

EARTHWATCH INSTITUTE ANNUAL FIELD REPORT

Date completed: 18 March 2009

Completed by: Bruce D. Patterson, PI

Period covered by this report: Aug to Dec 2008

Project title: Lions of Tsavo

Cover letter to volunteers



Dear Volunteers,

Owing to civil unrest in the wake of Kenya's national elections, "Lions of Tsavo" was unable to monitor lions on the Taita-Rukinga Conservancy during the first half of 2008. Expeditions resumed in July. During the unrest, a minority owner of Taita Ranch granted a grazing lease for thousands of cattle to local cattle interests, despite the exclusive eco-tourism contract that our landlords (Southern Cross Safaris) had earlier obtained from the majority owner! To ensure the safety and comfort of volunteers while these matters were resolved in Kenyan courts, I made the decision to relocate from our exclusive but rustic tented camp at the foot of Satao Rock (Campi ya Neka) to "Camp Tsavo" on Rukinga Ranch, formerly known as the Taita Discovery Center (TDC). There we have more comforts and better facilities, but our experience is now less bush camping than comfortable but inexpensive accommodations.

Five teams comprised the fact-finders for the 2008 season, led by me or grad student Andy Dosmann (University of Chicago). Their dedication is greatly appreciated and has produced a seventh consecutive year of surveys and monitoring on the Taita-Rukinga Conservancy.



Reporting on research objectives

Objective 1: Investigate the ecology of maneless lions in Tsavo's woodlands

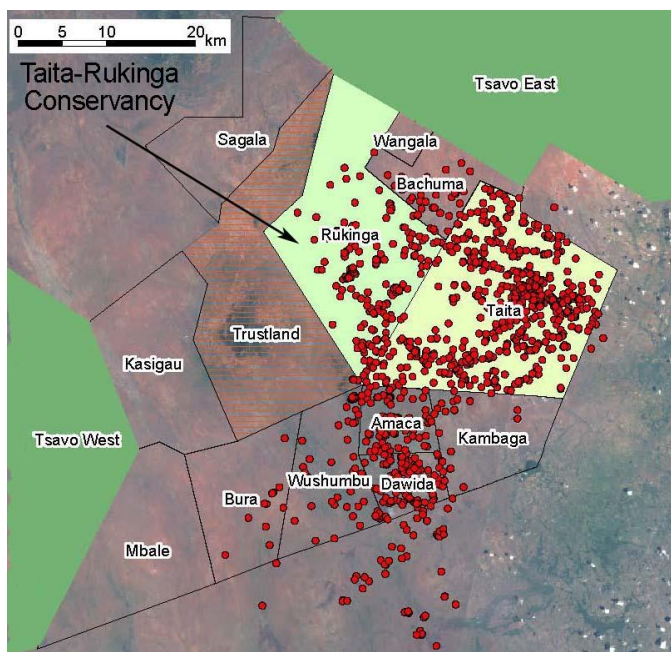
All five teams saw lions, on a total of 27 different occasions (avg. 5.5 sightings per team, range 1-9 sightings). We most frequently spotted a pair of male lions, their two females, and associated cubs between Pika Pika and Sagana. Team 7 named the brown male "Maridadi" (handsome one). This southern part of Taita Ranch had previously been occupied by Kabochi and Bahati, and subsequently by Dickens, so the presence of Maridadi and his

partner almost certainly indicates that these other males are absent. Despite assiduous efforts by volunteer teams, none of the radio-collared lions was located during the year.

Perhaps a response to the disappearance of resident males, the first case of infanticide in Tsavo was documented by Team 2008-09. This behavior is commonplace among lions in high-density grasslands and is thought to be a male adaptation to short expected tenures (ca. 18-24 months) and the need to sire their own offspring during this brief time-period. Because the tenures of Cassius (65 months) and Kabochi and Bahati (72 months) greatly exceeded this period, there appeared to be limited reason or evidence for this behavior in Tsavo. However, livestock-induced disruptions of Tsavo's lion populations might have weakened the social security for our cubs. This is an important association that we will do our best to track in the months and years ahead.

Objective 2: Help to mitigate lion-human conflict

2008 also saw a new proposal developed to the Born Free Foundation out of Earthwatch-collected information. Team 2007-05 had recollared male lion Kabochi for the third time, and his GPS collar was recovered with 2311 GPS points and times, documenting a perfectly enormous home range (more than 1400 km²), several times larger than previously documented for any male lion. His frequent sorties from the Taita-Rukinga Sanctuary routinely bring him into harm's way in the surrounding villages and working ranches to the north and south, yet somehow, Kabochi has managed to stay out of harm's way. Rob Dodson, who manages the ranger teams patrolling both Taita and Rukinga Ranches against poachers, wood cutters, charcoalers, etc, has proposed that the Born Free Foundation support four additional ranger teams who will de-snare and patrol all of the ranches between Taita-Rukinga and Tsavo West National Park. Such a program would help save the sanctuary's lions as well as many other wide-ranging wildlife species.



The range of male lion Kabochi, 2005-2007.

Objective 3: Assess woodland biodiversity

The five teams in 2008 made almost 7200 sightings of 59,000 individual animals. Together with sighting made in prior years, we now have more than 50,000 sightings of 108 species of wildlife, all timed and geo-referenced, between 2004 and 2008. Analysis of these data await the collection of a final year of data, which should offer us substantial power in analyses of population densities, habitat associations, and temporal trends on the ranches. Analysis of covariation with numbers of livestock will provide an assessment of the impact of herding on woodland biodiversity.

species	Times seen					Total	Number seen					Total
	2008-06	2008-07	2008-08	2008-09	2008-10		2008-06	2008-07	2008-08	2008-09	2008-10	
Aardvark		1	2		1	4		1	3		1	5
Aardwolf	32	5	6	5	10	58	35	5	6	5	11	62
Baboon, Yellow	19	11	13	6	2	51	259	165	92	70	62	648
Badger, Honey	1	1				2	1	2				3
Buffalo, African	106	37	36	13	14	206	3301	886	394	63	492	5136
Bushbaby, Senegal	551	230	269	178	84	1312	590	249	277	183	92	1391
Caracal		1	1		1	3		1	1		1	3
Cheetah	12	2	4	3	3	24	20	5	5	4	7	41
Civet, African	42	17	12	9	4	84	43	17	12	10	4	86
Dik-dik, Kirk's	925	358	428	403	357	2471	1624	579	739	657	556	4155
Domestic Cattle	47	21	16	22	4	110	7101	####	8583	7500	2398	37282
Domestic Goat	1		3	3		7	17		8	102		127
Duiker, Blue				1		1				1		1
Duiker, Bush	9	3	4	9	2	27	9	3	4	9	2	27
Eland	2	2	4	2	7	17	4	2	6	2	42	56
Elephant	132	74	86	31	79	402	1838	595	444	88	320	3285
Fox, Bat-Eared	39	12	16	11	18	96	62	21	27	13	33	156
Gazelle, Grant's	39	2	5	10		56	98	5	24	40		167
Gazelle, Peter's		13	8	4	23	48		39	25	13	89	166
Genet, Small-Spotted	36	26	34	16	20	132	36	34	34	17	21	142
Gerenuk	92	37	48	40	38	255	178	69	100	84	62	493
Giraffe	46	36	17	9	20	128	106	75	41	19	49	290
Hare, African	111	59	29	46	33	278	206	63	29	54	34	386
Hedgehog	1					1	2					2
Hyena, Spotted	16	4	4	4	3	31	42	8	5	6	4	65
Hyena, Striped	2	1	1		1	5	2	1	1		1	5
Hyrax, Rock	11	3	4	8	2	28	53	30	8	18	14	123
Impala	85	31	44	32	33	225	476	220	201	211	159	1267
Jackal, Black-Backed	45	21	17	22	21	126	50	28	19	34	35	166
Klipspringer	4	1				5	4	1				5
Kongoni (Coke's)	6	4	6	13	9	38	27	11	23	22	35	118
Kudu, Lesser	164	69	53	32	23	341	342	118	87	52	51	650
Lion	8	9	3	6	1	27	22	18	7	22	7	76
Marabou stork	4	3			3	10	10	6			4	20
Mongoose, Banded	3	1		1	4	9	15	8		4	43	70
Mongoose, Bushy-tailed					1	1					1	1

Mongoose, Dwarf	8	2	7		3	20	24	7	19		13	63
Mongoose, Egyptian			1		1	2			1		1	2
Mongoose, Slender		2				2		2				2
Mongoose, White-Tailed	25	12	13	8	6	64	30	14	13	8	6	71
Monkey, Vervet	1					1	1					1
Oryx, Fringe-eared	2	4	3	1	10	20	2	5	8	2	52	69
Porcupine, Crested	2		1			3	4		1			5
Serval	10	7	8	8	8	41	10	7	8	8	8	41
Squirrel, Bush	2					2	2					2
Squirrel, Striped ground		1				1		1				1
Squirrel, Unstriped ground			1		1	2			1		1	2
Warthog	46	21	20	18	8	113	123	46	33	57	30	289
Wildcat, African	8	2	8	5	12	35	8	2	8	5	13	36
Zebra, Burchell's	89	38	29	16	29	201	870	271	155	93	172	1561
Zebra, Grevy's	19	6	1	1	3	30	66	11	2	1	7	87

Birds

Eagle, Bateleur	14	3	3	4	3	27	31	3	4	4	3	45
Eagle, Brown snake	1		2	1	1	5	1		2	1	1	5
Eagle, Martial	1	3	3	2	2	11	1	4	3	2	2	12
Eagle, Steppe			3	8	1	12			6	11	1	18
Eagle, Tawny	12	2	7	6	7	34	62	2	9	7	9	89
Eagle, Wahlberg's	1					1	1					1
Ostrich	2				7	9	2				37	39
Owl, African Scops	2	2	1			5	2	2	1			5
Owl, Barn		1				1		1				1
Owl, Spotted eagle	1	2	1			4	1	2	1			4
Owl, Verreaux's eagle			2			2			2			2
Owl, White-Faced Scops	2					2	2					2
Vulture, Ruppell's Griffon	2					2	4					4
Vulture, Wt-backed	7	1				8	51	1				52

Reptiles

Terrapin					15	15					15	15
Tortoise, Leopard					4	4					5	5
Monitor Lizard					2	2					2	2
Grand Total	2803	1190	1265	996	902	7156	#####	#####	#####	9477	4933	58908

Non-technical summary of results

Give an account of the data collected and results (inputs and data) for the period covered by this report, mentioning any emerging trends.

We continued observations on a population of lions inhabiting Tsavo's *Acacia-Commiphora* woodlands for a sixth consecutive year. All five two-week teams saw lions, on 27 different occasions (avg. 5.5 sightings per team, range 1-9 sightings). We most frequently spotted a pair of male lions, their two females, and associated cubs between Pika Pika and Sagana. Team 7 named the brown male "Maridadi" (handsome one). This southern part of Taita Ranch had previously been occupied by Kabochi and Bahati, and subsequently by Dickens, so the presence of Maridadi and his partner almost certainly indicates that these other males are absent (and presumed dead). Despite assiduous efforts by volunteer teams, none of the radio-collared lions was located during the year.

Perhaps as a response to the disappearance of resident males, the first case of infanticide in Tsavo was documented by Team 2008-09. This behavior is commonplace among lions in high-density grasslands and is thought to be a male adaptation to short expected tenures (ca. 18-24 months) and the need to sire their own offspring during this brief time-period. Because the tenures of Cassius (65 months) and Kabochi and Bahati (72 months) greatly exceeded this period, there appeared to be limited reason or evidence for infanticidal behavior in Tsavo. However, livestock-induced disruptions of Tsavo's lion populations might have weakened the social security for our cubs. This is an important association that we will do our best to track in the months and years ahead.

How do these data contribute to achieving conservation impacts? (e.g. actions based on results, management plans, site protection)

Heightened lion mortality and social disruption documented by our team has sent out alarms to non-profit NGOs (Born Free Foundation) and to para-statal organizations (Kenya Wildlife Service) that the region is under threat. Funding for anti-snare patrols on all the ranches may be one outcome of this discovery, and KWS is assuredly alert for commercialization of lion parts in SE Kenya.

What is/ are the significance/ benefits of your research at the following levels?

- **Local (to the area of the research site)**

We provide a sustainable means of using the Taita ranch lands for ecotourism and research, rather than for extractive uses. Our ranch-use fees and camp leases replace the grazing leases and timber sales that formerly compensated the ranches' owners.

- **National / Regional**

We have assembled compelling documentation that the Taita-Rukinga Sanctuary houses one of Kenya's largest and most pristine woodland ecosystems, and is home to 13 species of eagles, 6 species of cats, 7 of mongooses, etc. I expect that our final tabulations of diversity and abundance can be used as the nucleus to provide governmental protection to this informal conservancy.

- **International**

The Taita-Rukinga ranches together encompass more land than either Amboseli or Kilimanjaro National Parks, and unlike them, is adjacent to Kenya's largest protected area.

Together with adjacent ranches, Taita-Rukinga lie between the tips of Tsavo West and Tsavo East, constituting a migration corridor and buffer zone between them. Securing protection for this region while it remains relatively pristine is a high priority.

Communication of results

In line with our mission, the Earthwatch Institute is committed to research and results that will be disseminated to local, national, and international audiences.

Printed: peer reviewed scientific publications; books / book sections; reports, management plans or policies; fact sheets, brochures, leaflets, pamphlets, posters, academic dissertations, annual reports, proceedings of conferences or workshops; letters; newsletters.

This is the first year since 2000 that I did not have a publication on lions. See others here: <http://sites.google.com/a/fieldmuseum.org/bruce-pattersons-lab/Home/research-areas/lions-of-tsavo/publications-news>

Digital: database; internet - websites, email group/ blog/forum; CD Rom, e-newsletter

[Pulse of the Planet coverage](#)

- [Science Diary: Lions of Tsavo - Poisoned Cattle](#)
- [Science Diary: Lions of Tsavo - Tracking](#)
- [Science Diary: Lions of Tsavo - Encroachment](#)

Mass media: broadcast production; film; TV, radio, print (newspaper/ magazine coverage); Press releases; press conference; interview, article creation; press trip

John Cody's WBBM interview (12 Sep 2008)

- [story headline](#) (wav file)
- [body of story](#) (wav file)

TV, radio and newspaper articles on Chicago's puma (cat-human conflict)

<http://abclocal.go.com/wls/story?section=news/local&id=6081659>

<http://www.chicagowildernessmag.org/issues/summer2008/news/cougar.html>

<http://www.blogsmonroe.com/expatriate/2008/04/chicago-cougar-was-wild/>

Meetings and conferences: presentations/ lectures; conferences; workshops; training sessions; discussions; local community meetings and events.

Public Presentations: Cheetah Conservation Fund, Chicago IL. (Introduction to African Research at Field Museum, including Lions of Tsavo)

Field Associates breakfast (lecture on Lions of Tsavo)

Educational Opportunities

Does your project directly or indirectly involve the following groups in your research topic?

- Local communities
- Students
- Early career scientists
- Other groups

I lecture to gap-year students who are staying in the education centre with us. Opportunistically, I also lecture to local school groups who are passing through our education centre.

Has your project contributed to the completion of Masters' or PhD theses or degrees, or other educational research findings?

We are currently sending the co-PI of the project, Alex Mwazo, through a MSc in Wildlife Biology at Kenyatta University in Nairobi (all expenses paid by private donations through the Field Museum).