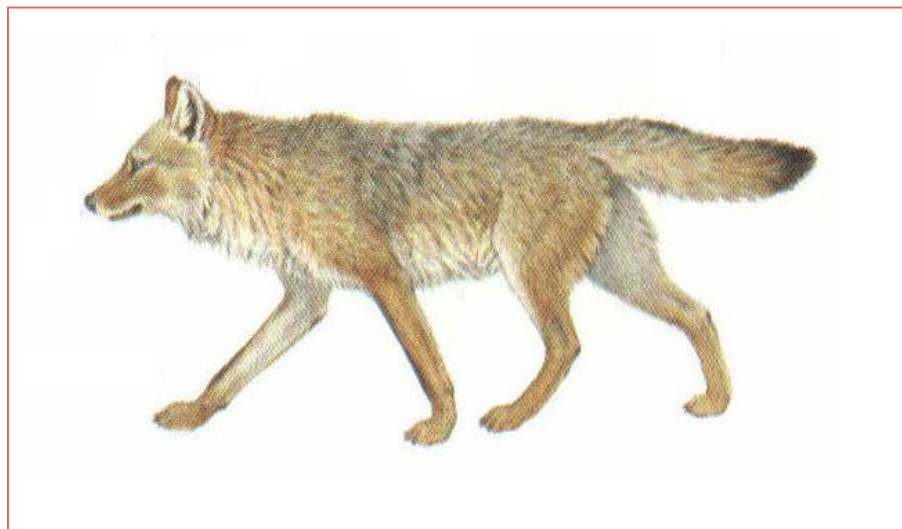


Population Analysis and Breeding and Transfer Plan

Red Wolf (*Canis rufus gregoryi*) AZA Species Survival Plan[®] Program



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Executive Summary

Red Wolf (*Canis rufus gregoryi*) SSP

The population of red wolves in zoos and nature centers consists of 178 (73 males, 105 females, 0 unknown sex) animals at 40 participating institutions (28 AZA, 12 non-AZA) as of July 2010. The population has been growing steadily in captivity since the managed breeding program was established in the early 1970s, with a slight decline in numbers in recent years. The target population size set by the SSP and the Canid and Hyaenid Taxon Advisory Group in the 2007-2010 RCP is 200. While this target size represents a decrease from the previous RCP target size of 250, recruitment of additional institutions in the RWSSP will continue in order to address space needs and support population stability and genetic diversity.

Current gene diversity for the managed population is 89.40% and is equivalent to the genetic diversity of a population descended from approximately five founders (FGE = 4.72). As gene diversity decreases, it is expected that reproduction will be increasingly compromised by, among other factors, lower birth weights, smaller litter sizes, and greater neonatal mortality. Although inbreeding should be avoided in order to maintain a healthy population, it has become increasingly difficult to avoid since no additional founders exist. When setting up breeding pairs for this breeding and transfer plan, offspring inbreeding coefficients greater than the population mean kinship (0.1060) were avoided.

The Red Wolf Recovery Plan (USFWS) has set the target gene diversity to be retained at 80 – 85%. Under the current conditions, with a target size of 200 and a growth rate of 2%, gene diversity can be maintained at or above 85% for approximately 22 years and above 80% for approximately 60 years. Strategies that may help maintain a high level of gene diversity for a longer period of time include increasing the population growth rate and increasing the proportion of breeders in the population (effective population size).

DEMOGRAPHY

Current Population Size (at time of planning meeting)	178 (73.105.0)
Animals Excluded from Genetic Analyses	14
Population size following exclusions	164 (64.100)
Target Population Size	250
Number of Participating Institutions	40
Mean Generation Time (years)	5.71
Historic / Potential Population Growth Rate (lambda)	1.035 / 1.02

GENETICS

	<i>Current</i>	<i>Potential</i>
Number of Founders	12	0
Founder Genome Equivalents (FGE)	4.72	7.60
Gene Diversity (%GD)	89.40	93.42
Population Mean Kinship (MK)	0.1060	--
Mean Inbreeding Coefficient (F)	0.0702	--
Percent pedigree known before assumptions/exclusions	100	--
Percent pedigree known after assumptions/exclusions	--	--
Effective Population Size to Census Size Ratio (Ne/N)	0.2087	--
Years to 90% Gene Diversity	already < 90%	--
Years to 85% GD	22	--
Year to 10% Loss in GD	63	--
Gene Diversity at 100 Years From Present (%)	74	--
<i>(assuming $\lambda = 1.02$, $Kt = 250$)</i>		

For the next year, the SSP will try to simply offset deaths and maintain the population at its current size, which will require approximately 18 – 21 births (0% growth rate or lambda = 1.00). To grow the population at a rate of 2%, approximately 23 – 27 births per year would be necessary. The SSP recommends 30 breeding pairs to meet demographic and genetic goals, assuming an average litter size of four and taking into account that as few as 25% of pairs may successfully reproduce. As with most PMP and SSP populations, breeding recommendations are based on mean kinship values, avoidance of inbreeding, avoidance of linking rare and common lineages, and logistical constraints identified by the participating institutions.

Summary Actions 2010: *The SSP recommends 30 breeding pairs and 19 transfers to create new breeding pairs or meet institutional requests.*

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CHATT NAT Chattanooga Nature Center	14
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CHICAGOLP Lincoln Park Zoo	14
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Acknowledgements

The Red Wolf SSP planning meeting was hosted by the Henson Robinson Zoo in Springfield, Illinois, on 22nd and 23rd July 2010 and was attended by the following:

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Description of Population Status

Red Wolf (*Canis rufus gregoryi*) SSP

Introduction: Red wolves have been maintained in zoos and nature centers since the early 1970s, when the U.S. Fish and Wildlife Service began capturing individuals from the remaining wild population in Texas and Louisiana. At that time, a captive breeding program was established to increase the population size of red wolves and reestablish this federally endangered species in portions of its original range. The zoo population has been managed demographically and genetically with the cooperation of approved zoos and nature centers across the country.

The demographic and genetic analyses upon which this report is based were performed in July 2010 using PopLink 2.1 and PM2000 v1.213 software and data obtained from the International Red Wolf Studbook, current to 15 July 2010. Based on these analyses, draft breeding recommendations were made at the Red Wolf SSP Master Plan Meeting at the Henson Robinson Zoo in Springfield, Illinois on 22nd and 23rd July 2010.

Analytical Population: As of July 2010, the size of the red wolf zoo population in North America was 178 wolves (73 males, 105 females) distributed among 40 institutions (28 AZA, 12 approved non-AZA member participants). This includes facilities at two USFWS locations at the Alligator River NWR, NC, and Cape Romain NWR, SC. Of these 178 animals, 14 were excluded from the genetic analyses due to reasons outlined in Appendix C, resulting in a potential breeding population of 164 wolves. The pedigree of the population is 100% known. A target population size of 200 for this species was set by the Canid and Hyaenid TAG. While this target size represents a decrease from the previous RCP target size of 250, recruitment of additional institutions in the RWSSP will continue in order to address space needs and support population stability and genetic diversity.

Demography: The SSP has decided that at this time, due to a lack of available space, a growth rate of 0% is reasonable for this population to maintain a stable age structure.

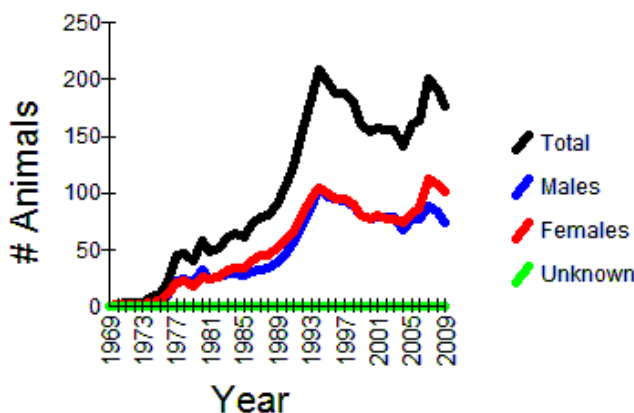


Figure 1. Census of the red wolf population in zoos and nature centers as of July 2010.

The red wolf population in zoos and nature centers increased steadily from the late 1970's to the mid 1990's, when the population size peaked and began to decline (Figure 1) as births sharply decreased due primarily to space limitations and the end of participation in the SSP by several cooperators. This resulted in fewer breeding recommendations and breeding prioritization of animals that, based on age, were considered marginal in terms of their reproductive potential. Additionally, space limitations during this time period required implanting reproductive inhibitors in a number of females which may have compromised their reproductive potential. When implants were removed to resume expanded reproduction in the population, this may have compromised their reproductive potential. In recent years, particularly in 2007, the population experienced a marked increase in size due in part to a focus on breeding younger animals and an increase in average litter size resulting in a more stable population the past decade. Despite the large number of births in 2007, a focus on maintaining at least a modest birth rate remains crucial to maintain the population size, replace the animals that will be lost due to natural attrition, and provide a reproductive base for the future.

The age structure of this population shows a large proportion of animals in the older age classes in addition to a large number of animals of peak reproductive age from the 2007 baby boom (Figures 2a and 2b). The

number of older animals that are reproductively senescent and no longer able to contribute to the genetic or demographic future of the population is an ongoing issue (Figure 2a). Demographic data indicate that the most reproductive age classes are between 3 and 9 years old. Both males and females are capable of breeding as young as one year old, but female red wolves in this SSP have not demonstrated the ability to reproduce reliably beyond the age of 11, and males not past 15 years (Appendix D). In order to achieve a sufficient number of births to maintain demographic stability, the inclusion of younger animals in breeding pairs should continue. First-year mortality for both sexes has averaged 38% historically (based on studbook data from 1980-2010); however, in recent years average first-year mortality has decreased dramatically to 32% for males and 25% for females. Litter size has been between 1 and 11 with the mean being 4 pups.

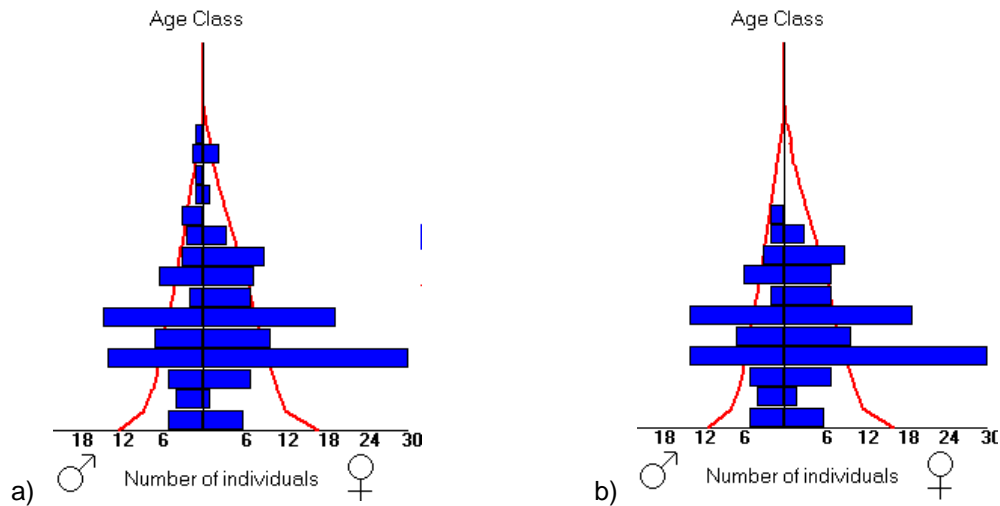


Figure 2. Age distributions of **a)** the entire SSP population of red wolves in zoos and nature centers as of July 2010 (no exclusions, N = 178 = 73.105); and **b)** the potentially breeding population of red wolves in zoos and nature centers as of July 2010 (N = 164 = 64.100).

Although the SSP target size is set at 200 (see Executive Summary), there is not sufficient space to grow to this population size and the number of participating institutions is not likely to increase significantly. To grow the population at a rate of 2%, approximately 23 – 27 births per year would be necessary. However for the next year, the SSP will try to simply offset deaths and maintain the population at its current size, which will require approximately 18 – 21 births (0% growth rate or $\lambda = 1.00$).

Genetics: Current gene diversity for the managed population is 89.40% and is equivalent to the genetic diversity of a population descended from approximately five founders ($FGE = 4.72$). Gene diversity has decreased slightly since last year and will inevitably continue to decrease over time due to random genetic processes, as offspring are produced and as previous generations pass away without passing on all of their alleles to the next generation. Data from other mammalian species has shown that when gene diversity falls below 90% and inbreeding increases, reproduction is increasingly compromised by, among other factors, lower birth weights, smaller litter sizes, and greater neonatal mortality. Recent research on red wolves has shown that higher inbreeding levels in males are correlated with reductions in sperm quality. Breeding success and litter size also appear to decrease with increased inbreeding levels of sires and dams (Lockyear 2006). Although inbreeding should be avoided in order to maintain a healthy population, it has become increasingly difficult to avoid since no additional founders exist. When setting up breeding pairs for this breeding and transfer plan, offspring inbreeding coefficients greater than the population mean kinship (0.1060) were avoided.

The Red Wolf Recovery Plan (USFWS) has set the target gene diversity to be retained at 80 – 85%. Under the current conditions, with a target size of 200 and a growth rate of 2%, gene diversity can be maintained at or above 85% for approximately 22 years and above 80% for approximately 60 years. Strategies that may help maintain a high level of gene diversity for a longer period of time include increasing the population growth rate, increasing the proportion of breeders in the population (effective population size), and prioritizing breeding pairs with low and similar mean kinship values.

Through the use of mean kinship to select breeding pairs, under-represented lineages can be increased and the loss of gene diversity can be minimized. Some measure of the success of careful genetic management in this population is visible in the change in founder representation over recent years. Founder representation changes with each birth and death, and changes from 2005 to 2010 have shown that some underrepresented founder lineages (16, 34, 42) have increased in the population in the past years. However, many of the over-represented founder lineages are linked to the underrepresented lineages, and efforts to equalize founder lineages may not be possible.

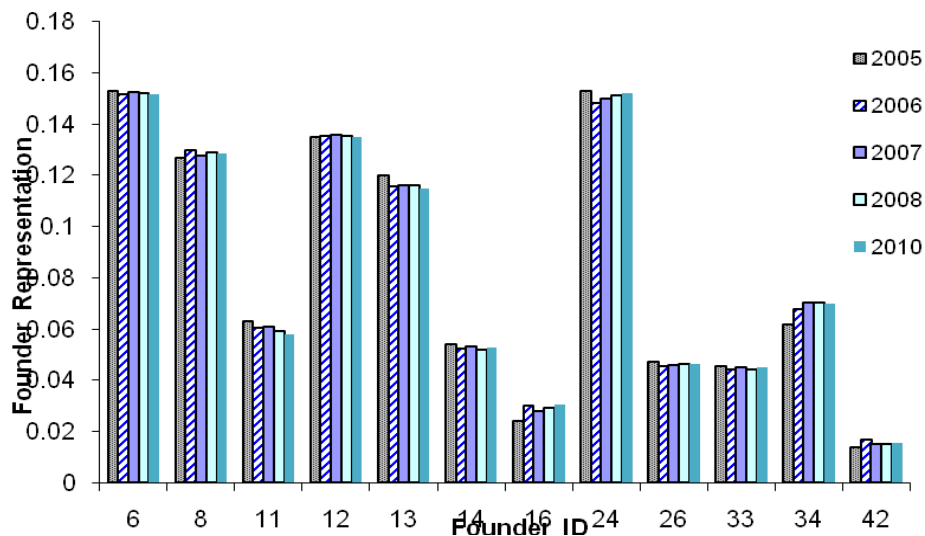


Figure 3. Founder representation graph illustrating the inequality of the 12 founder lineages that have contributed to the Red Wolf SSP zoo population and the differences in founder representation across years 2005 - 2010.

Genetics Summary of Red Wolf SSP	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010 Current	2010 Potential
Gene Diversity	90.4	90.4	90.4	90.3	90.3	89.84	89.65	89.52	89.50	89.42	89.4	93.42
Number of Founders	12	12	12	12	12	12	12	12	12	12	12	0
Founder Genome Equivalents	5.22	5.20	5.23	5.15	5.17	4.92	4.83	4.77	4.76	4.73	4.72	7.6
Founder Genome Surviving	8.34	8.25	8.31	8.12	--	7.89	7.80	7.65	7.64	7.61	7.6	7.6
Population Mean Kinship	0.0967	0.0961	0.096	0.0972	0.97	0.1016	0.1035	0.1048	0.0105	0.1058	0.106	--
Mean Inbreeding	0.0537	0.0546	0.0542	0.0562	0.0569	0.0625	0.0630	0.0670	0.0682	0.0693	0.0702	--
Ne/N (effective population size / actual population size)	--	--	--	--	--	0.2746	0.2872	0.242	0.242	0.17	0.2087	--
% Known Pedigree	100	100	100	100	100	100	100	100	100	100	100	--
Years To 90% Gene Diversity	0	0	0	0	0	0	0	0	0	0	0	--
Years To 85% Gene Diversity	--	--	--	--	--	--	--	--	25	16	22	--
Years to 10% Loss in GD	--	--	--	--	--	--	--	--	--	44	63	--
Gene Diversity at 100 Years	70.92	72.03	74.71	75.12	76	77.8	77.8	77.75	75.13	68.23	74.1	--

For 2009: lambda = 1.02, target size = 200. For 2010: lambda = 1.02, target size = 200.

Please note that projections across years may not be comparable due to different target sizes used.

Management Strategy: To grow the population at a rate of 2%, approximately 23 – 27 births per year would be necessary. However for the next year, the SSP will try to simply offset deaths and maintain the population at its current size, which will require approximately 18 – 21 births (0% growth rate or $\lambda = 1.00$). The SSP recommends 30 breeding pairs to meet demographic and genetic goals, assuming a litter size of four and taking into account that as few as 25% of pairs may successfully reproduce. Adjustments in recommended pairings or transfers may occur prior to next breeding season pending available space, assessment of individual medical cases and transfer logistics. One pairing was made (MANTEO, Sandy Ridge) to accommodate potential captive to wild fostering in the northeastern North Carolina recovery area, with an additional pairing possible at the discretion of USFWS field biologists. During the whelping season, coordination with the field team will occur to identify potential placement of pups from the RWSSP to wild litters when and where feasible. As with most PMP and SSP populations, breeding recommendations are based on mean kinship values, avoidance of inbreeding, avoidance of linking rare and common lineages, and logistical constraints identified by the participating institutions.

Summary and institutional tables in the following pages contain draft recommendations.

1. Recommend 30 breeding pairs.
2. Recommend 19 transfers to create new breeding pairs and meet institutional requests.
3. The AZA Wildlife Contraception Center is working closely with the Red Wolf SSP to develop safe and effective contraception recommendations. The current contraceptive recommendation for female Red Wolves that receive a 'Do Not Breed' request from the SSP and can NOT be separated from a male should receive two, 6-month formulation implants (4.7mg) of Suprelorin® (deslorelin) prior to the breeding season. Females should be implanted mid October to early November to ensure they go through the stimulation phase while the male is still infertile. To prevent ovulation and pseudo-pregnancy, it is strongly recommended these females also receive oral megestrol acetate (Ovaban) at a dose of 2-4mg/kg SID 7 days before implant, on the day of implant, and 7 days after deslorelin placement (total of 15 days). If this regimen is not possible, the female should be monitored closely for pseudo-pregnancy and potential signs of reproductive health (e.g. pyometra). Ordering information and questions can be directed to Sally Boutelle, AZA Wildlife Contraception Center. Phone: 314-646-4595. E-mail: contraception@stlzoo.org

Summary of Breeding and Transfer Recommendations 2010 – 2011

Sorted by Studbook ID

ID	Location	Sex	Age	Disposition	Location	Breeding	With	Notes
816	SALIS NC	M	14	HOLD	SALIS NC	DO NOT BREED		excluded
918	COAL VAL	s	13	HOLD	COAL VAL	DO NOT BREED		excluded
919	CHEHAW	F	13	HOLD	CHEHAW	DO NOT BREED		excluded
938	TACOMA	F	13	HOLD	TACOMA	DO NOT BREED		excluded
939	TACOMA	M	13	HOLD	TACOMA	DO NOT BREED		excluded
953	WNCNATCTR	M	12	HOLD	WNCNATCTR	DO NOT BREED		excluded
957	WSC MN	M	12	HOLD	WSC MN	DO NOT BREED		excluded
983	WNCNATCTR	F	12	HOLD	WNCNATCTR	DO NOT BREED		excluded
1009	TACOMA	s	11	HOLD	TACOMA	DO NOT BREED		excluded
1020	BREVARD	s	11	HOLD	BREVARD	DO NOT BREED		excluded
1091	FOSSILRIM	M	10	HOLD	FOSSILRIM	BREED WITH	1363	
1095	TACOMA	M	10	HOLD	TACOMA	BREED WITH	1224	
1097	PROVIDNCE	M	10	HOLD	PROVIDNCE	SEE NOTES		Excluded; see notes at institution table
1121	ASHEBORO	M	9	HOLD	ASHEBORO	BREED WITH	1366	
1122	CHICAGOLP	M	9	HOLD	CHICAGOLP	DO NOT BREED		
1124	ASHEBORO	s	9	HOLD	ASHEBORO	DO NOT BREED		excluded
1126	SALISBURY	F	9	HOLD	SALISBURY	DO NOT BREED		
1127	BRIDGEPRT	F	9	HOLD	BRIDGEPRT	DO NOT BREED		
1129	JACKSON	F	9	HOLD	JACKSON	BREED WITH	1400	
1194	ASHEBORO	M	8	HOLD	ASHEBORO	DO NOT BREED		
1195	SALIS NC	F	8	HOLD	SALIS NC	DO NOT BREED		
1196	OKLAHOMA	F	8	HOLD	OKLAHOMA	DO NOT BREED		
1197	ASHEBORO	F	8	HOLD	ASHEBORO	DO NOT BREED		
1200	MANTEO	M	8	HOLD	MANTEO	SEE NOTES		See notes at institution table
1201	GOLDENPND	M	8	HOLD	GOLDENPND	DO NOT BREED		
1203	ALEXANDRI	F	8	HOLD	ALEXANDRI	DO NOT BREED		
1204	SPRINGFIE	F	8	HOLD	SPRINGFIE	DO NOT BREED		
1224	TACOMA	F	8	HOLD	TACOMA	BREED WITH	1095	
1225	WSC MN	F	8	HOLD	WSC MN	BREED WITH	1401	
1227	DURHAM MS	F	8	SEND TO	ASHEBORO	BREED WITH	1605	breed w/ 1605 or 1606
1228	TACOMA	F	8	HOLD	TACOMA	BREED WITH	1277	
1273	VA MUSEUM	M	7	HOLD	VA MUSEUM	DO NOT BREED		
1274	LOWRY	F	7	SEND TO	CHEHAW	DO NOT BREED		See institutional notes
1275	CHATT NAT	F	7	HOLD	CHATT NAT	BREED WITH	1610	
1276	MANTEO	F	7	HOLD	MANTEO	SEE NOTES		See notes at institution table
1277	TACOMA	M	7	HOLD	TACOMA	BREED WITH	1228	
1278	TACOMA	M	7	HOLD	TACOMA	BREED WITH	1492	
1279	TACOMA	M	7	HOLD	TACOMA	DO NOT BREED		
1280	TACOMA	F	7	HOLD	TACOMA	DO NOT BREED		
1281	TACOMA	F	7	HOLD	TACOMA	DO NOT BREED		
1284	TACOMA	M	7	HOLD	TACOMA	BREED WITH	1385	
1286	TACOMA	M	7	HOLD	TACOMA	BREED WITH	1416	
1287	PROVIDNCE	F	7	SEND TO	DURHAM MS	BREED WITH	1369	
1291	NYWOLF	F	7	HOLD	NYWOLF	BREED WITH	1587	
1292	AWENDA	s	7	HOLD	AWENDA	DO NOT BREED		excluded
1353	CHICAGOLP	F	6	HOLD	CHICAGOLP	DO NOT BREED		
1359	TALLAHASE	M	6	HOLD	TALLAHASE	DO NOT BREED		
1360	KNOXVILLE	F	6	HOLD	KNOXVILLE	DO NOT BREED		
1361	BREVARD	F	6	HOLD	BREVARD	DO NOT BREED		
1363	FOSSILRIM	F	6	HOLD	FOSSILRIM	BREED WITH	1091	
1364	TACOMA	F	6	HOLD	TACOMA	DO NOT BREED		See notes at institutional table
1366	ASHEBORO	F	6	HOLD	ASHEBORO	BREED WITH	1121	
1369	DURHAM MS	M	6	HOLD	DURHAM MS	BREED WITH	1287	

ID	Location	Sex	Age	Disposition	Location	Breeding	With	Notes
1370	CHATT NAT	F	6	HOLD	CHATT NAT	BREED WITH	1408	
1375	LOWRY	M	5	SEND TO	TALLAHASE	DO NOT BREED		
1376	JACKSONVL	F	5	HOLD	JACKSONVL	DO NOT BREED		
1377	AWENDA	F	5	HOLD	AWENDA	DO NOT BREED		
1378	TALLAHASE	F	5	HOLD	TALLAHASE	DO NOT BREED		
1379	SYRACUSE	M	5	HOLD	SYRACUSE	BREED WITH	1398	
1380	TREVOR	s	5	HOLD	TREVOR	DO NOT BREED		excluded
1381	TACOMA	M	5	HOLD	TACOMA	BREED WITH	1496	
1382	TACOMA	F	5	HOLD	TACOMA	BREED WITH	1490	
1385	TACOMA	F	5	HOLD	TACOMA	BREED WITH	1284	
1386	FRESNO	M	5	HOLD	FRESNO	BREED WITH	1619	
1388	GREENBAY	F	5	HOLD	GREENBAY	BREED WITH	1464	
1390	JACKSONVL	M	5	HOLD	JACKSONVL	DO NOT BREED		
1392	ASHEBORO	F	5	HOLD	ASHEBORO	DO NOT BREED		
1393	ASHEBORO	F	5	HOLD	ASHEBORO	DO NOT BREED		
1394	MILL MOUN	M	5	HOLD	MILL MOUN	DO NOT BREED		
1395	KNOXVILLE	M	5	HOLD	KNOXVILLE	DO NOT BREED		
1396	MANTEO	F	5	HOLD	MANTEO	BREED WITH	1606	receive and breed 1605 or 1606
1397	NYWOLF	F	5	HOLD	NYWOLF	BREED WITH	1483	
1398	SYRACUSE	F	5	HOLD	SYRACUSE	BREED WITH	1379	
1400	JACKSON	M	5	HOLD	JACKSON	BREED WITH	1129	
1401	WSC MN	M	5	HOLD	WSC MN	BREED WITH	1225	
1402	WSC MN	M	5	SEND TO	WC SRC	BREED WITH	1593	
1403	AWENDA	F	5	HOLD	AWENDA	BREED WITH	1718	
1404	MANTEO	F	5	SEND TO	ASHEBORO	DO NOT BREED		possible future breeding. See institutional notes
1405	WOLFHAVEN	M	5	HOLD	WOLFHAVEN	BREED WITH	1485	
1406	TACOMA	F	5	HOLD	TACOMA	DO NOT BREED		
1407	TACOMA	F	5	HOLD	TACOMA	DO NOT BREED		
1408	CHATT NAT	M	5	HOLD	CHATT NAT	BREED WITH	1370	
1409	COAL VAL	F	5	HOLD	COAL VAL	DO NOT BREED		
1410	COAL VAL	F	5	HOLD	COAL VAL	DO NOT BREED		
1414	BLOOMINGT	M	5	HOLD	BLOOMINGT	BREED WITH	1722	
1415	TACOMA	F	5	HOLD	TACOMA	BREED WITH	1491	
1416	TACOMA	F	5	HOLD	TACOMA	BREED WITH	1286	
1460	LOWRY	M	5	HOLD	LOWRY	BREED WITH	1563	
1464	GREENBAY	M	4	HOLD	GREENBAY	BREED WITH	1388	
1467	SIoux FAL	M	4	HOLD	SIoux FAL	BREED WITH	1723	
1468	TACOMA	M	4	HOLD	TACOMA	BREED WITH	1495	
1473	MANTEO	F	4	HOLD	MANTEO	DO NOT BREED		
1479	TREVOR	F	4	HOLD	TREVOR	DO NOT BREED		
1480	WOLFHAVEN	F	4	HOLD	WOLFHAVEN	DO NOT BREED		Contracept
1482	TACOMA	M	4	SEND TO	WOLFHAVEN	DO NOT BREED		See notes at institutional table
1483	NYWOLF	M	4	HOLD	NYWOLF	BREED WITH	1397	
1485	TACOMA	F	4	SEND TO	WOLFHAVEN	BREED WITH	1405	Or send 1487 or 1488 instead
1487	TACOMA	F	4	HOLD	TACOMA	DO NOT BREED		
1488	TACOMA	F	4	HOLD	TACOMA	DO NOT BREED		
1489	TACOMA	F	4	HOLD	TACOMA	DO NOT BREED		
1490	TACOMA	M	4	HOLD	TACOMA	BREED WITH	1382	
1491	TACOMA	M	4	HOLD	TACOMA	BREED WITH	1415	
1492	TACOMA	F	4	HOLD	TACOMA	BREED WITH	1278	
1495	TACOMA	F	4	HOLD	TACOMA	BREED WITH	1468	
1496	TACOMA	F	4	HOLD	TACOMA	BREED WITH	1381	
1563	LOWRY	F	3	HOLD	LOWRY	BREED WITH	1460	
1564	CHEHAW	F	3	HOLD	CHEHAW	BREED WITH	1604	
1566	CHATT NAT	M	3	HOLD	CHATT NAT	DO NOT BREED		
1567	CHATT NAT	M	3	HOLD	CHATT NAT	DO NOT BREED		

ID	Location	Sex	Age	Disposition	Location	Breeding	With	Notes
1568	GOLDENPND	F	3	SEND TO	SIOUX FAL	DO NOT BREED		See institutional notes
1569	GOLDENPND	F	3	SEND TO	SIOUX FAL	DO NOT BREED		See institutional notes
1574	TALLAHASE	F	3	HOLD	TALLAHASE	DO NOT BREED		
1575	SALIS NC	F	3	HOLD	SALIS NC	DO NOT BREED		
1576	SALIS NC	F	3	HOLD	SALIS NC	DO NOT BREED		
1580	FORTWORTH	M	3	HOLD	FORTWORTH	DO NOT BREED		
1581	FORTWORTH	M	3	HOLD	FORTWORTH	DO NOT BREED		
1582	FOSSILRIM	F	3	HOLD	FOSSILRIM	DO NOT BREED		
1583	VICTOR TX	F	3	HOLD	VICTOR TX	DO NOT BREED		
1584	VICTOR TX	F	3	HOLD	VICTOR TX	DO NOT BREED		
1585	VICTOR TX	F	3	HOLD	VICTOR TX	DO NOT BREED		
1586	FOSSILRIM	F	3	HOLD	FOSSILRIM	DO NOT BREED		
1587	NYWOLF	M	3	HOLD	NYWOLF	BREED WITH	1291	
1589	TACOMA	F	3	HOLD	TACOMA	DO NOT BREED		
1590	TACOMA	F	3	HOLD	TACOMA	DO NOT BREED		
1591	TACOMA	F	3	HOLD	TACOMA	DO NOT BREED		
1593	WCSRC	F	3	HOLD	WCSRC	BREED WITH	1402	
1595	VA MUSEUM	M	3	HOLD	VA MUSEUM	DO NOT BREED		
1596	VA MUSEUM	M	3	HOLD	VA MUSEUM	DO NOT BREED		
1598	MANTEO	F	3	HOLD	MANTEO	DO NOT BREED		
1599	MANTEO	F	3	HOLD	MANTEO	DO NOT BREED		
1600	MANTEO	F	3	HOLD	MANTEO	DO NOT BREED		
1602	TACOMA	F	3	HOLD	TACOMA	DO NOT BREED		
1603	TACOMA	F	3	HOLD	TACOMA	DO NOT BREED		
1604	CHEHAW	M	3	HOLD	CHEHAW	BREED WITH	1564	
1605	ASHEBORO	M	3	HOLD	ASHEBORO	BREED WITH	1227	hold male 1605 or 1606
1606	ASHEBORO	M	3	SEND TO	MANTEO	BREED WITH	1396	send male 1605 or 1606
1607	SPRINGFIE	F	3	HOLD	SPRINGFIE	DO NOT BREED		
1608	SPRINGFIE	F	3	HOLD	SPRINGFIE	DO NOT BREED		
1609	WSC MN	M	3	HOLD	WSC MN	DO NOT BREED		
1610	SIOUX FAL	M	3	SEND TO	CHATT NAT	BREED WITH	1275	
1611	WSC MN	M	3	HOLD	WSC MN	DO NOT BREED		
1612	GOLDENPND	F	3	HOLD	GOLDENPND	DO NOT BREED		
1613	BRIDGEPRT	F	3	SEE NOTES		DO NOT BREED		send any one of three female sibs to Providence; see additional notes at Providence table
1614	BRIDGEPRT	F	3	SEE NOTES		DO NOT BREED		see notes at Providence table
1615	BRIDGEPRT	F	3	SEE NOTES		DO NOT BREED		see notes at Providence table
1619	FRESNO	F	3	HOLD	FRESNO	BREED WITH	1386	
1651	ALEXANDRI	F	3	HOLD	ALEXANDRI	DO NOT BREED		
1652	OKLAHOMA	M	3	HOLD	OKLAHOMA	DO NOT BREED		
1653	MILL MOUN	F	3	HOLD	MILL MOUN	DO NOT BREED		
1712	HOMOSASSA	M	2	HOLD	HOMOSASSA	DO NOT BREED		
1713	HOMOSASSA	M	2	HOLD	HOMOSASSA	DO NOT BREED		
1714	HOMOSASSA	M	2	HOLD	HOMOSASSA	DO NOT BREED		
1715	BREVARD	F	2	HOLD	BREVARD	DO NOT BREED		
1716	BREVARD	F	2	HOLD	BREVARD	DO NOT BREED		
1717	CHEHAW	M	2	HOLD	CHEHAW	DO NOT BREED		
1718	AWENDA	M	2	HOLD	AWENDA	BREED WITH	1403	
1719	SALISBURY	F	2	HOLD	SALISBURY	DO NOT BREED		
1720	SALISBURY	F	2	HOLD	SALISBURY	DO NOT BREED		
1721	SALISBURY	F	2	HOLD	SALISBURY	DO NOT BREED		
1722	BLOOMINGT	F	2	HOLD	BLOOMINGT	BREED WITH	1414	
1723	SIOUX FAL	F	2	HOLD	SIOUX FAL	BREED WITH	1467	

ID	Location	Sex	Age	Disposition	Location	Breeding	With	Notes
1731	CHATT NAT	M	1	SEND TO	MANTEO	DO NOT BREED		
1732	CHATT NAT	M	1	SEND TO	MANTEO	DO NOT BREED		
1734	MANTEO	F	1	SEND TO	WSC MN	DO NOT BREED		companion for 957. See institutional notes
1735	CHICAGOLP	M	1	SEND TO	WCSRC	DO NOT BREED		
1736	CHICAGOLP	M	1	SEND TO	WCSRC	DO NOT BREED		
1742	WNCNATCTR	F	1	HOLD	WNCNATCTR	DO NOT BREED		
1784	BLOOMINGT	M	0	HOLD	BLOOMINGT	DO NOT BREED		
1785	BLOOMINGT	F	0	HOLD	BLOOMINGT	DO NOT BREED		
1786	BLOOMINGT	F	0	HOLD	BLOOMINGT	DO NOT BREED		
1787	BLOOMINGT	F	0	HOLD	BLOOMINGT	DO NOT BREED		
1790	CHICAGOLP	M	0	SEND TO	WCSRC	DO NOT BREED		
1791	CHICAGOLP	M	0	SEND TO	WCSRC	DO NOT BREED		
1794	CHICAGOLP	F	0	HOLD	CHICAGOLP	DO NOT BREED		
1795	CHICAGOLP	F	0	HOLD	CHICAGOLP	DO NOT BREED		
1803	NYWOLF	M	0	HOLD	NYWOLF	DO NOT BREED		
1804	NYWOLF	M	0	HOLD	NYWOLF	DO NOT BREED		
1807	TACOMA	F	0	HOLD	TACOMA	DO NOT BREED		

ALEXANDRI

Alexandria Zoological Park
Alexandria, LA

Institutional Notes: **Maintain**

Transfer: None

Receive: None

ID	Local ID	Sex	Age	Disposition	Location	Breeding	With	Notes
1203	M00276	F	8	HOLD	ALEXANDRI	DO NOT BREED		
1651	M00291	F	3	HOLD	ALEXANDRI	DO NOT BREED		

No Change

ASHEBORO

North Carolina Zoological Park
Asheboro, NC

Institutional Notes:

Transfer: 1605 or 1606 to MANTEO

Receive: 1227 from DURHAM MS

1404 from MANTEO (Pending space)

ID	Local ID	Sex	Age	Disposition	Location	Breeding	With	Notes
1121	1782	M	9	HOLD	ASHEBORO	BREED WITH	1366	Existing pair
1124	1608	s	9	HOLD	ASHEBORO	DO NOT BREED		excluded from genetic analyses
1194	1676	M	8	HOLD	ASHEBORO	DO NOT BREED		
1197	1689	F	8	HOLD	ASHEBORO	DO NOT BREED		Contracept
1366	1654	F	6	HOLD	ASHEBORO	BREED WITH	1121	Existing pair
1392	1710	F	5	HOLD	ASHEBORO	DO NOT BREED		
1393	1711	F	5	HOLD	ASHEBORO	DO NOT BREED		
1605	1809	M	3	HOLD	ASHEBORO	BREED WITH	1227	hold male 1605 or 1606
1606	1810	M	3	SEND TO	MANTEO	BREED WITH	1396	send male 1605 or 1606
1227	04M08	F	8	RECEIVE FROM	DURHAM MS	BREED WITH	1605	breed w/ 1605 or 1606
1404	11404	F	5	RECEIVE FROM	MANTEO	DO NOT BREED		For possible future breeding next season. Move pending.

No Change – transfer of 1404F remains dependent upon health status of 1124m as relates to space to receive

AWENDA

Cape Romain Nat'l Wildlife Refuge
Awendaw, SC

Institutional Notes: **Maintain**

Transfer: None

Receive: None

ID	Local ID	Sex	Age	Disposition	Location	Breeding	With	Notes
1292	11292	s	7	HOLD	AWENDA	DO NOT BREED		excluded from genetic analyses
1377	11377	F	5	HOLD	AWENDA	DO NOT BREED		
1403	11403	F	5	HOLD	AWENDA	BREED WITH	1718	
1718	11718	M	2	HOLD	AWENDA	BREED WITH	1403	

No Change

BLOOMINGT**Miller Park Zoo**

Bloomington, IL

Institutional Notes: **Maintain breeding pair w/ 2010 pups****Transfer: None****Receive: None**

ID	Local ID	Sex	Age	Disposition	Location	Breeding	With	Notes
1414	MO7007	M	5	HOLD	BLOOMINGT	BREED WITH	1722	
1722	M09057	F	2	HOLD	BLOOMINGT	BREED WITH	1414	
1784	M10019	M	0	HOLD	BLOOMINGT	DO NOT BREED		
1785	M10020	F	0	HOLD	BLOOMINGT	DO NOT BREED		
1786	M10021	F	0	HOLD	BLOOMINGT	DO NOT BREED		
1787	M10022	F	0	HOLD	BLOOMINGT	DO NOT BREED		

No Change**BREVARD****Brevard Zoo**

Melbourne, FL

Institutional Notes: **Maintain****Transfer: None****Receive: None**

ID	Local ID	Sex	Age	Disposition	Location	Breeding	With	Notes
1020	24079	s	11	HOLD	BREVARD	DO NOT BREED		excluded from genetic analyses
1361	27010	F	6	HOLD	BREVARD	DO NOT BREED		
1715	28033	F	2	HOLD	BREVARD	DO NOT BREED		
1716	28034	F	2	HOLD	BREVARD	DO NOT BREED		

No Change**BRIDGEPRT****Connecticut's Beardsley Zoo**

Bridgeport, CT

Institutional Notes:

Transfer: Send one of three female sibs to PROVIDNCE**Receive: None**

ID	Local ID	Sex	Age	Disposition	Location	Breeding	With	Notes
1127	101359	F	9	HOLD	BRIDGEPRT	DO NOT BREED		
1613	101822	F	3	SEE NOTES	SEE NOTES	DO NOT BREED		send any one female (1613, 1614, 1615) to PROVIDNCE to alleviate sibling aggression issues at BRIDGEPRT
1614	101825	F	3	SEE NOTES	SEE NOTES	DO NOT BREED		send any one female (1613, 1614, 1615) to PROVIDNCE to alleviate sibling aggression issues at BRIDGEPRT
1615	101826	F	3	SEE NOTES	SEE NOTES	DO NOT BREED		send any one female (1613, 1614, 1615) to PROVIDNCE to alleviate sibling aggression issues at BRIDGEPRT

No Change

CHATT NAT

Chattanooga Nature Center
Chattanooga, TN

Institutional Notes:

Transfer: 1731 and 1732 to MANTEO

Receive: 1610 from SIOUX FAL

ID	Local ID	Sex	Age	Disposition	Location	Breeding	With	Notes
1275	1275	F	7	HOLD	CHATT NAT	BREED WITH	1610	
1370	1370	F	6	HOLD	CHATT NAT	BREED WITH	1408	
1408	1408	M	5	HOLD	CHATT NAT	BREED WITH	1370	
1566	1566	M	3	HOLD	CHATT NAT	DO NOT BREED		Separate from dam
1567	1567	M	3	HOLD	CHATT NAT	DO NOT BREED		Separate from dam
1731	1731	M	1	SEND TO	MANTEO	DO NOT BREED		
1732	1732	M	1	SEND TO	MANTEO	DO NOT BREED		
1610	_____	M	3	RECEIVE FROM	SIOUX FAL	BREED WITH	1275	

No Change

CHEHAW

Chehaw Wild Animal Park
Albany, GA

Institutional Notes:

Transfer: None

Receive: 1274 from LOWRY (pending)

ID	Local ID	Sex	Age	Disposition	Location	Breeding	With	Notes
919	MO3009	F	13	HOLD	CHEHAW	DO NOT BREED		excluded from genetic analyses
1564	M1004	F	3	HOLD	CHEHAW	BREED WITH	1604	
1604	M1003	M	3	HOLD	CHEHAW	BREED WITH	1564	
1717	_____	M	2	HOLD	CHEHAW	DO NOT BREED		
1274	102264	F	7	RECEIVE FROM	LOWRY	DO NOT BREED		Institutional request to ID possible replacement female for 919 given age

No Change: Receiving 1274F from still pending, however current off-site location at LOWRY is being closed requiring female to be moved somewhere if CHEHAW not able to receive. Alternative location is being explored.

CHICAGOLP

Lincoln Park Zoological Gardens
Chicago, IL

Institutional Notes:

Transfer: 1735, 1736, 1791, and 1794 to WCSRC

Receive: None

ID	Local ID	Sex	Age	Disposition	Location	Breeding	With	Notes
1122	21600	M	9	HOLD	CHICAGOLP	DO NOT BREED		
1353	21456	F	6	HOLD	CHICAGOLP	DO NOT BREED		Separate or contracept TBD
1735	22290	M	1	SEND TO	WCSRC	DO NOT BREED		Move w/ 09 sib & 2010 males
1736	22291	M	1	SEND TO	WCSRC	DO NOT BREED		Move w/ 09 sib & 2010 males
1790	22474	M	0	SEND TO	WCSRC	DO NOT BREED		Move w/ 2010 sib & 09 males
1791	22475	M	0	SEND TO	WCSRC	DO NOT BREED		Move w/ 2010 sib & 09 males
1794	22478	F	0	HOLD	CHICAGOLP	DO NOT BREED		
1795	22479	F	0	HOLD	CHICAGOLP	DO NOT BREED		

No Change

COAL VAL**Niabi Zoo**

Coal Valley, IL

Institutional Notes: **Maintain****Transfer: None****Receive: None**

ID	Local ID	Sex	Age	Disposition	Location	Breeding	With	Notes
918	M2001	s	13	HOLD	COAL VAL	DO NOT BREED		excluded from genetic analyses
1409	M2002	F	5	HOLD	COAL VAL	DO NOT BREED		
1410	M2003	F	5	HOLD	COAL VAL	DO NOT BREED		

No Change**DURHAM MS****N C Museum of Life and Science**

Durham, NC

Institutional Notes:

Transfer: 1227 to ASHEBORO**Receive: 1287 from PROVIDNCE**

ID	Local ID	Sex	Age	Disposition	Location	Breeding	With	Notes
1227	04M08	F	8	SEND TO	ASHEBORO	BREED WITH	1605	breed w/ 1605 or 1606
1369	03M08	M	6	HOLD	DURHAM MS	BREED WITH	1287	
1287	100192	F	7	RECEIVE FROM	PROVIDNCE	BREED WITH	1369	

No Change**FORTWORTH****Fort Worth Zoological Park**

Ft Worth, TX

Institutional Notes: **Maintain****Transfer: None****Receive: None**

ID	Local ID	Sex	Age	Disposition	Location	Breeding	With	Notes
1580	205953	M	3	HOLD	FORTWORTH	DO NOT BREED		
1581	205954	M	3	HOLD	FORTWORTH	DO NOT BREED		

No Change**FOSSILRIM****Fossil Rim Wildlife Center**

Glen Rose, TX

Institutional Notes: **Maintain****Transfer: None****Receive: None**

ID	Local ID	Sex	Age	Disposition	Location	Breeding	With	Notes
1091	5053	M	10	HOLD	FOSSILRIM	BREED WITH	1363	
1363	5051	F	6	HOLD	FOSSILRIM	BREED WITH	1091	
1582	5058	F	3	HOLD	FOSSILRIM	DO NOT BREED		
1586	5062	F	3	HOLD	FOSSILRIM	DO NOT BREED		

No Change

FRESNO

Fresno Chaffee Zoo
Fresno, CA

Institutional Notes: **Maintain**

Transfer: None

Receive: None

ID	Local ID	Sex	Age	Disposition	Location	Breeding	With	Notes
1386	250024	M	5	HOLD	FRESNO	BREED WITH	1619	
1619	290255	F	3	HOLD	FRESNO	BREED WITH	1386	

No Change

GOLDENPND

Land Between the Lakes
Golden Pond, KY

Institutional Notes:

Transfer: 1568 & 1569 to SIOUX FAL

Receive: None

ID	Local ID	Sex	Age	Disposition	Location	Breeding	With	Notes
1201	1201	M	8	HOLD	GOLDENPND	DO NOT BREED		
1568	1568	F	3	SEND TO	SIOUX FAL	DO NOT BREED		
1569	1569	F	3	SEND TO	SIOUX FAL	DO NOT BREED		
1612	1612	F	3	HOLD	GOLDENPND	DO NOT BREED		Contracept

Addendum: Enclosure for two females recommended for transfer to SIOUX FAL is now designated for new species. Alternative location will have to be identified.

GREENBAY

NEW Zoo
Green Bay, WI

Institutional Notes: **Maintain**

Transfer: None

Receive: None

ID	Local ID	Sex	Age	Disposition	Location	Breeding	With	Notes
1388	200762	F	5	HOLD	GREENBAY	BREED WITH	1464	
1464	200744	M	4	HOLD	GREENBAY	BREED WITH	1388	

No Change

HOMOSASSA

Homosassa Springs Wildlife State Park
Homosassa, FL

Institutional Notes: **Maintain**

Transfer: None

Receive: None

ID	Local ID	Sex	Age	Disposition	Location	Breeding	With	Notes
1712	HS0823	M	2	HOLD	HOMOSASSA	DO NOT BREED		
1713	HS0821	M	2	HOLD	HOMOSASSA	DO NOT BREED		
1714	HS0822	M	2	HOLD	HOMOSASSA	DO NOT BREED		

No Change

JACKSON

Jackson Zoological Park
Jackson, MS

Institutional Notes: **Maintain**

Transfer: None

Receive: None

ID	Local ID	Sex	Age	Disposition	Location	Breeding	With	Notes
1129	200137	F	9	HOLD	JACKSON	BREED WITH	1400	
1400	200821	M	5	HOLD	JACKSON	BREED WITH	1129	

No Change

JACKSONVL

Jacksonville Zoo and Gardens
Jacksonville, FL

Institutional Notes: **Maintain**

Transfer: None

Receive: None

ID	Local ID	Sex	Age	Disposition	Location	Breeding	With	Notes
1376	808326	F	5	HOLD	JACKSONVL	DO NOT BREED		Contracept
1390	810312	M	5	HOLD	JACKSONVL	DO NOT BREED		

No Change

KNOXVILLE

Knoxville Zoological Gardens
Knoxville, TN

Institutional Notes: **Maintain**

Transfer: None

Receive: None

ID	Local ID	Sex	Age	Disposition	Location	Breeding	With	Notes
1360	3167	F	6	HOLD	KNOXVILLE	DO NOT BREED		
1395	4175	M	5	HOLD	KNOXVILLE	DO NOT BREED		

No Change

LOWRY

Tampa's Lowry Park Zoo
Tampa, FL

Institutional Notes:

Transfer: 1274 to CHEHAW (Pending)

1375 to TALLAHASE

Receive: None

ID	Local ID	Sex	Age	Disposition	Location	Breeding	With	Notes
1274	102264	F	7	SEND TO	CHEHAW	DO NOT BREED		[See CHEHAW table]
1375	102291	M	5	SEND TO	TALLAHASE	DO NOT BREED		
1460	102082	M	5	HOLD	LOWRY	BREED WITH	1563	
1563	102334	F	3	HOLD	LOWRY	BREED WITH	1460	

No Change: Transfer of 1274F to CHEHAW still pending, however current off-site location at LOWRY is being closed requiring female to be moved somewhere if CHEHAW not able to receive. Alternative location is being explored.

MANTEO

Alligator River Nat'l Wldf Refuge

Manteo, NC

Institutional Notes:

Transfer: 1404 to ASHEBORO (Pending available space)
1734 to WSC MN

Receive: 1731 & 1732 from CHATT NAT
1605 or 1606 from ASHEBORO

ID	Local ID	Sex	Age	Disposition	Location	Breeding	With	Notes
1606	1810	M	3	RECEIVE FROM	ASHEBORO	BREED WITH	1396	send male 1605 or 1606
1731	1731	M	1	RECEIVE FROM	CHATT NAT	DO NOT BREED		
1732	1732	M	1	RECEIVE FROM	CHATT NAT	DO NOT BREED		
1200	11200	M	8	HOLD	MANTEO	SEE NOTES		Breed this pair at institutional discretion, for fostering
1276	11276	F	7	HOLD	MANTEO	SEE NOTES		
1396	11396	F	5	HOLD	MANTEO	BREED WITH	1606	receive and breed 1605 or 1606
1404	11404	F	5	SEND TO	ASHEBORO	DO NOT BREED		for future breeding
1473	11473	F	4	HOLD	MANTEO	DO NOT BREED		
1598	11598	F	3	HOLD	MANTEO	DO NOT BREED		
1599	11599	F	3	HOLD	MANTEO	DO NOT BREED		
1600	11600	F	3	HOLD	MANTEO	DO NOT BREED		
1734	11734	F	1	SEND TO	WSC MN	DO NOT BREED		companion for 957

Addendum: See ASHEBORO re: transfer of 1404F
Coordinator to explore possibility of MANTEO maintaining 1734F vs. transferring to WSC MN to allow potential transfer of 1274F at LOWRY to WSC MN (see LOWRY note).

MILL MOUN

Mill Mountain Zoo

Roanoke, VA

Institutional Notes: **Maintain****Transfer: None****Receive: None**

ID	Local ID	Sex	Age	Disposition	Location	Breeding	With	Notes
1394	582	M	5	HOLD	MILL MOUN	DO NOT BREED		
1653	10049	F	3	HOLD	MILL MOUN	DO NOT BREED		Contracept

No Change

NYWOLF**Wolf Conservation Center**

South Salem, NY

Institutional Notes: **Maintain****Transfer: None****Receive: None**

ID	Local ID	Sex	Age	Disposition	Location	Breeding	With	Notes
1291	1291	F	7	HOLD	NYWOLF	BREED WITH	1587	
1397	1397	F	5	HOLD	NYWOLF	BREED WITH	1483	Maintain w/ 2010 pups
1483	1483	M	4	HOLD	NYWOLF	BREED WITH	1397	Maintain w/ 2010 pups
1587	1587	M	3	HOLD	NYWOLF	BREED WITH	1291	
1803	1803	M	0	HOLD	NYWOLF	DO NOT BREED		
1804	1804	M	0	HOLD	NYWOLF	DO NOT BREED		

No Change**OKLAHOMA****Oklahoma City Zoological Park**

Oklahoma City, OK

Institutional Notes: **Maintain****Transfer: None****Receive: None**

ID	Local ID	Sex	Age	Disposition	Location	Breeding	With	Notes
1196	770119	F	8	HOLD	OKLAHOMA	DO NOT BREED		Contracept
1652	770622	M	3	HOLD	OKLAHOMA	DO NOT BREED		

No Change**PROVIDNCE****Roger Williams Park Zoo**

Providence, RI

Institutional Notes:

Transfer: 1287 to DURHAM MS**Receive: One of three female siblings from BRIDFEPRT**

ID	Local ID	Sex	Age	Disposition	Location	Breeding	With	Notes
1613 or 1614 or 1615	101822, 101823, 101824	F	3	RECEIVE FROM	BRIDGEPRT	SEE NOTES		Male is excluded due to health and low likelihood of breeding; however if he does breed with BRIDGEPRT female, it is ok (do not contracept).
1097	100119	M	10	HOLD	PROVIDNCE	SEE NOTES		
1287	100192	F	7	SEND TO	DURHAM MS	BREED WITH	1369	

No Change

SALIS NC

Dan Nicholas Nature Center

Salisbury, NC

Institutional Notes: **Maintain****Transfer: None****Receive: None**

ID	Local ID	Sex	Age	Disposition	Location	Breeding	With	Notes
816	816	M	14	HOLD	SALIS NC	DO NOT BREED		excluded from genetic analyses
1195	1195	F	8	HOLD	SALIS NC	DO NOT BREED		
1575	1575	F	3	HOLD	SALIS NC	DO NOT BREED		
1576	1576	F	3	HOLD	SALIS NC	DO NOT BREED		

No Change**SALISBURY**

Salisbury Zoological Park

Salisbury, MD

Institutional Notes: **Maintain****Transfer: None****Receive: None**

ID	Local ID	Sex	Age	Disposition	Location	Breeding	With	Notes
1126	1693	F	9	HOLD	SALISBURY	DO NOT BREED		
1719	1703	F	2	HOLD	SALISBURY	DO NOT BREED		
1720	1705	F	2	HOLD	SALISBURY	DO NOT BREED		
1721	1704	F	2	HOLD	SALISBURY	DO NOT BREED		

No Change**SIOUX FAL**

Great Plains Zoo

Sioux Falls, SD

Institutional Notes:

Transfer: 1610 to CHATT NAT**Receive: 1568 & 1569 from GOLDENPND**

ID	Local ID	Sex	Age	Disposition	Location	Breeding	With	Notes
1568	1568	F	3	RECEIVE FROM	GOLDENPND	DO NOT BREED		
1569	1569	F	3	RECEIVE FROM	GOLDENPND	DO NOT BREED		
1467	4072	M	4	HOLD	SIOUX FAL	BREED WITH	1723	
1610	_____	M	3	SEND TO	CHATT NAT	BREED WITH	1275	
1723	3752	F	2	HOLD	SIOUX FAL	BREED WITH	1467	

Addendum: Enclosure for two females recommended for transfer from GOLDENPND is now designated for new species. Alternative location will have to be identified.

SPRINGFIE

Henson Robinson Zoo

Springfield, IL

Institutional Notes: **Maintain****Transfer: None****Receive: None**

ID	Local ID	Sex	Age	Disposition	Location	Breeding	With	Notes
1204	848	F	8	HOLD	SPRINGFIE	DO NOT BREED		
1607	905	F	3	HOLD	SPRINGFIE	DO NOT BREED		
1608	906	F	3	HOLD	SPRINGFIE	DO NOT BREED		

No Change

SYRACUSE**Rosamond Gifford Zoo at Burnet Park**

Syracuse, NY

Institutional Notes: **Maintain****Transfer: None****Receive: None**

ID	Local ID	Sex	Age	Disposition	Location	Breeding	With	Notes
1379	M07095	M	5	HOLD	SYRACUSE	BREED WITH	1398	
1398	MO5094	F	5	HOLD	SYRACUSE	BREED WITH	1379	

No Change**TACOMA****Point Defiance Zoo & Aquarium**

Tacoma, WA

Institutional Notes:

Transfer: 1485 to WOLFHAVEN**1482 to WOLFHAVEN****Receive: None**

ID	Local ID	Sex	Age	Disposition	Location	Breeding	With	Notes
938	0938	F	13	HOLD	TACOMA	DO NOT BREED		excluded from genetic analyses
939	0939	M	13	HOLD	TACOMA	DO NOT BREED		excluded from genetic analyses
1009	01009	s	11	HOLD	TACOMA	DO NOT BREED		excluded from genetic analyses
1095	01095	M	10	HOLD	TACOMA	BREED WITH	1224	
1224	01224	F	8	HOLD	TACOMA	BREED WITH	1095	
1228	01228	F	8	HOLD	TACOMA	BREED WITH	1277	
1277	01277	M	7	HOLD	TACOMA	BREED WITH	1228	
1278	01278	M	7	HOLD	TACOMA	BREED WITH	1492	
1279	01279	M	7	HOLD	TACOMA	DO NOT BREED		
1280	01280	F	7	HOLD	TACOMA	DO NOT BREED		
1281	01281	F	7	HOLD	TACOMA	DO NOT BREED		
1284	01284	M	7	HOLD	TACOMA	BREED WITH	1385	
1286	01286	M	7	HOLD	TACOMA	BREED WITH	1416	
1364	01364	F	6	HOLD	TACOMA	DO NOT BREED		Maintain w/ 2010 pup
1381	01381	M	5	HOLD	TACOMA	BREED WITH	1496	
1382	01382	F	5	HOLD	TACOMA	BREED WITH	1490	
1385	01385	F	5	HOLD	TACOMA	BREED WITH	1284	
1406	01406	F	5	HOLD	TACOMA	DO NOT BREED		
1407	01407	F	5	HOLD	TACOMA	DO NOT BREED		
1415	01415	F	5	HOLD	TACOMA	BREED WITH	1491	
1416	01416	F	5	HOLD	TACOMA	BREED WITH	1286	
1468	01468	M	4	HOLD	TACOMA	BREED WITH	1495	
1482	01482	M	4	SEND TO	WOLFHAVEN	DO NOT BREED		Companion w/ 1480
1485	01485	F	4	SEND TO	WOLFHAVEN	BREED WITH	1405	
1487	01487	F	4	HOLD	TACOMA	DO NOT BREED		
1488	01488	F	4	HOLD	TACOMA	DO NOT BREED		
1489	01489	F	4	HOLD	TACOMA	DO NOT BREED		
1490	01490	M	4	HOLD	TACOMA	BREED WITH	1382	
1491	01491	M	4	HOLD	TACOMA	BREED WITH	1415	
1492	01492	F	4	HOLD	TACOMA	BREED WITH	1278	
1495	01495	F	4	HOLD	TACOMA	BREED WITH	1468	
1496	01496	F	4	HOLD	TACOMA	BREED WITH	1381	
1589	01589	F	3	HOLD	TACOMA	DO NOT BREED		
1590	01590	F	3	HOLD	TACOMA	DO NOT BREED		
1591	01591	F	3	HOLD	TACOMA	DO NOT BREED		
1602	01602	F	3	HOLD	TACOMA	DO NOT BREED		
1603	01603	F	3	HOLD	TACOMA	DO NOT BREED		
1807	01807	F	0	HOLD	TACOMA	DO NOT BREED		Maintain w/ dam

No Change

TALLAHASE

Tallahassee Museum of History and Natural Science

Tallahassee, FL

Institutional Notes:

Transfer: None**Receive: 1375 from LOWRY**

ID	Local ID	Sex	Age	Disposition	Location	Breeding	With	Notes
1375	102291	M	5	RECEIVE FROM	LOWRY	DO NOT BREED		
1359	05L009	M	6	HOLD	TALLAHASE	DO NOT BREED		
1378	05L004	F	5	HOLD	TALLAHASE	DO NOT BREED		Contracept
1574	L09002	F	3	HOLD	TALLAHASE	DO NOT BREED		Contracept

No Change**TREVOR**

Trevor Zoo

Millbrook, NY

Institutional Notes: **Maintain****Transfer: None****Receive: None**

ID	Local ID	Sex	Age	Disposition	Location	Breeding	With	Notes
1380	A5M679	s	5	HOLD	TREVOR	DO NOT BREED		excluded from genetic analyses
1479	1067	F	4	HOLD	TREVOR	DO NOT BREED		

No Change**VA MUSEUM**

Virginia Living Museum

Newport News, VA

Institutional Notes: **Maintain****Transfer: None****Receive: None**

ID	Local ID	Sex	Age	Disposition	Location	Breeding	With	Notes
1273	1222	M	7	HOLD	VA MUSEUM	DO NOT BREED		
1595	1265	M	3	HOLD	VA MUSEUM	DO NOT BREED		
1596	1266	M	3	HOLD	VA MUSEUM	DO NOT BREED		

No Change**VICTOR TX**

Texas Zoo

Victoria, TX

Institutional Notes: **Maintain****Transfer: None****Receive: None**

ID	Local ID	Sex	Age	Disposition	Location	Breeding	With	Notes
1583	200900	F	3	HOLD	VICTOR TX	DO NOT BREED		
1584	200901	F	3	HOLD	VICTOR TX	DO NOT BREED		
1585	200902	F	3	HOLD	VICTOR TX	DO NOT BREED		

No Change

WCSRC**Endangered Wolf Center**

Eureka, MO

Institutional Notes:

Transfer: None**Receive: 1401 or 1402 from WSC MN****1735, 1736, 1790, and 1791 from CHICAGOLP (Manage as group)**

ID	Local ID	Sex	Age	Disposition	Location	Breeding	With	Notes
1735	22290	M	1	RECEIVE FROM	CHICAGOLP	DO NOT BREED		
1736	22291	M	1	RECEIVE FROM	CHICAGOLP	DO NOT BREED		
1790	22474	M	0	RECEIVE FROM	CHICAGOLP	DO NOT BREED		
1791	22475	M	0	RECEIVE FROM	CHICAGOLP	DO NOT BREED		
1593	200701	F	3	HOLD	WCSRC	BREED WITH	1402	
1402	1402	M	5	RECEIVE FROM	WSC MN	BREED WITH	1593	May receive 1401 instead

No Change**WNCNATCTR****Western North Carolina Nature Center**

Asheville, NC

Institutional Notes: **Maintain****Transfer: None****Receive: None**

ID	Local ID	Sex	Age	Disposition	Location	Breeding	With	Notes
953	3425	M	12	HOLD	WNCNATCTR	DO NOT BREED		excluded from genetic analyses. Recommend vasectomizing this male.
983	02M301	F	12	HOLD	WNCNATCTR	DO NOT BREED		excluded from genetic analyses
1742	9M0301	F	1	HOLD	WNCNATCTR	DO NOT BREED		

No Change**WOLFHAVEN****Wolf Haven International**

Tenino, WA

Institutional Notes:

Transfer: None**Receive: 1485 from TACOMA****1482 from TACOMA**

ID	Local ID	Sex	Age	Disposition	Location	Breeding	With	Notes
1485	01485	F	4	RECEIVE FROM	TACOMA	BREED WITH	1405	
1482	01482	M	4	RECEIVE FROM	TACOMA	DO NOT BREED		Companion w/ 1480
1405	1405	M	5	HOLD	WOLFHAVEN	BREED WITH	1485	
1480	1480	F	4	HOLD	WOLFHAVEN	DO NOT BREED		Contracept

No Change

WSC MN

Wildlife Science Center
Forest Lake, MN

Institutional Notes: **Maintain**

Transfer: 1401 or 1402 to WCSRC

Receive: 1734 from MANTEO

ID	Local ID	Sex	Age	Disposition	Location	Breeding	With	Notes
1734	11734	F	1	RECEIVE FROM	MANTEO	DO NOT BREED		companion for 957
957	957	M	12	HOLD	WSC MN	DO NOT BREED		excluded from genetic analyses
1225	1225	F	8	HOLD	WSC MN	BREED WITH	1401	OR 1402
1401	1401	M	5	HOLD	WSC MN	BREED WITH	1225	OR 1402
1402	1402	M	5	SEND TO	WCSRC	BREED WITH	1593	send 1401 or 1402
1609	1609	M	3	HOLD	WSC MN	DO NOT BREED		
1611	1611	M	3	HOLD	WSC MN	DO NOT BREED		

Addendum: Coordinator to determine possibility of MANTEO maintaining 1734F vs. transferring to WSC MN to allow potential transfer of 1274F at LOWRY to WSC MN (see LOWRY note).

Appendix A Assumptions

No assumptions were used in the analyses

Appendix B Summary of Data Exports Used to Prepare Breeding & Transfer Plan

Project: RW2010
Report compiled under Population Management 2000, version 1.212
July 21 2010

Comments: pre-meeting project

Date to be used for calculations: 7/21/2010
Studbook information:
Data exported on: 7/21/2010
Data compiled by: William Waddell, Point Defiance Zoo & Aquarium
Data current thru: 7/15/2010
Scope of data: International

Demographic data from: C:\Documents and Settings\slong\My Documents\PopLink 2.1\PopLink Databases\REDWOLF\mREDWOLF.prn and C:\Documents and Settings\slong\My Documents\PopLink 2.1\PopLink Databases\REDWOLF\REDWOLF.prn
Demographic filter conditions:
Locations = N.AMERICA During 1/1/1980 - 7/21/2010 Status = Living CAPFREE = C

Genetic data from: C:\Documents and Settings\slong\My Documents\PopLink 2.1\PopLink Databases\REDWOLF\REDWOLF.ped
Genetic filter conditions:
Locations = N.AMERICA
As of 7/21/2010
Status = Living
CAPFREE = C

Appendix C List of Individuals Excluded from the Genetic Analyses

Age exclusions included females over 10 and males over 12 years old

SB#	Location	Age	Sex	Reason
816	SALIS NC	14	M	Sterile
918	COAL VAL	13	F	Sterile
919	CHEHAW	13	F	Age
938	TACOMA	13	F	Age
939	TACOMA	13	M	Age
953	WNCNATCTR	12	M	Age
957	WSC MN	12	M	Age

SB#	Location	Age	Sex	Reason
983	WNCNATCTR	12	F	Age
1009	TACOMA	11	F	Age
1020	BREVARD	11	M	Sterile
1097	PROVIDNCE	10	M	Health
1124	ASHEBORO	9	M	Sterile
1292	AWENDA	7	M	Sterile
1380	TREVOR	5	M	Sterile/PRA

Appendix D Life Tables

Data from 1980 - 2010

Males

Age (x)	Qx	Px	lx	Mx	Vx	Ex	Risk (Qx)	Risk (Mx)
0	0.38	0.62	1	0	1.235	6.73	417	272.5
1	0.14	0.86	0.62	0.04	1.794	8.049	259.2	238.2
2	0.07	0.93	0.533	0.27	2.033	7.899	220.6	212
3	0.06	0.94	0.496	0.41	1.952	7.38	195.9	191.2
4	0.06	0.94	0.466	0.36	1.696	6.788	176	171.5
5	0.08	0.92	0.438	0.23	1.486	6.221	152.1	148.8
6	0.06	0.94	0.403	0.3	1.398	5.617	138.2	134.4
7	0.13	0.87	0.379	0.29	1.253	5.095	127.3	118.9
8	0.09	0.91	0.33	0.35	1.122	4.609	110.3	104.4
9	0.12	0.88	0.3	0.22	0.891	4.029	98.6	93.2
10	0.14	0.86	0.264	0.37	0.797	3.479	83.6	78.7
11	0.14	0.86	0.227	0.28	0.514	2.882	70.6	65.8
12	0.28	0.72	0.195	0.11	0.305	2.367	60.6	52.9
13	0.34	0.66	0.141	0.16	0.29	1.967	44.4	36.9
14	0.5	0.5	0.093	0.12	0.225	1.621	28.3	20.8
15	0.64	0.36	0.046	0.24	0.24	1.371	14	10.5
16	0.8	0.2	0.017	0	0	1.167	5	1.9
17	1	0	0.003	0	0	1	1	0.6
18	1	0	0	0	0	0	0	0

$r = 0.0339$
 $\lambda = 1.0345$
 $T = 5.96$
 $N = 71.00$
 $N(\text{at } 20 \text{ yrs}) = 139.88$

Females

Age (x)	Qx	Px	lx	Mx	Vx	Ex	Risk (Qx)	Risk (Mx)
0	0.38	0.62	1	0.01	1.235	7.274	454	310.6
1	0.08	0.92	0.62	0.09	1.725	8.538	285.5	269.8
2	0.04	0.96	0.57	0.17	1.802	8.027	259.7	252.7
3	0.06	0.94	0.548	0.29	1.777	7.395	227	218.9
4	0.06	0.94	0.515	0.37	1.638	6.803	198.6	192.9
5	0.06	0.94	0.484	0.43	1.396	6.173	170.7	165.8
6	0.06	0.94	0.455	0.35	1.063	5.504	152.2	146.5
7	0.08	0.92	0.428	0.21	0.793	4.841	137.7	133.3
8	0.1	0.9	0.393	0.24	0.663	4.219	118.7	112.1
9	0.15	0.85	0.354	0.3	0.5	3.673	105.9	97.5
10	0.18	0.82	0.301	0.17	0.247	3.197	89.8	80.8
11	0.22	0.78	0.247	0.1	0.1	2.739	73.4	65.2
12	0.31	0.69	0.192	0	0	2.349	55	47.7
13	0.28	0.72	0.133	0	0	1.92	35.6	30.5
14	0.44	0.56	0.096	0	0	1.409	25	19.6
15	0.93	0.07	0.054	0	0	1.065	14	7.6
16	1	0	0.004	0	0	1	1	0.1
17	1	0	0	0	0	0	0	0
18	1	0	0	0	0	0	0	0

$r = 0.0344$
 $\lambda = 1.0350$
 $T = 5.46$
 $N = 104.00$
 $N(\text{at } 20 \text{ yrs}) = 206.92$

Appendix E

Ordered Mean Kinship List

Note: This list is current to 15 July 2010 and values are subject to change with any birth, death, import, export, inclusion, or exclusion.
Population Average MK = 0.1060

Males					Females				
Studbk#	MK	% known	Age	Location	Studbk#	MK	% known	Age	Location
1369	0.098	100.0	6	DURHAM MS	1227	0.092	100.0	8	DURHAM MS
1381	0.098	100.0	5	TACOMA	1225	0.092	100.0	8	WSC MN
1286	0.099	100.0	7	TACOMA	1228	0.093	100.0	8	TACOMA
1121	0.100	100.0	9	ASHEBORO	1291	0.094	100.0	7	NYWOLF
1386	0.100	100.0	5	FRESNO	1224	0.094	100.0	8	TACOMA
1490	0.100	100.0	4	TACOMA	1287	0.095	100.0	7	PROVIDNCE
1491	0.100	100.0	4	TACOMA	1385	0.095	100.0	5	TACOMA
1460	0.101	100.0	5	LOWRY	1564	0.096	100.0	3	CHEHAW
1467	0.101	100.0	4	SIOUX FAL	1563	0.096	100.0	3	LOWRY
1278	0.101	100.0	7	TACOMA	1382	0.097	100.0	5	TACOMA
1279	0.101	100.0	7	TACOMA	1370	0.098	100.0	6	CHATT NAT
1468	0.101	100.0	4	TACOMA	1723	0.098	100.0	2	SIOUX FAL
1405	0.101	100.0	5	WOLFHAVEN	1366	0.099	100.0	6	ASHEBORO
1414	0.102	100.0	5	BLOOMINGT	1415	0.099	100.0	5	TACOMA
1464	0.102	100.0	4	GREENBAY	1416	0.099	100.0	5	TACOMA
1095	0.102	100.0	10	TACOMA	1495	0.099	100.0	4	TACOMA
1277	0.102	100.0	7	TACOMA	1496	0.099	100.0	4	TACOMA
1784	0.103	100.0	0	BLOOMINGT	1722	0.100	100.0	2	BLOOMINGT
1284	0.104	100.0	7	TACOMA	1619	0.100	100.0	3	FRESNO
1482	0.104	100.0	4	TACOMA	1388	0.100	100.0	5	GREENBAY
1605	0.105	100.0	3	ASHEBORO	1492	0.100	100.0	4	TACOMA
1606	0.105	100.0	3	ASHEBORO	1280	0.101	100.0	7	TACOMA
1408	0.105	100.0	5	CHATT NAT	1281	0.101	100.0	7	TACOMA
1604	0.105	100.0	3	CHEHAW	1406	0.101	100.0	5	TACOMA
1400	0.105	100.0	5	JACKSON	1407	0.101	100.0	5	TACOMA
1483	0.105	100.0	4	NYWOLF	1364	0.102	100.0	6	TACOMA
1401	0.105	100.0	5	WSC MN	1602	0.102	100.0	3	TACOMA
1402	0.105	100.0	5	WSC MN	1603	0.102	100.0	3	TACOMA
1194	0.106	100.0	8	ASHEBORO	1593	0.102	100.0	3	WCSRC
1395	0.106	100.0	5	KNOXVILLE	1785	0.103	100.0	0	BLOOMINGT
1394	0.106	100.0	5	MILL MOUN	1786	0.103	100.0	0	BLOOMINGT
1379	0.106	100.0	5	SYRACUSE	1787	0.103	100.0	0	BLOOMINGT
1201	0.107	100.0	8	GOLDENPND	1742	0.103	100.0	1	WNCNATCTR
1122	0.108	100.0	9	CHICAGOLP	1485	0.104	100.0	4	TACOMA
1803	0.108	100.0	0	NYWOLF	1487	0.104	100.0	4	TACOMA
1804	0.108	100.0	0	NYWOLF	1488	0.104	100.0	4	TACOMA
1718	0.109	100.0	2	AWENDA	1489	0.104	100.0	4	TACOMA
1717	0.109	100.0	2	CHEHAW	1807	0.104	100.0	0	TACOMA
1735	0.109	100.0	1	CHICAGOLP	1403	0.105	100.0	5	AWENDA
1736	0.109	100.0	1	CHICAGOLP	1409	0.105	100.0	5	COAL VAL
1790	0.109	100.0	0	CHICAGOLP	1410	0.105	100.0	5	COAL VAL
1791	0.109	100.0	0	CHICAGOLP	1129	0.105	100.0	9	JACKSON
1580	0.109	100.0	3	FORTWORTH	1404	0.105	100.0	5	MANTEO
1581	0.109	100.0	3	FORTWORTH	1607	0.105	100.0	3	SPRINGFIE
1091	0.109	100.0	10	FOSSILRIM	1608	0.105	100.0	3	SPRINGFIE
1587	0.109	100.0	3	NYWOLF	1363	0.106	100.0	6	FOSSILRIM
1359	0.109	100.0	6	TALLAHASE	1396	0.106	100.0	5	MANTEO
1610	0.110	100.0	3	SIOUX FAL	1196	0.106	100.0	8	OKLAHOMA
1609	0.110	100.0	3	WSC MN	1398	0.106	100.0	5	SYRACUSE
1611	0.110	100.0	3	WSC MN	1197	0.108	100.0	8	ASHEBORO
1712	0.111	100.0	2	HOMOSASSA	1353	0.108	100.0	6	CHICAGOLP
1713	0.111	100.0	2	HOMOSASSA	1274	0.108	100.0	7	LOWRY
1714	0.111	100.0	2	HOMOSASSA	1397	0.108	100.0	5	NYWOLF
1390	0.111	100.0	5	JACKSONVL	1195	0.108	100.0	8	SALIS NC
1273	0.111	100.0	7	VA MUSEUM	1575	0.108	100.0	3	SALIS NC
1566	0.112	100.0	3	CHATT NAT	1576	0.108	100.0	3	SALIS NC
1567	0.112	100.0	3	CHATT NAT	1794	0.109	100.0	0	CHICAGOLP
1731	0.112	100.0	1	CHATT NAT	1795	0.109	100.0	0	CHICAGOLP
1732	0.112	100.0	1	CHATT NAT	1582	0.109	100.0	3	FOSSILRIM
1200	0.112	100.0	8	MANTEO	1586	0.109	100.0	3	FOSSILRIM
1375	0.113	100.0	5	LOWRY	1360	0.109	100.0	6	KNOXVILLE
1652	0.113	100.0	3	OKLAHOMA	1276	0.109	100.0	7	MANTEO
1595	0.114	100.0	3	VA MUSEUM	1719	0.109	100.0	2	SALISBURY
1596	0.114	100.0	3	VA MUSEUM	1720	0.109	100.0	2	SALISBURY
					1721	0.109	100.0	2	SALISBURY
					1589	0.109	100.0	3	TACOMA
					1590	0.109	100.0	3	TACOMA

Males					Females				
Studbk#	MK	% known	Age	Location	Studbk#	MK	% known	Age	Location
					1591	0.109	100.0	3	TACOMA
					1583	0.109	100.0	3	VICTOR TX
					1584	0.109	100.0	3	VICTOR TX
					1585	0.109	100.0	3	VICTOR TX
					1480	0.109	100.0	4	WOLFHAVEN
					1613	0.110	100.0	3	BRIDGEPRT
					1614	0.110	100.0	3	BRIDGEPRT
					1615	0.110	100.0	3	BRIDGEPRT
					1275	0.110	100.0	7	CHATT NAT
					1612	0.110	100.0	3	GOLDENPND
					1204	0.110	100.0	8	SPRINGFIE
					1479	0.110	100.0	4	TREVOR
					1392	0.111	100.0	5	ASHEBORO
					1393	0.111	100.0	5	ASHEBORO
					1715	0.111	100.0	2	BREVARD
					1716	0.111	100.0	2	BREVARD
					1127	0.111	100.0	9	BRIDGEPRT
					1574	0.111	100.0	3	TALLAHASE
					1203	0.112	100.0	8	ALEXANDRI
					1568	0.112	100.0	3	GOLDENPND
					1569	0.112	100.0	3	GOLDENPND
					1734	0.112	100.0	1	MANTEO
					1651	0.113	100.0	3	ALEXANDRI
					1377	0.113	100.0	5	AWENDA
					1361	0.113	100.0	6	BREVARD
					1376	0.113	100.0	5	JACKSONVL
					1653	0.113	100.0	3	MILL MOUN
					1126	0.113	100.0	9	SALISBURY
					1378	0.113	100.0	5	TALLAHASE
					1473	0.114	100.0	4	MANTEO
					1598	0.114	100.0	3	MANTEO
					1599	0.114	100.0	3	MANTEO
					1600	0.114	100.0	3	MANTEO

Appendix F

Definitions

Management Terms

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

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

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

Demographic Terms

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

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

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

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

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

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

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

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

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

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

Genetic Terms

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

Appendix G

List of Institutional Representatives

Contact Name (IR)	Title/Position	Institution	Email	Phone
Carmen Murach	Animal Curator	GREENBAY - NEW Zoo, Green Bay, WI	bc_zoo_keepers@co.brown.wi.us	920-434-7841 (x104)
Art Beyer	Field Coordinator	MANTEO - Alligator River NWR, Manteo, NC	art_beyer@fws.gov	252-473-1131 (x241)
Rebecca Bose	Curator	NYWOLF - Wolf Conservation Center of New York, South Salem, NY	rebecca@nywolf.org	914-763-2373
Jan Wilson	Curator	VICTOR TX - Texas Zoo, Victoria, TX	wshn41@yahoo.com	361-573-7681
Peggy Callahan	Director	WSC MN - Wildlife Science Center, Forest Lake, MN	peggy@wildlifesciencecenter.org	651-464-3993
Sarah Dawsey	Biologist	AWENDA - Cape Romain NWR, Awenda, SC	sarah_dawsey@fws.gov	843-928-3264
Allison Ballentine	Animal Curator	WNCNATCTR - Western NC Nature Center, Asheville, NC	Aballentine@ashevillenc.gov	828-298-5600 (x311)
Tish Gailmard	Wildlife Curator	CHATT NAT - Chattanooga Nature Center, Chattanooga, TN	tgailmard@chattanature.org	423-821-1160 (x103)
Don Goff	Director Animal Programs	BRIDGEPRT - Connecticut's Beardsley Zoo, Bridgeport, CT	dgoff@beardsleyzoo.org	203-394-6564
John Ward	Assistant Curator	FORTWORTH - Fort Worth Zoological Park, Ft Worth, TX	jward@fortworthzoo.org	817-759-7196
Mike Jones	Animal Curator	TALLAHASEE - Tallahassee Museum of Natural History, Tallahassee, FL	animals@tallahasseeuseum.org	850-575-8685
Tom Labarge	Curator of Animals	SYRACUSE - Rosamond Gifford Zoo at Burnet Park, Syracuse, NY	ThomasLaBarge@ongov.net	315-435-8511 (x117)
James Burnett	Project Leader	ST.VINCE - St. Vincent Island NWR, Apalachicola, FL	james_burnett@fws.gov	850-925-6121
Kim Scott	Executive Director	WCSRC – Endangered Wolf Center, Eureka, MO	kscott@endangeredwolfcenter.org	636-938-5900
Tim French	Deputy Director	PROVIDNCE - Roger Williams Park Zoo, Providence, RI	tfrench@rwpzoo.org	401-785-3510 (x306)
George Mathews	General Curator	VA MUSEUM - Virginia Living Museum, Newport News, VA	george.mathews@thevlm.org	757-595-1900 (x213)
Jon Meigs	Director	TREVOR - Trevor Zoo, Millbrook, NY	jomeigs@millbrook.org	845-677-3704
Chris Lasher	Animal Supervisor	ASHEBORO - North Carolina Zoological Park, Asheboro, NC	chris.lasher@nczoo.org	336-879-7670
Craig Miller	Curator of Mammals	JACKSONVL - Jacksonville Zoo and Gardens, Jacksonville, FL	millercc@jaxzoo.org	904-757-4463 (x136)
Diane Mulkerin	Associate Curator	CHICAGOLP - Lincoln Park Zoological Gardens, Chicago, IL	dmulkerin@lpzoo.org	312-742-2376
Terry Cannon	Curator of Mammals	KNOXVILLE - Knoxville Zoological Gardens, Knoxville, TN	tcannon@knoxville-zoo.org	865-637-5331 (x388)
Talon Thornton	Director	SPRINGFIE - Henson Robinson Zoo, Springfield, IL	tthornton@hensonrobinsonzoo.org	217-753-6217
Bob Pendergrass	Supervisor	SALIS NC - Dan Nicholas Nature Center, Salisbury, NC	bobpend@co.rowan.nc.us	704-216-7819
LeeAnn Rottman	General Curator	LOWRY - Tampa's Lowry Park Zoo, Tampa, FL	leeann.rottman@lowryparkzoo.com	813-935-8552 (x221)
Darrin Samborski	Biologist	GOLDENPND - Land Between the Lakes, Golden Pond, KY	dsamborski@fs.fed.us	270-924-2050
Sherry Samuels	Animal Director	DURHAM MS - North Carolina Museum of Life & Science, Durham, NC	sherry.samuels@ncmls.org	919-220-5429 (x333)
Jonathan Reding	Animal Supervisor	OKLAHOMA - Oklahoma City Zoological Park, Oklahoma City, OK	jreding@okczoo.com	405-425-0225
Michelle Smurl	Director Animal Programs	BREVARD - Brevard Zoo, Melbourne, FL	mismurl@brevardzoo.org	321-254-9453 (x217)
Wendy Spencer	Curator	WOLFHAVEN - Wolf Haven International, Tenino, WA	wendy@wolfhaven.org	360-264-4695

Contact Name (IR)	Title/Position	Institution	Email	Phone
Mary Jo Stearns	Curator	FOSSILRIM - Fossil Rim Wildlife Center, Glen Rose, TX	maryjos@fossilrim.org	254-898-4235
Angie Bloomer	Keeper	SIOUX FAL - Great Plains Zoo, Sioux Falls, SD	ablommer@gpzoo.org	605-367-8313 (x19)
Jan Thompson	Animal Curator	CHEHAW - Chehaw Wild Animal Park, Albany, GA	jthompson@chehaw.org	229-430-2972
Andy Snider	Director Animal Care/Conservation	FRESNO - Fresno Chaffee Zoo, Fresno, CA	asnider@fresnochaffeezoo.com	559-498-5910
Jay Tetzloff	Director	BLOOMINGT - Miller Park Zoo, Bloomington, IL	jtetzloff@cityblm.org	309-434-2825
Will Waddell	RWSSP Coordinator	TACOMA - Point Defiance Zoo & Aquarium, Tacoma, WA	will.waddell@pdza.org	253-858-9172
Dave Wetzell	General Curator	JACKSON - Jackson Zoological Park, Jackson, MS	dhwetzell@msn.com	601-352-2590
Lisa Laskoski	Veterinary Technician	ALEXANDRI - Alexandria Zoological Park, Alexandria, LA	lisa.laskoski@cityofalex.com	318-441-6819
Debbie Graham	Veterinary Technician	SALISBURY - Salisbury Zoological Park, Salisbury, MD	dgraham@ci.salisbury.md.us	410-548-3188 (x7)
David Orndorff	General Curator	MILL MOUN - Mill Mountain Zoo, Roanoke, VA	dorndorff@mmzoo.org	540-343-3241 (x31)
Jennifer Ryan	Assistant Director	COAL VAL - Niabi Zoo, Coal Valley, IL	jryan@niabizoo.com	309-799-3482 (x221)
Susan Lowe	Wildlife Care Supervisor	HOMOSASSA - Homosassa Springs Wildlife State Park, Homosassa, FL	Susan.Lowe@dep.state.fl.us	352-628-1508