6	6	6	6	4	4	6	6	6

For 2019 Breeding Season			Females >	704	735	739	740	750	755	756	759	771	784
Notes			MK	0.025	0.026	0.024	0.024	0.026	0.021	0.021	0.022	0.026	0.022
			Name	PING PING	MIN MIN	A LING	LIN BING	BO SI	SHEN BIN	SHU QIN	YAO MAN	CAI YUN	XIAO BAITU
Males V	MK	Name	Location	CCRCGP	CCRCGP	CCRCGP	CCRCGP	CCRCGP	CCRCGP	CCRCGP	CCRCGP	CCRCGP	CCRCGP
842	0.019	XIAO LIWU	SANDIEGOZ	4	4	4	4	4	4	2	4	4	3
721	0.027	AO YUN	SHENNONGJ	4	4	4	4	4	4	-	-	4	4
787	0.013	YUAN ZHOU	SHENZHEN	4	4	4	4	4	3	3	4	4	4
529	0.027	YA XIANG	SHIH CHIA	4	4	4	4	4	4	4	4	4	4
749	0.019	YUN ZI	SHIH CHIA	4	4	4	4	4	4	2	4	4	3
726	0.026	KAI KAI	SHIPAIWAN	4	4	4	4	4	3	4	4	4	4
690	0.024	WU JIE	SINGAPORE	4	4	-	4	4	-	3	4	-	-
607	0.021	XI WANG	TAIAN R	4	4	4	4	6	4	2	4	4	4
689	0.025	WU JUN	TAIAN R	4	4	-	4	4	-	3	4	-	-
588	0.027	TUAN TUAN	TAIPEI	4	4	4	4	4	4	4	4	4	4
770	0.024	ER XI	TSINANWAW	4	4	4	4	4	3	3	2	4	4
390	0.025	YONGMING	WAKAYAMA	4	-	4	4	6	3	3	3	4	-
530	0.027	YA GUANG	WENZHOU	4	4	4	4	4	4	4	4	4	4
599	0.027	XIAN ZI	XIXIAKOU	4	4	4	4	4	3	-	4	4	4
841	0.026	YUAN XIN	YONG IN	4	-	4	4	4	4	3	4	4	4
586	0.020	TONG TONG	YUANSHAN	4	4	4	4	-	4	2	4	4	2

For 2019 Breeding Season			Females >	791	800	810	827	834	837	838	846	860
Notes			MK	0.013	0.024	0.027	0.005	0.026	0.006	0.006	0.025	0.002
			Name	YANG HUA	ZHI CHUN	YUN DUO	SU SHAN	ZHENG ZHENG	YI RAN	YI CHANG	JIA JIA	QIAO QIAO
Males V	MK	Name	Location	CCRCGP	CCRCGP	CCRCGP	CCRCGP	CCRCGP	CCRCGP	CCRCGP	CCRCGP	CCRCGP
327	0.001	AN AN	ABERDE HK	3.5	3.5	3.5	1	3.5	1	1	3.5	1
606	0.019	LE LE	ABERDE HK	3	3	3	4	3	4	4	3	4
620	0.020	WANG WAN	ADELAIDE	3	3	4	4	3	4	4	3	6
867	0.026	HUA BAO	AHTARI	4	4	-	6	4	6	6	4	6
536	0.025	XIAO JIAO	ANJI BAMB	4	4	4	6	4	6	6	4	6
575	0.026	QING ZAI	ANJI BAMB	4	4	4	6	4	6	6	4	6
461	0.020	YANG YANG	ATLANTA	3	3	3	4	3	4	4	3	6
746	0.025	XING RUI	BAOX ECTR	4	-	4	6	-	6	6	-	6
736	0.023	YUAN ZI	BEAUVAL	4	2	4	4	4	4	4	2	6
496	0.027	GU GU	BEIJING	4	4	4	6	4	6	6	4	6
769	0.020	JIAO QING	BERLINZOO	3	4	3	4	3	4	4	3	6
778	0.024	CAI TAO	BOGOR	4	4	4	6	4	6	6	4	6
488	0.024	YUAN YUAN	CCRCGP	4	4	4	6	4	6	6	4	6
502	0.024	WU GANG	CCRCGP	4	4	-	6	4	6	6	4	6
503	0.026	LU LU	CCRCGP	4	-	4	6	-	6	6	-	6
542	0.000	DAI LI	CCRCGP	3.5	3.5	3.5	1	3.5	1	1	3.5	1
579	0.006	YANGYANG	CCRCGP	-	6	6	1	6	1	1	6	1
582	0.015	RONG RONG	CCRCGP	2	4	-	4	4	4	4	4	4
592	0.024	LAN ZI	CCRCGP	4	4	4	6	4	6	6	4	6
595	0.020	TAI SHAN	CCRCGP	3	4	4	4	4	4	4	4	6
609	0.014	HUI HUI	CCRCGP	4	4	4	4	-	3	3	4	4
619	0.027	WEI WEI	CCRCGP	4	4	4	6	4	6	6	-	6
623	0.008	BAI YANG	CCRCGP	2	4	6	-	4	1	1	4	2
661	0.005	YI BAO	CCRCGP	3	6	6	1	6	-	-	6	1
668	0.024	HUA LONG	CCRCGP	4	-	4	6	-	6	6	-	6
669	0.024	HUA AO	CCRCGP	4	-	4	6	-	6	6	-	6
674	0.018	XIANG GE	CCRCGP	2	3	-	4	3	4	4	3	4
719	0.021	AN AN	CCRCGP	3	3	4	4	3	4	4	3	6
747	0.025	XIANG LU	CCRCGP	4	-	4	6	-	6	6	-	6
748	0.016	XIANG LIN	CCRCGP	2	3	4	4	4	4	4	4	4
751	0.026	SHEN WEI	CCRCGP	4	4	4	6	4	6	6	4	6
752	0.013	ZI YAN	CCRCGP	1	4	4	3	4	3	3	4	4
758	0.025	LU LIN	CCRCGP	4	-	4	6	-	6	6	-	6
775	0.016	AO AO	CCRCGP	1	4	-	4	4	-	-	4	4
789	0.021	FU HU	CCRCGP	4	4	4	4	4	4	4	4	6
865	0.007	HUA HU	CCRCGP	3	4	6	-	6	1	1	4	1
886	0.006	HUA YANG	CCRCGP	-	6	6	1	6	-	-	6	1
887	0.021	FU BAO	CCRCGP	4	4	4	4	4	4	4	4	6
890	0.027	GONG GONG	CCRCGP	4	-	6	6	-	6	6	-	6
902	0.025	SHUN SHUN	CCRCGP	4	-	4	6	-	6	6	-	6
905	0.010	SEN SEN	CCRCGP	1	4	4	1	4	-	-	4	4
989	0.000	ZI JIN	CCRCGP	3.5	3.5	3.5	1	3.5	2	2	3.5	1
857	0.024	CHENG SHU	CHANGSHA	4	4	4	6	4	6	6	4	6
858	0.024	CHENG DUI	CHANGSHA	4	4	4	6	4	6	6	4	6
520	0.021	BINGDIAN	CHENGDU	3	3	4	4	3	4	4	3	6
342	0.007	XIAO PINGPI	CHENPANDA	3	4	6	1	6	1	1	6	1

For 2019 Breeding Season			Females >	791	800	810	827	834	837	838	846	860
Notes			MK	0.013	0.024	0.027	0.005	0.026	0.006	0.006	0.025	0.002
			Name	YANG HUA	ZHI CHUN	YUN DUO	SU SHAN	ZHENG ZHENG	YI RAN	YI CHANG	JIA JIA	QIAO QIAO
Males V	**MK**	**Name**	**Location**	CCRCGP	CCRCGP	CCRCGP	CCRCGP	CCRCGP	CCRCGP	CCRCGP	CCRCGP	CCRCGP
532	0.024	FUFU	CHENPANDA	4	4	4	6	6	6	6	4	6
614	0.027	XINGBING	CHENPANDA	4	4	4	6	4	6	6	4	6
624	0.007	QIAO QIAO	CHENPANDA	2	4	6	1	6	1	1	4	2
649	0.026	MEI LAN	CHENPANDA	4	4	4	6	4	6	6	4	6
703	0.001	ABAO	CHENPANDA	4	6	6	1	6	1	1	6	1
711	0.015	GONG ZI	CHENPANDA	1	4	4	4	4	4	4	4	4
724	0.016	YING YING	CHENPANDA	1	4	4	4	4	4	4	4	4
731	0.022	XI LAN	CHENPANDA	4	4	4	4	4	4	4	2	6
788	0.013	YUAN LIN	CHENPANDA	1	4	4	3	4	3	3	4	4
792	0.024	DE DE	CHENPANDA	4	4	4	6	4	6	6	4	6
831	0.001	LONG LONG	CHENPANDA	4	6	6	1	6	1	1	6	1
839	0.028	AOLIAO	CHENPANDA	4	4	4	6	4	6	6	4	6
510	0.018	CHUANGCHU	CHIANGMAI	2	3	3	4	3	4	4	3	4
513	0.027	LIANG LIANG	CHONGQING	4	4	4	6	4	6	6	4	6
518	0.023	LONG SHEN(	DAFENG	4	2	4	6	4	4	4	4	6
742	0.028	YUN YUN	DEQING	4	4	-	6	4	6	6	4	6
564	0.024	YANGGUANC	EDINBURGH	4	4	4	6	6	6	6	4	6
454	0.026	XIAO SHUAN	FUCHOW	4	4	4	6	4	6	6	4	6
538	0.027	LIN YANG	FUCHOW	4	4	4	6	4	6	6	4	6
515	0.026	LIANGLIANG	HEFEI W	4	4	4	6	4	6	6	4	6
573	0.027	LONGBING	HUAIAN	4	4	4	6	4	6	6	4	6
793	0.024	A BAO	HUAIAN	4	4	4	6	4	6	6	4	6
830	0.018	YUN TAO	HUAYING	3	3	4	-	4	4	4	4	4
639	0.027	FU WA	KUALA LUM	4	-	4	6	-	6	6	-	6
906	0.024	XING BAO	KUEIYANG	4	4	4	6	4	6	6	4	6
685	0.021	FU LONG	LANGZHONG	4	4	4	4	4	4	4	4	6
852	0.025	HAN HAN	LINYIZ	4	-	4	6	-	6	6	-	6
662	0.027	MINGBING	LIUCHOW	4	4	4	6	4	6	6	4	6
714	0.025	NING NING	LIUGONGDA	4	-	4	6	-	6	6	-	6
772	0.025	ZHAO YANG	LONGKOU	4	4	-	6	4	6	6	4	6
786	0.027	QING SHAN	LONGKOU	4	4	4	6	4	6	6	4	6
713	0.023	QIN CHUAN	LOUGUANTA	4	2	4	4	4	4	4	2	6
715	0.027	LELE	LOUGUANTA	4	4	4	6	4	6	6	4	6
802	0.000	QI ZAI	LOUGUANTA	3.5	3.5	3.5	1	3.5	2	2	3.5	1
803	0.000	ER LANG	LOUGUANTA	3.5	3.5	3.5	1	3.5	2	2	3.5	1
519	0.023	BINGXING	MADRID Z	4	2	4	4	4	4	4	4	6
466	0.019	LELE	MEMPHIS	3	3	3	4	3	4	4	3	6
589	0.027	MEI LING	NANCHANG	4	4	4	6	4	6	6	-	6
458	0.025	TIAN TIAN	NZP-WASH	4	4	-	6	4	6	6	4	6
745	0.025	XING HUI	PAIRI DAI	4	-	4	6	-	6	6	-	6
563	0.019	MEISHENG	PANYU	4	3	4	4	4	4	4	4	4
613	0.020	YOU YOU	PANYU	3	3	3	4	3	4	4	3	6
744	0.026	YIN KE	PANYU	4	-	4	6	-	6	6	-	6
874	0.024	HUA RONG	QINGSHEN	4	4	-	6	4	6	6	-	6
879	0.025	XING YA	RHENEN	4	4	4	6	4	6	6	4	6
415	0.004	GAOGAO	SANDIEGOZ	4	6	6	1	6	1	1	6	1

For 2019 Breeding Season			Females >	791	800	810	827	834	837	838	846	860
Notes			MK	0.013	0.024	0.027	0.005	0.026	0.006	0.006	0.025	0.002
			Name	YANG HUA	ZHI CHUN	YUN DUO	SU SHAN	ZHENG ZHENG	YI RAN	YI CHANG	JIA JIA	QIAO QIAO
Males V	**MK**	**Name**	**Location**	CCRCGP	CCRCGP	CCRCGP	CCRCGP	CCRCGP	CCRCGP	CCRCGP	CCRCGP	CCRCGP
842	0.019	XIAO LIWU	SANDIEGOZ	4	3	4	4	4	4	4	4	4
721	0.027	AO YUN	SHENNONGJ	4	-	4	6	-	6	6	-	6
787	0.013	YUAN ZHOU	SHENZHEN	1	4	4	3	4	3	3	4	4
529	0.027	YA XIANG	SHIH CHIA	4	4	4	6	4	6	6	4	6
749	0.019	YUN ZI	SHIH CHIA	4	3	4	4	4	4	4	4	4
726	0.026	KAI KAI	SHIPAIWAN	4	4	4	6	4	6	6	4	6
690	0.024	WU JIE	SINGAPORE	4	4	-	6	4	6	6	4	6
607	0.021	XI WANG	TAIAN R	3	3	4	4	4	4	4	4	6
689	0.025	WU JUN	TAIAN R	4	4	-	6	4	6	6	4	6
588	0.027	TUAN TUAN	TAIPEI	4	4	4	6	4	6	6	-	6
770	0.024	ER XI	TSINANWAW	4	4	4	6	4	6	6	4	6
390	0.025	YONGMING	WAKAYAMA	4	4	4	6	4	6	6	4	6
530	0.027	YA GUANG	WENZHOU	4	4	4	6	4	6	6	4	6
599	0.027	XIAN ZI	XIXIAKOU	4	4	4	6	4	6	6	4	6
841	0.026	YUAN XIN	YONG IN	4	4	4	6	4	6	6	4	6
586	0.020	TONG TONG	YUANSHAN	4	3	4	4	6	4	4	4	6

For 2019 Breeding Season			Females >	862	897	522	523	537	561	598	637
Notes			MK	0.008	0.020	0.021	0.023	0.027	0.018	0.023	0.023
			Name	XIN XIN	BAO BAO	CHENGGONG	CHENGJI	QING HE	YUANYUAN	JING JING	YA ZI
Males V	MK	Name	Location	CCRCGP	CCRCGP	CHENPANDA	CHENPANDA	CHENPANDA	CHENPANDA	CHENPANDA	CHENPANDA
327	0.001	AN AN	ABERDE HK	2	3.5	3.5	3.5	3.5	3.5	3.5	3.5
606	0.019	LE LE	ABERDE HK	-	2	2	3	4	2	3	3
620	0.020	WANG WAN	ADELAIDE	4	4	2	2	4	2	3	2
867	0.026	HUA BAO	AHTARI	6	4	3	4	4	3	4	4
536	0.025	XIAO JIAO	ANJI BAMB	4	4	3	4	-	4	4	2
575	0.026	QING ZAI	ANJI BAMB	6	3	4	4	-	3	4	4
461	0.020	YANG YANG	ATLANTA	4	2	4	4	4	2	-	-
746	0.025	XING RUI	BAOX ECTR	4	4	3	4	4	3	4	4
736	0.023	YUAN ZI	BEAUVAL	4	2	4	4	4	-	4	4
496	0.027	GU GU	BEIJING	6	4	4	4	4	4	4	4
769	0.020	JIAO QING	BERLINZOO	4	4	-	-	4	-	-	-
778	0.024	CAI TAO	BOGOR	4	4	3	2	4	3	4	2
488	0.024	YUAN YUAN	CCRCGP	4	3	3	2	4	3	4	2
502	0.024	WU GANG	CCRCGP	4	3	3	2	4	3	4	2
503	0.026	LU LU	CCRCGP	6	3	3	4	4	3	4	4
542	0.000	DAI LI	CCRCGP	2	3.5	3.5	3.5	3.5	3.5	3.5	3.5
579	0.006	YANGYANG	CCRCGP	1	4	4	4	6	4	6	4
582	0.015	RONG RONG	CCRCGP	3	4	3	4	4	3	4	3
592	0.024	LAN ZI	CCRCGP	4	4	6	6	6	4	4	4
595	0.020	TAI SHAN	CCRCGP	4	-	2	3	3	2	3	2
609	0.014	HUI HUI	CCRCGP	3	4	3	4	4	3	4	3
619	0.027	WEI WEI	CCRCGP	6	4	4	4	4	4	4	4
623	0.008	BAI YANG	CCRCGP	-	4	4	4	6	4	4	4
661	0.005	YI BAO	CCRCGP	1	4	4	6	6	4	6	6
668	0.024	HUA LONG	CCRCGP	4	4	3	4	4	3	4	2
669	0.024	HUA AO	CCRCGP	4	4	3	4	4	3	4	2
674	0.018	XIANG GE	CCRCGP	-	2	3	3	4	2	3	3
719	0.021	AN AN	CCRCGP	4	2	2	2	4	2	2	2
747	0.025	XIANG LU	CCRCGP	4	4	3	4	4	3	4	2
748	0.016	XIANG LIN	CCRCGP	-	3	3	3	4	2	3	3
751	0.026	SHEN WEI	CCRCGP	6	4	3	4	4	3	4	4
752	0.013	ZI YAN	CCRCGP	2	3	3	4	4	2	4	4
758	0.025	LU LIN	CCRCGP	4	4	3	4	4	3	4	4
775	0.016	AO AO	CCRCGP	3	3	3	3	4	2	3	3
789	0.021	FU HU	CCRCGP	4	4	2	2	4	3	2	2
865	0.007	HUA HU	CCRCGP	-	4	4	4	6	4	4	4
886	0.006	HUA YANG	CCRCGP	1	4	4	4	6	4	4	4
887	0.021	FU BAO	CCRCGP	4	4	2	2	4	3	2	2
890	0.027	GONG GONG	CCRCGP	6	4	4	4	4	3	4	4
902	0.025	SHUN SHUN	CCRCGP	4	4	3	4	4	3	4	4
905	0.010	SEN SEN	CCRCGP	1	4	4	4	4	3	4	4
989	0.000	ZI JIN	CCRCGP	2	3.5	3.5	3.5	3.5	3.5	3.5	3.5
857	0.024	CHENG SHU	CHANGSHA	4	4	-	-	4	4	4	4
858	0.024	CHENG DUI	CHANGSHA	4	4	-	-	4	4	4	4
520	0.021	BINGDIAN	CHENGDU	4	2	2	2	-	-	2	2
342	0.007	XIAO PINGPI	CHENPANDA	1	4	4	4	6	4	4	4

For 2019 Breeding Season			Females >	862	897	522	523	537	561	598	637
Notes			MK	0.008	0.020	0.021	0.023	0.027	0.018	0.023	0.023
			Name	XIN XIN	BAO BAO	CHENGGONG	CHENGJI	QING HE	YUANYUAN	JING JING	YA ZI
Males V	**MK**	**Name**	**Location**	CCRCGP	CCRCGP	CHENPANDA	CHENPANDA	CHENPANDA	CHENPANDA	CHENPANDA	CHENPANDA
532	0.024	FUFU	CHENPANDA	4	4	3	2	4	3	4	2
614	0.027	XINGBING	CHENPANDA	6	4	4	4	4	4	4	4
624	0.007	QIAO QIAO	CHENPANDA	1	4	4	4	6	4	4	4
649	0.026	MEI LAN	CHENPANDA	6	4	4	4	4	4	4	4
703	0.001	ABAO	CHENPANDA	2	6	6	6	6	4	6	6
711	0.015	GONG ZI	CHENPANDA	3	3	-	-	4	4	4	4
724	0.016	YING YING	CHENPANDA	3	3	-	-	4	4	4	4
731	0.022	XI LAN	CHENPANDA	4	4	4	4	4	4	4	4
788	0.013	YUAN LIN	CHENPANDA	2	3	4	4	4	-	4	4
792	0.024	DE DE	CHENPANDA	4	3	4	4	6	4	4	4
831	0.001	LONG LONG	CHENPANDA	2	6	6	6	6	4	6	6
839	0.028	AOLIAO	CHENPANDA	6	4	4	4	4	4	4	4
510	0.018	CHUANGCHU	CHIANGMAI	4	2	2	3	4	2	3	3
513	0.027	LIANG LIANG	CHONGQING	6	4	4	4	4	4	4	4
518	0.023	LONG SHEN(	DAFENG	4	4	2	2	4	3	2	2
742	0.028	YUN YUN	DEQING	6	4	4	4	4	4	4	4
564	0.024	YANGGUANG	EDINBURGH	4	4	2	2	4	3	2	2
454	0.026	XIAO SHUAN	FUCHOW	6	3	4	4	-	3	4	4
538	0.027	LIN YANG	FUCHOW	6	4	4	4	4	3	4	4
515	0.026	LIANGLIANG	HEFEI W	6	3	4	4	-	3	4	4
573	0.027	LONGBING	HUAIAN	6	4	4	4	4	4	4	4
793	0.024	A BAO	HUAIAN	4	3	4	4	6	4	4	4
830	0.018	YUN TAO	HUAYING	-	4	2	3	4	2	3	3
639	0.027	FU WA	KUALA LUM	6	4	4	4	4	4	4	4
906	0.024	XING BAO	KUEIYANG	4	3	4	4	6	4	4	4
685	0.021	FU LONG	LANGZHONG	4	4	2	2	4	3	2	2
852	0.025	HAN HAN	LINYIZ	4	4	3	4	4	3	4	4
662	0.027	MINGBING	LIUCHOW	6	4	4	4	4	4	4	4
714	0.025	NING NING	LIUGONGDA	4	3	3	4	4	3	4	2
772	0.025	ZHAO YANG	LONGKOU	4	4	3	4	4	3	4	4
786	0.027	QING SHAN	LONGKOU	6	4	4	4	4	3	4	4
713	0.023	QIN CHUAN	LOUGUANTA	4	2	2	2	4	3	2	2
715	0.027	LELE	LOUGUANTA	6	3	4	4	6	4	4	4
802	0.000	QI ZAI	LOUGUANTA	2	3.5	3.5	3.5	3.5	3.5	3.5	3.5
803	0.000	ER LANG	LOUGUANTA	2	3.5	3.5	3.5	3.5	3.5	3.5	3.5
519	0.023	BINGXING	MADRID Z	4	2	2	2	-	-	2	2
466	0.019	LELE	MEMPHIS	4	2	2	3	3	2	3	3
589	0.027	MEI LING	NANCHANG	6	4	4	4	4	4	4	4
458	0.025	TIAN TIAN	NZP-WASH	4	-	3	4	4	3	4	4
745	0.025	XING HUI	PAIRI DAI	4	4	3	4	4	3	4	4
563	0.019	MEISHENG	PANYU	4	4	2	3	4	2	3	3
613	0.020	YOU YOU	PANYU	4	2	2	3	3	2	3	2
744	0.026	YIN KE	PANYU	6	4	3	4	4	3	4	4
874	0.024	HUA RONG	QINGSHEN	4	4	2	2	4	3	2	2
879	0.025	XING YA	RHENEN	4	3	3	4	4	3	4	4
415	0.004	GAOGAO	SANDIEGOZ	1	4	4	6	6	4	6	6

For 2019 Breeding Season			Females >	862	897	522	523	537	561	598	637
Notes			MK	0.008	0.020	0.021	0.023	0.027	0.018	0.023	0.023
			Name	XIN XIN	BAO BAO	CHENGGONG	CHENGJI	QING HE	YUANYUAN	JING JING	YA ZI
Males V	**MK**	**Name**	**Location**	CCRCGP	CCRCGP	CHENPANDA	CHENPANDA	CHENPANDA	CHENPANDA	CHENPANDA	CHENPANDA
842	0.019	XIAO LIWU	SANDIEGOZ	4	4	2	3	4	2	3	3
721	0.027	AO YUN	SHENNONGJ	6	4	4	4	4	4	4	4
787	0.013	YUAN ZHOU	SHENZHEN	2	3	4	4	4	-	4	4
529	0.027	YA XIANG	SHIH CHIA	6	3	4	4	-	4	-	-
749	0.019	YUN ZI	SHIH CHIA	4	4	2	3	4	2	3	3
726	0.026	KAI KAI	SHIPAIWAN	6	3	4	4	4	3	-	-
690	0.024	WU JIE	SINGAPORE	4	4	3	2	4	3	4	2
607	0.021	XI WANG	TAIAN R	4	4	2	2	4	2	2	2
689	0.025	WU JUN	TAIAN R	4	4	3	4	4	3	4	2
588	0.027	TUAN TUAN	TAIPEI	6	4	4	4	4	4	4	4
770	0.024	ER XI	TSINANWAW	4	4	4	4	4	4	4	4
390	0.025	YONGMING	WAKAYAMA	4	3	3	4	4	3	4	4
530	0.027	YA GUANG	WENZHOU	6	3	4	4	-	4	-	-
599	0.027	XIAN ZI	XIXIAKOU	6	4	4	4	4	3	4	4
841	0.026	YUAN XIN	YONG IN	6	4	3	4	4	3	4	4
586	0.020	TONG TONG	YUANSHAN	4	4	2	2	4	2	3	2

For 2019 Breeding Season			Females >	652	665	678	680	681	725	761
Notes			MK	0.025	0.025	0.021	0.020	0.022	0.017	0.023
			Name	MENG MENG	XIANG BING	KE LIN	XING RONG	XING YA	NI NI	WEN LI
Males V	MK	Name	Location	CHENPANDA	CHENPANDA	CHENPANDA	CHENPANDA	CHENPANDA	CHENPANDA	CHENPANDA
327	0.001	AN AN	ABERDE HK	3.5	3.5	3.5	3.5	3.5	3.5	3.5
606	0.019	LE LE	ABERDE HK	-	3	2	2	3	2	3
620	0.020	WANG WAN	ADELAIDE	3	-	2	2	2	3	2
867	0.026	HUA BAO	AHTARI	4	4	3	3	4	4	4
536	0.025	XIAO JIAO	ANJI BAMB	4	4	-	3	6	3	2
575	0.026	QING ZAI	ANJI BAMB	4	4	3	4	-	4	4
461	0.020	YANG YANG	ATLANTA	3	3	2	4	4	4	4
746	0.025	XING RUI	BAOX ECTR	4	4	3	3	3	3	4
736	0.023	YUAN ZI	BEAUVAL	2	4	6	4	4	4	-
496	0.027	GU GU	BEIJING	4	4	4	3	4	4	4
769	0.020	JIAO QING	BERLINZOO	3	4	-	-	4	4	2
778	0.024	CAI TAO	BOGOR	4	4	3	3	2	3	2
488	0.024	YUAN YUAN	CCRCGP	4	4	3	3	2	3	2
502	0.024	WU GANG	CCRCGP	4	4	3	3	2	3	2
503	0.026	LU LU	CCRCGP	4	4	3	3	4	4	4
542	0.000	DAI LI	CCRCGP	3.5	3.5	3.5	3.5	3.5	3.5	3.5
579	0.006	YANGYANG	CCRCGP	6	6	4	4	4	4	4
582	0.015	RONG RONG	CCRCGP	4	4	3	3	3	1	3
592	0.024	LAN ZI	CCRCGP	4	4	4	4	4	4	4
595	0.020	TAI SHAN	CCRCGP	3	4	4	2	2	3	2
609	0.014	HUI HUI	CCRCGP	4	4	3	3	3	1	4
619	0.027	WEI WEI	CCRCGP	-	4	4	3	4	4	4
623	0.008	BAI YANG	CCRCGP	4	4	4	4	4	3	4
661	0.005	YI BAO	CCRCGP	6	6	4	4	4	4	6
668	0.024	HUA LONG	CCRCGP	4	4	3	3	2	3	2
669	0.024	HUA AO	CCRCGP	4	4	3	3	2	3	2
674	0.018	XIANG GE	CCRCGP	3	3	3	2	3	2	3
719	0.021	AN AN	CCRCGP	-	3	2	2	2	3	2
747	0.025	XIANG LU	CCRCGP	4	4	4	3	2	3	2
748	0.016	XIANG LIN	CCRCGP	4	4	3	3	3	2	3
751	0.026	SHEN WEI	CCRCGP	4	4	3	3	4	4	4
752	0.013	ZI YAN	CCRCGP	4	4	3	3	4	2	4
758	0.025	LU LIN	CCRCGP	4	4	3	3	3	3	4
775	0.016	AO AO	CCRCGP	4	4	3	3	3	2	3
789	0.021	FU HU	CCRCGP	4	4	2	2	2	3	2
865	0.007	HUA HU	CCRCGP	6	6	4	4	4	4	4
886	0.006	HUA YANG	CCRCGP	6	6	4	4	4	4	4
887	0.021	FU BAO	CCRCGP	4	4	2	2	2	3	2
890	0.027	GONG GONG	CCRCGP	4	4	4	3	4	4	4
902	0.025	SHUN SHUN	CCRCGP	4	4	3	3	3	3	4
905	0.010	SEN SEN	CCRCGP	-	4	4	4	4	3	4
989	0.000	ZI JIN	CCRCGP	3.5	3.5	3.5	3.5	3.5	3.5	3.5
857	0.024	CHENG SHU	CHANGSHA	4	4	4	4	4	-	4
858	0.024	CHENG DUI	CHANGSHA	4	4	4	4	4	-	4
520	0.021	BINGDIAN	CHENGDU	3	-	4	2	-	3	2
342	0.007	XIAO PINGPI	CHENPANDA	6	6	4	-	-	-	4

For 2019 Breeding Season			Females >	652	665	678	680	681	725	761
Notes			MK	0.025	0.025	0.021	0.020	0.022	0.017	0.023
			Name	MENG MENG	XIANG BING	KE LIN	XING RONG	XING YA	NI NI	WEN LI
Males V	**MK**	**Name**	**Location**	CHENPANDA	CHENPANDA	CHENPANDA	CHENPANDA	CHENPANDA	CHENPANDA	CHENPANDA
532	0.024	FUFU	CHENPANDA	4	4	3	3	2	3	2
614	0.027	XINGBING	CHENPANDA	4	4	4	4	4	4	4
624	0.007	QIAO QIAO	CHENPANDA	4	6	4	4	4	4	4
649	0.026	MEI LAN	CHENPANDA	4	4	4	4	4	4	4
703	0.001	ABAO	CHENPANDA	6	6	6	6	6	4	6
711	0.015	GONG ZI	CHENPANDA	4	4	4	-	4	-	4
724	0.016	YING YING	CHENPANDA	4	4	4	-	4	-	4
731	0.022	XI LAN	CHENPANDA	2	4	4	4	4	3	4
788	0.013	YUAN LIN	CHENPANDA	4	4	6	-	6	-	4
792	0.024	DE DE	CHENPANDA	4	4	4	4	-	4	4
831	0.001	LONG LONG	CHENPANDA	6	6	6	6	6	4	6
839	0.028	AOLIAO	CHENPANDA	4	4	4	4	4	4	-
510	0.018	CHUANGCHU	CHIANGMAI	3	6	2	2	3	2	3
513	0.027	LIANG LIANG	CHONGQING	-	4	4	3	4	4	4
518	0.023	LONG SHEN(	DAFENG	4	4	2	3	2	3	2
742	0.028	YUN YUN	DEQING	4	4	4	3	4	4	4
564	0.024	YANGGUAN(	EDINBURGH	4	4	3	3	2	3	2
454	0.026	XIAO SHUAN	FUCHOW	4	4	3	4	-	4	4
538	0.027	LIN YANG	FUCHOW	4	4	4	3	4	4	4
515	0.026	LIANGLIANG	HEFEI W	4	4	3	4	-	4	4
573	0.027	LONGBING	HUAIAN	4	4	4	4	4	4	4
793	0.024	A BAO	HUAIAN	4	4	4	4	-	4	4
830	0.018	YUN TAO	HUAYING	3	4	2	2	3	2	3
639	0.027	FU WA	KUALA LUM	4	4	4	3	4	4	4
906	0.024	XING BAO	KUEIYANG	4	4	4	4	-	4	4
685	0.021	FU LONG	LANGZHONG	4	4	2	2	2	3	2
852	0.025	HAN HAN	LINYIZ	4	4	3	3	3	3	4
662	0.027	MINGBING	LIUCHOW	4	4	4	4	4	4	4
714	0.025	NING NING	LIUGONGDA	4	4	3	3	2	3	2
772	0.025	ZHAO YANG	LONGKOU	4	4	3	3	3	4	4
786	0.027	QING SHAN	LONGKOU	4	4	4	3	4	4	4
713	0.023	QIN CHUAN	LOUGUANTA	2	4	2	3	2	3	-
715	0.027	LELE	LOUGUANTA	4	4	4	4	4	4	-
802	0.000	QI ZAI	LOUGUANTA	3.5	3.5	3.5	3.5	3.5	3.5	3.5
803	0.000	ER LANG	LOUGUANTA	3.5	3.5	3.5	3.5	3.5	3.5	3.5
519	0.023	BINGXING	MADRID Z	4	-	4	3	-	3	2
466	0.019	LELE	MEMPHIS	-	3	2	2	2	2	3
589	0.027	MEI LING	NANCHANG	-	4	4	3	4	4	4
458	0.025	TIAN TIAN	NZP-WASH	4	4	3	3	3	4	4
745	0.025	XING HUI	PAIRI DAI	4	4	3	3	3	3	4
563	0.019	MEISHENG	PANYU	3	4	2	2	3	2	3
613	0.020	YOU YOU	PANYU	-	3	2	2	2	3	2
744	0.026	YIN KE	PANYU	4	4	3	3	4	4	4
874	0.024	HUA RONG	QINGSHEN	4	4	3	3	2	3	2
879	0.025	XING YA	RHENEN	4	4	3	3	3	4	4
415	0.004	GAOGAO	SANDIEGOZ	6	6	4	4	6	4	6

For 2019 Breeding Season			Females >	652	665	678	680	681	725	761
Notes			MK	0.025	0.025	0.021	0.020	0.022	0.017	0.023
			Name	MENG MENG	XIANG BING	KE LIN	XING RONG	XING YA	NI NI	WEN LI
Males V	MK	Name	Location	CHENPANDA	CHENPANDA	CHENPANDA	CHENPANDA	CHENPANDA	CHENPANDA	CHENPANDA
842	0.019	XIAO LIWU	SANDIEGOZ	3	4	2	2	3	2	3
721	0.027	AO YUN	SHENNONGJ	4	4	4	3	4	4	4
787	0.013	YUAN ZHOU	SHENZHEN	4	4	6	-	6	-	4
529	0.027	YA XIANG	SHIH CHIA	4	4	4	4	6	4	4
749	0.019	YUN ZI	SHIH CHIA	3	4	2	2	3	2	3
726	0.026	KAI KAI	SHIPAIWAN	4	4	3	4	4	4	-
690	0.024	WU JIE	SINGAPORE	4	4	3	3	2	3	2
607	0.021	XI WANG	TAIAN R	3	4	2	2	2	3	2
689	0.025	WU JUN	TAIAN R	4	4	3	3	2	3	2
588	0.027	TUAN TUAN	TAIPEI	-	4	4	3	4	4	4
770	0.024	ER XI	TSINANWAW	4	4	4	-	-	4	4
390	0.025	YONGMING	WAKAYAMA	4	4	3	3	3	4	4
530	0.027	YA GUANG	WENZHOU	4	4	4	4	6	4	4
599	0.027	XIAN ZI	XIXIAKOU	-	-	3	3	4	4	4
841	0.026	YUAN XIN	YONG IN	4	4	3	3	4	4	4
586	0.020	TONG TONG	YUANSHAN	3	4	2	2	2	3	2

For 2019 Breeding Season			Females >	762	765	796	801	811	823	870
Notes			MK	0.023	0.001	0.023	0.022	0.025	0.024	0.022
			Name	YA LI	BEI CHUAN	YA YUN	A BAO(PO)	AI LI	ER QIAO	MEI LUN
Males V	MK	Name	Location	CHENPANDA	CHENPANDA	CHENPANDA	CHENPANDA	CHENPANDA	CHENPANDA	CHENPANDA
327	0.001	AN AN	ABERDE HK	3.5	1	3.5	3.5	3.5	3.5	3.5
606	0.019	LE LE	ABERDE HK	3	3.5	3	2	3	3	2
620	0.020	WANG WAN	ADELAIDE	2	3.5	3	2	3	3	2
867	0.026	HUA BAO	AHTARI	4	3.5	4	4	4	4	4
536	0.025	XIAO JIAO	ANJI BAMB	4	3.5	4	4	4	4	4
575	0.026	QING ZAI	ANJI BAMB	4	3.5	4	4	4	4	4
461	0.020	YANG YANG	ATLANTA	4	3.5	-	-	4	4	-
746	0.025	XING RUI	BAOX ECTR	4	3.5	4	3	4	4	3
736	0.023	YUAN ZI	BEAUVAL	-	3.5	4	4	4	2	4
496	0.027	GU GU	BEIJING	4	3.5	4	4	4	4	4
769	0.020	JIAO QING	BERLINZOO	3	3.5	-	4	4	4	4
778	0.024	CAI TAO	BOGOR	2	3.5	2	2	4	4	2
488	0.024	YUAN YUAN	CCRCGP	2	3.5	2	2	4	4	2
502	0.024	WU GANG	CCRCGP	2	3.5	4	2	4	4	2
503	0.026	LU LU	CCRCGP	4	3.5	4	3	4	4	3
542	0.000	DAI LI	CCRCGP	3.5	1	3.5	3.5	3.5	3.5	3.5
579	0.006	YANGYANG	CCRCGP	4	1	4	4	6	6	4
582	0.015	RONG RONG	CCRCGP	3	3.5	4	3	4	4	3
592	0.024	LAN ZI	CCRCGP	4	3.5	4	4	4	4	4
595	0.020	TAI SHAN	CCRCGP	3	3.5	3	4	4	4	4
609	0.014	HUI HUI	CCRCGP	4	3.5	4	3	4	4	3
619	0.027	WEI WEI	CCRCGP	4	3.5	4	4	4	4	4
623	0.008	BAI YANG	CCRCGP	4	2	4	4	4	4	4
661	0.005	YI BAO	CCRCGP	6	1	6	4	6	6	4
668	0.024	HUA LONG	CCRCGP	2	3.5	4	2	4	4	2
669	0.024	HUA AO	CCRCGP	2	3.5	4	2	4	4	2
674	0.018	XIANG GE	CCRCGP	3	3.5	3	3	3	3	3
719	0.021	AN AN	CCRCGP	2	3.5	2	2	3	3	2
747	0.025	XIANG LU	CCRCGP	4	3.5	4	4	4	4	4
748	0.016	XIANG LIN	CCRCGP	3	3.5	3	3	4	4	3
751	0.026	SHEN WEI	CCRCGP	4	3.5	4	3	4	4	3
752	0.013	ZI YAN	CCRCGP	4	3.5	4	4	4	4	4
758	0.025	LU LIN	CCRCGP	4	3.5	4	3	4	4	3
775	0.016	AO AO	CCRCGP	3	3.5	3	3	4	4	3
789	0.021	FU HU	CCRCGP	2	3.5	2	2	3	3	2
865	0.007	HUA HU	CCRCGP	4	2	4	4	6	4	4
886	0.006	HUA YANG	CCRCGP	4	1	4	4	6	6	4
887	0.021	FU BAO	CCRCGP	2	3.5	2	2	3	3	2
890	0.027	GONG GONG	CCRCGP	4	3.5	4	4	4	4	4
902	0.025	SHUN SHUN	CCRCGP	4	3.5	4	3	4	4	3
905	0.010	SEN SEN	CCRCGP	4	3.5	4	4	4	4	4
989	0.000	ZI JIN	CCRCGP	3.5	1	3.5	3.5	3.5	3.5	3.5
857	0.024	CHENG SHU	CHANGSHA	4	3.5	4	2	4	4	2
858	0.024	CHENG DUI	CHANGSHA	4	3.5	4	2	4	4	2
520	0.021	BINGDIAN	CHENGDU	2	3.5	2	4	3	3	4
342	0.007	XIAO PINGPI	CHENPANDA	4	2	4	4	6	-	4

For 2019 Breeding Season			Females >	762	765	796	801	811	823	870
Notes			MK	0.023	0.001	0.023	0.022	0.025	0.024	0.022
			Name	YA LI	BEI CHUAN	YA YUN	A BAO(PO)	AI LI	ER QIAO	MEI LUN
Males V	MK	Name	Location	CHENPANDA	CHENPANDA	CHENPANDA	CHENPANDA	CHENPANDA	CHENPANDA	CHENPANDA
532	0.024	FUFU	CHENPANDA	2	3.5	2	2	4	4	2
614	0.027	XINGBING	CHENPANDA	4	3.5	4	4	-	-	4
624	0.007	QIAO QIAO	CHENPANDA	4	2	4	4	4	4	4
649	0.026	MEI LAN	CHENPANDA	4	3.5	4	-	4	4	-
703	0.001	ABAO	CHENPANDA	6	1	6	6	6	6	6
711	0.015	GONG ZI	CHENPANDA	4	3.5	4	3	4	4	3
724	0.016	YING YING	CHENPANDA	4	3.5	4	3	4	4	3
731	0.022	XI LAN	CHENPANDA	4	3.5	4	-	4	4	-
788	0.013	YUAN LIN	CHENPANDA	4	3.5	4	4	4	4	4
792	0.024	DE DE	CHENPANDA	4	3.5	4	4	4	4	4
831	0.001	LONG LONG	CHENPANDA	6	1	6	6	6	6	6
839	0.028	AOLIAO	CHENPANDA	-	3.5	4	4	-	4	4
510	0.018	CHUANGCHU	CHIANGMAI	3	3.5	3	3	3	3	3
513	0.027	LIANG LIANG	CHONGQING	4	3.5	4	4	4	4	4
518	0.023	LONG SHEN(	DAFENG	2	3.5	2	2	4	2	2
742	0.028	YUN YUN	DEQING	4	3.5	4	4	4	4	4
564	0.024	YANGGUAN(	EDINBURGH	2	3.5	2	2	4	4	2
454	0.026	XIAO SHUAN	FUCHOW	4	3.5	4	4	4	4	4
538	0.027	LIN YANG	FUCHOW	4	3.5	4	4	4	4	4
515	0.026	LIANGLIANG	HEFEI W	4	3.5	4	4	4	4	4
573	0.027	LONGBING	HUAIAN	4	3.5	4	4	-	-	4
793	0.024	A BAO	HUAIAN	4	3.5	4	4	4	4	4
830	0.018	YUN TAO	HUAYING	3	3.5	3	3	3	3	3
639	0.027	FU WA	KUALA LUM	4	3.5	4	4	4	4	4
906	0.024	XING BAO	KUEIYANG	4	3.5	4	4	4	4	4
685	0.021	FU LONG	LANGZHONG	2	3.5	2	2	3	3	2
852	0.025	HAN HAN	LINYIZ	4	3.5	4	3	4	4	3
662	0.027	MINGBING	LIUCHOW	4	3.5	4	4	-	-	4
714	0.025	NING NING	LIUGONGDA	4	3.5	4	3	4	4	3
772	0.025	ZHAO YANG	LONGKOU	4	3.5	4	3	4	4	3
786	0.027	QING SHAN	LONGKOU	4	3.5	4	4	4	4	4
713	0.023	QIN CHUAN	LOUGUANTA	-	3.5	2	2	4	2	2
715	0.027	LELE	LOUGUANTA	-	3.5	4	4	4	4	4
802	0.000	QI ZAI	LOUGUANTA	3.5	1	3.5	3.5	3.5	3.5	3.5
803	0.000	ER LANG	LOUGUANTA	3.5	1	3.5	3.5	3.5	3.5	3.5
519	0.023	BINGXING	MADRID Z	2	3.5	2	4	4	2	4
466	0.019	LELE	MEMPHIS	3	3.5	3	2	3	3	2
589	0.027	MEI LING	NANCHANG	4	3.5	4	4	4	4	4
458	0.025	TIAN TIAN	NZP-WASH	4	3.5	4	3	4	4	3
745	0.025	XING HUI	PAIRI DAI	4	3.5	4	3	4	4	3
563	0.019	MEISHENG	PANYU	3	3.5	3	2	3	3	2
613	0.020	YOU YOU	PANYU	3	3.5	3	2	3	3	2
744	0.026	YIN KE	PANYU	4	3.5	4	4	4	4	4
874	0.024	HUA RONG	QINGSHEN	2	3.5	2	2	4	4	2
879	0.025	XING YA	RHENEN	4	3.5	4	3	4	4	3
415	0.004	GAOGAO	SANDIEGOZ	6	1	6	4	6	6	4

For 2019 Breeding Season			Females >	762	765	796	801	811	823	870
Notes			MK	0.023	0.001	0.023	0.022	0.025	0.024	0.022
			Name	YA LI	BEI CHUAN	YA YUN	A BAO(PO)	AI LI	ER QIAO	MEI LUN
Males V	MK	Name	Location	CHENPANDA	CHENPANDA	CHENPANDA	CHENPANDA	CHENPANDA	CHENPANDA	CHENPANDA
842	0.019	XIAO LIWU	SANDIEGOZ	3	3.5	3	2	3	3	2
721	0.027	AO YUN	SHENNONGJ	4	3.5	4	4	4	4	4
787	0.013	YUAN ZHOU	SHENZHEN	4	3.5	4	4	4	4	4
529	0.027	YA XIANG	SHIH CHIA	4	3.5	-	4	4	4	4
749	0.019	YUN ZI	SHIH CHIA	3	3.5	3	2	3	3	2
726	0.026	KAI KAI	SHIPAIWAN	-	3.5	-	4	4	4	4
690	0.024	WU JIE	SINGAPORE	2	3.5	4	2	4	4	2
607	0.021	XI WANG	TAIAN R	2	3.5	2	2	4	4	2
689	0.025	WU JUN	TAIAN R	4	3.5	4	3	4	4	3
588	0.027	TUAN TUAN	TAIPEI	4	3.5	4	4	4	4	4
770	0.024	ER XI	TSINANWAW	4	3.5	4	4	-	-	4
390	0.025	YONGMING	WAKAYAMA	4	3.5	4	3	-	-	3
530	0.027	YA GUANG	WENZHOU	4	3.5	-	4	4	4	4
599	0.027	XIAN ZI	XIXIAKOU	4	3.5	4	4	4	4	4
841	0.026	YUAN XIN	YONG IN	4	3.5	4	4	4	4	4
586	0.020	TONG TONG	YUANSHAN	2	3.5	3	2	3	3	2

For 2019 Breeding Season			Females >	871	990	1119	539	548	774	601	569
Notes			MK	0.022	0.000	0.000	0.027	0.028	0.027	0.021	0.017
			Name	MEI HUAN	ZHAO MEI	JIAYUAN	LIN HUI	LAN XIANG	FEI YUN	YAO YAO	TIAN TIAN
Males V	MK	Name	Location	CHENPANDA	CHENPANDA	CHENPANDA	CHIANGMAI	CHONGQING	DALIAN	DEQING	EDINBURGH
327	0.001	AN AN	ABERDE HK	3.5	1	1	3.5	3.5	3.5	3.5	3.5
606	0.019	LE LE	ABERDE HK	2	3.5	3.5	4	4	3	2	2
620	0.020	WANG WAN	ADELAIDE	2	3.5	3.5	4	4	4	4	3
867	0.026	HUA BAO	AHTARI	4	3.5	3.5	4	4	4	4	6
536	0.025	XIAO JIAO	ANJI BAMB	4	3.5	3.5	4	4	4	3	3
575	0.026	QING ZAI	ANJI BAMB	4	3.5	3.5	4	4	4	3	4
461	0.020	YANG YANG	ATLANTA	-	3.5	3.5	3	4	3	2	2
746	0.025	XING RUI	BAOX ECTR	3	3.5	3.5	4	4	-	3	3
736	0.023	YUAN ZI	BEAUVAL	4	3.5	3.5	4	4	4	2	3
496	0.027	GU GU	BEIJING	4	3.5	3.5	-	4	4	4	4
769	0.020	JIAO QING	BERLINZOO	4	3.5	3.5	4	4	3	2	3
778	0.024	CAI TAO	BOGOR	2	3.5	3.5	4	4	4	3	6
488	0.024	YUAN YUAN	CCRCGP	2	3.5	3.5	4	4	4	3	-
502	0.024	WU GANG	CCRCGP	2	3.5	3.5	4	4	4	-	3
503	0.026	LU LU	CCRCGP	3	3.5	3.5	4	4	-	3	3
542	0.000	DAI LI	CCRCGP	3.5	1	1	3.5	3.5	3.5	3.5	3.5
579	0.006	YANGYANG	CCRCGP	4	2	2	6	6	6	4	4
582	0.015	RONG RONG	CCRCGP	3	3.5	3.5	4	4	4	4	2
592	0.024	LAN ZI	CCRCGP	4	3.5	3.5	4	4	4	3	3
595	0.020	TAI SHAN	CCRCGP	4	3.5	3.5	4	4	4	4	2
609	0.014	HUI HUI	CCRCGP	3	3.5	3.5	4	4	4	3	2
619	0.027	WEI WEI	CCRCGP	4	3.5	3.5	4	4	4	4	4
623	0.008	BAI YANG	CCRCGP	4	2	2	6	6	6	4	4
661	0.005	YI BAO	CCRCGP	4	1	1	6	6	6	4	4
668	0.024	HUA LONG	CCRCGP	2	3.5	3.5	4	4	-	3	3
669	0.024	HUA AO	CCRCGP	2	3.5	3.5	4	4	-	3	3
674	0.018	XIANG GE	CCRCGP	3	3.5	3.5	4	4	4	-	2
719	0.021	AN AN	CCRCGP	2	3.5	3.5	4	4	4	2	3
747	0.025	XIANG LU	CCRCGP	4	3.5	3.5	4	4	-	3	3
748	0.016	XIANG LIN	CCRCGP	3	3.5	3.5	4	4	4	3	6
751	0.026	SHEN WEI	CCRCGP	3	3.5	3.5	4	4	4	4	-
752	0.013	ZI YAN	CCRCGP	4	3.5	3.5	4	4	4	3	6
758	0.025	LU LIN	CCRCGP	3	3.5	3.5	6	4	-	4	3
775	0.016	AO AO	CCRCGP	3	3.5	3.5	4	4	4	-	2
789	0.021	FU HU	CCRCGP	2	3.5	3.5	6	6	4	4	3
865	0.007	HUA HU	CCRCGP	4	2	2	6	6	6	4	4
886	0.006	HUA YANG	CCRCGP	4	2	2	6	6	6	4	4
887	0.021	FU BAO	CCRCGP	2	3.5	3.5	6	6	4	4	3
890	0.027	GONG GONG	CCRCGP	4	3.5	3.5	4	4	-	4	4
902	0.025	SHUN SHUN	CCRCGP	3	3.5	3.5	4	4	-	3	3
905	0.010	SEN SEN	CCRCGP	4	3.5	3.5	4	-	4	4	3
989	0.000	ZI JIN	CCRCGP	3.5	1	1	3.5	3.5	3.5	3.5	3.5
857	0.024	CHENG SHU	CHANGSHA	2	3.5	3.5	4	4	4	3	3
858	0.024	CHENG DUI	CHANGSHA	2	3.5	3.5	4	4	4	3	3
520	0.021	BINGDIAN	CHENGDU	4	3.5	3.5	4	4	4	2	3
342	0.007	XIAO PINGPI	CHENPANDA	4	2	2	6	6	6	4	4

For 2019 Breeding Season			Females >	871	990	1119	539	548	774	601	569
Notes			MK	0.022	0.000	0.000	0.027	0.028	0.027	0.021	0.017
			Name	MEI HUAN	ZHAO MEI	JIAYUAN	LIN HUI	LAN XIANG	FEI YUN	YAO YAO	TIAN TIAN
Males V	**MK**	**Name**	**Location**	CHENPANDA	CHENPANDA	CHENPANDA	CHIANGMAI	CHONGQING	DALIAN	DEQING	EDINBURGH
532	0.024	FUFU	CHENPANDA	2	3.5	3.5	4	4	4	4	3
614	0.027	XINGBING	CHENPANDA	4	3.5	3.5	4	4	4	4	6
624	0.007	QIAO QIAO	CHENPANDA	4	2	2	6	6	6	4	4
649	0.026	MEI LAN	CHENPANDA	-	3.5	3.5	4	4	4	3	4
703	0.001	ABAO	CHENPANDA	6	1	1	6	6	6	6	4
711	0.015	GONG ZI	CHENPANDA	3	3.5	3.5	4	4	4	3	2
724	0.016	YING YING	CHENPANDA	3	3.5	3.5	4	4	4	3	2
731	0.022	XI LAN	CHENPANDA	-	3.5	3.5	4	4	4	2	3
788	0.013	YUAN LIN	CHENPANDA	4	3.5	3.5	4	4	4	3	2
792	0.024	DE DE	CHENPANDA	4	3.5	3.5	4	4	4	3	3
831	0.001	LONG LONG	CHENPANDA	6	1	1	6	6	6	6	4
839	0.028	AOLIAO	CHENPANDA	4	3.5	3.5	4	4	4	4	4
510	0.018	CHUANGCHU	CHIANGMAI	3	3.5	3.5	4	4	4	4	2
513	0.027	LIANG LIANG	CHONGQING	4	3.5	3.5	4	-	4	4	4
518	0.023	LONG SHEN	DAFENG	2	3.5	3.5	4	6	4	4	3
742	0.028	YUN YUN	DEQING	4	3.5	3.5	6	4	4	-	4
564	0.024	YANGGUANG	EDINBURGH	2	3.5	3.5	6	4	4	4	3
454	0.026	XIAO SHUAN	FUCHOW	4	3.5	3.5	4	4	4	3	4
538	0.027	LIN YANG	FUCHOW	4	3.5	3.5	-	4	4	4	4
515	0.026	LIANGLIANG	HEFEI W	4	3.5	3.5	4	4	4	3	4
573	0.027	LONGBING	HUAIAN	4	3.5	3.5	4	4	4	4	6
793	0.024	A BAO	HUAIAN	4	3.5	3.5	4	4	4	3	3
830	0.018	YUN TAO	HUAYING	3	3.5	3.5	4	4	-	4	2
639	0.027	FU WA	KUALA LUM	4	3.5	3.5	4	4	-	4	4
906	0.024	XING BAO	KUEIYANG	4	3.5	3.5	4	4	4	3	3
685	0.021	FU LONG	LANGZHONG	2	3.5	3.5	6	6	4	4	3
852	0.025	HAN HAN	LINYIZ	3	3.5	3.5	6	4	-	4	3
662	0.027	MINGBING	LIUCHOW	4	3.5	3.5	4	4	4	4	6
714	0.025	NING NING	LIUGONGDA	3	3.5	3.5	4	4	-	3	3
772	0.025	ZHAO YANG	LONGKOU	3	3.5	3.5	6	4	4	-	3
786	0.027	QING SHAN	LONGKOU	4	3.5	3.5	4	6	4	3	6
713	0.023	QIN CHUAN	LOUGUANTA	2	3.5	3.5	4	4	4	4	3
715	0.027	LELE	LOUGUANTA	4	3.5	3.5	4	4	4	4	4
802	0.000	QI ZAI	LOUGUANTA	3.5	1	1	3.5	3.5	3.5	3.5	3.5
803	0.000	ER LANG	LOUGUANTA	3.5	1	1	3.5	3.5	3.5	3.5	3.5
519	0.023	BINGXING	MADRID Z	4	3.5	3.5	4	4	4	2	3
466	0.019	LELE	MEMPHIS	2	3.5	3.5	3	3	3	2	2
589	0.027	MEI LING	NANCHANG	4	3.5	3.5	4	4	4	4	4
458	0.025	TIAN TIAN	NZP-WASH	3	3.5	3.5	6	4	-	4	3
745	0.025	XING HUI	PAIRI DAI	3	3.5	3.5	4	4	-	3	3
563	0.019	MEISHENG	PANYU	2	3.5	3.5	4	4	4	4	2
613	0.020	YOU YOU	PANYU	2	3.5	3.5	4	4	3	2	2
744	0.026	YIN KE	PANYU	4	3.5	3.5	4	4	-	3	4
874	0.024	HUA RONG	QINGSHEN	2	3.5	3.5	4	4	4	-	3
879	0.025	XING YA	RHENEN	3	3.5	3.5	4	4	4	3	6
415	0.004	GAOGAO	SANDIEGOZ	4	1	1	6	6	6	4	4

For 2019 Breeding Season			Females >	871	990	1119	539	548	774	601	569
Notes			MK	0.022	0.000	0.000	0.027	0.028	0.027	0.021	0.017
			Name	MEI HUAN	ZHAO MEI	JIAYUAN	LIN HUI	LAN XIANG	FEI YUN	YAO YAO	TIAN TIAN
Males V	**MK**	**Name**	**Location**	CHENPANDA	CHENPANDA	CHENPANDA	CHIANGMAI	CHONGQING	DALIAN	DEQING	EDINBURGH
842	0.019	XIAO LIWU	SANDIEGOZ	2	3.5	3.5	4	4	4	4	2
721	0.027	AO YUN	SHENNONGJ	4	3.5	3.5	4	4	-	4	4
787	0.013	YUAN ZHOU	SHENZHEN	4	3.5	3.5	4	4	4	3	2
529	0.027	YA XIANG	SHIH CHIA	4	3.5	3.5	4	4	4	4	4
749	0.019	YUN ZI	SHIH CHIA	2	3.5	3.5	4	4	4	4	2
726	0.026	KAI KAI	SHIPAIWAN	4	3.5	3.5	4	4	4	3	4
690	0.024	WU JIE	SINGAPORE	2	3.5	3.5	6	4	4	-	3
607	0.021	XI WANG	TAIAN R	2	3.5	3.5	4	4	4	4	-
689	0.025	WU JUN	TAIAN R	3	3.5	3.5	6	4	4	-	3
588	0.027	TUAN TUAN	TAIPEI	4	3.5	3.5	4	4	4	4	4
770	0.024	ER XI	TSINANWAW	4	3.5	3.5	4	4	4	3	4
390	0.025	YONGMING	WAKAYAMA	3	3.5	3.5	4	4	4	3	-
530	0.027	YA GUANG	WENZHOU	4	3.5	3.5	4	4	4	4	4
599	0.027	XIAN ZI	XIXIAKOU	4	3.5	3.5	4	-	4	4	4
841	0.026	YUAN XIN	YONG IN	4	3.5	3.5	4	4	4	4	6
586	0.020	TONG TONG	YUANSHAN	2	3.5	3.5	4	4	4	4	3

For 2019 Breeding Season			Females >	641	835	509	562	757	908	576	507
Notes			MK	0.027	0.026	0.019	0.015	0.010	0.009	0.024	0.008
			Name	FENG YI	HUI HUI	ZHU ZHU	LOU SHENG	YA YA	QIN QIN	HUA ZUI BA	YA YA
Males V	MK	Name	Location	KUALA LUM	LANGZHONG	LOUGUANTA	LOUGUANTA	LOUGUANTA	LOUGUANTA	MADRID Z	MEMPHIS
327	0.001	AN AN	ABERDE HK	3.5	3.5	3.5	3.5	3.5	2	3.5	2
606	0.019	LE LE	ABERDE HK	3	3	2	3	3	4	3	4
620	0.020	WANG WAN	ADELAIDE	4	3	6	3	4	4	3	4
867	0.026	HUA BAO	AHTARI	4	4	3	4	4	4	4	6
536	0.025	XIAO JIAO	ANJI BAMB	4	4	3	4	4	4	4	4
575	0.026	QING ZAI	ANJI BAMB	4	4	3	4	4	4	4	6
461	0.020	YANG YANG	ATLANTA	3	3	2	3	4	4	4	4
746	0.025	XING RUI	BAOX ECTR	4	-	3	4	4	4	4	4
736	0.023	YUAN ZI	BEAUVAL	4	4	3	-	4	4	-	4
496	0.027	GU GU	BEIJING	4	4	3	4	4	6	4	6
769	0.020	JIAO QING	BERLINZOO	3	3	2	3	4	4	3	4
778	0.024	CAI TAO	BOGOR	4	4	3	4	4	4	4	4
488	0.024	YUAN YUAN	CCRCGP	4	4	3	4	4	4	4	4
502	0.024	WU GANG	CCRCGP	-	4	3	4	4	4	4	4
503	0.026	LU LU	CCRCGP	4	-	3	4	4	4	4	4
542	0.000	DAI LI	CCRCGP	3.5	3.5	3.5	3.5	3.5	3.5	3.5	2
579	0.006	YANGYANG	CCRCGP	6	6	4	4	2	1	6	1
582	0.015	RONG RONG	CCRCGP	4	4	3	1	2	4	4	3
592	0.024	LAN ZI	CCRCGP	4	4	3	3	4	4	4	4
595	0.020	TAI SHAN	CCRCGP	4	4	2	4	4	4	3	4
609	0.014	HUI HUI	CCRCGP	4	-	3	1	2	4	4	3
619	0.027	WEI WEI	CCRCGP	4	4	3	4	4	6	4	6
623	0.008	BAI YANG	CCRCGP	6	4	4	3	1	1	4	1
661	0.005	YI BAO	CCRCGP	6	6	4	4	1	1	6	1
668	0.024	HUA LONG	CCRCGP	4	-	3	4	4	4	4	4
669	0.024	HUA AO	CCRCGP	4	-	3	4	4	4	4	4
674	0.018	XIANG GE	CCRCGP	-	3	2	2	3	4	3	4
719	0.021	AN AN	CCRCGP	4	3	2	3	4	4	2	4
747	0.025	XIANG LU	CCRCGP	4	-	3	4	4	4	4	4
748	0.016	XIANG LIN	CCRCGP	4	4	2	1	3	3	3	4
751	0.026	SHEN WEI	CCRCGP	4	4	3	4	4	4	4	4
752	0.013	ZI YAN	CCRCGP	4	4	3	1	1	2	4	4
758	0.025	LU LIN	CCRCGP	4	-	4	4	4	4	4	4
775	0.016	AO AO	CCRCGP	-	4	3	1	2	3	3	3
789	0.021	FU HU	CCRCGP	4	4	4	3	4	4	2	4
865	0.007	HUA HU	CCRCGP	6	6	4	3	2	1	4	1
886	0.006	HUA YANG	CCRCGP	6	6	4	4	2	1	4	1
887	0.021	FU BAO	CCRCGP	4	4	4	3	4	4	2	4
890	0.027	GONG GONG	CCRCGP	-	-	3	4	4	6	4	6
902	0.025	SHUN SHUN	CCRCGP	4	-	3	4	4	4	4	4
905	0.010	SEN SEN	CCRCGP	4	4	3	2	1	1	4	1
989	0.000	ZI JIN	CCRCGP	3.5	3.5	3.5	3.5	3.5	3.5	3.5	2
857	0.024	CHENG SHU	CHANGSHA	4	4	3	4	4	4	4	4
858	0.024	CHENG DUI	CHANGSHA	4	4	3	4	4	4	4	4
520	0.021	BINGDIAN	CHENGDU	4	3	2	3	4	4	2	4
342	0.007	XIAO PINGPI	CHENPANDA	6	6	4	3	2	1	4	1

For 2019 Breeding Season			Females >	641	835	509	562	757	908	576	507
Notes			MK	0.027	0.026	0.019	0.015	0.010	0.009	0.024	0.008
			Name	FENG YI	HUI HUI	ZHU ZHU	LOU SHENG	YA YA	QIN QIN	HUA ZUI BA	YA YA
Males V	**MK**	**Name**	**Location**	KUALA LUM	LANGZHONG	LOUGUANTA	LOUGUANTA	LOUGUANTA	LOUGUANTA	MADRID Z	MEMPHIS
532	0.024	FUFU	CHENPANDA	4	6	3	4	4	4	4	4
614	0.027	XINGBING	CHENPANDA	4	4	4	4	4	6	4	6
624	0.007	QIAO QIAO	CHENPANDA	6	6	4	3	2	1	4	1
649	0.026	MEI LAN	CHENPANDA	4	4	3	4	4	4	4	6
703	0.001	ABAO	CHENPANDA	6	6	6	4	4	2	6	2
711	0.015	GONG ZI	CHENPANDA	4	4	3	1	2	3	4	3
724	0.016	YING YING	CHENPANDA	4	4	3	1	2	3	4	3
731	0.022	XI LAN	CHENPANDA	4	4	3	3	4	4	4	4
788	0.013	YUAN LIN	CHENPANDA	4	4	3	1	1	2	4	2
792	0.024	DE DE	CHENPANDA	4	4	3	4	4	4	-	4
831	0.001	LONG LONG	CHENPANDA	6	6	6	4	4	2	6	2
839	0.028	AOLIAO	CHENPANDA	4	4	4	4	4	6	6	6
510	0.018	CHUANGCHU	CHIANGMAI	4	3	-	3	-	4	3	4
513	0.027	LIANG LIANG	CHONGQING	4	4	3	4	4	6	4	6
518	0.023	LONG SHEN	DAFENG	4	4	4	3	4	4	2	4
742	0.028	YUN YUN	DEQING	-	4	4	4	4	6	4	6
564	0.024	YANGGUANG	EDINBURGH	4	6	3	3	4	4	4	4
454	0.026	XIAO SHUAN	FUCHOW	4	4	3	4	4	4	4	6
538	0.027	LIN YANG	FUCHOW	4	4	3	4	4	6	4	6
515	0.026	LIANGLIANG	HEFEI W	4	4	3	4	4	4	4	6
573	0.027	LONGBING	HUAIAN	4	4	4	4	4	6	4	6
793	0.024	A BAO	HUAIAN	4	4	3	4	4	4	-	4
830	0.018	YUN TAO	HUAYING	-	4	2	2	3	4	3	4
639	0.027	FU WA	KUALA LUM	4	-	4	4	4	6	4	6
906	0.024	XING BAO	KUEIYANG	4	4	3	4	4	4	-	4
685	0.021	FU LONG	LANGZHONG	4	4	4	3	4	4	2	4
852	0.025	HAN HAN	LINYIZ	4	-	4	4	4	4	4	4
662	0.027	MINGBING	LIUCHOW	4	4	4	4	4	6	4	6
714	0.025	NING NING	LIUGONGDA	4	-	-	4	4	4	4	4
772	0.025	ZHAO YANG	LONGKOU	-	4	3	4	4	4	4	4
786	0.027	QING SHAN	LONGKOU	4	4	3	4	4	6	4	6
713	0.023	QIN CHUAN	LOUGUANTA	4	4	-	-	-	4	-	4
715	0.027	LELE	LOUGUANTA	4	4	4	-	4	6	-	6
802	0.000	QI ZAI	LOUGUANTA	3.5	3.5	3.5	3.5	3.5	3.5	3.5	2
803	0.000	ER LANG	LOUGUANTA	3.5	3.5	3.5	3.5	3.5	3.5	3.5	2
519	0.023	BINGXING	MADRID Z	4	4	3	3	4	4	2	4
466	0.019	LELE	MEMPHIS	3	3	2	3	4	4	3	4
589	0.027	MEI LING	NANCHANG	4	4	3	4	4	6	4	6
458	0.025	TIAN TIAN	NZP-WASH	-	4	3	4	4	4	4	4
745	0.025	XING HUI	PAIRI DAI	4	-	3	4	4	4	4	4
563	0.019	MEISHENG	PANYU	4	4	2	3	3	4	3	4
613	0.020	YOU YOU	PANYU	3	3	2	3	4	4	3	4
744	0.026	YIN KE	PANYU	4	-	3	4	4	4	4	6
874	0.024	HUA RONG	QINGSHEN	-	4	3	3	4	4	2	4
879	0.025	XING YA	RHENEN	4	4	4	4	4	4	4	4
415	0.004	GAOGAO	SANDIEGOZ	6	6	4	4	2	1	6	1

For 2019 Breeding Season			Females >	641	835	509	562	757	908	576	507
Notes			MK	0.027	0.026	0.019	0.015	0.010	0.009	0.024	0.008
			Name	FENG YI	HUI HUI	ZHU ZHU	LOU SHENG	YA YA	QIN QIN	HUA ZUI BA	YA YA
Males V	**MK**	**Name**	**Location**	KUALA LUM	LANGZHONG	LOUGUANTA	LOUGUANTA	LOUGUANTA	LOUGUANTA	MADRID Z	MEMPHIS
842	0.019	XIAO LIWU	SANDIEGOZ	4	4	2	3	3	4	3	4
721	0.027	AO YUN	SHENNONGJ	-	-	3	4	4	6	4	6
787	0.013	YUAN ZHOU	SHENZHEN	4	4	3	1	1	2	4	2
529	0.027	YA XIANG	SHIH CHIA	4	4	3	4	4	6	4	6
749	0.019	YUN ZI	SHIH CHIA	4	4	2	3	3	4	3	4
726	0.026	KAI KAI	SHIPAIWAN	4	4	3	-	4	4	-	6
690	0.024	WU JIE	SINGAPORE	-	4	4	4	4	4	4	4
607	0.021	XI WANG	TAIAN R	4	4	2	3	4	4	3	-
689	0.025	WU JUN	TAIAN R	-	4	4	4	4	4	4	4
588	0.027	TUAN TUAN	TAIPEI	4	4	4	4	4	6	4	6
770	0.024	ER XI	TSINANWAW	4	4	3	4	4	4	4	4
390	0.025	YONGMING	WAKAYAMA	4	4	3	4	4	4	4	4
530	0.027	YA GUANG	WENZHOU	4	4	3	4	4	6	4	6
599	0.027	XIAN ZI	XIXIAKOU	4	4	6	4	4	4	4	6
841	0.026	YUAN XIN	YONG IN	4	4	3	4	4	4	4	6
586	0.020	TONG TONG	YUANSHAN	4	6	2	3	4	4	3	4

For 2019 Breeding Season			Females >	473	741	557	618	625	631	650	706	734
Notes			MK	0.014	0.027	0.025	0.027	0.024	0.027	0.019	0.023	0.025
			Name	MEIXIANG	HAO HAO	JU XIAO	TING TING	SI XUE	MEI XI	QIAN QIAN	YUN YUN	HU BAO
Males V	MK	Name	Location	NZP-WASH	PAIRI DAI	PANYU	PANYU	SHANGHAI	SHANGHAI	SHANGHAI	SHENNONGJ	SINGAPORE
327	0.001	AN AN	ABERDE HK	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5
606	0.019	LE LE	ABERDE HK	3	-	3	-	3	3	2	-	3
620	0.020	WANG WAN	ADELAIDE	3	4	4	4	4	4	2	3	3
867	0.026	HUA BAO	AHTARI	4	4	4	4	4	-	4	4	-
536	0.025	XIAO JIAO	ANJI BAMB	4	4	4	4	4	4	4	4	4
575	0.026	QING ZAI	ANJI BAMB	4	4	4	4	6	4	3	4	4
461	0.020	YANG YANG	ATLANTA	3	3	3	3	4	3	2	3	3
746	0.025	XING RUI	BAOX ECTR	4	4	4	4	4	4	3	4	4
736	0.023	YUAN ZI	BEAUVAL	4	4	4	4	2	4	3	2	4
496	0.027	GU GU	BEIJING	4	4	-	4	4	4	3	4	4
769	0.020	JIAO QING	BERLINZOO	4	3	3	4	3	3	4	3	3
778	0.024	CAI TAO	BOGOR	4	4	4	4	4	4	4	4	-
488	0.024	YUAN YUAN	CCRCGP	4	4	4	4	4	4	4	4	-
502	0.024	WU GANG	CCRCGP	4	4	4	4	4	-	3	4	4
503	0.026	LU LU	CCRCGP	4	4	4	4	4	4	3	4	4
542	0.000	DAI LI	CCRCGP	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5
579	0.006	YANGYANG	CCRCGP	3	6	6	6	6	6	4	6	6
582	0.015	RONG RONG	CCRCGP	1	4	4	4	4	-	3	4	4
592	0.024	LAN ZI	CCRCGP	4	4	4	4	-	4	4	2	4
595	0.020	TAI SHAN	CCRCGP	-	4	4	4	3	4	4	3	4
609	0.014	HUI HUI	CCRCGP	1	4	4	4	4	4	3	4	4
619	0.027	WEI WEI	CCRCGP	4	-	4	-	4	4	3	-	4
623	0.008	BAI YANG	CCRCGP	2	6	4	6	4	6	4	4	4
661	0.005	YI BAO	CCRCGP	4	6	6	6	6	6	4	6	6
668	0.024	HUA LONG	CCRCGP	4	-	4	-	4	4	3	4	4
669	0.024	HUA AO	CCRCGP	4	-	4	-	4	4	3	4	4
674	0.018	XIANG GE	CCRCGP	2	4	3	4	3	-	2	3	3
719	0.021	AN AN	CCRCGP	3	-	3	-	3	4	2	-	3
747	0.025	XIANG LU	CCRCGP	4	4	4	4	4	4	-	4	4
748	0.016	XIANG LIN	CCRCGP	1	4	4	4	3	4	4	3	-
751	0.026	SHEN WEI	CCRCGP	4	4	6	4	4	4	4	4	4
752	0.013	ZI YAN	CCRCGP	1	4	4	4	4	4	4	4	-
758	0.025	LU LIN	CCRCGP	4	4	4	4	4	4	3	4	4
775	0.016	AO AO	CCRCGP	1	4	4	4	4	-	3	3	4
789	0.021	FU HU	CCRCGP	3	4	6	4	3	4	4	4	4
865	0.007	HUA HU	CCRCGP	3	6	6	6	4	6	4	4	6
886	0.006	HUA YANG	CCRCGP	3	6	6	6	6	6	4	4	6
887	0.021	FU BAO	CCRCGP	3	4	6	4	3	4	4	4	4
890	0.027	GONG GONG	CCRCGP	4	4	4	4	4	6	3	4	4
902	0.025	SHUN SHUN	CCRCGP	4	4	4	4	4	4	3	4	4
905	0.010	SEN SEN	CCRCGP	2	4	4	4	4	4	4	-	4
989	0.000	ZI JIN	CCRCGP	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5
857	0.024	CHENG SHU	CHANGSHA	4	4	4	4	4	4	3	4	4
858	0.024	CHENG DUI	CHANGSHA	4	4	4	4	4	4	3	4	4
520	0.021	BINGDIAN	CHENGDU	3	4	3	4	4	4	2	2	3
342	0.007	XIAO PINGPI	CHENPANDA	3	6	6	6	4	6	4	4	6

For 2019 Breeding Season			Females >	473	741	557	618	625	631	650	706	734
Notes			MK	0.014	0.027	0.025	0.027	0.024	0.027	0.019	0.023	0.025
			Name	MEIXIANG	HAO HAO	JU XIAO	TING TING	SI XUE	MEI XI	QIAN QIAN	YUN YUN	HU BAO
Males V	**MK**	**Name**	**Location**	NZP-WASH	PAIRI DAI	PANYU	PANYU	SHANGHAI	SHANGHAI	SHANGHAI	SHENNONGJ	SINGAPORE
532	0.024	FUFU	CHENPANDA	4	4	4	4	4	4	3	4	4
614	0.027	XINGBING	CHENPANDA	4	4	4	4	4	4	4	4	4
624	0.007	QIAO QIAO	CHENPANDA	3	6	4	6	4	6	4	4	6
649	0.026	MEI LAN	CHENPANDA	4	4	4	4	4	4	4	4	4
703	0.001	ABAO	CHENPANDA	4	6	6	6	6	6	6	6	6
711	0.015	GONG ZI	CHENPANDA	1	4	4	4	4	4	3	4	4
724	0.016	YING YING	CHENPANDA	1	4	4	4	4	4	3	3	4
731	0.022	XI LAN	CHENPANDA	4	4	2	4	2	4	4	2	3
788	0.013	YUAN LIN	CHENPANDA	1	4	4	4	4	4	3	4	4
792	0.024	DE DE	CHENPANDA	4	4	4	4	4	4	3	2	4
831	0.001	LONG LONG	CHENPANDA	4	6	6	6	6	6	6	6	6
839	0.028	AOLIAO	CHENPANDA	4	4	4	4	4	4	4	4	4
510	0.018	CHUANGCHU	CHIANGMAI	3	4	3	4	-	4	2	3	3
513	0.027	LIANG LIANG	CHONGQING	4	4	4	4	4	4	4	-	4
518	0.023	LONG SHEN	DAFENG	4	4	4	4	4	4	3	2	4
742	0.028	YUN YUN	DEQING	4	4	6	4	4	-	4	4	4
564	0.024	YANGGUANG	EDINBURGH	4	4	4	4	4	4	3	2	4
454	0.026	XIAO SHUAN	FUCHOW	4	4	4	4	6	4	3	4	4
538	0.027	LIN YANG	FUCHOW	4	4	-	4	4	4	3	4	4
515	0.026	LIANGLIANG	HEFEI W	4	4	4	4	6	4	3	4	4
573	0.027	LONGBING	HUAIAN	4	4	4	4	4	4	4	4	4
793	0.024	A BAO	HUAIAN	4	4	4	4	4	4	3	2	4
830	0.018	YUN TAO	HUAYING	3	4	4	4	3	4	2	3	4
639	0.027	FU WA	KUALA LUM	4	4	4	4	4	4	4	4	4
906	0.024	XING BAO	KUEIYANG	4	4	4	4	4	4	3	2	4
685	0.021	FU LONG	LANGZHONG	3	4	6	4	3	4	4	4	4
852	0.025	HAN HAN	LINYIZ	4	4	4	4	4	4	3	4	4
662	0.027	MINGBING	LIUCHOW	4	4	4	4	4	4	4	4	4
714	0.025	NING NING	LIUGONGDA	4	4	4	4	-	4	3	4	4
772	0.025	ZHAO YANG	LONGKOU	4	4	-	4	4	-	3	4	4
786	0.027	QING SHAN	LONGKOU	4	4	4	4	4	4	4	4	-
713	0.023	QIN CHUAN	LOUGUANTA	4	4	4	4	4	4	3	2	4
715	0.027	LELE	LOUGUANTA	4	4	4	4	4	4	4	4	4
802	0.000	QI ZAI	LOUGUANTA	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5
803	0.000	ER LANG	LOUGUANTA	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5
519	0.023	BINGXING	MADRID Z	4	4	4	4	4	4	3	2	4
466	0.019	LELE	MEMPHIS	3	-	3	-	3	3	2	-	3
589	0.027	MEI LING	NANCHANG	4	-	4	-	4	4	3	-	4
458	0.025	TIAN TIAN	NZP-WASH	4	4	4	4	4	-	3	4	4
745	0.025	XING HUI	PAIRI DAI	4	4	4	4	4	4	3	4	4
563	0.019	MEISHENG	PANYU	3	4	4	4	3	4	2	3	4
613	0.020	YOU YOU	PANYU	3	-	3	-	3	3	2	-	4
744	0.026	YIN KE	PANYU	4	4	4	4	4	4	3	4	4
874	0.024	HUA RONG	QINGSHEN	4	-	4	-	4	-	3	2	4
879	0.025	XING YA	RHENEN	4	4	4	4	4	4	4	4	-
415	0.004	GAOGAO	SANDIEGOZ	4	6	6	6	6	6	4	6	6

For 2019 Breeding Season			Females >	473	741	557	618	625	631	650	706	734
Notes			MK	0.014	0.027	0.025	0.027	0.024	0.027	0.019	0.023	0.025
			Name	MEIXIANG	HAO HAO	JU XIAO	TING TING	SI XUE	MEI XI	QIAN QIAN	YUN YUN	HU BAO
Males V	**MK**	**Name**	**Location**	NZP-WASH	PAIRI DAI	PANYU	PANYU	SHANGHAI	SHANGHAI	SHANGHAI	SHENNONGJ	SINGAPORE
842	0.019	XIAO LIWU	SANDIEGOZ	3	4	4	4	3	4	2	3	4
721	0.027	AO YUN	SHENNONGJ	4	4	4	4	4	4	3	4	4
787	0.013	YUAN ZHOU	SHENZHEN	1	4	4	4	4	4	3	4	4
529	0.027	YA XIANG	SHIH CHIA	4	4	4	4	4	4	3	4	4
749	0.019	YUN ZI	SHIH CHIA	3	4	4	4	3	4	2	3	4
726	0.026	KAI KAI	SHIPAIWAN	4	4	4	4	4	4	3	4	4
690	0.024	WU JIE	SINGAPORE	4	4	4	4	4	-	3	4	4
607	0.021	XI WANG	TAIAN R	3	4	4	4	3	4	-	2	4
689	0.025	WU JUN	TAIAN R	4	4	4	4	4	-	3	4	4
588	0.027	TUAN TUAN	TAIPEI	4	-	4	-	4	4	3	-	4
770	0.024	ER XI	TSINANWAW	4	4	4	4	4	4	4	4	4
390	0.025	YONGMING	WAKAYAMA	4	4	4	4	4	4	4	4	-
530	0.027	YA GUANG	WENZHOU	4	4	4	4	4	4	3	4	4
599	0.027	XIAN ZI	XIXIAKOU	4	4	4	4	4	4	4	-	4
841	0.026	YUAN XIN	YONG IN	4	4	4	4	4	4	4	4	-
586	0.020	TONG TONG	YUANSHAN	3	4	6	4	3	4	2	3	4

For 2019 Breeding Season			Females >	453	549	565	587	864	877	880	600	760
Notes			MK	0.028	0.025	0.024	0.023	0.026	0.026	0.025	0.027	0.021
			Name	DA SHUANG	ZHU YUN	XIN YUE	YUAN YUAN	YUAN ZAI	XI LE	XING AN	XIAN NU	YAO XIN
Males V	**MK**	**Name**	**Location**	SUZHOU W	TAIHU EP	TAIHU EP	TAIPEI	TAIPEI	TIANJIN	TIANMUHU	TOKYOUENO	WENLING S
327	0.001	AN AN	ABERDE HK	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5
606	0.019	LE LE	ABERDE HK	4	3	3	3	4	3	3	3	2
620	0.020	WANG WAN	ADELAIDE	4	4	4	-	4	3	4	-	4
867	0.026	HUA BAO	AHTARI	4	4	4	4	4	4	-	4	4
536	0.025	XIAO JIAO	ANJI BAMB	-	4	4	4	4	4	4	4	3
575	0.026	QING ZAI	ANJI BAMB	-	4	4	4	4	4	4	4	4
461	0.020	YANG YANG	ATLANTA	4	3	3	3	3	3	3	3	2
746	0.025	XING RUI	BAOX ECTR	4	6	4	4	4	4	4	4	-
736	0.023	YUAN ZI	BEAUVAL	4	2	2	2	4	4	4	4	2
496	0.027	GU GU	BEIJING	4	4	-	4	4	4	4	4	4
769	0.020	JIAO QING	BERLINZOO	4	3	3	3	3	3	3	3	2
778	0.024	CAI TAO	BOGOR	4	6	4	4	4	4	-	4	2
488	0.024	YUAN YUAN	CCRCGP	4	4	4	4	4	4	-	4	2
502	0.024	WU GANG	CCRCGP	4	4	4	4	4	-	4	4	3
503	0.026	LU LU	CCRCGP	4	4	4	4	4	-	-	4	-
542	0.000	DAI LI	CCRCGP	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5
579	0.006	YANGYANG	CCRCGP	6	6	6	6	6	6	6	6	4
582	0.015	RONG RONG	CCRCGP	4	4	4	4	4	4	4	4	4
592	0.024	LAN ZI	CCRCGP	6	4	4	2	4	4	4	4	2
595	0.020	TAI SHAN	CCRCGP	4	4	4	4	4	4	3	4	4
609	0.014	HUI HUI	CCRCGP	4	4	6	4	4	-	4	4	3
619	0.027	WEI WEI	CCRCGP	4	4	4	4	-	4	4	4	4
623	0.008	BAI YANG	CCRCGP	6	4	4	4	4	4	4	6	4
661	0.005	YI BAO	CCRCGP	6	6	6	6	6	6	6	6	4
668	0.024	HUA LONG	CCRCGP	4	4	4	4	4	4	4	4	-
669	0.024	HUA AO	CCRCGP	4	4	4	4	4	4	4	4	-
674	0.018	XIANG GE	CCRCGP	4	3	3	3	3	4	3	4	3
719	0.021	AN AN	CCRCGP	4	3	3	2	4	3	3	4	2
747	0.025	XIANG LU	CCRCGP	4	4	4	4	4	4	4	4	-
748	0.016	XIANG LIN	CCRCGP	4	4	3	3	4	4	-	4	3
751	0.026	SHEN WEI	CCRCGP	4	4	4	4	4	4	4	4	4
752	0.013	ZI YAN	CCRCGP	4	4	4	4	4	4	-	4	3
758	0.025	LU LIN	CCRCGP	4	4	4	4	4	4	4	4	-
775	0.016	AO AO	CCRCGP	4	4	3	3	4	4	4	4	3
789	0.021	FU HU	CCRCGP	4	4	4	4	4	4	3	4	4
865	0.007	HUA HU	CCRCGP	6	6	4	4	6	6	6	6	4
886	0.006	HUA YANG	CCRCGP	6	6	6	4	6	6	6	6	4
887	0.021	FU BAO	CCRCGP	4	4	4	4	4	4	3	4	4
890	0.027	GONG GONG	CCRCGP	4	4	4	4	4	6	4	4	-
902	0.025	SHUN SHUN	CCRCGP	4	6	4	4	4	4	4	4	-
905	0.010	SEN SEN	CCRCGP	4	4	4	4	4	4	4	-	4
989	0.000	ZI JIN	CCRCGP	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5
857	0.024	CHENG SHU	CHANGSHA	4	4	6	4	4	4	4	4	2
858	0.024	CHENG DUI	CHANGSHA	4	4	6	4	4	4	4	4	2
520	0.021	BINGDIAN	CHENGDU	-	3	2	2	3	3	3	4	2
342	0.007	XIAO PINGPI	CHENPANDA	6	6	4	4	6	6	6	6	4

For 2019 Breeding Season			Females >	453	549	565	587	864	877	880	600	760
Notes			MK	0.028	0.025	0.024	0.023	0.026	0.026	0.025	0.027	0.021
			Name	DA SHUANG	ZHU YUN	XIN YUE	YUAN YUAN	YUAN ZAI	XI LE	XING AN	XIAN NU	YAO XIN
Males V	**MK**	**Name**	**Location**	SUZHOU W	TAIHU EP	TAIHU EP	TAIPEI	TAIPEI	TIANJIN	TIANMUHU	TOKYOUENO	WENLING S
532	0.024	FUFU	CHENPANDA	4	6	-	4	4	6	4	4	4
614	0.027	XINGBING	CHENPANDA	4	4	4	4	4	4	4	4	4
624	0.007	QIAO QIAO	CHENPANDA	6	4	4	4	6	6	6	6	4
649	0.026	MEI LAN	CHENPANDA	4	4	4	4	4	4	4	4	4
703	0.001	ABAO	CHENPANDA	6	6	6	6	6	6	6	6	6
711	0.015	GONG ZI	CHENPANDA	4	4	4	4	4	4	4	4	3
724	0.016	YING YING	CHENPANDA	4	4	3	3	4	4	4	4	3
731	0.022	XI LAN	CHENPANDA	4	2	2	2	4	4	3	4	2
788	0.013	YUAN LIN	CHENPANDA	4	4	4	4	4	4	4	4	3
792	0.024	DE DE	CHENPANDA	6	4	4	2	4	4	4	4	2
831	0.001	LONG LONG	CHENPANDA	6	6	6	6	6	6	6	6	6
839	0.028	AOLIAO	CHENPANDA	5	4	4	4	4	4	4	4	4
510	0.018	CHUANGCHU	CHIANGMAI	4	3	3	6	4	3	4	6	4
513	0.027	LIANG LIANG	CHONGQING	4	-	4	4	4	4	4	-	4
518	0.023	LONG SHEN	DAFENG	4	-	4	4	4	4	4	4	4
742	0.028	YUN YUN	DEQING	4	4	4	4	4	6	4	4	4
564	0.024	YANGGUANG	EDINBURGH	4	4	-	4	4	6	4	4	4
454	0.026	XIAO SHUAN	FUCHOW	-	4	4	4	4	4	4	4	4
538	0.027	LIN YANG	FUCHOW	4	4	6	4	4	4	4	4	4
515	0.026	LIANGLIANG	HEFEI W	-	4	4	4	4	4	4	4	4
573	0.027	LONGBING	HUAIAN	4	4	4	4	4	4	4	4	4
793	0.024	A BAO	HUAIAN	6	4	4	2	4	4	4	4	2
830	0.018	YUN TAO	HUAYING	4	4	4	4	4	4	3	4	4
639	0.027	FU WA	KUALA LUM	4	6	4	4	4	4	4	4	-
906	0.024	XING BAO	KUEIYANG	6	4	4	2	4	4	4	4	2
685	0.021	FU LONG	LANGZHONG	4	4	4	4	4	4	3	4	4
852	0.025	HAN HAN	LINYIZ	4	4	4	4	4	4	4	4	-
662	0.027	MINGBING	LIUCHOW	4	4	4	4	4	4	4	4	4
714	0.025	NING NING	LIUGONGDA	4	4	4	4	4	4	-	4	-
772	0.025	ZHAO YANG	LONGKOU	4	4	4	4	4	4	4	4	3
786	0.027	QING SHAN	LONGKOU	4	4	4	4	4	4	-	4	4
713	0.023	QIN CHUAN	LOUGUANTA	4	2	2	4	4	4	4	4	4
715	0.027	LELE	LOUGUANTA	6	4	4	4	4	4	4	4	4
802	0.000	QI ZAI	LOUGUANTA	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5
803	0.000	ER LANG	LOUGUANTA	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5
519	0.023	BINGXING	MADRID Z	-	4	2	2	4	4	4	4	2
466	0.019	LELE	MEMPHIS	3	3	3	3	4	3	3	3	2
589	0.027	MEI LING	NANCHANG	4	4	4	4	-	4	4	4	4
458	0.025	TIAN TIAN	NZP-WASH	4	4	-	4	4	4	4	4	4
745	0.025	XING HUI	PAIRI DAI	4	6	4	4	4	4	4	4	-
563	0.019	MEISHENG	PANYU	4	4	4	4	4	4	3	4	4
613	0.020	YOU YOU	PANYU	4	-	3	-	-	3	3	3	2
744	0.026	YIN KE	PANYU	4	4	6	4	4	-	4	4	-
874	0.024	HUA RONG	QINGSHEN	4	4	4	2	4	4	4	4	2
879	0.025	XING YA	RHENEN	4	4	4	4	4	4	-	4	4
415	0.004	GAOGAO	SANDIEGOZ	6	6	6	6	6	6	6	6	4

For 2019 Breeding Season			Females >	453	549	565	587	864	877	880	600	760
Notes			MK	0.028	0.025	0.024	0.023	0.026	0.026	0.025	0.027	0.021
			Name	DA SHUANG	ZHU YUN	XIN YUE	YUAN YUAN	YUAN ZAI	XI LE	XING AN	XIAN NU	YAO XIN
Males V	**MK**	**Name**	**Location**	SUZHOU W	TAIHU EP	TAIHU EP	TAIPEI	TAIPEI	TIANJIN	TIANMUHU	TOKYOUENO	WENLING S
842	0.019	XIAO LIWU	SANDIEGOZ	4	4	4	4	4	4	3	4	4
721	0.027	AO YUN	SHENNONGJ	4	4	4	4	4	4	4	4	-
787	0.013	YUAN ZHOU	SHENZHEN	4	4	4	4	4	4	4	4	3
529	0.027	YA XIANG	SHIH CHIA	-	4	4	4	4	4	4	4	4
749	0.019	YUN ZI	SHIH CHIA	4	4	4	4	4	4	3	4	4
726	0.026	KAI KAI	SHIPAIWAN	4	4	4	4	4	4	4	4	4
690	0.024	WU JIE	SINGAPORE	4	4	4	4	4	4	4	4	4
607	0.021	XI WANG	TAIAN R	4	6	4	4	4	4	4	4	4
689	0.025	WU JUN	TAIAN R	4	4	4	4	4	4	4	4	4
588	0.027	TUAN TUAN	TAIPEI	4	4	4	4	-	4	4	4	4
770	0.024	ER XI	TSINANWAW	4	4	4	4	4	4	4	4	2
390	0.025	YONGMING	WAKAYAMA	4	4	4	4	4	4	-	4	3
530	0.027	YA GUANG	WENZHOU	-	4	4	4	4	4	4	4	4
599	0.027	XIAN ZI	XIXIAKOU	4	4	4	-	4	4	4	-	4
841	0.026	YUAN XIN	YONG IN	4	6	4	4	4	4	-	4	4
586	0.020	TONG TONG	YUANSHAN	4	4	-	4	4	6	3	4	4

For 2019 Breeding Season			Females >	869
Notes			MK	0.025
			Name	HUA NI
Males V	MK	Name	Location	YONG IN
327	0.001	AN AN	ABERDE HK	3.5
606	0.019	LE LE	ABERDE HK	3
620	0.020	WANG WAN	ADELAIDE	3
867	0.026	HUA BAO	AHTARI	4
536	0.025	XIAO JIAO	ANJI BAMB	4
575	0.026	QING ZAI	ANJI BAMB	4
461	0.020	YANG YANG	ATLANTA	3
746	0.025	XING RUI	BAOX ECTR	-
736	0.023	YUAN ZI	BEAUVAL	4
496	0.027	GU GU	BEIJING	4
769	0.020	JIAO QING	BERLINZOO	4
778	0.024	CAI TAO	BOGOR	4
488	0.024	YUAN YUAN	CCRCGP	4
502	0.024	WU GANG	CCRCGP	-
503	0.026	LU LU	CCRCGP	-
542	0.000	DAI LI	CCRCGP	3.5
579	0.006	YANGYANG	CCRCGP	6
582	0.015	RONG RONG	CCRCGP	4
592	0.024	LAN ZI	CCRCGP	4
595	0.020	TAI SHAN	CCRCGP	4
609	0.014	HUI HUI	CCRCGP	4
619	0.027	WEI WEI	CCRCGP	4
623	0.008	BAI YANG	CCRCGP	4
661	0.005	YI BAO	CCRCGP	6
668	0.024	HUA LONG	CCRCGP	-
669	0.024	HUA AO	CCRCGP	-
674	0.018	XIANG GE	CCRCGP	4
719	0.021	AN AN	CCRCGP	3
747	0.025	XIANG LU	CCRCGP	-
748	0.016	XIANG LIN	CCRCGP	4
751	0.026	SHEN WEI	CCRCGP	4
752	0.013	ZI YAN	CCRCGP	4
758	0.025	LU LIN	CCRCGP	-
775	0.016	AO AO	CCRCGP	4
789	0.021	FU HU	CCRCGP	4
865	0.007	HUA HU	CCRCGP	6
886	0.006	HUA YANG	CCRCGP	6
887	0.021	FU BAO	CCRCGP	4
890	0.027	GONG GONG	CCRCGP	-
902	0.025	SHUN SHUN	CCRCGP	-
905	0.010	SEN SEN	CCRCGP	4
989	0.000	ZI JIN	CCRCGP	3.5
857	0.024	CHENG SHU	CHANGSHA	4
858	0.024	CHENG DUI	CHANGSHA	4
520	0.021	BINGDIAN	CHENGDU	3
342	0.007	XIAO PINGPI	CHENPANDA	6

For 2019 Breeding Season			Females >	869
Notes			MK	0.025
			Name	HUA NI
Males V	MK	Name	Location	YONG IN
532	0.024	FUFU	CHENPANDA	4
614	0.027	XINGBING	CHENPANDA	4
624	0.007	QIAO QIAO	CHENPANDA	6
649	0.026	MEI LAN	CHENPANDA	4
703	0.001	ABAO	CHENPANDA	6
711	0.015	GONG ZI	CHENPANDA	4
724	0.016	YING YING	CHENPANDA	4
731	0.022	XI LAN	CHENPANDA	4
788	0.013	YUAN LIN	CHENPANDA	4
792	0.024	DE DE	CHENPANDA	4
831	0.001	LONG LONG	CHENPANDA	6
839	0.028	AOLIAO	CHENPANDA	4
510	0.018	CHUANGCHU	CHIANGMAI	3
513	0.027	LIANG LIANG	CHONGQING	4
518	0.023	LONG SHEN(	DAFENG	4
742	0.028	YUN YUN	DEQING	4
564	0.024	YANGGUANC	EDINBURGH	4
454	0.026	XIAO SHUAN	FUCHOW	4
538	0.027	LIN YANG	FUCHOW	4
515	0.026	LIANGLIANG	HEFEI W	4
573	0.027	LONGBING	HUAIAN	4
793	0.024	A BAO	HUAIAN	4
830	0.018	YUN TAO	HUAYING	3
639	0.027	FU WA	KUALA LUM	-
906	0.024	XING BAO	KUEIYANG	4
685	0.021	FU LONG	LANGZHONG	4
852	0.025	HAN HAN	LINYIZ	-
662	0.027	MINGBING	LIUCHOW	4
714	0.025	NING NING	LIUGONGDA	-
772	0.025	ZHAO YANG	LONGKOU	4
786	0.027	QING SHAN	LONGKOU	4
713	0.023	QIN CHUAN	LOUGUANTA	4
715	0.027	LELE	LOUGUANTA	4
802	0.000	QI ZAI	LOUGUANTA	3.5
803	0.000	ER LANG	LOUGUANTA	3.5
519	0.023	BINGXING	MADRID Z	4
466	0.019	LELE	MEMPHIS	3
589	0.027	MEI LING	NANCHANG	4
458	0.025	TIAN TIAN	NZP-WASH	4
745	0.025	XING HUI	PAIRI DAI	-
563	0.019	MEISHENG	PANYU	3
613	0.020	YOU YOU	PANYU	3
744	0.026	YIN KE	PANYU	-
874	0.024	HUA RONG	QINGSHEN	4
879	0.025	XING YA	RHENEN	4
415	0.004	GAOGAO	SANDIEGOZ	6

For 2019 Breeding Season			Females >	869
Notes			MK	0.025
			Name	HUA NI
Males V	MK	Name	Location	YONG IN
842	0.019	XIAO LIWU	SANDIEGOZ	3
721	0.027	AO YUN	SHENNONGJ	-
787	0.013	YUAN ZHOU	SHENZHEN	4
529	0.027	YA XIANG	SHIH CHIA	4
749	0.019	YUN ZI	SHIH CHIA	3
726	0.026	KAI KAI	SHIPAIWAN	4
690	0.024	WU JIE	SINGAPORE	4
607	0.021	XI WANG	TAIAN R	3
689	0.025	WU JUN	TAIAN R	4
588	0.027	TUAN TUAN	TAIPEI	4
770	0.024	ER XI	TSINANWAW	4
390	0.025	YONGMING	WAKAYAMA	4
530	0.027	YA GUANG	WENZHOU	4
599	0.027	XIAN ZI	XIXIAKOU	4
841	0.026	YUAN XIN	YONG IN	4
586	0.020	TONG TONG	YUANSHAN	3