

SUPPLEMENTARY INFORMATION
Table S1. List of bird species recorded in Bai Tu Long national park
(November 2024 – November 2025)

TT	Common name	Scientific name	Habitats								Residency status [3]
			E1	E2	E3	E4	E5	E6	E7	E8	
I	ANSERIFORMES	ANSERIFORMES									
	1. Ducks, Geese, and Waterfowl	Anatidae									
1	Northern Pintail	<i>Anas acuta</i> (Linnaeus, 1758)			1					1	W
II	CUCULIFORMES	CUCULIFORMES									
	2. Cuckoos	Cuculidae									
2	Greater Coucal	<i>Centropus sinensis</i> (Stephens, 1815)	1	1	1					1	R
3	Chestnut-winged Cuckoo	<i>Clamator coromandus</i>	1								W
4	Plaintive Cuckoo	<i>Cacomantis merulinus</i> (Scopoli, 1786)	1	1						1	R
5	Drongo Cuckoo	<i>Surniculus lugubris</i> (Horsfield, 1821)	1								R
6	Hodgson's Hawk Cuckoo	<i>Hierococcyx nasicolor</i> (Horsfield, 1821)	1								R
7	Indian Cuckoo	<i>Cuculus micropterus</i> (Gould, 1837)	1	1							R
8	Green-billed Malkoha	<i>Phaenicophaeus tristis</i> (Lesson, 1830)	1	1	1					1	R
III	COLUMBIFORMES	COLUMBIFORMES									
	3. Pigeons and Doves	Columbidae									
9	Red Collared-Dove	<i>Streptopelia tranquebarica</i> (Hermann, 1804)	1	1	1					1	R
10	Spotted Dove	<i>Streptopelia chinensis</i> (Scopoli, 1786)	1	1	1					1	R
11	Thick-billed Green Pigeon	<i>Treron curvirostra</i> (Gmelin, 1789)	1	1	1						R
12	White-bellied Green Pigeon	<i>Treron sieboldii</i> (Temminck, 1835)	1	1							R
13	Emerald Dove	<i>Chalcophaps indica</i> (Linnaeus, 1758)	1	1						1	R
14	Zebra Dove	<i>Geopelia striata</i> (Linnaeus, 1766)	1	1						1	Va
IV	CAPRIMULGIFORMES	CAPRIMULGIFORMES									
	4. Nightjars and Allies	Caprimulgidae									
15	Grey Nightjar	<i>Caprimulgus jotaka</i> (Latham, 1790)	1	1							R
V	APODIFORMES	APODIFORMES									
	5. Swifts	Apodidae									
16	Pacific Swift	<i>Apus pacificus</i> (Latham, 1802)	1	1							R
VI	GRUIFORMES	GRUIFORMES									
	6. Rails, Gallinules, and Coots	Rallidae									
17	White-breasted Waterhen	<i>Amaurornis phoenicurus</i> Pennant, 1769			1					1	R
18	Common Moorhen	<i>Gallinula chloropus</i> (Linnaeus, 1758)			1					1	R
19	White-browed Crake	<i>Porzana cinerea</i> (Vieillot, 1819)			1					1	R
20	Slaty-legged Crake	<i>Rallina eurizonoides</i>	1								B

		(Lafresnaye, 1845)									
VII	PODICIPEDIFORMES	PODICIPEDIFORMES									
	7. Grebes	Podicipedidae									
21	Little Grebe	<i>Tachybaptus ruficollis</i> (Pallas, 1764)			1				1		R
VIII	CHARADRIIFORMES	CHARADRIIFORMES									
	8. Stilts and Avocets	Recurvirostridae									
22	Black-winged Stilt	<i>Himantopus himantopus</i> (Linnaeus, 1758)						1	1		R,W
	9. Plovers and Lapwings	Charadriidae									
23	Grey-headed Lapwing	<i>Vanellus cinereus</i> (Blyth, 1842)			1			1	1		W
24	Little Ringed Plover	<i>Charadrius dubius</i> (Scopoli, 1786)						1	1		R
25	Kentish Plover	<i>Charadrius alexandrius</i> (Linnaeus, 1758)			1			1	1		R
26	Greater Sand Plover	<i>Charadrius leschnaultii</i> (Lesson, 1826)			1			1	1		Pm,W
27	Lesser Sand Plover	<i>Charadrius mongolus</i> (Pallas, 1776)			1			1			Pm,W
	10. Sandpipers and Allies	Scolopacidae									
28	Sanderling	<i>Calidris alba</i> (Pallas, 1776)						1			W
29	Broad-billed Sandpiper	<i>Limicola falcinellus</i> (Pontoppidan, 1763)						1	1		Pm,W
30	Dunlin	<i>Calidris alpina</i> (Linnaeus, 1758)						1	1		Pm,W
31	Long-tosed Stint	<i>Calidris subminuta</i> Middendorff, 1853						1	1		W
32	Red-necked Stint	<i>Calidris ruficollis</i> (Pallas, 1776)						1	1		Pm,W
33	Temminck's Stint	<i>Calidris temminckii</i> (Leisler, 1812)						1	1		W
34	Red-necked Phalarope	<i>Phalaropus lobatus</i> (Linnaeus, 1758)							1		Pm
35	Marsh Sandpiper	<i>Tringa stagnatilis</i> (Bechstein, 1803)						1	1		Pm,W
36	Black-tailed Godwit	<i>Limosa limosa</i> (Linnaeus, 1758)			1			1	1		Pm,W
37	Eurasian Curlew	<i>Numenius arquata</i> (Linnaeus, 1758)						1	1		Pm,W
38	Common Sandpiper	<i>Actitis hypoleucos</i> (Linnaeus, 1758)			1			1	1	1	Pm,W
39	Green Sandpiper	<i>Tringa acchropus</i> (Linnaeus, 1758)						1	1		W
40	Common Greenshank	<i>Tringa nebularia</i> (Gunnerus, 1758)			1			1	1		Pm,W
41	Little Stint	<i>Calidris minuta</i> (Leisler, 1812)						1	1		Va
	11. Gulls, Terns, and Skimmers	Laridae									
42	Heuglin's Gull	<i>Larus fuscus</i> (Bree, 1876)				1	1	1	1		W
43	Whiskered Tern	<i>Chlidonias hybrida</i> (Pallas, 1811)			1			1	1		W
IX	PELECANIFORMES	PELECANIFORMES									
	12. Herons, Egrets, and Bitterns	Ardeidae									
44	Black-crowned Night Heron	<i>Nycticorax nycticorax</i> Linnaeus, 1758	1	1	1				1		R

45	Chinese Pond Heron	<i>Ardeola bacchus</i> (Bonaparte, 1855)	1	1	1					1	R
46	Eastern Cattle Egret	<i>Bubulcus coromandus</i> (Linnaeus, 1758)			1					1	R
47	Purple Heron	<i>Ardea pupured</i> (Linnaeus, 1766)			1				1	1	R
48	Grey Heron	<i>Ardea cinerea</i> (Linnaeus, 1758)			1				1	1	Pm,W
49	Great Egret	<i>Ardea alba</i> (Linnaeus, 1758)			1				1	1	R
50	Intermediate Egret	<i>Mesophoyx intermedia</i> (Wagler, 1827)			1				1	1	R
51	Little Egret	<i>Egretta garzetta</i> (Linnaeus, 1766)	1	1	1				1	1	R
52	Yellow Bittern	<i>Ixobrychus sinensis</i> (Gmelin, 1789)			1					1	R
53	Pacific Reef-Egret	<i>Egretta sacra</i> (Gmelin, 1789)				1		1	1		R
54	Striated Heron	<i>Butorides striatus</i> (Linnaeus, 1758)			1			1	1	1	R
X	ACCIPITRIFORMES	ACCIPITRIFORMES									
	13. Hawks, Eagles, and Kites	Accipitridae									
55	Crested Goshawk	<i>Accipiter trivirgatus</i> (Temminck, 1824)	1	1							R
56	Black Kite	<i>Milvus migrans</i> (Boddaert, 1783)	1	1	1	1	1	1	1	1	R
57	Oriental Honey Buzzard	<i>Pernis ptilorhynchus</i> (Temminck, 1821)	1	1							R
58	Himalayan Buzzard	<i>Buteo burmanicus</i> (Linnaeus, 1758)			1					1	W
59	Crested Serpent Eagle	<i>Spilornis cheela</i> (Latham, 1790)	1	1						1	R
60	Jerdon's Baza	<i>Aviceda jerdoni</i> (Blyth, 1842)	1	1						1	R
XI	STRIGIFORMES	STRIGIFORMES									
	14. Owls	Strigidae									
61	Collared Scops-Owl	<i>Otus lettia</i> (Pennant, 1769)	1	1							R
62	Mountain Scops-Owl	<i>Otus spiocephalus</i> (Blyth, 1846)	1								R
63	Brown Wood Owl	<i>Strix leptogrammica</i> (Temminck, 1821)	1								R
64	Brown Fish Owl	<i>Ketupa zeylonensis</i> (Gmelin, 1788)	1					1			R
XII	BUCEROTIFORMES	BUCEROTIFORMES									
	15. Hornbills	Bucerotidae									
65	Oriental Pied Hornbill	<i>Anthracaceros albrostris</i> (Shaw & Nodder, 1870)	1	1							R
	16. Hoopoes	Upupidae									
66	Eurasian Hoopoe	<i>Upupa epops</i> (Linnaeus, 1758)	1	1						1	R
XIII	CORACIIFORMES	CORACIIFORMES									
	17. Rollers	Coraciidae									
67	Dollarbird	<i>Eurystomus orientalis</i> (Linnaeus, 1766)	1	1						1	R
	18. Kingfishers	Alcedinidae									
68	White-throated Kingfisher	<i>Halcyon smyrnensis</i> (Linnaeus, 1758)	1	1	1			1		1	R
69	Black-capped Kingfisher	<i>Halcyon pileata</i> (Boddaert, 1783)			1					1	Pm,W

70	Common Kingfisher	<i>Alcedo atthis</i> (Linnaeus, 1758)			1	1		1	1	1	R
	19. Bee-eaters	<i>Meropidae</i>									
71	Blue-throated Bee-eater	<i>Merops viridis</i> (Linnaeus, 1758)			1					1	R
XIV	PICIFORMES	PICIFORMES									
	20. Asian Barbets	<i>Megalaimidae</i>									
72	Green-eared Barbet	<i>Psilopogon faiostriata</i> (Temminck, 1831)	1	1							R
	21. Woodpeckers	<i>Picidae</i>									
73	Eurasian Wryneck	<i>Jynx torquilla</i> (Linnaeus, 1758)	1	1						1	Pm,W
XV	FALCONIFORMES	FALCONIFORMES									
	22. Falcons and Caracaras	<i>Falconidae</i>									
74	Common Kestrel	<i>Falco tinnunculus</i> (Linnaeus, 1758)		1						1	R
75	Peregrine Falcon	<i>Falco peregrinus</i> Tunstall, 1771	1	1	1					1	R
76	Oriental Hobby	<i>Falco severus</i> (Horsfield, 1821)		1							R
XVI	PASSERIFORMES	PASSERIFORMES									
	23. Woodswallows, Bellmagpies, and Allies	<i>Artamidae</i>									
77	Ashy Woodswallow	<i>Artamus fuscus</i> (Vieillot, 1817)	1	1						1	R
	24. Cuckooshrikes	<i>Campephagidae</i>									
78	Ashy Minivet	<i>Pericrocotus divaricatus</i> (Raffles, 1822)	1	1	1					1	W
	25. Shrikes	<i>Laniidae</i>									
79	Brown Shrike	<i>Lanius cristatus</i> Linnaeus, 1758	1	1	1					1	Pm,W
80	Long-tailed Shrike	<i>Lanius schach</i> Linnaeus, 1758	1	1	1					1	R
	26. Vireos, Shrike-Babblers, and Erpornis	<i>Vireonidae</i>									
81	White-bellied Erpornis	<i>Epornis zantholeuca</i> (Blyth, 1844)	1	1							R
	27. Old World Orioles	<i>Oriolidae</i>									
82	Black-naped Oriole	<i>Oriolus chinensis</i> Linnaeus, 1766	1	1	1						W
	28. Drongos	<i>Dicruridae</i>									
83	Black Drongos	<i>Dicrurus macrocercus</i> Vieillot, 1817	1	1						1	R
84	Hair-crested Drongo	<i>Dicrurus hottentottus</i> (Linnaeus, 1766)	1	1	1						R
85	Ashy Drongo	<i>Dicrurus leucophaeus</i> (Vieillot, 1817)	1	1						1	R
	29. Fantails	<i>Rhipiduridae</i>									
86	White-throated Fantail	<i>Rhipidura albicollis</i> (Vieillot, 1818)	1	1	1					1	R
	30. Monarch Flycatchers	<i>Monarchidae</i>									
87	Black-naped Monarch	<i>Hypothymis azurea</i> (Boddaert, 1783)	1	1	1					1	R
88	Chinese Paradise Flycatcher	<i>Terpsiphone affinis</i> (Blyth, 1846)	1								R
	31. Crows, Jays, and Magpies	<i>Corvidae</i>									
89	Large-billed Crow	<i>Corvus macrorhynchos</i> Wagler, 1827	1	1	1			1		1	R

90	Red-billed Blue Magpie	<i>Urocissa erythrorhyncha</i> (<u>Boddaert</u> , 1783)	1	1	1					1	R
	32. Fairy Flycatchers	<i>Stenostiridae</i>									
91	Grey-headed Canary Flycatcher	<i>Culicicapa ceylonensis</i> (<u>Swainson</u> , 1820)	1	1	1					1	R
	33. Tits, Chickadees, and Titmice	<i>Paridae</i>									
92	Japanese Tit	<i>Parus minor</i> Temminck & Schlegel, 1848	1	1	1					1	R
	34. Bulbuls	<i>Pycnonotidae</i>									
93	Black-crested Bulbul	<i>Pycnonotus melanicterus</i> (<u>Gmelin</u> , 1789)	1	1							R
94	Red-whiskered Bulbul	<i>Pycnonotus jocosus</i> (<u>Linnaeus</u> , 1758)	1	1	1					1	R
95	Light-vented Bulbul	<i>Pycnonotus sinensis</i> (<u>Gmelin</u> , 1789)	1	1	1					1	R
96	Sooty-headed Bulbul	<i>Pycnonotus aurigaster</i> (<u>Vieillot</u> , 1818)	1	1	1					1	R
97	Ochraceous Bulbul	<i>Himixos castanonotus</i> (<u>Swinhoe</u> , 1870)	1	1							R
98	Puff-throated Bulbul	<i>Alophoixus pallidus</i> (<u>Swinhoe</u> , 1870)	1	1							R
99	Black Bulbul	<i>Hypsipetes leucocephalus</i> (<u>Gmelin</u> , 1789)	1	1							R
	35. Swallows	<i>Hirundinidae</i>									
100	Barn Swallow	<i>Hirundo rustica</i> <u>Linnaeus</u> , 1758			1			1	1	1	Pm,W
101	Red-rumped Swallow	<i>Cecropis daurica</i> (<u>Laxmann</u> , 1769)							1	1	W
	36. Leaf Warblers	<i>Phylloscopidae</i>									
102	Yellow-browed Warbler	<i>Phylloscopus inornatus</i> (<u>Blyth</u> , 1842)	1	1	1					1	W
103	Dusky Warbler	<i>Phylloscopus fuscatus</i> (<u>Blyth</u> , 1842)	1		1					1	W
104	Sulphur-breasted Warbler	<i>Phylloscopus ricketti</i> (<u>Slater</u> , 1897)	1								Pm
105	Arctic Warbler	<i>Phylloscopus borealis</i> (<u>Blasius,H</u> , 1858)	1	1							W
106	Radde's Warbler	<i>Phylloscopus schwarzi</i> (<u>Radde</u> , 1863)	1								W
	37. Reed Warblers and Allies	<i>Acrocephalidae</i>									
107	Thick-billed Warbler	<i>Arundinax aedon</i> (<u>Pallas</u> , 1776)	1							1	Pm,W
	38. Cisticolas and Allies	<i>Cisticolidae</i>									
108	Plain Prinia	<i>Prinia inornata</i> (<u>Sykes</u> , 1832)			1					1	R
109	Common Tailorbird	<i>Orthotomus sutorius</i> (<u>Pennant</u> , 1769)	1	1	1					1	R
110	Dark-necked Tailorbird	<i>Orthotomus atrogularis</i> (<u>Temminck</u> , 1836)	1	1	1					1	R
	39. Tree-Babblers, Scimitar-Babblers, and Allies	<i>Timaliidae</i>									
111	Pin-striped Tit-Babbler	<i>Mixornis gularis</i> (<u>Horsfield</u> , 1822)	1	1	1						R
	40. Ground Babblers and Allies	<i>Pellorneidae</i>									
112	Pin-striped Tit-Babbler	<i>Gypsophila brevicaudata</i>		1							R

		(Blyth, 1855)									
	41. Laughingthrushes and Allies	<i>Leiothrichidae</i>									
113	Blue-winged Minla	<i>Actinodura cyanouroptera</i> (Hodgson, 1838)	1	1							R
	42. White-eyes, Yuhinas, and Allies	<i>Zosteropidae</i>									
114	Indochinese Yuhina	<i>Staphida torqueola</i> (Swinhoe, 1870)	1	1							R
115	Swinhoe's White-eye	<i>Zosterops simplex</i> (Swinhoe, 1861)	1	1					1		R
	43. Starlings	<i>Sturnidae</i>									
116	Crested Myna	<i>Acridotheres cristatellus</i> (Linnaeus, 1766)							1		R
117	Common Myna	<i>Acridotheres tristis</i> (Linnaeus, 1766)							1		R
118	Red-billed Starling	<i>Spodiopsar sericeus</i> Gmelin, 1788			1				1		W
119	White-shouldered Starling	<i>Sturnia sinensis</i> (Gmelin, 1788)			1				1		R
	44. Thrushes and Allies	<i>Turdidae</i>									
120	Gray-backed Thrush	<i>Turdus hortulorum</i> (Sclater, 1863)	1	1					1		Pm
121	Black-breasted Thrush	<i>Turdus dissimilis</i> (Blyth, 1847)	1	1					1		R
122	Japanese Thrush	<i>Turdus cardis</i> (Temminck, 1831)	1	1	1				1		Pm
123	Eye-browed Thrush	<i>Turdus obscurus</i> (Gmelin, 1789)	1	1	1						Pm,W
124	Chinese Blackbird	<i>Turdus mandarinus</i> (Bonaparte, 1850)	1	1					1		Pm,W
	45. Old World Flycatchers	<i>Muscicapidae</i>									
125	Oriental Magpie-Robin	<i>Copsychus saularis</i> (Linnaeus, 1758)	1	1	1				1		R
126	White-rumped Shama	<i>Copsychus malabaricus</i> (Scopoli, 1788)	1	1							R
127	Asian Brown Flycatcher	<i>Muscicapa dauurica</i> Pallas, 1811	1	1					1		Pm,W
128	Gray-streaked Flycatcher	<i>Muscicapa griseisticta</i> (Swinhoe, 1861)	1	1							Va
129	Brown-breasted Flycatcher	<i>Muscicapa muttui</i> (Layard, 1854)	1								W
130	Hainan Blue Flycatcher	<i>Cyornis hainanus</i> (Ogilvie-Grant, 1900)	1	1					1		R
131	Narcissus Flycatcher	<i>Ficedula narcissina</i> (Temminck, 1836)	1								Pm
132	Fujian Niltava	<i>Niltava davidi</i> (La Touche, 1907)	1	1							R
133	Verditer Flycatcher	<i>Eumyias thalassinus</i> (Swainson, 1838)	1	1	1				1		R
134	Siberian Rubythroat	<i>Calliope calliope</i> (Pallas, 1776)	1	1	1				1		W
135	Bluethroat	<i>Luscinia svecica</i> (Linnaeus, 1758)	1	1	1				1		Pm,W
136	White-tailed Robin	<i>Myiomela leucura</i> (Hodgson, 1845)	1	1	1				1		R
137	Red-flanked Bluetail	<i>Tarsiger cyanurus</i> (Pallas, 1773)	1	1							W
138	Slaty-backed Forktail	<i>Enicurus schistaceus</i> (	1								R

		Hodgson, 1836)									
139	Blue Whistling-Thrush	<i>Myophonus caeruleus</i> (Scopoli, 1786)	1	1	1					1	R
140	Taiga Flycatcher	<i>Ficedula albicilla</i> (Pallas, 1811)	1	1	1					1	W
141	Daurian Redstart	<i>Phoenicurus auroreus</i> (Pallas, 1776)	1	1	1					1	W
142	Blue Rock-Thrush	<i>Monticola solitarius</i> (Linnaeus, 1758)	1	1					1	1	R
143	Amur Stonechat	<i>Saxicola stejnegeri</i> (Parrot, 1908)	1	1	1					1	R
144	Gray Bushchat	<i>Saxicola ferreus</i> (Gray, 1847)	1	1	1					1	R
	46. Flowerpeckers	Dicaeidae									
145	Scarlet-backed Flowerpecker	<i>Dicaeum cruentatum</i> (Linnaeus, 1758)	1	1	1						R
146	Plain Flowerpecker	<i>Dicaeum minullum</i> (Swinhoe, 1870)									R
	47. Sunbirds and Spiderhunters	Nectariniidae									
147	Crimson Sunbird	<i>Aethopyga siparaja</i> (Raffles, 1822)	1	1							R
148	Garden Sunbird	<i>Cinnyris jugularis</i> (Linnaeus, 1766)	1	1	1					1	R
	48. Old World Sparrows	Passeridae									
149	Eurasian Tree Sparrow	<i>Passer montanus</i> (Linnaeus, 1758)								1	R
	49. Waxbills and Allies	Estrildidae									
150	Scaly-breasted Munia	<i>Lonchura punctulata</i> (Linnaeus, 1758)	1	1	1					1	R
151	White-rumped Munia	<i>Lonchura striata</i> (Linnaeus, 1766)	1	1	1					1	R
	50. Wagtails and Pipits	Motacillidae									
152	Gray Wagtail	<i>Motacilla cinerea</i> (Tunstall, 1771)	1	1	1				1	1	Pm,W
153	Eastern Yellow Wagtail	<i>Motacilla schutschensis</i> (Gmelin, JF, 1789)	1							1	W
154	White Wagtail	<i>Motacilla alba</i> (Linnaeus, 1758)	1	1	1			1	1	1	R
155	Western Yellow Wagtail	<i>Motacilla flava</i> (Linnaeus, 1758)	1	1	1				1	1	W
156	Paddyfield Pipit	<i>Anthus rufulus</i> (Vieillot, 1818)								1	R
157	Olive-backed Pipit	<i>Anthus hodgsoni</i> (Richmond, 1907)	1	1	1					1	W
	51. Finches, Euphonias, and Allies	Fringillidae									
158	Common Rosefinch	<i>Carpodacus erythrurus</i> (Pallas, 1770)	1	1							Pm,W
	52. Old World Buntings	Emberizidae									
159	Black-faced Bunting	<i>Emberiza spodocephala</i> (Pallas, 1776)	1	1	1					1	W
160	Little Bunting	<i>Emberiza pusilla</i> (Pallas, 1776)	1	1	1					1	W
161	Yellow-breasted Bunting	<i>Emberiza aureola</i> (Pallas, 1773)	1		1					1	W

Note: R- Resident; W- Winter visitor; B- Breeding migrant; Va- Vagrant; Pm- Passage migrant; 1 – presence; 0 – absence.

SOME IMAGES OF THE HABITATS IN BAI TU LONG NATIONAL PARK

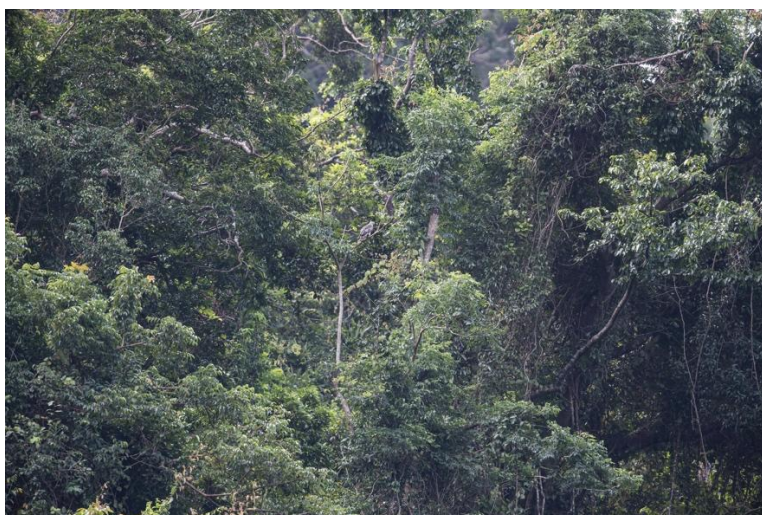


Figure S1. Evergreen broadleaf forest on soil mountains



Figure S2. Evergreen broadleaf forest on limestone mountains



Figure S3. Mangrove forest



Figure S4. Intertidal flats



Figure S5. Agricultural land



Figure S6. Karst lagoons within limestone mountains (Tung–Ang system)