CONTENTS

CONTEN	CONTENTS	
TABLES		IV
FIGURE	S	V
ZUSAMN	MENFASSUNG	VII
SUMMA	RY	X
1 INTRO	DDUCTION	1
2 BACK	GROUND	3
2.1 Di	STRIBUTION AND STATUS OF FERAL GORILLAS	3
2.2 Ec	COLOGY OF FREE-RANGING GORILLAS	8
2.3 Sc	OCIAL BEHAVIOR OF FREE-RANGING GORILLAS	9
2.3.1	Social structures	9
2.3.2	All-male groups	12
2.4 ST	ATUS IN CAPTIVITY	14
2.4.1	Introductions of juvenile and adolescent gorillas	16
2.4.2	Establishment of all-male groups of gorillas in zoos	17
3 MATE	RIAL AND METHODS	19
3.1 St	UBJECTS	19
3.2 Ho	DUSING	24
3.2.1	Cologne	24
3.2.2	Paignton, Great Britain	26
3.2.3	Loro Park, Tenerife	29
3.3 M	ETHOD	33
3.3.1	Data Analysis	37

4	RES	ULTS		_
	4.1	Quali	TATIVE DESCRIPTION: GROUP FORMATION AT PAIGNTON ZOO	_
	4.2	QUANT	TITATIVE RESULTS: GROUP FORMATION AT PAIGNTON ZOO	_
	4.2.	1 Se	ocial and non-social behaviors	_
	4.	.2.1.1	Idle	_
	4.	.2.1.2	Locomotion	_
	4.	.2.1.3	Ingestion	_
	4.	.2.1.4	Self-directed behavior	
	4.	.2.1.5	Stereotypic and aberrant behaviors	_
	4.	.2.1.6	Solitary play	_
	4.	.2.1.7	Object play	_
	4.	.2.1.8	Social affiliative behaviors	_
	4.	.2.1.9	Agonistic behaviors	
	4.2.	2 E	nclosure utilization at Paignton Zoo	
	4.3	THE AI	LL-MALE GROUP AT LORO PARK	
	4.3.	1 Se	ocial affiliative behaviors	_
	4.3.	2 A	ggressive behaviors	
	4.3	3 U	tilization of the enclosure at Loro Park	
5	DISC	CUSSI	ON	
	5.1	Groui	P FORMATION AT PAIGNTON ZOO	_
	5.1.	1 N	on-social behaviors	_
	5.1.	2 A	berrant and stereotypic behaviors	_
	5.1	3 Se	ocial affiliative behaviors	1
	5.1.	4 Se	exual behaviors	
	5.1	5 A	ggressive behaviors	Ì
	5.1.	6 C	oalitions and agonistic support	Ì
	5.1.	7 E	nclosure utilization	
	5.2	Loro l	Park	. 1
	5.2.		ocial affiliative behaviors at Loro Park	
	5.2.		exual behaviors	
	5.2		gonistic behaviors	

	5.2.4	Coalitions and agonistic support	112
	5.2.5	Stereotypic behaviors	113
	5.2.6	Enclosure utilization	114
	5.2.7	Enrichment	115
	5.3	CONCLUDING REMARKS	118
6	REFI	122	
7	APPI	ENDIX	136
	7.1	Curriculum Vitae	136
	7.2 I	PUBLICATIONS	138
	73	ACKNOWI EDGEMENT	139

TABLES

based on the suggestions by Groves (2001).	_5
Table 2: Individuals at Paignton Zoo ((hr) = hand-reared; (mr) = mother-reared)	23
Table 3: Individuals at Loro Park, Tenerife, ((hr) = hand-reared; (mr) = mother-reared).23
Table 4: Summary of the behavioral categories used during this study	36
Table 5: Summary of the main events of the group formation of the all-male group at Paignton Zoo	48
Table 6: Enclosure utilization, as percentage of the observation time, prior and post group formation.	68
Table 7: Distribution of social affiliative behaviors at Loro Park.	77
Table 8: Distribution of aggressive behaviors at Loro Park.	85
Table 9: Detailed enclosure utilization of the individuals at Loro Park.	90

FIGURES

from Stewart et al., 2001).	5
Fig. 2: Pertinax at Paignton Zoo (Courtesy of Paignton Zoo).	_ 20
Fig. 3: Claus at Paignton Zoo.	_ 20
Fig. 4: Richard at Paignton Zoo (Courtesy of Paignton Zoo).	_ 20
Fig. 5: Avahli at Paignton Zoo (Courtesy of Paignton Zoo).	_ 20
Fig. 6: Schorsch.	_ 22
Fig. 7: Noel	_ 22
Fig. 8: Ivo	_22
Fig. 9: Maayabu.	_ 22
Fig. 10: Polepole.	_ 22
Fig. 11: Rafiki.	_22
Fig. 12: Enclosure Layout, Cologne Zoo (modified after Nogge, 1985).	_ 25
Fig. 13: Cologne Zoo, Indoor Enclosure.	_ 25
Fig. 14: Enclosure Layout, Paignton Zoo (courtesy of Paignton Zoo).	_27
Fig. 15: Paignton Indoor Show Den.	_27
Fig. 16: Paignton Gorilla Island.	_28
Fig. 17: Loro Park Outline (modified after Neuwald, 1998).	_31
Fig. 18 Loro Park, West Terrace, view from open view point.	_31
Fig. 19: Loro Park, East Terrace from open view point.	_32
Fig. 20: Loro Park, view of one of the sleeping dens.	_ 32
Fig. 21: Pertinax (rear) and Claus (front, facing back) head divert towards each other	. 41
Fig. 22: Pertinax (rear) bluff charges towards Claus (front).	_41
Fig. 23: Idle behavior, as percentage of observation time, for each individual gorilla a Paignton Zoo; prior to and post group formation.	at _ 52
Fig. 24: Locomotion, as percentage of observation time, of all three gorillas at Paignt Zoo, prior to and post group formation.	ton _ 53

Fig. 25: Ingestion (ING), as percentage of the observation time, expressed by the ground at Paignton Zoo prior to and post group formation.	up _ 55
Fig. 26: Self-directed behaviors, as percentage of the observation time, expressed by the group members at Paignton Zoo; prior to and post group formation.	_56
Fig. 27: Stereotypic and aberrant behaviors, as percentage of the observation time, expressed by the gorillas at Paignton Zoo prior and post group formation.	_ 59
Fig. 28: Solitary play, as percentage of the observation time, expressed by the individual gorillas at Paignton Zoo prior and post group formation.	_60
Fig. 29: Object play, as percentage of the observation time, expressed by the gorillas Paignton Zoo prior and post group formation.	at _ 62
Fig. 30: Social affiliative behaviors (SAF), as percentage of the observation time, expressed by the gorillas at Paignton Zoo prior and post group formation.	_ 64
Fig. 31: Moderate aggression, as percentage of the observation time, expressed by the gorillas at Paignton Zoo prior and post group formation.	_ 66
Fig. 32: Proportional rates of all social affiliative behaviors (n = 394), for each individual at Loro Park.	_71
Fig. 33: Partner preferences for social affiliative interactions for each gorilla at Loro Park. Order of graphs correspond with the ages of the gorillas	_74
Fig. 34: Distribution of selected affiliative behaviors within the all-male group at Lor Park, for each interacting dyad	o _78
Fig. 35: Maayabu and Rafiki (top) playing inside the cave at the west terrace.	_ 79
Fig. 36: Proportional rates of all agonistic behaviors (n = 159) for each individual at Loro Park.	_81
Fig. 37: Individual distribution of agonistic interactions for each gorilla at Loro Park.	83
Fig. 38: Distribution of selected aggressive behaviors within the all-male group at Lo Park, for each interacting dyad	
Fig. 39: Noel (right, facing away) and Ivo (left, staring) standing opposite to each other.	_87
Fig. 40: Enclosure Utilization of the Individuals at Loro Park, Tenerife.	_ 89
Fig. 41: Direction and number of agonistic behaviors of the males at Loro Park	110
Fig. 42: Maayabu fishing for yoghurt at Loro Park.	117
Fig. 43: Maayabu taking a "shower" at Loro Park.	117