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Movement dynamics of gibbons after the construction of canopy bridges over a park road

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Supplementary material

Video S1. The locomotion of gibbons (*Hylobates lar*) when crossing the bridges.

Table S1. Canopy bridge project timeline with milestones in collaboration with Khao Yai National Park, Thailand.

Date	Description
June 2014	A storm broke the tree branch gibbons used for crossing. Gibbons started using the ground to cross at this location (future location of North Bridge).
11 July 2014	A researcher (C.S.) discussed with the park chief and park officials how to aid gibbons by designing canopy bridges at this location (future location of North Bridge) and another problematic crossing location (future location of South Bridge).
17 July-28 August 2014	A bridge project was developed, which included the design and construction of two canopy bridges, finding funding, and submitting the project to the park.
30 August 2014	The park chief endorsed the project.
27 September 2014	Single rope bridges were installed to the north (North Bridge) and the south (South Bridge).
5 October-23 November 2014	Two camera traps were installed in the North Bridge.
4 December 2014	The park guard first reported gibbons using the South Bridge.
8 December 2014	Gibbon used the North Bridge.
2 February 2015	The female adult gibbon had an atypical locomotion on the South Bridge.
14 February 2015	A horizontal ‘ship’ ladder bridge was installed to support gibbon locomotion at the South Bridge.

Table S2. Data on gibbons (*Hylobates lar*) crossing roads at Khao Yai National Park using group follows (GF) and from bridge monitoring by the Park guard (GO) in this study. The road crossing rate for each period was calculated as the number of crossing event divided by the number of observation hours per day.

No.	Data Set	Study Period	Date	No. crossing events*	Crossing Rate (events/day)	Crossing/Bridge Location
1	GF	Before	March 3, 2013	0	0	
2	GF	Before	March 29, 2013	1	1.32	South
3	GF	Before	April 8, 2013	0	0	
4	GF	Before	April 11, 2013	0	0	
5	GF	Before	May 8, 2013	0	0	
6	GF	Before	May 13, 2013	0	0	
7	GF	Before	June 20, 2013	0	0	
8	GF	Before	February 15, 2014	0	0	
9	GF	Before	April 24, 2014	1	1.46	North
10	GF	Before	May 31, 2014	2(1)	2.8	South (others)
11	GF	Before	June 8, 2014	0	0	
12	GF	Before	June 9, 2014	3(2)	3.56	North (others)
13	GF	Before	June 10, 2014	1	1.32	North
14	GF	Before	June 11, 2014	2(1)	2.59	South (others)
15	GF	After	October 9, 2014	0	0	
16	GF	After	February 15, 2015	1	2.21	North
17	GF	After	March 16, 2015	0	0	
18	GF	After	July 5, 2015	0	0	
19	GF	After	July 6, 2015	1	1.31	South
20	GF	After	July 16, 2015	0	0	
21	GF	After	July 19, 2015	1	1.36	South
22	GF	After	July 21, 2015	1	1.56	Ladder
23	GF	After	July 22, 2015	0	0	
24	GF	After	July 26, 2015	0	0	
25	GF	After	July 27, 2015	1	2.99	North
26	GF	After	July 28, 2015	1	1.99	North
27	GF	After	July 29, 2015	1	1.1	South
28	GF	After	July 30, 2015	0	0	
29	GF	After	July 31, 2015	2	2.55	North
30	GF	After	August 1, 2015	2	4.18	South
31	GF	After	August 2, 2015	2	2.31	North
32	GF	After	August 5, 2015	1	1.35	South
33	GF	After	August 6, 2015	2	2.27	South & North

No.	Data Set	Study Period	Date	No. crossing events*	Crossing Rate (events/day)	Crossing/Bridge Location
34	GF	After	August 7, 2015	1	1.53	South
35	GF	After	August 8, 2015	2	2.26	North
36	GF	After	August 29, 2015	2	2.26	North
37	GF	After	September 25, 2015	0	0	
38	GF	After	September 26, 2015	0	0	
39	GF	After	September 28, 2015	0	0	
40	GF	After	January 3, 2016	0	0	
41	GF	After	January 4, 2016	4	4.66	North
42	GF	After	January 5, 2016	0	0	
43	GF	After	January 6, 2016	0	0	
44	GF	After	January 8, 2016	0	0	
45	GF	After	January 9, 2016	0	0	
46	GF	After	January 30, 2016	1	1.26	North
47	GF	After	January 31, 2016	1	1.07	North
48	GF	After	February 1, 2016	0	0	
49	GF	After	February 27, 2016	0	0	
50	GF	After	February 28, 2016	0	0	
51	GF	After	February 29, 2016	0	0	
52	GF	After	March 5, 2016	1	2.3	North
53	GF	After	March 6, 2016	1	1.88	North
54	GF	After	March 7, 2016	0	0	
55	GF	After	March 8, 2016	0	0	
56	GF	After	March 9, 2016	0	0	
57	GF	After	March 20, 2016	2	4.53	North
58	GF	After	April 10, 2016	0	0	
59	GF	After	April 11, 2016	0	0	
60	GF	After	April 12, 2016	2	2.78	North & South
61	GF	After	May 10, 2016	1	1.85	Others
62	GF	After	May 11, 2016	1	1.82	Others
63	GF	After	July 3, 2016	2	2.93	Others
64	GF	After	July 4, 2016	2	4.52	Others
65	GF	After	July 6, 2016	2	4.74	Others
66	GF	After	July 14, 2016	1	1.94	Others
67	GF	After	July, 16 2016	0	0	
68	GO	After	January 4, 2015	1	0.91	South
69	GO	After	January 5, 2015	1	0.91	North
70	GO	After	March 5, 2015	2	1.82	Ladder & North
71	GO	After	March 6, 2015	1	0.91	Ladder

No.	Data Set	Study Period	Date	No. crossing events*	Crossing Rate (events/day)	Crossing/Bridge Location
72	GO	After	March 7, 2015	2	1.82	South
73	GO	After	March 8, 2015	1	0.91	North
74	GO	After	March 18, 2015	1	0.91	North
75	GO	After	March 22, 2015	1	0.91	North
76	GO	After	May 4, 2014	1	0.91	North
77	GO	After	June 14, 2015	2	1.82	Ladder & North
78	GO	After	June 21, 2015	1	0.91	South
79	GO	After	June 29, 2015	2	1.82	North
80	GO	After	July 3, 2015	2	1.82	South
81	GO	After	July 8, 2015	1	0.91	South
82	GO	After	July 13, 2015	1	0.91	South
83	GO	After	July 18, 2015	1	0.91	South
84	GO	After	July 20, 2015	4	3.64	North & Ladder
85	GO	After	July 23, 2015	1	0.91	South
86	GO	After	July 24, 2015	2	1.82	South & North
87	GO	After	July 25, 2015	1	0.91	North
88	GO	After	August 4, 2015	2	1.82	North & South
89	GO	After	August 9, 2015	1	0.91	South
90	GO	After	August 10, 2015	2	1.82	South & North
91	GO	After	August 11, 2015	1	0.91	South
92	GO	After	August 14, 2015	1	0.91	North
93	GO	After	August 18, 2015	2	1.82	North
94	GO	After	August 21, 2015	2	1.82	South
95	GO	After	August 22, 2015	5	4.55	South/North
96	GO	After	August 23, 2015	1	0.91	North
97	GO	After	August 25, 2015	1	0.91	North
98	GO	After	August 30, 2015	1	0.91	North
99	GO	After	August 31, 2015	1	0.91	North
100	GO	After	September 3, 2015	1	0.91	North
101	GO	After	September 4, 2015	2	1.82	South
102	GO	After	September 5, 2015	2	1.82	North
103	GO	After	September 7, 2015	4	3.64	North
104	GO	After	September 8, 2015	2	1.82	North
105	GO	After	September 10, 2015	1	0.91	North
106	GO	After	September 11, 2015	2	1.82	North
107	GO	After	September 14, 2015	2	1.82	North
108	GO	After	September 15, 2015	2	1.82	North
109	GO	After	September 22, 2015	2	1.82	North

No.	Data Set	Study Period	Date	No. crossing events*	Crossing Rate (events/day)	Crossing/Bridge Location
110	GO	After	September 23, 2015	1	0.91	South
111	GO	After	October 4, 2015	1	0.91	South
112	GO	After	October 9, 2015	1	0.91	South
113	GO	After	December 4, 2015	1	0.91	South
114	GO	After	December 9, 2015	2	1.82	South
115	GO	After	December 11, 2015	2	1.82	South
116	GO	After	December 12, 2015	2	1.82	South

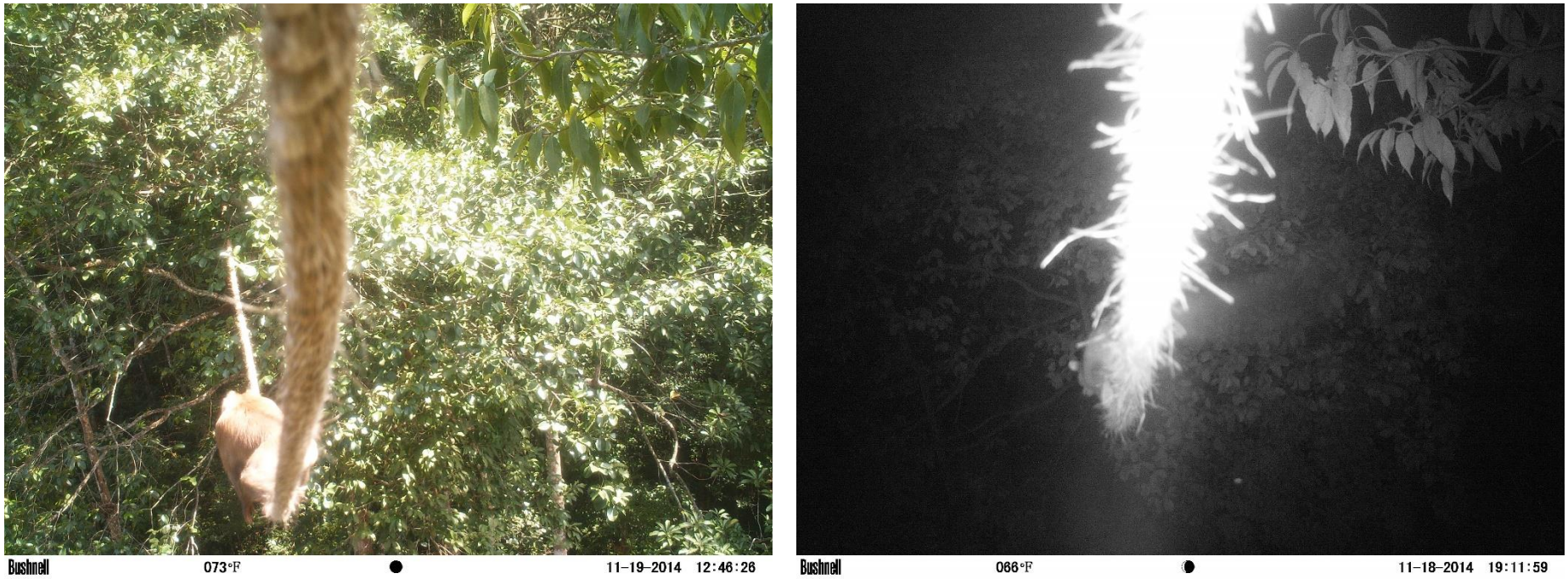
*The number in parentheses indicates the number of crossings in locations where the bridges were not placed (others).


Bushnell
077°F
11-09-2014 10:47:59

(a)


Bushnell
064°F
11-12-2014 07:57:24

(b)



(c) (d)

Figure S1. Pictures obtained from the camera traps showing other species using the canopy bridge. The first species was *Ratufa bicolor* (a), followed by *Callosciurus finlaysoni* (b) *Macaca nemestrina* (c), and *Arctogalidia trivirgata* (d).