

Identification of Ecological Conservation Priority Areas for Key Terrestrial Wildlife in the Guangdong–Hong Kong–Macao Greater Bay Area

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1 Accuracy Test Results of MaxEnt Model

The AUC values of the 32 studied species were all greater than 0.7, meeting the modeling accuracy requirements. Among them, 21 species had AUC values greater than 0.9, i.e., the simulation results were superior.

Supplementary Table 1: Model simulation results of the key terrestrial wildlife in the study area

No.	Species	Endangered class			Number occurrence records	Weight	AUC
		IUCN Red List of Threatened Species	List of State Key Protected Wild Animals	China's Red List of Biodiversity			
Mammal							
1	<i>Herpestes javanicus</i>	LC	—	VU	6	2	0.869
2	<i>Lutra lutra</i>	NT	II	EN	11	4	0.893
3	<i>Manis pentadactyla</i>	CR	I	CR	13	8	0.919
4	<i>Muntiacus reevesi</i>	LC	—	VU	5	2	0.868

5	<i>Muntiacus vaginalis</i>	LC	—	NT	32	1	0.950
6	<i>Prionailurus bengalensis</i>	LC	II	VU	72	2	0.913
7	<i>Viverricula indica</i>	LC	I	VU	17	2	0.886
Bird							
8	<i>Aerodramus brevirostris</i>	LC	—	NT	24	1	0.981
9	<i>Aythya nyroca</i>	NT	—	NT	9	1	0.985
10	<i>Calidris pygmeus</i>	CR	—	CR	6	8	0.731
11	<i>Centropus sinensis</i>	LC	II	LC	83	1	0.939
12	<i>Charadrius placidus</i>	LC	—	NT	81	1	0.976
13	<i>Corvus pectoralis</i>	VU	—	NT	324	2	0.973
14	<i>Emberiza tristrami</i>	LC	—	LC	116	1	0.957
15	<i>Garrulax canorus</i>	LC	II	NT	61	2	0.949
16	<i>Lophura nycthemera</i>	LC	II	LC	16	1	0.888
17	<i>Milvus migrans</i>	LC	II	LC	189	1	0.964
18	<i>Platalea minor</i>	EN	II	EN	266	4	0.979
19	<i>Terpsiphone atrocaudata</i>	LC	—	NT	62	1	0.939
20	<i>Zapornia fusca</i>	LC	—	NT	18	1	0.917
Amphibian							
21	<i>Hoplobatrachus chinensis</i>	EN	II	EN	72	4	0.912
22	<i>Kalophrynus interlineatus</i>	LC	—	NT	18	1	0.984
23	<i>Leptobranchella laui</i>	VU	—	—	41	2	0.986
24	<i>Megophrys mangshanensis</i>	LC	—	LC	6	1	0.800
25	<i>Quasipaa exilispinosa</i>	LC	—	VU	150	2	0.985
Reptile							
26	<i>Bungarus fasciatus</i>	L	—	EN	72	4	0.855
27	<i>Coelognathus radiates</i>	LC	II	EN	8	4	0.812
28	<i>Gekko melli</i>	LC	—	VU	6	2	0.903
29	<i>Mauremys sinensis</i>	CR	II	CR	50	8	0.949
30	<i>Pelodiscus sinensis</i>	VU	—	EN	41	4	0.872

31	<i>Platysternon megacephalum</i>	CR	II	CR	10	8	0.770
32	<i>Python molurus bivittatus</i>	VU (NT)	II	CR	6	8	0.951

NOTE

The conservation level of each species in the conservation lists may change over time, which presented in the table were the ones during the experimental time.

2 Result of Contribution Assessment of Environmental Variables

Supplementary Table 2: Final modelling of each species and assessment of the relative contributions of environmental variables

Species	Reserved variables
Mammal	
<i>Herpestes javanicus</i>	Bio7, Buildland, Dis_build, Landuse, Bio13, People
<i>Lutra lutra</i>	Bio15, Buildland, Bio3, Bio14, Dis_river
<i>Manis pentadactyla</i>	DEM, Slope, Buildland, Bio5, Aspect, Dis_build, Landuse, Bio2, Dis_road, Bio8
<i>Muntiacus reevesi</i>	Dis_road, Bio14, Dis_build, Dis_river, Aspect, Buildland, People, Bio4
<i>Muntiacus vaginalis</i>	Bio15, Bio2, DEM, Slope, People, Dis_road, Bio5, Dis_river
<i>Prionailurus bengalensis</i>	Bio10, Bio2, Bio12, Dis_river, Slope, People, Dis_road
<i>Viverricula indica</i>	DEM, Bio5, Bio15, Buildland, Dis_river, Bio14, Bio2, Aspect, Dis_road, Buildland
Bird	
<i>Aerodramus brevirostris</i>	Bio15, Bio19, Bio1, Dis_river, People, Bio14, Aspect, Slope
<i>Aythya nyroca</i>	Bio15, Bio19, Slope, Dis_road, People, Dis_river
<i>Calidris pygmeus</i>	Bio15, DEM, Bio19, Bio14, Slope, Dis_build, Aspect
<i>Centropus sinensis</i>	Bio15, Bio14, Bio3, Bio13, Aspect, Bio5
<i>Charadrius placidus</i>	Bio19, Bio2, Bio8, Bio15, DEM, Slope, Dis_river, Bio11
<i>Corvus pectoralis</i>	Bio15, Bio19, Dis_river, Bio3, Bio8, Bio5, Bio14
<i>Emberiza tristrami</i>	Bio15, Bio17, Dis_river, Bio16, Bio5, Bio1, Slope, Dis_build, Bio3, Dis_road
<i>Garrulax canorus</i>	Bio15, Bio7, Bio14, People, Bio5, Bio13, Dis_river, Aspect, Slope
<i>Lophura nycthemera</i>	Bio10, Landuse, Dis_river, Bio4, Aspect, Bio3, Bio15, Dis_road, Bio14, Bio13, Dis_build
<i>Milvus migrans</i>	Bio15, Bio14, Dis_river, Bio3, Bio5, Bio8
<i>Platalea minor</i>	Bio15, Bio19, Bio14, Bio8, Bio3, Bio5
<i>Terpsiphone atrocaudata</i>	Bio15, Bio17, Bio13, Bio3, Dis_build, People
<i>Zapornia fusca</i>	Bio15, Bio17, Dis_river, Bio19, Bio8, Bio11, Buildland, Aspect, Dis_river

Amphibian	
<i>Hoplobatrachus chinensis</i>	Bio15, Bio14, Bio13, Dis_river, Bio3, Slope
<i>Kaloula pulchra</i>	Bio17, Bio15, Bio4, Dis_river, Bio19, Bio7, Bio1
<i>Leptobranchella laui</i>	Bio15, Bio17, Dis_river, Bio5, Bio14, Bio4
<i>Megophrys mangshanensis</i>	Bio19, Dis_road, Bio2, Bio17
<i>Quasipaa exilispinosa</i>	Bio17, Dis_river, Bio2, Bio1, Bio4
Reptile	
<i>Bungarus fasciatus</i>	Bio13, Bio15, Dis_river, Bio3, Dis_build, Slope, DEM, Aspect, Landuse, People
<i>Coelognathus radiates</i>	Slope, Bio8, Dis_build, Aspect, Bio7
<i>Gekko melli</i>	Slope, Dis_build, Bio18, Aspect, Bio13, Bio3
<i>Mauremys sinensis</i>	Bio15, People, Bio6, Dis_river, Bio13, Landuse, Aspect
<i>Pelodiscus sinensis</i>	People, Buildland, Bio3, Dis_road, Bio7, Slope, Bio13
<i>Platysternon megacephalum</i>	Slope, DEM, Bio18, Dis_road, Buildland, Aspect
<i>Python molurus bivittatus</i>	Bio5, Buildland, Dis_road

NOTE

The retained variables for each species were ranked in the table according to the contribution value of the environmental variable, from highest to lowest.

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粤港澳大湾区重点陆生野生动物生态保护优先区识别

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1 MaxEnt 模型结果精度检验

32 个研究物种的 AUC 值均大于 0.7, 满足建模准确度要求。其中, 21 个物种的 AUC 值大于 0.9, 即模拟结果较为优秀。

附表 1: 大湾区重点陆生野生动物模型模拟结果

序号	名称	拉丁名	濒危等级			分布点数量	权重	AUC
			IUCN	国家保护级别	中国生物多样性红色名录			
哺乳类								
1	爪哇猿	<i>Herpestes javanicus</i>	LC	—	VU	6	2	0.869
2	水獭	<i>Lutra lutra</i>	NT	II	EN	11	4	0.893
3	穿山甲	<i>Manis pentadactyla</i>	CR	I	CR	13	8	0.919
4	小鹿	<i>Muntiacus reevesi</i>	LC	—	VU	5	2	0.868

5	赤麂	<i>Muntiacus vaginalis</i>	LC	—	NT	32	1	0.950
6	豹猫	<i>Prionailurus bengalensis</i>	LC	II	VU	72	2	0.913
7	小灵猫	<i>Viverricula indica</i>	LC	I	VU	17	2	0.886
鸟类								
8	短嘴金丝燕	<i>Aerodramus brevirostris</i>	LC	—	NT	24	1	0.981
9	白眼潜鸭	<i>Aythya nyroca</i>	NT	—	NT	9	1	0.985
10	勺嘴鹬	<i>Calidris pygmeus</i>	CR	—	CR	6	8	0.731
11	褐翅鸦鹃	<i>Centropus sinensis</i>	LC	II	LC	83	1	0.939
12	长嘴剑鸻	<i>Charadrius placidus</i>	LC	—	NT	81	1	0.976
13	白颈鸦	<i>Corvus pectoralis</i>	VU	—	NT	324	2	0.973
14	白眉鹀	<i>Emberiza tristrami</i>	LC	—	LC	116	1	0.957
15	画眉	<i>Garrulax canorus</i>	LC	II	NT	61	2	0.949
16	白鹇	<i>Lophura nycthemera</i>	LC	II	LC	16	1	0.888
17	黑鸢	<i>Milvus migrans</i>	LC	II	LC	189	1	0.964
18	黑脸琵鹭	<i>Platalea minor</i>	EN	II	EN	266	4	0.979
19	紫寿带	<i>Terpsiphone atrocaudata</i>	LC	—	NT	62	1	0.939
20	红胸田鸡	<i>Zapornia fusca</i>	LC	—	NT	18	1	0.917
两栖类								
21	虎纹蛙	<i>Hoplobatrachus chinensis</i>	EN	II	EN	72	4	0.912
22	花狭口蛙	<i>Kalophrynus interlineatus</i>	LC	—	NT	18	1	0.984
23	刘氏掌突蟾	<i>Leptobrachella laui</i>	VU	—	—	41	2	0.986
24	莽山角蟾	<i>Megophrys mangshanensis</i>	LC	—	LC	6	1	0.800
25	小棘蛙	<i>Quasipaa exilispinosa</i>	LC	—	VU	150	2	0.985
爬行类								
26	金环蛇	<i>Bungarus fasciatus</i>	L	—	EN	72	4	0.855
27	三索蛇	<i>Coelognathus radiates</i>	LC	II	EN	8	4	0.812
28	梅氏壁虎	<i>Gekko melli</i>	LC	—	VU	6	2	0.903
29	花龟	<i>Mauremys sinensis</i>	CR	II	CR	50	8	0.949
30	中华鳖	<i>Pelodiscus sinensis</i>	VU	—	EN	41	4	0.872
31	平胸龟	<i>Platysternon megacephalum</i>	CR	II	CR	10	8	0.770
32	蟒蛇	<i>Python molurus bivittatus</i>	VU	II	CR	6	2	0.951

注

各保护名录中保护等级会随时间出现变化，文中所使用的以实验当时为准。

2 环境变量贡献率评估结果

附表 4：各物种最终建模及环境变量贡献率评估

名称	拉丁名	保留变量
哺乳类		
红颊獭	<i>Herpestes javanicus</i>	Bio7、Buildland、Dis_build、Landuse、Bio13、People
水獭	<i>Lutra lutra</i>	Bio15、Buildland、Bio3、Bio14、Dis_river
中华穿山甲	<i>Manis pentadactyla</i>	DEM、Slope、Buildland、Bio5、Aspect、Dis_build、Landuse、Bio2、Dis_road、Bio8
小鹿	<i>Muntiacus reevesi</i>	Dis_road、Bio14、Dis_build、Dis_river、Aspect、Buildland、People、Bio4
赤鹿	<i>Muntiacus vaginalis</i>	Bio15、Bio2、DEM、Slope、People、Dis_road、Bio5、Dis_river
豹猫	<i>Prionailurus bengalensis</i>	Bio10、Bio2、Bio12、Dis_river、Slope、People、Dis_road
小灵猫	<i>Viverricula indica</i>	DEM、Bio5、Bio15、Buildland、Dis_river、Bio14、Bio2、Aspect、Dis_road、Buildland
鸟类		
短嘴金丝燕	<i>Aerodramus brevirostris</i>	Bio15、Bio19、Bio1、Dis_river、People、Bio14、Aspect、Slope
白眼潜鸭	<i>Aythya nyroca</i>	Bio15、Bio19、Slope、Dis_road、People、Dis_river
勺嘴鹬	<i>Calidris pygmeus</i>	Bio15、DEM、Bio19、Bio14、Slope、Dis_build、Aspect
褐翅鸦鹃	<i>Centropus sinensis</i>	Bio15、Bio14、Bio3、Bio13、Aspect、Bio5
长嘴剑鸻	<i>Charadrius placidus</i>	Bio19、Bio2、Bio8、Bio15、DEM、Slope、Dis_river、Bio11
白颈鸦	<i>Corvus pectoralis</i>	Bio15、Bio19、Dis_river、Bio3、Bio8、Bio5、Bio14
白眉鹀	<i>Emberiza tristrami</i>	Bio15、Bio17、Dis_river、Bio16、Bio5、Bio1、Slope、Dis_build、Bio3、Dis_road
画眉	<i>Garrulax canorus</i>	Bio15、Bio7、Bio14、People、Bio5、Bio13、Dis_river、Aspect、Slope
白鹇	<i>Lophura nycthemera</i>	Bio10、Landuse、Dis_river、Bio4、Aspect、Bio3、Bio15、Dis_road、Bio14、Bio13、Dis_build
黑鸢	<i>Milvus migrans</i>	Bio15、Bio14、Dis_river、Bio3、Bio5、Bio8
黑脸琵鹭	<i>Platalea minor</i>	Bio15、Bio19、Bio14、Bio8、Bio3、Bio5
紫寿带	<i>Terpsiphone atrocaudata</i>	Bio15、Bio17、Bio13、Bio3、Dis_build、People
红胸田鸡	<i>Zapornia fusca</i>	Bio15、Bio17、Dis_river、Bio19、Bio8、Bio11、Buildland、Aspect、Dis_river
两栖类		
虎纹蛙	<i>Hoplobatrachus chinensis</i>	Bio15、Bio14、Bio13、Dis_river、Bio3、Slope
花狭口蛙	<i>Kaloula pulchra</i>	Bio17、Bio15、Bio4、Dis_river、Bio19、Bio7、Bio1
刘氏掌突蟾	<i>Leptobrachella laui</i>	Bio15、Bio17、Dis_river、Bio5、Bio14、Bio4

莽山角蟾	<i>Megophrys mangshanensis</i>	Bio19、Dis_road、Bio2、Bio17
小棘蛙	<i>Quasipaa exilispinosa</i>	Bio17、Dis_river、Bio2、Bio1、Bio4
爬行类		
金环蛇	<i>Bungarus fasciatus</i>	Bio13、Bio15、Dis_river、Bio3、Dis_build、Slope、DEM、Aspect、Landuse、People
三索蛇	<i>Coelognathus radiates</i>	Slope、Bio8、Dis_build、Aspect、Bio7
梅氏壁虎	<i>Gekko melli</i>	Slope、Dis_build、Bio18、Aspect、Bio13、Bio3
花龟	<i>Mauremys sinensis</i>	Bio15、People、Bio6、Dis_river、Bio13、Landuse、Aspect
野生中华鳖	<i>Pelodiscus sinensis</i>	People、Buildland、Bio3、Dis_road、Bio7、Slope、Bio13
平胸龟	<i>Platysternon megacephalum</i>	Slope、DEM、Bio18、Dis_road、Buildland、Aspect
蟒蛇	<i>Python molurus bivittatus</i>	Bio5、Buildland、Dis_road

注

表格中每一物种的保留变量按照环境变量贡献率的数值由高到低排列。