

张梦, 曹荣军, 王功芳, 邹琼玖, 吴林庭, 付伟昌, 周友兵, 彭刚志 (2026) 道路干扰对偶蹄类动物的影响: 以湖北大老岭国家级自然保护区为例. 生物多样性, 34, 26050. doi: 10.17520/biods.2026050; cstr: 32101.14.biods.2026050.

附录 1 湖北大老岭国家级自然保护区 388 台红外相机数据
Appendix 1 388 camera trap sites in Hubei Dalaoing National Nature Reserve

序号 Number	相机名 Camera_id	纬度 Latitude	经度 Longitude	距 S287 距离 distance_to_S287_m	开始录制日期 first_date	结束录制日期 last_date
1	HBNR016X-DLL304-20210317	31.091362	110.945291	212.9	2021/3/17	2021/8/31
2	HBNR016X-DLL305-20210317	31.102197	110.958873	163.2	2021/3/17	2021/8/31
3	HBNR016X-DLL309-20210325	31.110878	110.952178	66.2	2021/3/25	2021/8/31
4	HBNR016X-DLL005-20210422	31.087875	110.989375	2604.5	2021/4/22	2021/8/31
5	HBNR016X-DLL011-20210421	31.091139	110.952383	39.7	2021/4/21	2021/8/31
6	HBNR016X-DLL021-20210420	31.083380	110.938952	584	2021/4/20	2021/8/31
7	HBNR016X-DLL301-20210316	31.091190	110.961910	94.7	2021/3/16	2021/8/31
8	HBNR016X-DLL302-20210316	31.089213	110.968692	630.4	2021/3/15	2021/9/1
9	HBNR016X-DLL303-20210317	31.085544	110.953063	163.6	2021/3/17	2021/8/31
10	HBNR016X-DLL306-20210317	31.100985	110.964373	375.3	2021/3/17	2021/9/2
11	HBNR016X-DLL102-20201223	31.093000	110.928100	1843.5	2020/12/23	2021/9/9
12	HBNR016X-DLL103-20201223	31.089000	110.925900	1538.3	2020/12/23	2021/9/2
13	HBNR016X-DLL105-20210429	31.076149	110.977365	2115.6	2021/4/29	2021/9/2
14	HBNR016X-DLL106-20210429	31.077397	110.971200	1643	2021/4/29	2021/8/6
15	HBNR016X-DLL107-20210105	31.064273	110.961537	1435.4	2021/1/5	2021/4/6
16	HBNR016X-DLL001-20210421	31.106248	110.945431	273.2	2021/4/19	2021/8/7
17	HBNR016X-DLL026-20210602	31.069520	110.927097	138.6	2021/6/2	2021/9/2
18	HBNR016X-DLL104-20210429	31.080460	110.990830	2931.2	2021/4/29	2021/9/2

19	HBNR016X-DLL310-20210325	31.116968	110.927302	1642.6	2021/3/24	2021/9/7
20	HBNR016X-DLL311-20210325	31.112881	110.932050	1057.4	2021/3/25	2021/9/8
21	HBNR016X-DLL312-20210419	31.112241	110.920062	2172.8	2021/4/19	2021/9/8
22	HBNR016X-DLL313-20210330	31.117774	110.941341	799.4	2021/3/30	2021/9/8
23	HBNR016X-DLL314-20210330	31.117271	110.939420	820	2021/3/30	2021/9/8
24	HBNR016X-DLL315-20210421	31.078473	110.951218	143.4	2021/4/21	2021/9/2
25	HBNR016X-DLL317-20210422	31.108020	110.937516	568.9	2021/4/20	2021/9/6
26	HBNR016X-DLL318-20210422	31.107623	110.939958	410	2021/4/22	2021/9/8
27	HBNR016X-DLL319-20210601	31.106500	110.934600	893.5	2021/6/1	2021/9/9
28	HBNR016X-DLL107-20210429	31.064273	110.961537	1435.4	2021/4/29	2021/8/31
29	HBNR016X-DLL108-20210422	31.059559	110.937817	251.8	2021/4/22	2021/9/1
30	HBNR016X-DLL109-20210422	31.061400	110.944000	6.6	2021/4/22	2021/9/1
31	HBNR016X-DLL116-20210413	31.085655	110.914859	1683.3	2021/4/13	2021/9/2
32	HBNR016X-DLL118-20210413	31.076384	110.928865	309.9	2021/4/13	2021/9/1
33	HBNR016X-DLL119-20210413	31.063396	110.949306	418.1	2021/4/13	2021/9/2
34	HBNR016X-DLL120-20210413	31.062663	110.947436	225.1	2021/4/14	2021/9/3
35	HBNR016X-DLL121-20210415	31.059583	110.919826	544.4	2021/4/15	2021/9/8
36	HBNR016X-DLL122-20210415	31.051671	110.918832	1402.5	2021/4/15	2021/9/8
37	HBNR016X-DLL123-20210415	31.052893	110.921570	1198.8	2021/4/15	2021/9/8
38	HBNR016X-DLL124-20210415	31.072702	110.941222	587.9	2021/4/15	2021/9/2
39	HBNR016X-DLL125-20210415	31.069553	110.936733	702.4	2021/4/15	2021/9/2
40	HBNR016X-DLL126-20210415	31.062579	110.929145	2.2	2021/4/15	2021/9/2
41	HBNR016X-DLL127-20210427	31.087453	110.929900	1206.5	2021/4/27	2021/9/1
42	HBNR016X-DLL201-20210413	31.045714	110.946356	248.5	2021/4/13	2021/9/8
43	HBNR016X-DLL202-20210413	31.045700	110.948700	31.7	2021/3/14	2021/8/2

44	HBNR016X-DLL205-20210415	31.052230	110.955932	716.7	2021/4/15	2021/8/31
45	HBNR016X-DLL206-20210416	31.059600	110.959200	1074.7	2021/4/16	2021/9/1
46	HBNR016X-DLL207-20210421	31.056370	110.971160	2195.1	2021/4/21	2021/8/6
47	HBNR016X-DLL128-20210601	31.083385	110.910978	1689.2	2021/6/1	2021/10/26
48	HBNR016X-DLL009-20191029	31.093333	110.919722	2271.5	2019/3/17	2020/4/21
49	HBNR016X-DLL011-20191212	31.092222	110.919167	2209.8	2020/1/1	2020/4/21
50	HBNR016X-DLL012-20191029	31.068056	110.915000	428.8	2020/1/1	2020/4/21
51	HBNR016X-WZY001-20240126	31.057787	110.952109	404.4	2024/1/26	2024/5/14
52	HBNR016X-WZY003-20240126	31.062656	110.929185	11.2	2024/1/26	2024/5/14
53	HBNR016X-WZY004-20240128	31.072406	110.929790	52	2023/1/28	2024/5/14
54	HBNR016X-WZY005-20240126	31.072406	110.929790	52	2024/1/26	2024/5/16
55	HBNR016X-WZY006-20240127	31.058225	110.942174	283.1	2024/1/27	2024/5/13
56	HBNR016X-WZY007-20240126	31.072496	110.940619	594.7	2024/1/26	2024/5/16
57	HBNR016X-WZY009-20240126	31.076703	110.971496	1723	2024/1/26	2024/5/16
58	HBNR016X-WZY011-20240126	31.074925	110.977310	2213.3	2024/1/26	2024/5/15
59	HBNR016X-WZY012-20240127	31.077430	110.954470	449.1	2024/1/27	2024/5/15
60	HBNR016X-WZY015-20240127	31.087928	110.971671	936.7	2024/1/27	2024/4/28
61	HBNR016X-WZY016-20240127	31.099760	110.969265	817.1	2024/1/27	2024/5/14
62	HBNR016X-WZY017-20240127	31.099531	110.964214	358.8	2024/1/27	2024/5/14
63	HBNR016X-D4G002-20231101	31.095668	110.971053	878	2023/11/1	2024/3/29
64	HBNR016X-D4G007-20231227	31.098971	110.971008	947.8	2023/12/27	2024/5/15
65	HBNR016X-D4G038-20231117	31.079800	110.966057	1176.1	2023/11/17	2024/3/8
66	HBNR016X-DLL001-20230803	31.105250	110.945152	387.3	2023/8/3	2023/12/7
67	HBNR016X-DLL001-20231207	31.105249	110.945151	387.4	2023/12/7	2024/5/21
68	HBNR016X-DLL002-20230801	31.088230	110.952300	28.6	2023/8/1	2023/12/5

69	HBNR016X-DLL002-20231205	31.088138	110.951254	50.5	2023/12/5	2024/5/14
70	HBNR016X-DLL003-20240808	31.115095	110.944584	374.7	2023/8/8	2023/11/24
71	HBNR016X-DLL004-20231207	31.106194	110.945427	279.1	2023/12/7	2024/5/21
72	HBNR016X-DLL005-20230801	31.075059	110.952883	554.1	2023/8/1	2023/12/5
73	HBNR016X-DLL005-20231205	31.075107	110.952940	551.5	2023/12/5	2024/3/11
74	HBNR016X-DLL008-20230808	31.115400	110.946400	271.5	2023/8/8	2023/11/17
75	HBNR016X-DLL008-20230809	31.074167	110.942536	401.7	2023/8/9	2024/3/12
76	HBNR016X-DLL010-20231102	31.079206	110.987935	2734.4	2023/11/2	2024/5/16
77	HBNR016X-DLL011-20230809	31.086921	110.973893	1170.7	2023/8/9	2024/1/4
78	HBNR016X-DLL012-20230809	31.087254	110.968243	656.9	2023/8/9	2024/1/4
79	HBNR016X-DLL012-20240104	31.087247	110.968272	659.7	2024/1/4	2024/5/21
80	HBNR016X-DLL013-20230808	31.115063	110.944614	370.3	2023/8/8	2023/12/6
81	HBNR016X-DLL058-20231117	31.080334	110.990606	2916.4	2023/11/17	2024/5/15
82	HBNR016X-DLL059-20231117	31.076096	110.977351	2119	2023/11/17	2024/5/16
83	HBNR016X-DLL435-20231228	31.099120	110.963830	313.2	2023/12/28	2024/5/13
84	HBNR016X-DLL438-20230801	31.088734	110.950411	23.8	2023/8/1	2023/11/11
85	HBNR016X-QJY002-20240104	31.087019	110.973865	1165	2024/1/4	2024/5/21
86	HBNR016X-QJYT08-20231227	31.098971	110.971008	947.8	2023/12/27	2024/5/15
87	HBNR016X-DLL015-20231206	31.090300	110.919800	2009.8	2023/12/6	2024/4/18
88	HBNR016X-DLL018-20231206	31.079912	110.925217	809.9	2023/12/6	2024/5/6
89	HBNR016X-DLL019-20231207	31.047900	110.950200	10.6	2023/12/7	2024/6/12
90	HBNR016X-DLL021-20231205	31.079600	110.925100	785.8	2023/12/5	2024/5/6
91	HBNR016X-DLL022-20231206	31.091600	110.914170	2305.2	2023/12/6	2024/4/18
92	HBNR016X-DLL023-20231206	31.080400	110.921500	899	2023/12/6	2024/5/9
93	HBNR016X-DLL024-20230626	31.060800	110.915900	626.8	2023/6/26	2024/3/13

94	HBNR016X-DLL025-20230626	31.060890	110.915900	618.9	2023/6/26	2023/10/23
95	HBNR016X-DLL028-20241121	31.057635	110.952235	419.9	2023/11/21	2024/3/19
96	HBNR016X-DLL040-20231101	31.087743	110.924467	1503.7	2023/11/1	2024/5/23
97	HBNR016X-DLL052-20231101	31.090400	110.925200	1705.3	2023/11/1	2024/4/9
98	HBNR016X-DLL053-20231101	31.090972	110.925917	1725.1	2023/11/1	2024/4/9
99	HBNR016X-DLL054-20231101	31.091035	110.926369	1710.6	2023/11/1	2024/4/8
100	HBNR016X-DLL055-20231101	31.092524	110.925740	1885.2	2023/11/1	2024/4/9
101	HBNR016X-DLL056-20231101	31.091326	110.925008	1802.5	2023/11/1	2024/4/9
102	HBNR016X-DLL061-20231129	31.070800	110.923700	100.5	2023/11/29	2024/5/8
103	HBNR016X-DLL062-20231129	31.070600	110.921200	11.1	2023/11/29	2024/5/8
104	HBNR016X-DLL064-20231129	31.076700	110.912300	1059.7	2023/12/23	2024/5/8
105	HBNR016X-DLL065-20231129	31.068300	110.911600	749.8	2023/11/29	2024/5/7
106	HBNR016X-DLL066-20231129	31.066900	110.912300	667.2	2023/11/29	2024/5/8
107	HBNR016X-DLL067-20231129	31.073200	110.910300	1047.4	2023/11/29	2024/5/8
108	HBNR016X-DLL069-20230711	31.065528	110.921267	65.6	2023/7/11	2024/1/9
109	HBNR016X-DLL151-20230918	31.069500	110.937200	682.8	2023/9/18	2024/3/20
110	HBNR016X-DLL152-20230918	31.072300	110.932700	233.5	2023/9/18	2024/3/20
111	HBNR016X-DLL154-20231009	31.077700	110.929000	433.3	2023/10/9	2024/5/8
112	HBNR016X-DLL155-20231024	31.083900	110.929700	865.7	2023/10/24	2024/5/23
113	HBNR016X-DLL160-20231123	31.043300	110.910000	2582.4	2023/11/23	2024/7/24
114	HBNR016X-DLL163-20231123	31.049900	110.920200	1552.4	2023/11/23	2024/7/24
115	HBNR016X-DLLT07-20231024	31.108600	110.939600	364.8	2023/10/24	2024/5/23
116	HBNR016X-W4G005-20240111	31.092500	110.925700	1884.5	2024/1/11	2024/5/6
117	HBNR016X-D4G203-20231230	31.042700	110.950750	83.9	2023/12/30	2024/6/25
118	HBNR016X-DLL027-20231121	31.057635	110.952235	419.9	2023/11/21	2024/3/19

119	HBNR016X-DLL028-20231121	31.057635	110.952235	419.9	2023/11/21	2024/3/19
120	HBNR016X-DLL030-20231101	31.064021	110.960289	1316.4	2023/11/1	2024/3/14
121	HBNR016X-DLL032-20231121	31.063302	110.949710	452.2	2023/11/21	2024/3/19
122	HBNR016X-DLL034-20231101	31.064017	110.960236	1311.7	2023/11/1	2024/3/14
123	HBNR016X-DLL039-20230428	31.063730	110.919171	179.6	2023/4/28	2024/3/18
124	HBNR016X-DLL041-20231121	31.030267	110.939195	1191.4	2023/11/21	2024/6/19
125	HBNR016X-DLL045-20231121	31.032255	110.935523	1593.1	2023/11/21	2024/6/19
126	HBNR016X-DLL046-20231121	31.032473	110.925475	2514.6	2023/11/21	2024/5/7
127	HBNR016X-DLL421-20231121	31.032363	110.925565	2503.1	2023/11/21	2024/5/7
128	HBNR016X-DLL426-20230727	31.058915	110.968078	1915.4	2023/7/27	2024/3/6
129	HBNR016X-DLLT01-20231121	31.032193	110.935636	1580.9	2023/11/21	2024/3/30
130	HBNR016X-DLL008-20240409	31.090917	110.925943	1718.5	2024/4/9	2024/10/23
131	HBNR016X-WZS006-20240409	31.091337	110.925010	1803.5	2024/4/9	2024/9/9
132	HBNR016X-WZS007-20240409	31.091165	110.926371	1723.3	2024/4/9	2024/10/24
133	HBNR016X-WZS009-20240409	31.090415	110.925148	1709.4	2024/4/9	2024/7/18
134	HBNR016X-WZS014-20231205	31.058305	110.942000	285.8	2023/12/5	2024/6/12
135	HBNR016X-WZS025-20241207	31.086724	110.914834	1788.5	2023/12/7	2024/9/3
136	HBNR016X-WZY001-20240514	31.057787	110.952109	404.4	2024/5/14	2024/8/29
137	HBNR016X-WZY002-20240514	31.057464	110.951228	333.9	2024/5/14	2024/8/29
138	HBNR016X-WZY003-20240515	31.062656	110.929185	11.2	2024/5/15	2024/8/29
139	HBNR016X-WZY004-20240515	31.072406	110.929790	52	2023/5/15	2023/8/30
140	HBNR016X-WZY005-20240516	31.075684	110.927339	306.9	2024/5/16	2024/8/14
141	HBNR016X-WZY007-20240516	31.075961	110.942545	224	2024/5/16	2024/8/29
142	HBNR016X-WZY008-20240516	31.077418	110.971223	1642.2	2024/5/16	2024/8/28
143	HBNR016X-WZY009-20240516	31.076703	110.971496	1723	2024/5/16	2024/8/28

144	HBNR016X-WZY010-20240516	31.076149	110.977394	2117.5	2024/5/16	2024/8/29
145	HBNR016X-WZY011-20240514	31.074925	110.977310	2213.3	2024/5/14	2024/8/28
146	HBNR016X-WZY011-20240515	31.074925	110.977310	2213.3	2024/5/15	2024/8/28
147	HBNR016X-WZY012-20240515	31.077430	110.954470	449.1	2024/5/15	2024/8/28
148	HBNR016X-WZY013-20240515	31.084888	110.954889	263.3	2024/5/15	2024/8/28
149	HBNR016X-WZY016-20240514	31.099506	110.969412	819.7	2024/5/14	2024/8/28
150	HBNR016X-WZY017-20240514	31.099531	110.964214	358.8	2024/5/14	2024/8/28
151	HBNR016X-WZY018-20240515	31.081020	110.944138	330.6	2024/5/15	2024/8/29
152	HBNR016X-WZY020-20240516	31.042466	110.950678	81.5	2024/5/16	2024/8/29
153	HBNR016X-DLLT07-20230110	31.082500	110.907000	1867.8	2023/1/10	2023/4/20
154	HBNR016X-DLL025-20230111	31.047500	110.909500	2202.5	2023/1/11	2023/4/26
155	HBNR016X-DLL023-20221129	31.092500	110.932000	1472.8	2022/11/29	2023/4/13
156	HBNR016X-DLL022-20221206	31.083200	110.909500	1768.4	2022/12/6	2023/4/20
157	HBNR016X-DLL021-20221123	31.088700	110.920800	1817.7	2022/11/23	2023/4/13
158	HBNR016X-DLL020-20221123	31.088700	110.920800	1817.7	2022/11/23	2023/4/13
159	HBNR016X-DLL019-20221122	31.088700	110.928800	1375.4	2022/11/22	2023/4/24
160	HBNR016X-DLL018-20221122	31.089200	110.919300	1899.6	2022/11/22	2023/4/24
161	HBNR016X-DLL016-20221117	31.075300	110.926600	329.3	2022/11/17	2023/4/13
162	HBNR016X-DLL012-20221220	31.105600	110.942500	479.1	2022/12/20	2023/5/29
163	HBNR016X-DLL011-20221220	31.105200	110.945000	396.1	2022/12/20	2023/5/30
164	HBNR016X-DLLT05-20221220	31.105200	110.945000	396.1	2022/12/20	2023/6/13
165	HBNR016X-DLL010-20221129	31.086300	110.973500	1157.7	2022/11/29	2023/5/18
166	HBNR016X-DLL009-20221129	31.086900	110.973800	1163	2022/11/29	2023/5/31
167	HBNR016X-DLL008-20221129	31.083200	110.958100	563.1	2022/11/29	2023/5/30
168	HBNR016X-DLL007-20221129	31.075600	110.955700	666.9	2022/11/29	2023/5/18

169	HBNR016X-DLL005-20221129	31.099700	110.964000	342.7	2022/11/29	2023/5/31
170	HBNR016X-DLL003-20221129	31.098600	110.969700	817.1	2022/11/29	2023/5/29
171	HBNR016X-DLL002-20221129	31.098700	110.969000	755.1	2022/11/29	2023/5/18
172	HBNR016X-DLL027-20221110	31.057635	110.952235	419.9	2022/11/10	2023/4/14
173	HBNR016X-DLL028-20221110	31.057635	110.952235	419.9	2022/11/10	2023/4/18
174	HBNR016X-DLL033-20221117	31.063760	110.948903	396.9	2022/11/17	2023/4/10
175	HBNR016X-DLL034-20221117	31.063243	110.949499	431.1	2022/11/17	2023/6/7
176	HBNR016X-DLL039-20221127	31.063730	110.919171	179.6	2022/11/27	2023/4/24
177	HBNR016X-DLL045-20221115	31.090873	110.972295	970.6	2022/11/15	2023/6/12
178	HBNR016X-DLL047-20221128	31.064287	110.961304	1416.1	2022/11/28	2023/8/1
179	HBNR016X-DLL189-20221101	31.090285	110.925128	1698.2	2022/11/1	2023/5/4
180	HBNR016X-DLL101-20221101	31.090986	110.925940	1725.4	2022/11/1	2023/2/16
181	HBNR016X-DLL128-20221101	31.091165	110.926371	1723.3	2022/11/1	2023/6/7
182	HBNR016X-DLL124-20221101	31.092497	110.925690	1884.7	2022/11/1	2023/6/7
183	HBNR016X-DLL117-20221101	31.091376	110.925048	1805.4	2022/11/1	2023/6/7
184	HBNR016X-DLL116-20221108	31.065889	110.921370	106.3	2022/11/8	2023/4/11
185	HBNR016X-DLL120-20221108	31.065528	110.921267	65.6	2022/11/8	2023/7/11
186	HBNR016X-DLL306-20221108	31.068562	110.923674	220.4	2022/11/9	2023/4/1
187	HBNR016X-DLL401-20221109	31.069452	110.923644	146.5	2022/11/9	2023/6/13
188	HBNR016X-DLL115-20221109	31.070133	110.923964	129.6	2022/11/9	2023/6/13
189	HBNR016X-DLL402-20221109	31.070270	110.919507	130.1	2022/11/9	2023/6/13
190	HBNR016X-DLL105-20221109	31.070259	110.918386	219.3	2022/11/8	2023/6/12
191	HBNR016X-DLL111-20221109	31.070798	110.915367	508.9	2022/11/9	2023/6/13
192	HBNR016X-DLL112-20221109	31.070516	110.917404	316.2	2022/11/9	2023/6/13
193	HBNR016X-DLL040-20221110	31.087743	110.924467	1503.7	2022/11/10	2023/6/7

194	HBNR016X-DLL041-20221115	31.078278	110.941946	3.8	2022/11/15	2023/3/24
195	HBNR016X-DLL043-20221115	31.078990	110.942898	76.2	2022/11/15	2023/6/9
196	HBNR016X-DLL042-20221115	31.079010	110.942898	78.2	2022/11/15	2023/6/9
197	HBNR016X-DLL040-20230607	31.087723	110.924527	1498.4	2023/6/7	2023/11/1
198	HBNR016X-DLL052-20230607	31.090415	110.925148	1709.4	2023/6/7	2023/11/1
199	HBNR016X-DLL053-20230607	31.090956	110.925970	1721.1	2023/6/7	2023/11/1
200	HBNR016X-DLL054-20230607	31.091037	110.926371	1710.7	2023/6/7	2023/11/1
201	HBNR016X-DLL055-20230607	31.092557	110.925720	1889.3	2023/6/7	2023/11/1
202	HBNR016X-DLL058-20230608	31.080324	110.990643	2920.2	2023/6/8	2023/11/17
203	HBNR016X-DLL059-20230608	31.076145	110.977398	2118.1	2023/6/8	2023/10/28
204	HBNR016X-DLL061-20230613	31.070683	110.923574	117.6	2023/6/13	2023/11/29
205	HBNR016X-DLL062-20230613	31.070691	110.921340	14.1	2023/6/13	2023/11/29
206	HBNR016X-DLL065-20230613	31.070360	110.918416	222	2023/6/13	2023/11/29
207	HBNR016X-DLL066-20230613	31.070169	110.917464	297.4	2023/6/13	2023/11/29
208	HBNR016X-DLL067-20230613	31.070888	110.915421	507.2	2023/6/13	2023/11/29
209	HBNR016X-DLL041-20230712	31.030267	110.939195	1191.4	2023/7/12	2023/11/21
210	HBNR016X-DLL045-20230713	31.032203	110.935536	1590.5	2023/7/13	2023/11/21
211	HBNR016X-DLL027-20230418	31.057865	110.952104	402.2	2023/4/18	2023/11/21
212	HBNR016X-DLL028-20230418	31.057723	110.951432	343.4	2023/4/18	2023/11/14
213	HBNR016X-DLL009-20230808	31.106201	110.945383	279.3	2023/8/8	2023/12/6
214	HBNR016X-DLL003-20230808	31.115411	110.946466	268.8	2023/8/8	2023/11/24
215	HBNR016X-DLL030-20230613	31.066358	110.955070	1051.4	2023/6/13	2023/11/1
216	HBNR016X-DLL034-20230613	31.066358	110.955070	1051.4	2023/6/13	2023/11/1
217	HBNR016X-DLL046-20230706	31.032325	110.925498	2508.1	2023/7/6	2023/11/21
218	HBNR016X-DLLT02-20230706	31.032413	110.925671	2494.8	2023/7/6	2023/11/21

219	HBNR016X-DLL301-20210831	31.091190	110.961910	94.7	2021/8/31	2022/3/9
220	HBNR016X-DLL312-20210909	31.092260	110.964150	229.1	2021/9/9	2022/3/13
221	HBNR016X-DLL315-20210902	31.078473	110.951218	143.4	2021/9/2	2022/1/16
222	HBNR016X-DLL105-20211224	31.076149	110.977365	2115.6	2020/12/24	2021/4/29
223	HBNR016X-DLL107-20210831	31.064273	110.961537	1435.4	2021/8/31	2022/1/17
224	HBNR016X-DLL007-20201112	31.061110	110.946670	179.2	2020/11/12	2021/6/29
225	HBNR016X-DLL008-20201112	31.087463	110.993135	2965.3	2020/11/12	2021/12/14
226	HBNR016X-DLL010-20201112	31.089000	110.925900	1538.3	2020/11/12	2021/11/23
227	HBNR016X-DLL016-20211102	31.073620	110.915830	584.6	2021/11/2	2022/2/6
228	HBNR016X-DLL021-20210907	31.078380	110.950240	132.7	2021/9/7	2021/12/23
229	HBNR016X-DLL321-20211116	31.087463	110.993135	2965.3	2021/11/6	2022/3/28
230	HBNR016X-DLL324-20211117	31.061570	110.978555	2931.1	2021/11/17	2022/3/4
231	HBNR016X-DLL110-20220316	31.060205	110.946930	119.4	2022/3/16	2022/6/22
232	HBNR016X-DLL072-20220301	31.041653	110.948038	289.9	2022/3/1	2022/6/8
233	HBNR016X-DLL201-20220308	31.043103	110.951846	10.9	2022/3/8	2022/6/16
234	HBNR016X-DLL105-20220407	31.077209	110.971464	1674.3	2022/4/7	2022/8/9
235	HBNR016X-DLL001-20210908	31.108651	110.940235	312.2	2021/9/8	2022/4/5
236	HBNR016X-DLL020-20210907	31.089680	110.963130	101.2	2021/9/7	2022/1/9
237	HBNR016X-DLL028-20210909	31.101360	110.965790	515.7	2021/9/9	2022/4/6
238	HBNR016X-DLL302-20210902	31.089310	110.968670	626.9	2021/9/2	2022/4/11
239	HBNR016X-DLL303-20210831	31.085544	110.953063	163.6	2021/8/31	2022/5/11
240	HBNR016X-DLL304-20210831	31.091362	110.945291	212.9	2021/8/31	2022/5/12
241	HBNR016X-DLL305-20210831	31.102197	110.958873	163.2	2021/8/31	2022/4/11
242	HBNR016X-DLL306-20210902	31.100985	110.964373	375.3	2021/9/2	2022/4/11
243	HBNR016X-DLL307-20210907	31.083350	110.938940	580.6	2021/9/7	2022/5/12

244	HBNR016X-DLL308-20210907	31.101510	110.958560	82.2	2021/9/7	2022/4/11
245	HBNR016X-DLL309-20210831	31.110878	110.952178	66.2	2021/8/31	2022/5/17
246	HBNR016X-DLL310-20210908	31.117290	110.928950	1521	2021/9/8	2022/3/30
247	HBNR016X-DLL317-20210908	31.108020	110.937516	568.9	2021/9/8	2022/5/16
248	HBNR016X-DLL318-20210908	31.107623	110.939958	410	2021/9/8	2022/5/16
249	HBNR016X-DLL319-20210909	31.099770	110.964950	430	2021/9/9	2022/4/10
250	HBNR016X-DLL111-20220407	31.073238	110.910321	1046.7	2022/4/7	2022/9/28
251	HBNR016X-DLL112-20211123	31.070788	110.918450	230.5	2021/11/23	2022/4/7
252	HBNR016X-DLL115-20211123	31.069351	110.923731	159.8	2021/11/23	2022/4/7
253	HBNR016X-DLL104-20201224	31.078476	110.972016	1589.9	2020/12/24	2021/4/29
254	HBNR016X-DLL105-20201224	31.076149	110.977365	2115.6	2020/12/24	2021/4/29
255	HBNR016X-DLL101-20211203	31.057100	110.925400	664.3	2021/12/3	2022/3/16
256	HBNR016X-DLL125-20211123	31.074800	110.929000	141.1	2021/11/23	2022/3/16
257	HBNR016X-DLL117-20211207	31.088300	110.925200	1510.8	2021/12/7	2022/3/15
258	HBNR016X-DLL128-20211207	31.088700	110.925700	1520.8	2021/12/7	2022/3/15
259	HBNR016X-DLL123-20211123	31.086300	110.928100	1172.5	2021/11/23	2022/3/15
260	HBNR016X-DLL103-20211207	31.081900	110.912900	1444.6	2021/12/7	2022/3/8
261	HBNR016X-DLL113-20211207	31.084600	110.918200	1439.5	2021/12/7	2022/3/8
262	HBNR016X-DLL210-20210926	31.063930	110.960260	1309.4	2021/9/26	2022/1/17
263	HBNR016X-DLL190-20220118	31.066593	110.922180	211.9	2022/1/18	2022/4/26
264	HBNR016X-DLL116-20220426	31.068297	110.916209	324.3	2022/4/26	2022/10/31
265	HBNR016X-DLL112-20220407	31.072528	110.912340	840.3	2022/4/7	2022/11/4
266	HBNR016X-DLL111-20211123	31.066570	110.913460	555.4	2021/11/23	2022/4/7
267	HBNR016X-DLL105-20211202	31.084315	110.987205	2469.5	2021/12/2	2022/4/7
268	HBNR016X-DLL104-20220407	31.078476	110.972016	1589.9	2022/4/7	2022/8/6

269	HBNR016X-DLL121-20220407	31.079567	110.966157	1203.7	2022/4/7	2022/7/22
270	HBNR016X-DLL126-20220407	31.079567	110.966157	1203.7	2022/4/7	2022/10/12
271	HBNR016X-DLL127-20220407	31.079567	110.966157	1203.7	2022/4/7	2022/9/16
272	HBNR016X-DLL101-20220316	31.057100	110.925400	664.3	2022/3/16	2022/9/28
273	HBNR016X-DLL106-20220316	31.061800	110.921400	258.6	2022/3/16	2022/9/28
274	HBNR016X-DLL122-20220316	31.074900	110.938900	283	2022/3/16	2022/9/28
275	HBNR016X-DLL123-20220315	31.086300	110.928100	1172.5	2022/3/15	2022/8/21
276	HBNR016X-DLL103-20220308	31.081900	110.912900	1444.6	2022/3/8	2022/9/22
277	HBNR016X-DLL113-20220308	31.084600	110.918200	1439.5	2022/3/8	2022/9/22
278	HBNR016X-DLL117-20220315	31.088300	110.925200	1510.8	2022/3/15	2022/6/25
279	HBNR016X-DLL128-20220315	31.088700	110.925700	1520.8	2022/3/15	2022/8/28
280	HBNR016X-DLL402-20220407	31.072777	110.914280	672.4	2022/4/7	2022/11/9
281	HBNR016X-DLL072-20220608	31.041653	110.948038	289.9	2022/6/8	2022/9/27
282	HBNR016X-DLL109-20220608	31.063679	110.938896	56.9	2022/6/8	2022/9/22
283	HBNR016X-DLL071-20220608	31.041692	110.948096	283.3	2022/6/8	2022/9/27
284	HBNR016X-DLL189-20220609	31.092796	110.920048	2205.3	2022/6/9	2022/10/1
285	HBNR016X-DLL124-20220609	31.094945	110.920550	2370.5	2022/6/9	2022/11/1
286	HBNR016X-DLL026-20220609	31.094945	110.920550	2370.5	2022/6/9	2022/11/1
287	HBNR016X-DLL008-20220609	31.093806	110.919868	2304.8	2022/6/9	2022/10/6
288	HBNR016X-DLL190-20220609	31.081322	110.937674	370.4	2022/6/9	2022/11/15
289	HBNR016X-DLL307-20220512	31.083000	110.938900	541.6	2022/5/12	2022/9/26
290	HBNR016X-DLL304-20220512	31.091000	110.945000	225	2022/5/12	2022/8/10
291	HBNR016X-DLL020-20220607	31.088800	110.968100	583.4	2022/6/7	2022/9/26
292	HBNR016X-DLL319-20220511	31.097000	110.966270	459	2022/5/11	2022/9/26
293	HBNR016X-DLL028-20220406	31.101200	110.965780	511.4	2022/4/6	2022/9/14

294	HBNR016X-DLL308-20220411	31.101800	110.958824	119.5	2022/4/11	2022/9/26
295	HBNR016X-DLL305-20220411	31.101800	110.958824	119.5	2022/4/11	2022/9/24
296	HBNR016X-DLL309-20220517	31.110800	110.952000	47.4	2022/5/17	2022/9/26
297	HBNR016X-DLL311-20220516	31.115300	110.946500	256.9	2022/5/16	2022/9/27
298	HBNR016X-DLL315-20220317	31.078542	110.951173	134.6	2022/3/17	2022/7/26
299	HBNR016X-DLL110-20220622	31.060205	110.946930	119.4	2022/6/22	2022/9/22
300	HBNR016X-DLL421-20221011	31.075729	110.928022	273.5	2022/10/11	2023/6/9
301	HBNR016X-WZS157-20241205	31.053142	110.923801	1124.1	2023/12/5	2024/12/5
302	HBNR016X-D4G008-20241227	31.113973	110.927534	1504.1	2023/12/27	2024/4/14
303	HBNR016X-DLL013-20241206	31.113300	110.943836	287.9	2023/12/6	2024/5/28
304	HBNR016X-WZS001-20240109	31.063600	110.908700	1046.9	2024/1/9	2024/8/14
305	HBNR016X-WZS002-20240109	31.058200	110.949600	161.1	2024/1/9	2024/5/18
306	HBNR016X-DLL049-20241203	31.084480	110.926520	1101.4	2024/12/3	2025/6/6
307	HBNR016X-DLL051-20241207	31.087325	110.929905	1193.2	2024/12/7	2025/6/16
308	HBNR016X-W4G001-20240319	31.078641	110.912461	1198.2	2024/3/19	2025/4/13
309	HBNR016X-WZS003-20240320	31.069900	110.938600	681.9	2024/3/20	2025/3/6
310	HBNR016X-WZS005-20240909	31.092500	110.925700	1884.5	2024/9/9	2025/4/21
311	HBNR016X-WZS006-20240909	31.091300	110.924900	1805.4	2024/9/9	2025/3/20
312	HBNR016X-WZS007-20241030	31.091000	110.926300	1710.3	2024/10/30	2025/4/22
313	HBNR016X-WZS008-20241024	31.091000	110.926300	1710.3	2024/10/24	2025/6/25
314	HBNR016X-WZS011-20241202	31.089227	110.919314	1902.2	2024/12/2	2025/6/11
315	HBNR016X-WZS012-20240506	31.092461	110.932095	1463.2	2024/5/6	2024/10/5
316	HBNR016X-WZS014-20240508	31.070730	110.923577	114.5	2024/5/8	2024/11/25
317	HBNR016X-WZS015-20240508	31.070687	110.921331	14.1	2024/5/8	2025/6/12
318	HBNR016X-WZS016-20240508	31.070863	110.915413	507	2024/5/8	2025/6/12

319	HBNR016X-WZS017-20240508	31.066892	110.907387	1134.9	2024/5/8	2025/6/11
320	HBNR016X-WZS018-20240508	31.068339	110.911582	752.3	2024/5/8	2025/6/12
321	HBNR016X-WZS019-20240508	31.076883	110.912439	1062.7	2024/5/8	2025/6/12
322	HBNR016X-WZS021-20240509	31.077600	110.929100	419	2024/5/9	2025/7/2
323	HBNR016X-WZS022-20240509	31.079868	110.925120	810.3	2024/5/9	2025/6/18
324	HBNR016X-WZS023-20240509	31.079664	110.925088	792.4	2024/5/9	2025/6/15
325	HBNR016X-WZS024-20240313	31.083900	110.929700	865.7	2024/3/13	2025/4/5
326	HBNR016X-WZS024-20240523	31.058500	110.921100	616.6	2024/5/23	2025/7/3
327	HBNR016X-WZS025-20240523	31.083600	110.929500	848.1	2024/5/23	2025/7/3
328	HBNR016X-WZS026-20240313	31.059600	110.920200	528.3	2024/3/13	2024/12/3
329	HBNR016X-WZS029-20240612	31.087213	110.927754	1275.9	2024/6/12	2024/12/6
330	HBNR016X-WZS030-20240612	31.070336	110.914125	598.6	2024/6/12	2025/6/10
331	HBNR016X-WZS031-20240723	31.079500	110.940500	154.4	2024/7/23	2025/7/2
332	HBNR016X-WZS032-20241205	31.049758	110.920112	1569.7	2024/12/5	2025/6/17
333	HBNR016X-WZS036-20241206	31.080844	110.944140	313	2024/12/6	2025/4/9
334	HBNR016X-WZS037-20240814	31.065200	110.921100	26	2024/8/14	2025/4/21
335	HBNR016X-WZS038-20240814	31.063500	110.908700	1050	2024/8/14	2025/4/10
336	HBNR016X-WZS039-20240814	31.059100	110.903600	1685.6	2024/8/14	2025/7/5
337	HBNR016X-WZS040-20240904	31.086100	110.914300	1752.9	2024/9/4	2025/7/1
338	HBNR016X-WZS041-20240903	31.086700	110.914800	1787.6	2024/9/3	2025/5/23
339	HBNR016X-WZS042-20240909	31.090400	110.952510	22.1	2024/9/9	2025/4/6
340	HBNR016X-WZS044-20241207	31.088484	110.930907	1282.4	2024/12/7	2025/5/14
341	HBNR016X-WZS069-20240109	31.065100	110.914600	460.8	2024/1/9	2025/7/5
342	HBNR016X-WZS156-20241205	31.050319	110.914733	1683	2024/12/5	2025/6/17
343	HBNR016X-WZS020-20240818	31.077600	110.929100	419	2024/8/18	2025/7/2

344	HBNR016X-D4G211-20240716	31.043446	110.949205	63	2024/7/16	2025/2/16
345	HBNR016X-DLL030-20240314	31.064022	110.960250	1313.2	2024/3/14	2024/11/19
346	HBNR016X-DLL032-20240319	31.063321	110.949717	453.4	2024/3/19	2025/7/3
347	HBNR016X-DLLT01-20240619	31.032230	110.935614	1584	2024/6/19	2024/9/28
348	HBNR016X-DLL003-20240312	31.115095	110.944584	374.7	2024/2/12	2024/10/13
349	HBNR016X-QJY003-20240515	31.075100	110.952400	527.6	2024/5/15	2024/11/11
350	HBNR016X-DLL049-20240618	31.084480	110.926520	1101.4	2024/6/18	2024/12/3
351	HBNR016X-WZS008-20240409	31.091000	110.925900	1728.6	2024/4/9	2024/10/23
352	HBNR016X-WZS011-20240418	31.089200	110.919300	1899.6	2024/4/18	2024/12/2
353	HBNR016X-WZS036-20240806	31.063400	110.948500	345.9	2024/8/6	2024/12/5
354	HBNR016X-DLL051-20240521	31.087325	110.929905	1193.2	2024/5/21	2024/10/16
355	HBNR016X-DLL420-20240528	31.075140	110.940551	311.1	2024/5/28	2024/11/10
356	HBNR016X-DLL438-20240515	31.088815	110.950435	15.8	2024/5/15	2024/9/1
357	HBNR016X-DLL439-20240515	31.085000	110.954700	250.1	2024/5/15	2024/8/31
358	HBNR016X-QJY001-20240521	31.086460	110.973640	1164.1	2024/5/21	2024/11/8
359	HBNR016X-QJY002-20240521	31.086960	110.973940	1173.8	2024/5/21	2024/12/17
360	HBNR016X-QJY004-20240515	31.088170	110.951250	51.8	2024/5/15	2024/12/18
361	HBNR016X-QJY009-20240521	31.106140	110.945490	283.7	2024/5/21	2024/12/18
362	HBNR016X-QJY010-20240521	31.105220	110.945130	391	2024/5/21	2024/12/18
363	HBNR016X-QJY011-20240521	31.087230	110.968290	662.1	2024/5/21	2024/12/17
364	HBNR016X-QJY013-20240528	31.113200	110.943800	281.1	2024/5/28	2024/12/19
365	HBNR016X-QJY014-20240528	31.115300	110.946400	262.5	2024/5/28	2024/12/19
366	HBNR016X-D4G007-20240807	31.099770	110.973150	1167.7	2024/8/7	2025/2/4
367	HBNR016X-D4G008-20240613	31.113973	110.927534	1504.1	2024/6/13	2025/3/21
368	HBNR016X-DLL047-20241217	31.090842	110.972174	958.8	2024/12/17	2025/7/5

369	HBNR016X-DLL436-20240813	31.114538	110.932443	1084.6	2024/8/13	2025/7/3
370	HBNR016X-DLL437-20240813	31.115761	110.933444	1067.5	2024/8/13	2024/12/1
371	HBNR016X-DLL438-20241218	31.088815	110.950435	15.8	2024/12/18	2025/6/12
372	HBNR016X-DLL441-20240516	31.076714	110.963572	1250.1	2024/5/16	2024/8/14
373	HBNR016X-DLL443-20240515	31.098682	110.969732	822.2	2024/5/15	2025/6/16
374	HBNR016X-WZY001-20240829	31.057787	110.952109	404.4	2024/8/29	2025/2/20
375	HBNR016X-WZY005-20240829	31.075684	110.927339	306.9	2024/8/29	2025/2/19
376	HBNR016X-WZY007-20240829	31.075961	110.942545	224	2024/8/29	2025/1/16
377	HBNR016X-WZY010-20240904	31.042653	110.949986	111.7	2024/9/4	2025/2/19
378	HBNR016X-WZY012-20240828	31.077430	110.954470	449.1	2024/8/28	2025/2/19
379	HBNR016X-WZY013-20240828	31.084888	110.954889	263.3	2024/8/28	2025/1/11
380	HBNR016X-WZY015-20240108	31.087937	110.971870	954.9	2024/1/8	2025/2/16
381	HBNR016X-WZY016-20240828	31.099760	110.969265	817.1	2024/8/28	2025/2/18
382	HBNR016X-WZY017-20240828	31.099531	110.964214	358.8	2024/8/28	2025/1/23
383	HBNR016X-WZY020-20240829	31.087432	110.959565	216.5	2024/8/29	2025/2/4
384	HBNR016X-QJY012-20240522	31.091061	110.929621	1592.4	2024/5/22	2025/6/11
385	HBNR016X-QJY013-20241219	31.113272	110.943822	286.3	2024/12/19	2025/7/2
386	HBNR016X-QJY014-20241219	31.053973	110.946485	63.7	2024/12/19	2025/7/2
387	HBNR016X-QJYT05-20240613	31.113973	110.927534	1504.1	2024/6/13	2025/7/6
388	HBNR016X-DLL034-20240505	31.063922	110.960183	1302.4	2024/5/5	2025/4/8

附录 2 湖北大老岭国家级自然保护区 6 种偶蹄类动物基本信息
Appendix 2 Basic information of six artiodactyl species of Hubei Dalaoling National Nature Reserve

物种 Species	道路影响域阈值 Road effect zone threshold (m)		体重 Body weight(kg)	昼行性 指数 Diurnal- nocturnal index	年产胎数 No.litter/ year	窝仔数 Litter size	数据来源 Date source	繁殖数 Fecundity	家域范围 Home range (km ²)	数据来源 Date Source
	近端 Near	远端 Far								
野猪 <i>Sus scrofa</i>	900	1,300	125 (50–200)	0.65	1	6 (4–8)	Smith 和解 焱, 2009	6 (4–8)	8	Mitchell et al., 2009
毛冠鹿 <i>Elaphodus cephalophus</i>	600	1,700	21.5 (15–28)	0.51	1	1.5 (1–2)	Smith 和解 焱, 2009	1.5 (1–2)	–	–
小鹿 <i>Muntiacus reevesi</i>	1,300	1,700	13.5 (11–16)	0.41	1	1.5 (1–2)	冯祚建等, 1986	1.5 (1–2)	1	Smith 和解 焱, 2009
中华鬣羚 <i>Capricornis milneedwardsii</i>	1,400	1,800	112.5 (85–140)	0.32	1	1.5 (1–2)	周友兵等, 2005	1.5 (1–2)	–	–
中华斑羚 <i>Naemorhedus griseus</i>	1,400	1,800	27 (22–32)	0.40	1	1.5 (1–2)	Smith 和解 焱, 2009	1.5 (1–2)	0.33	Yin et al., 2024
林麝 <i>Moschus berezovskii</i>	1,400	1,800	7.5 (6–9)	0.32	1	1.5 (1–2)	Smith 和解 焱, 2009	1.5 (1–2)	1.16	刘嘉辉等, 2020

繁殖数 = 窝仔数 × 年产胎数
Fecundity = Litter size × Number of litter

附录 3 基于 Tweedie GLM 模型的道路距离分段对 6 种偶蹄类动物相对丰富度指数(RAI)的影响效应
Appendix 3 Effects of road distance segments on the relative abundance index (RAI) of six artiodactyl species based on Tweedie GLM models

物种 Species	道路影响域阈值 Road effect zone threshold (m)		回避区(0–近端影响域阈值) Avoidance zone (0–Near-road effect zone threshold)			过渡区(近端影响域阈值–远端影响域阈值) Transition zone (Near-road effect zone threshold–Far-road effect zone threshold)			稳定区(远端影响域阈值–3000) Stable zone (Far-road effect zone threshold–3000)		
	近端 Near	远端 Far	$\beta(10^{-3})$	T	P	$\beta(10^{-3})$	T	P	$\beta(10^{-3})$	T	P
野猪 <i>Sus scrofa</i>	900	1,300	0.023	0.066	0.947	2.858	4.096	< 0.001***	–0.395	–1.616	0.107
毛冠鹿 <i>Elaphodus cephalophus</i>	600	1,700	0.517	0.983	0.326	–1.594	–5.263	< 0.001***	0.692	1.345	0.179
小鹿 <i>Muntiacus reevesi</i>	1,300	1,700	0.432	1.885	0.060	1.645	2.303	0.021*	–1.520	–2.446	0.015*
中华鬣羚 <i>Capricornis milneedwardsii</i>	1,400	1,800	1.461	8.058	< 0.001***	–2.78	–3.886	< 0.001***	0.012	0.026	0.979
中华斑羚 <i>Naemorhedus griseus</i>	1,400	1,800	1.349	6.005	< 0.001***	–2.45	–2.753	0.006**	–0.299	–0.515	0.606
林麝 <i>Moschus berezovskii</i>	1,400	1,800	1.597	6.904	< 0.001***	–2.227	–2.753	0.011*	–0.086	–0.158	0.874

β , 每个区域对数尺度上的斜率; T , Wald 检验统计量; *** $P < 0.001$, ** $P < 0.01$, * $P < 0.05$.
 β , Slope on log scale; T , Wald statistic; *** $P < 0.001$, ** $P < 0.01$, * $P < 0.05$.

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