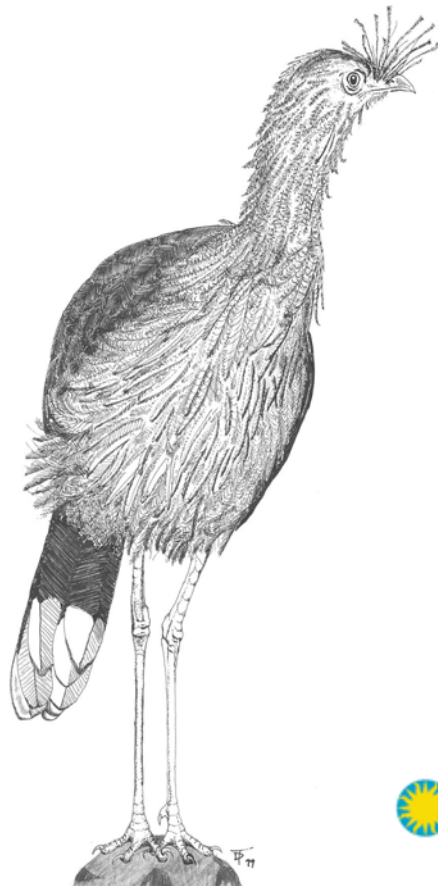



2009
Population Management Plan
for the
Red-legged seriema
Cariama cristata

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participation is voluntary.*

Executive Summary - Population Management Plan for 2009

Breeding and Transfer Recommendations for RED-LEGGED SERIEMA (*Cariama cristata*)

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Report compiled under Population Management 2000, version 1.213

The following assumptions were made in conducting the demographic and genetic analysis of this PMP:

1. Assumed studbook 45 was the dam of studbook 65.
2. Assumed parents of studbook 109 were 58 and 81.
3. Assumed studbook 186 parents were 148 and 171.
4. Assumed studbook 56 parents were 45 and 55.
5. Assumed studbook 170 parents were 60 and 63.
6. Removed studbook 46 TULSA and 52 SAN ANTON from the genetic analysis as they are assumed to be post-reproductive due to their advanced age.
7. All show birds were removed from the genetic analysis, as it is unlikely that they will be part of future breeding programs. This includes:

166 CINCINNAT	257 CRAWFRD W	205 KNOXVILLE	170 WORLDBIRD
264 COLUMBIA	116 RIO GRAND	165 OMAHA	189 WORLDBIRD
167 CRAWFRD W	255 TACOMA	206 WILD WRLD	273 PITTS CA
200 CRAWFRD W	157 DENVER	261 WILD WRLD	293 LOWRY
256 CRAWFRD W	240 DREHER PA		

Current Managed Population

There are currently 67 (29.30.8) at 27 institutions.

Introduction:

The Population Management Plan (PMP) for red-legged seriemas provides genetic and demographic analysis of captive birds in the United States. The managed population

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2009 Population Management Plan for the red-legged seriema

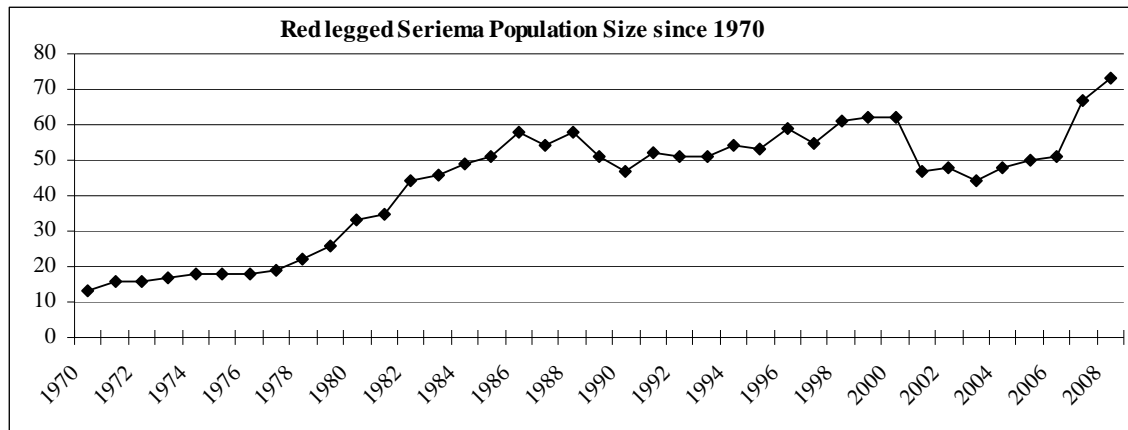
consists of 67 birds in 27 institutions. Genetic analysis was done only on non-show birds as they are not in breeding situations and are unlikely to be so. The red-legged seriema PMP includes recommendations for breeding of non-show individuals for the upcoming 2009 breeding season, with the ultimate goal of preventing inbreeding, increasing breeding between valuable pairs and maintaining a healthy gene pool.

Objectives:

The objectives of this PMP are to make maximal and responsible use of the birds currently in captivity. Recruiting new genetic lineages (from the wild, Europe or private) and increasing the target population size will slow the loss of gene diversity. The Gruiformes TAG space survey indicates 75 spaces (show and breeding) for red legged seriemas over the next 5 years so the population can grow from its current number of 67 birds.

Demographic Summary Table:

Current size of managed population	67 (29.30.8)
# Specimens excluded from demographic management	0
Mean generation time	10 years
Potential population growth rate	1.03
# Births in past year	11
# Deaths in past year	4



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2009 Population Management Plan for the red-legged seriema

Founder Statistics Table:

Studbook #	Sex	Age	Representation	Contribution	Allele Retent.	Potential Ret.	Descendants
21	M	D	0.0908	5.3130	0.9150	0.9150	38.00
22	F	D	0.0908	5.3130	0.9170	0.9170	38.00
25	M	D	0.0983	5.7500	0.7380	0.7380	45.00
26	F	D	0.0983	5.7500	0.7625	0.7625	45.00
31	F	D	0.1036	6.0630	0.9430	0.9430	24.00
43	M	D	0.0171	1.0000	0.6505	0.6505	4.00
45	F	D	0.0107	0.6250	0.1825	0.1825	10.00
59	M	D	0.1923	11.2500	0.9540	0.9540	47.00
60	F	D	0.1923	11.2500	0.9590	0.9590	47.00
62	M	D	0.1058	6.1880	0.9445	0.9445	24.00

Genetic Summary Table of entire population:

	Current	Potential
Founders	10	0 additional
Founder genome equivalents	4.77	7.97
Founder genome surviving	7.97	7.97
Gene diversity retained	0.895	0.937
Population mean kinship	0.105	0.063
Mean inbreeding	0.044	0.063
Ne / N	0.29	-----
% of pedigree known	87	-----

Genetic Summary Table of breeding (non-show) population:

	Current	Potential
Founders	10	0 additional
Founder genome equivalents	4.44	7.46
Founder genome surviving	7.46	7.46
Gene diversity retained	0.887	0.933
Population mean kinship	0.113	0.067
Mean inbreeding	0.029	0.067
Ne / N	0.35	-----
% of pedigree known	82	-----

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Summary of Breeding and Transfer Recommendations

ID	Location	Local ID	Sex	Age	Disposition	Location	Breeding	With	Notes
269	CALDWELL	106250	M	1	HOLD	CALDWELL	BREED WITH	288	
166	CINCINNAT	293130	U	16	HOLD	CINCINNAT			Show bird
120	COLUMBIA	004977	F	21	HOLD	COLUMBIA	BREED WITH	289	
264	COLUMBIA	9348	F	2	HOLD	COLUMBIA			Show bird
270	COLUMBIA	9782	M	1	SEND TO	MILL MOUN			
155	CRAWFRD	Gomez	M	17	HOLD	CRAWFRD	BREED WITH	156	
156	CRAWFRD	Sarah	F	17	HOLD	CRAWFRD	BREED WITH	155	
167	CRAWFRD	Locust	U	15	HOLD	CRAWFRD			Show bird
200	CRAWFRD	Gidget	U	11	HOLD	CRAWFRD			Show bird
256	CRAWFRD		M	3	HOLD	CRAWFRD			Show bird
257	CRAWFRD		M	3	HOLD	CRAWFRD			Show bird
81	DALLAS	844042	F	25	HOLD	DALLAS	BREED WITH	86	
86	DALLAS	02E317	M	24	HOLD	DALLAS	BREED WITH	81	
157	DENVER	990191	F	16	HOLD	DENVER			Show bird
204	DENVER	A07277	F	10	HOLD	DENVER			
240	DREHER PA	204011	F	5	HOLD	DREHER PA			Show bird
227	GRANBY	B99045	M	10	HOLD	GRANBY	BREED WITH	262	
262	GRANBY	B06005	F	3	HOLD	GRANBY	BREED WITH	227	
225	JACKSONVL	602376	F	7	HOLD	JACKSONVL			
164	KNOXVILLE	2656	F	16	HOLD	KNOXVILLE			
205	KNOXVILLE	2543	F	10	HOLD	KNOXVILLE			Show bird
186	LOSANGELE	991063	M	13	HOLD	LOSANGELE	DO NOT BREED		Sibling to 226
226	LOSANGELE	991064	F	7	HOLD	LOSANGELE	DO NOT BREED		Sibling to 186
249	LUFKIN		M	4	HOLD	LUFKIN			
92	LOWRY	205356	M	22	HOLD	LOWRY	DO NOT BREED		Over represented
182	LOWRY	205357	F	12	HOLD	LOWRY	DO NOT BREED		Over represented
293	LOWRY	205899	U	1	HOLD	LOWRY	DO NOT BREED		Show bird
176	NZP-WASH	213705	M	15	HOLD	NZP-WASH	BREED WITH	178	
178	NZP-WASH	215590	F	14	HOLD	NZP-WASH	BREED WITH	176	
265	OMAHA	16778	U	3	HOLD	OMAHA			Show bird
207	ORLANDO	RLS250	F	9	HOLD	ORLANDO	BREED WITH	286	
286	ORLANDO	RLS252	M	1	HOLD	ORLANDO	BREED WITH	207	
273	PITTS CA	7564	M	2	HOLD	PITTS CA			Show bird
116	RIO GRAND	B21734	F	21	HOLD	RIO GRAND			Show bird

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2009 Population Management Plan for the red-legged seriema

49	SAN ANTON	791240	F	30	HOLD	SAN ANTON			Post reproductive
52	SAN ANTON	791643	M	30	HOLD	SAN ANTON	BREED WITH	272	
271	SAN ANTON	J08008	M	1	HOLD	SAN ANTON	BREED WITH	272	
272	SAN ANTON	A08003	F	1	HOLD	SAN ANTON	BREED WITH	52 or 271	Breeding ok with either male (52 higher priority) Dam to 250
191	SCOT NECK	_____	F	12	HOLD	SCOT NECK	DO NOT BREED		
250	SCOT NECK	_____	U	4	HOLD	SCOT NECK	DO NOT BREED		Offspring of 191
88	SEDGWICK	10408	F	24	HOLD	SEDGWICK	BREED WITH	192	
192	SEDGWICK	8965	M	11	HOLD	SEDGWICK	BREED WITH	88	
288	SEDGWICK	12243	M	0	SEND TO	CALDWELL	BREED WITH	269	
289	SEDGWICK	12246	M	0	SEND TO	COLUMBIA	BREED WITH	120	
239	ST LOUIS	105679	M	6	HOLD	ST LOUIS			
255	TACOMA	T05A02	F	3	HOLD	TACOMA			Show bird
185	TORONTO	39385	F	13	HOLD	TORONTO	BREED WITH	221	
221	TORONTO	41434	M	7	HOLD	TORONTO	BREED WITH	185	
46	TULSA	3287	M	31	HOLD	TULSA			Post reproductive
64	WILD WRLD	6195	M	27	DO NOT BREED	WILD WRLD			Over represented
206	WILD WRLD	6119	M	10	HOLD	WILD WRLD			Show bird
242	WILD WRLD	7425	F	5	DO NOT BREED	WILD WRLD			Over represented
258	WILD WRLD	7683	M	3	DO NOT BREED	WILD WRLD			Over represented
260	WILD WRLD	7681	F	3	DO NOT BREED	WILD WRLD			Over represented
261	WILD WRLD	7682	M	3	HOLD	WILD WRLD			Show bird
274	WILD WRLD	8284	F	2	DO NOT BREED	WILD WRLD			Over represented
275	WILD WRLD	8285	M	2	DO NOT BREED	WILD WRLD			Over represented
284	WILD WRLD	7640	M	1	DO NOT BREED	WILD WRLD			Over represented
285	WILD WRLD	8605	U	1	DO NOT BREED	WILD WRLD			Over represented
189	WORLDBIRD	990021	M	13	HOLD	WORLDBIRD			Show bird
278	WORLDBIRD	M07035	F	3	SEND TO	TRACY AV			
279	WORLDBIRD	M07036	M	3	SEND TO	TRACY AV			
280	WORLDBIRD	M07041	M	3	DO NOT BREED	WORLDBIRD			Determine parentage
281	WORLDBIRD	M07042	F	3	DO NOT	WORLDBIRD			Determine

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2009 Population Management Plan for the red-legged seriema

282	WORLDBIRD	M07047	F	1	BREED DO NOT BREED	WORLDBIRD		parentage
287	WORLDBIRD	M08002	F	1	DO NOT BREED	WORLDBIRD		
294	WORLDBIRD	M08016	U	0	DO NOT BREED	WORLDBIRD		Sex

CALDWELL

Caldwell Zoo
Tyler, TX

ID	Local ID	Sex	Age	Disposition	Location	Breeding	With	Notes
269	106250	F	1	HOLD	CALDWELL	BREED WITH	288	
288		M	0	RECEIVE FROM	SEDGWICK	BREED WITH	269	

CINCINNAT

Cincinnati Zoo & Botanical Garden
Cincinnati, OH

ID	Local ID	Sex	Age	Disposition	Location	Breeding	With	Notes
166	293130	U	16	HOLD	CINCINNAT			Show bird

COLUMBIA

Riverbanks Zoo and Garden
Columbia, SC

ID	Local ID	Sex	Age	Disposition	Location	Breeding	With	Notes
120	004977	F	21	HOLD	COLUMBIA	BREED WITH	289	
264	9348	F	2	HOLD	COLUMBIA			Show bird
270	9782	M	1	SEND TO	MILL MOUN			
289	12246	M	0	RECEIVE FROM	SEDGWICK	BREED WITH	120	

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2009 Population Management Plan for the red-legged seriema

CRAWFRD W

World Bird Sanctuary
Valley Park, MO

ID	Local ID	Sex	Age	Disposition	Location	Breeding	With	Notes
155	Gomez	M	17	HOLD	CRAWFRD W	BREED WITH	156	
156	Sarah	F	17	HOLD	CRAWFRD W	BREED WITH	155	
167	Locust	U	15	HOLD	CRAWFRD W			Show bird
200	Gidget	U	11	HOLD	CRAWFRD W			Show bird
256	UNK	M	3	HOLD	CRAWFRD W			Show bird
257	UNK	M	3	HOLD	CRAWFRD W			Show bird

DALLAS

Dallas Zoo
Dallas, TX

ID	Local ID	Sex	Age	Disposition	Location	Breeding	With	Notes
81	844042	F	25	HOLD	DALLAS	BREED WITH	86	
86	02E317	M	24	HOLD	DALLAS	BREED WITH	81	

DENVER

Denver Zoological Gardens
Denver, CO

ID	Local ID	Sex	Age	Disposition	Location	Breeding	With	Notes
157	990191	F	16	HOLD	DENVER			Show bird
204	A07277	F	10	HOLD	DENVER			

DREHER PA

Palm Beach Zoo at Dreher Park
West Palm Beach, FL

ID	Local ID	Sex	Age	Disposition	Location	Breeding	With	Notes
240	204011	F	5	HOLD	DREHER PA			Show bird

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2009 Population Management Plan for the red-legged seriema

GRANBY

Granby Zoo
Granby, Quebec

ID	Local ID	Sex	Age	Disposition	Location	Breeding	With	Notes
227	B99045	M	10	HOLD	GRANBY	BREED WITH	262	
262	B06005	F	3	HOLD	GRANBY	BREED WITH	227	

JACKSONVL

Jacksonville Zoo and Gardens
Jacksonville, FL

ID	Local ID	Sex	Age	Disposition	Location	Breeding	With	Notes
225	602376	F	7	HOLD	JACKSONVL			

LOWRY

Lowry Park Zoological Garden
Tampa, FL

ID	Local ID	Sex	Age	Disposition	Location	Breeding	With	Notes
92	205356	M	22	HOLD	LOWRY	DO NOT BREED		Over represented
182	205357	F	12	HOLD	LOWRY	DO NOT BREED		Over represented
293	205899	U	1	HOLD	LOWRY	DO NOT BREED		Show bird

KNOXVILLE

Knoxville Zoological Gardens
Knoxville, TN

ID	Local ID	Sex	Age	Disposition	Location	Breeding	With	Notes
164	2656	F	16	HOLD	KNOXVILLE	HOLD		
205	2543	F	10	HOLD	KNOXVILLE	HOLD		Show bird

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2009 Population Management Plan for the red-legged seriema

LOSANGELE

Los Angeles Zoo & Botanical Gardens
Los Angeles, CA

ID	Local ID	Sex	Age	Disposition	Location	Breeding	With	Notes
186	991063	M	13	HOLD	LOSANGELE	DO NOT BREED		Sibling to 226
226	991064	F	7	HOLD	LOSANGELE	DO NOT BREED		Sibling to 186

LUFKIN

Ellen Trout Zoo
Lufkin, TX

ID	Local ID	Sex	Age	Disposition	Location	Breeding	With	Notes
249	UNK	M	4	HOLD	LUFKIN			

NZP-WASH

Smithsonian National Zoological Park
Washington DC

ID	Local ID	Sex	Age	Disposition	Location	Breeding	With	Notes
176	213705	M	15	HOLD	NZP-WASH	BREED WITH	178	
178	215590	F	14	HOLD	NZP-WASH	BREED WITH	176	

OMAHA

Omaha's Henry Doorly Zoo
Omaha, NE

ID	Local ID	Sex	Age	Disposition	Location	Breeding	With	Notes
265	16778	U	3	HOLD	OMAHA			Show bird

ORLANDO

Sea World Orlando
Orlando, FL

ID	Local ID	Sex	Age	Disposition	Location	Breeding	With	Notes
207	RLS250	F	9	HOLD	ORLANDO	BREED WITH	286	
286	RLS252	M	1	HOLD	ORLANDO	BREED WITH	207	

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2009 Population Management Plan for the red-legged seriema

PITTS CA

National Aviary in Pittsburgh
Pittsburgh, PA

ID	Local ID	Sex	Age	Disposition	Location	Breeding	With	Notes
273	7564	M	2	HOLD	PITTS CA			Show bird

RIO GRAND

Albuquerque Biological Park
Albuquerque, NM

ID	Local ID	Sex	Age	Disposition	Location	Breeding	With	Notes
116	B21734	F	21	HOLD	RIO GRAND			Show bird

SAN ANTON

San Antonio Zoological Gardens & Aquarium
San Antonio, TX

ID	Local ID	Sex	Age	Disposition	Location	Breeding	With	Notes
49	791240	F	30	HOLD	SAN ANTON			Post reproductive
52	791643	M	30	HOLD	SAN ANTON			Breed with 272
271	J08008	M	1	HOLD	SAN ANTON	BREED WITH	272	Breed with 272
272	A08003	F	1	HOLD	SAN ANTON	BREED WITH	271	Breed with 52 or 272 (52 preferable)

SCOT NECK

Sylvan Heights Waterfowl
Scotland Neck, NC

ID	Local ID	Sex	Age	Disposition	Location	Breeding	With	Notes
191		F	12	HOLD	SCOT NECK	DO NOT BREED		Dam to 250
250		U	4	HOLD	SCOT NECK	DO NOT BREED		Offspring of 191

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2009 Population Management Plan for the red-legged seriema

SEDGWICK

Sedgwick County Zoo
Wichita, KS

ID	Local ID	Sex	Age	Disposition	Location	Breeding	With	Notes
88	10408	F	24	HOLD	SEDGWICK	BREED WITH	192	
192	8965	M	11	HOLD	SEDGWICK	BREED WITH	88	
288	12243	M	0	SEND TO	CALDWELL			
289	12246	M	0	SEND TO	COLUMBIA			

ST LOUIS

Saint Louis Zoological Park
St. Louis, MO

ID	Local ID	Sex	Age	Disposition	Location	Breeding	With	Notes
239	105679	M	6	HOLD	ST LOUIS			

TACOMA

Point Defiance Zoo & Aquarium
Tacoma, WA

ID	Local ID	Sex	Age	Disposition	Location	Breeding	With	Notes
255	T05A02	F	3	HOLD	TACOMA			Show bird

TORONTO

Toronto Zoo
Scarborough, Ontario

ID	Local ID	Sex	Age	Disposition	Location	Breeding	With	Notes
185	39385	F	13	HOLD	TORONTO	BREED WITH	221	
221	41434	M	7	HOLD	TORONTO	BREED WITH	185	

TULSA

Tulsa Zoo & Living Museum
Tulsa, OK

ID	Local ID	Sex	Age	Disposition	Location	Breeding	With	Notes
46	3287	M	31	HOLD	TULSA			Post reproductive

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2009 Population Management Plan for the red-legged seriema

WILD WRLD

Wildlife World Zoo
Litchfield Park, AZ

ID	Local ID	Sex	Age	Disposition	Location	Breeding	With	Notes
64	6195	M	27	HOLD	WILD WRLD	DO NOT BREED		Over represented
206	6119	M	10	HOLD	WILD WRLD			Show bird
242	7425	F	5	HOLD	WILD WRLD	DO NOT BREED		Over represented
258	7683	M	3	HOLD	WILD WRLD	DO NOT BREED		Over represented
260	7681	F	3	HOLD	WILD WRLD	DO NOT BREED		Over represented
261	7682	M	3	HOLD	WILD WRLD			Show bird
274	8284	F	2	HOLD	WILD WRLD	DO NOT BREED		Over represented
275	8285	M	2	HOLD	WILD WRLD	DO NOT BREED		Over represented
284	7640	M	1	HOLD	WILD WRLD	DO NOT BREED		Over represented
285	8605	U	1	HOLD	WILD WRLD	DO NOT BREED		Over represented

WORLDBIRD

Steve Martin Natural Encounters, Inc.
Winter Haven, FL

ID	Local ID	Sex	Age	Disposition	Location	Breeding	With	Notes
189	990021	M	13	HOLD	WORLDBIRD			Show bird
278	M07035	F	3	SEND TO	TRACY AVIARY			
279	M07036	M	3	SEND TO	TRACY AVIARY			
280	M07041	M	3	HOLD	WORLDBIRD	DO NOT BREED		Determine parentage
281	M07042	F	3	HOLD	WORLDBIRD	DO NOT BREED		Determine parentage
282	M07047	F	1	HOLD	WORLDBIRD	DO NOT		

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2009 Population Management Plan for the red-legged seriema

287	M08002	F	1	HOLD	WORLDBIRD	BREED DO NOT BREED	
294	M08016	U	0	HOLD	WORLDBIRD	DO NOT BREED	Determine sex

MILL MOUN

Mill Mountain Zoo
Roanoke, VA

ID	Local ID	Sex	Age	Disposition	Location	Breeding	With	Notes
270		M	1	RECEIVE FROM	COLUMBIA			

TRACY AV

Tracy Aviary
Salt Lake City, UT

ID	Local ID	Sex	Age	Disposition	Location	Breeding	With	Notes
278		F	3	RECEIVE FROM	WORLDBIRD			
279		M	3	RECEIVE FROM	WORLDBIRD			

Goals and Strategy for 2009

- Since the population is already at 67 birds and the Gruiformes Space Survey indicates a maximum of 75 spaces over the next 5 years, space limitations are a concern within the PMP. Thus, the 2009 PMP focuses on encouraging breeding among pairs that are especially valuable. We are still able to form non-related pairings, but this will be increasingly difficult in years to come if new birds are not added to the population.
- The limited founder number, the small number of birds breeding and the limits on the overall population size severely restrict the genetic viability of this population. Unrelated animals will have to be periodically imported to maintain the genetic health of this population (source- wild or European captive born).
- Reproduction: Produce 3-5 chicks over the next year to maintain population size.

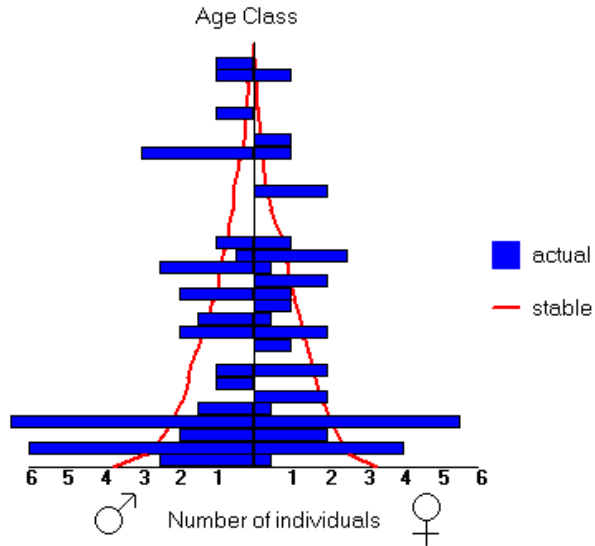
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2009 Population Management Plan for the red-legged seriema

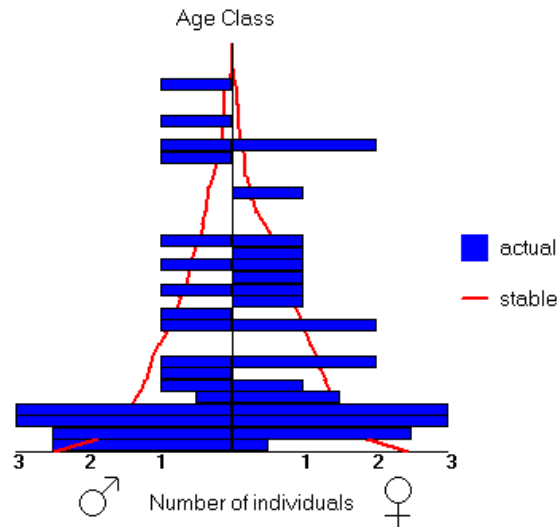
- **Specific Suggestions:** Specific suggestions for each facility are attached. For those zoos, which are known to maintain their seriemas for use in shows, we have recommended that these birds remain as show birds.
- The use of seriemas in educational programs and shows can be beneficial in promoting conservation messages about birds in general and more specifically, seriemas. Curators are encouraged to consult the PMP Manager when considering the use of a seriema in a show, as some seriemas are more genetically valuable than other birds and are therefore better suited for placement in a breeding situation.

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Age Distribution of entire population



Age Distribution of breeding (non-show) birds



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Appendix 1: Life Table data for males and females

Age	Males					Females				
	Q _x	P _x	L _x	M _x	V _x	Q _x	P _x	L _x	M _x	V _x
0	0.310	0.690	1.000	0.000	1.183	0.300	0.700	1.000	0.000	1.176
1	0.080	0.920	0.690	0.040	1.555	0.070	0.930	0.700	0.100	1.525
2	0.060	0.940	0.635	0.130	1.678	0.030	0.970	0.651	0.110	1.547
3	0.090	0.910	0.597	0.090	1.723	0.070	0.930	0.631	0.120	1.558
4	0.040	0.960	0.543	0.160	1.802	0.040	0.960	0.587	0.220	1.568
5	0.060	0.940	0.521	0.170	1.779	0.030	0.970	0.564	0.200	1.439
6	0.000	1.000	0.490	0.080	1.710	0.040	0.960	0.547	0.100	1.323
7	0.020	0.980	0.490	0.160	1.696	0.020	0.980	0.525	0.080	1.299
8	0.000	1.000	0.480	0.250	1.598	0.000	1.000	0.514	0.080	1.269
9	0.110	0.890	0.480	0.160	1.470	0.080	0.920	0.514	0.070	1.276
10	0.030	0.970	0.427	0.140	1.454	0.000	1.000	0.473	0.060	1.296
11	0.060	0.940	0.415	0.270	1.417	0.020	0.980	0.473	0.100	1.287
12	0.070	0.930	0.390	0.120	1.263	0.080	0.920	0.464	0.200	1.286
13	0.040	0.960	0.362	0.260	1.247	0.060	0.940	0.427	0.160	1.204
14	0.060	0.940	0.348	0.160	1.069	0.020	0.980	0.401	0.090	1.121
15	0.000	1.000	0.327	0.040	0.967	0.040	0.960	0.393	0.270	1.095
16	0.050	0.950	0.327	0.200	0.979	0.000	1.000	0.377	0.190	0.868
17	0.150	0.850	0.311	0.030	0.890	0.040	0.960	0.377	0.160	0.713
18	0.000	1.000	0.264	0.090	0.964	0.130	0.870	0.362	0.140	0.622
19	0.090	0.910	0.264	0.030	0.943	0.280	0.720	0.315	0.260	0.620
20	0.070	0.930	0.240	0.180	1.022	0.150	0.850	0.227	0.120	0.479
21	0.000	1.000	0.223	0.150	0.900	0.110	0.890	0.193	0.120	0.426
22	0.040	0.960	0.223	0.080	0.788	0.180	0.820	0.172	0.000	0.368
23	0.210	0.790	0.215	0.330	0.832	0.070	0.930	0.141	0.080	0.435
24	0.000	1.000	0.169	0.440	0.586	0.000	1.000	0.131	0.380	0.380
25	0.330	0.670	0.169	0.180	0.180	0.220	0.780	0.131	0.000	0.000
26	0.000	1.000	0.114	0.000	0.000	0.290	0.710	0.102	0.000	0.000
27	0.000	1.000	0.114	0.000	0.000	0.000	1.000	0.073	0.000	0.000
28	0.000	1.000	0.114	0.000	0.000	0.000	1.000	0.073	0.000	0.000
29	0.240	0.760	0.114	0.000	0.000	0.200	0.800	0.073	0.000	0.000
30	0.000	1.000	0.086	0.000	0.000	0.000	1.000	0.058	0.000	0.000
31	1.000	0.000	0.086	0.000	0.000	1.000	0.000	0.058	0.000	0.000
32	1.000	0.000	0.000	0.000	0.000	1.000	0.000	0.000	0.000	0.000

Q_x = mortality; P_x = survival; L_x = cumulative survivorship; M_x = fecundity; V_x = expected future reproduction

Projected population growth rates

Males: $r = 0.0295$; $\lambda = 1.0300$; $R_0 = 1.359$; $T = 10.39$

Females: $r = 0.0298$; $\lambda = 1.0302$; $R_0 = 1.336$; $T = 9.74$

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Appendix II. Ordered mean kinships of breeding (non-show) population

Males						Females					
Rank	Stbk#	MK	Known	Age	Location	Rank	Stbk#	MK	Known	Age	Location
1	227	0.0393	50.0	10	GRANBY	1	156	0.0617	100.0	17	CRAWFRD
2	86	0.0617	100.0	25	DALLAS	2	178	0.0630	100.0	15	NZP-WASH
3	155	0.0617	100.0	17	CRAWFRD	3	120	0.0680	100.0	21	COLUMBIA
4	52	0.0752	100.0	30	SAN ANTON	4	88	0.0775	100.0	25	SEDGWICK
5	221	0.0869	100.0	7	TORONTO	5	262	0.0906	100.0	3	GRANBY
6	186	0.0969	100.0	13	LOSANGELE	6	207	0.0940	100.0	10	ORLANDO
7	249	0.1027	100.0	5	LUFKIN	7	269	0.1056	100.0	2	CALDWELL
8	270	0.1027	100.0	2	COLUMBIA	8	272	0.1056	100.0	2	SAN ANTON
9	271	0.1027	100.0	2	SAN ANTON	9	81	0.1068	100.0	25	DALLAS
10	92	0.1036	100.0	24	LOWRY	10	164	0.1161	100.0	16	KNOXVILLE
11	288	0.1154	100.0	0	SEDGWICK	11	182	0.1161	100.0	14	LOWRY
12	289	0.1154	100.0	0	SEDGWICK	12	185	0.1248	100.0	13	TORONTO
13	176	0.1367	100.0	15	NZP-WASH	13	242	0.1344	100.0	5	WILD WRLD
14	192	0.1406	100.0	11	SEDGWICK	14	191	0.1358	100.0	12	SCOT NECK
15	239	0.1426	100.0	6	ST LOUIS	15	204	0.1426	100.0	10	DENVER
16	64	0.1464	100.0	27	WILD WRLD	16	225	0.1426	100.0	7	JACKSONVL
17	258	0.1467	100.0	3	WILD WRLD	17	226	0.1457	100.0	7	LOSANGELE
18	275	0.1467	100.0	2	WILD WRLD	18	260	0.1467	100.0	4	WILD WRLD
19	284	0.1467	100.0	1	WILD WRLD	19	274	0.1467	100.0	2	WILD WRLD
20	279	---	---	3	WORLDBIRD	20	278	---	---	3	WORLDBIRD
21	280	---	---	3	WORLDBIRD	21	281	---	---	3	WORLDBIRD
22	286	---	---	1	ORLANDO	22	282	---	---	1	WORLDBIRD
						23	287	---	---	1	WORLDBIRD

Ordered Mean Kinships for Unknown sex animals

Rank	Stbk#	MK	Known	Age	Location
1	250	0.1252	100.0	4	SCOT NECK
2	285	0.1472	100.0	1	WILD WRLD
3	294	---	---	0	WORLDBIRD

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Appendix III: Ordered mean kinships of entire population

Males						Females					
Rank	Stbk#	MK	Known	Age	Location	Rank	Stbk#	MK	Known	Age	Location
1	227	0.0350	50.0	10	GRANBY	1	227	0.0561	100.0	17	CRAWFRD
2	46	0.0497	100.0	31	TULSA	2	46	0.0646	100.0	30	SAN ANTON
3	155	0.0561	100.0	17	CRAWFRD	3	155	0.0648	100.0	15	NZP-WASH
4	86	0.0588	100.0	25	DALLAS	4	86	0.0662	100.0	21	COLUMBIA
5	52	0.0684	100.0	30	SAN ANTON	5	52	0.0721	100.0	17	DENVER
6	189	0.0721	100.0	13	WORLDBIRD	6	189	0.0748	100.0	25	SEDGWICK
7	221	0.0775	100.0	7	TORONTO	7	221	0.0830	100.0	4	TACOMA
8	256	0.0951	100.0	3	CRAWFRD	8	256	0.0849	100.0	3	GRANBY
9	257	0.0951	100.0	3	CRAWFRD	9	257	0.0957	100.0	3	COLUMBIA
10	249	0.0957	100.0	5	LUFKIN	10	249	0.0977	100.0	10	KNOXVILLE
11	270	0.0957	100.0	2	COLUMBIA	11	270	0.0977	100.0	10	ORLANDO
12	271	0.0957	100.0	2	SAN ANTON	12	271	0.1026	100.0	25	DALLAS
13	206	0.0977	100.0	10	WILD WRLD	13	206	0.1030	100.0	2	CALDWELL
14	186	0.1016	100.0	13	LOSANGELE	14	186	0.1030	100.0	2	SAN ANTON
15	288	0.1042	100.0	0	SEDGWICK	15	288	0.1079	100.0	21	RIO GRAND
16	289	0.1042	100.0	0	SEDGWICK	16	289	0.1134	100.0	13	TORONTO
17	92	0.1090	100.0	24	LOWRY	17	92	0.1192	100.0	5	WILD WRLD
18	273	0.1202	100.0	2	PITTS CA	18	273	0.1207	100.0	16	KNOXVILLE
19	192	0.1251	100.0	11	SEDGWICK	19	192	0.1229	100.0	14	LOWRY
20	239	0.1331	100.0	6	ST LOUIS	20	239	0.1235	100.0	5	DREHER PA
21	176	0.1336	100.0	15	NZP-WASH	21	176	0.1241	100.0	12	SCOT NECK
22	258	0.1365	100.0	3	WILD WRLD	22	258	0.1331	100.0	10	DENVER
23	261	0.1365	100.0	3	WILD WRLD	23	261	0.1331	100.0	7	JACKSONVL
24	275	0.1365	100.0	2	WILD WRLD	24	275	0.1365	100.0	4	WILD WRLD
25	284	0.1365	100.0	1	WILD WRLD	25	284	0.1365	100.0	2	WILD WRLD
26	64	0.1453	100.0	27	WILD WRLD	26	64	0.1374	100.0	7	LOSANGELE
27	279	---	---	3	WORLDBIRD	27	279	---	---	3	WORLDBIRD
28	280	---	---	3	WORLDBIRD	28	280	---	---	3	WORLDBIRD
29	286	---	---	1	ORLANDO	29	286	---	---	1	WORLDBIRD
30							287	---	---	1	WORLDBIRD

Ordered Mean Kinships for Unknown sex animals

Rank	Stbk#	MK	Known	Age	Location
1	166	0.1136	100.0	16	CINCINNAT
2	167	0.1136	100.0	15	CRAWFRD W
3	265	0.1178	100.0	3	OMAHA
4	293	0.1178	100.0	1	LOWRY
5	250	0.1208	100.0	4	SCOT NECK
6	200	0.1300	100.0	11	CRAWFRD W
7	285	0.1345	100.0	1	WILD WRLD
8	294	---	---	0	WORLDBIRD

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