

1	1	2,	1	1	1	3,	3,
	3,	3,	1	4	1	1,5	
(1.			200241	2.		201500;	
3.			200041;	4.		201200	
	5.						

(表 2),平均监测时长(125.0 ± 105.98) d、平均数据个数($2\,777.3\pm2\,509.60$)个. 9 只监测个体中有 4 只监测到迁徙行为,包括 2 只斑嘴鸭(BZ002、BZ003)和 2 只绿头鸭(LT002、LT003)(表 2). 我们依据最早发生迁徙行为的个体 BZ002 的迁徙开始时间,将越冬季的结束时间设定为 2017 年 4 月 3 日(表 2).

表 2 监测个体 GPS 跟踪数据汇总
Tab. 2 Summary of GPS data of each tracked individual

编号	总位 点数/个	总监测 时间/d	监测时间	位点数/个	监测时间	位点数/个	$d_{\text{迁徙}}/\text{km}$
			浦东东滩越冬期		北方栖息地		
BZ001	1 192	53	2017-01-18 至 2017-03-11	1 192	—	—	—
BZ002 [*]	3 509	268	2017-01-18 至 2017-04-03	1 730	2017-04-04 至 2017-10-13	2 779	1 018.32
BZ003 [*]	4 363	191	2017-01-18 至 2017-04-30	2 098	2017-05-01 至 2017-07-27	2 265	211.99
BZ004	164	69	2017-01-18 至 2017-03-27	164	—	—	—
BZ005 [#]	7 189	315	2017-01-18 至 2017-11-28	7 189	—	—	—
LT001	406	34	2017-01-18 至 2017-02-20	406	—	—	—
LT002 [*]	2 090	310	2017-01-18 至 2017-04-05	1 436	2017-04-06 至 2017-11-23	654	962.23
LT003 [*]	4 764	208	2017-01-18 至 2017-04-11	1 849	2017-04-12 至 2017-08-13	2 915	635.75
LT004	363	33	2017-01-18 至 2017-02-19	363	—	—	—

注:—表示没有数据;*表示监测到迁徙行为的个体;#表示斑嘴鸭 BZ005 个体整个监测期间均未离开浦东东滩地区.

2.2 监测个体在浦东东滩的活动范围

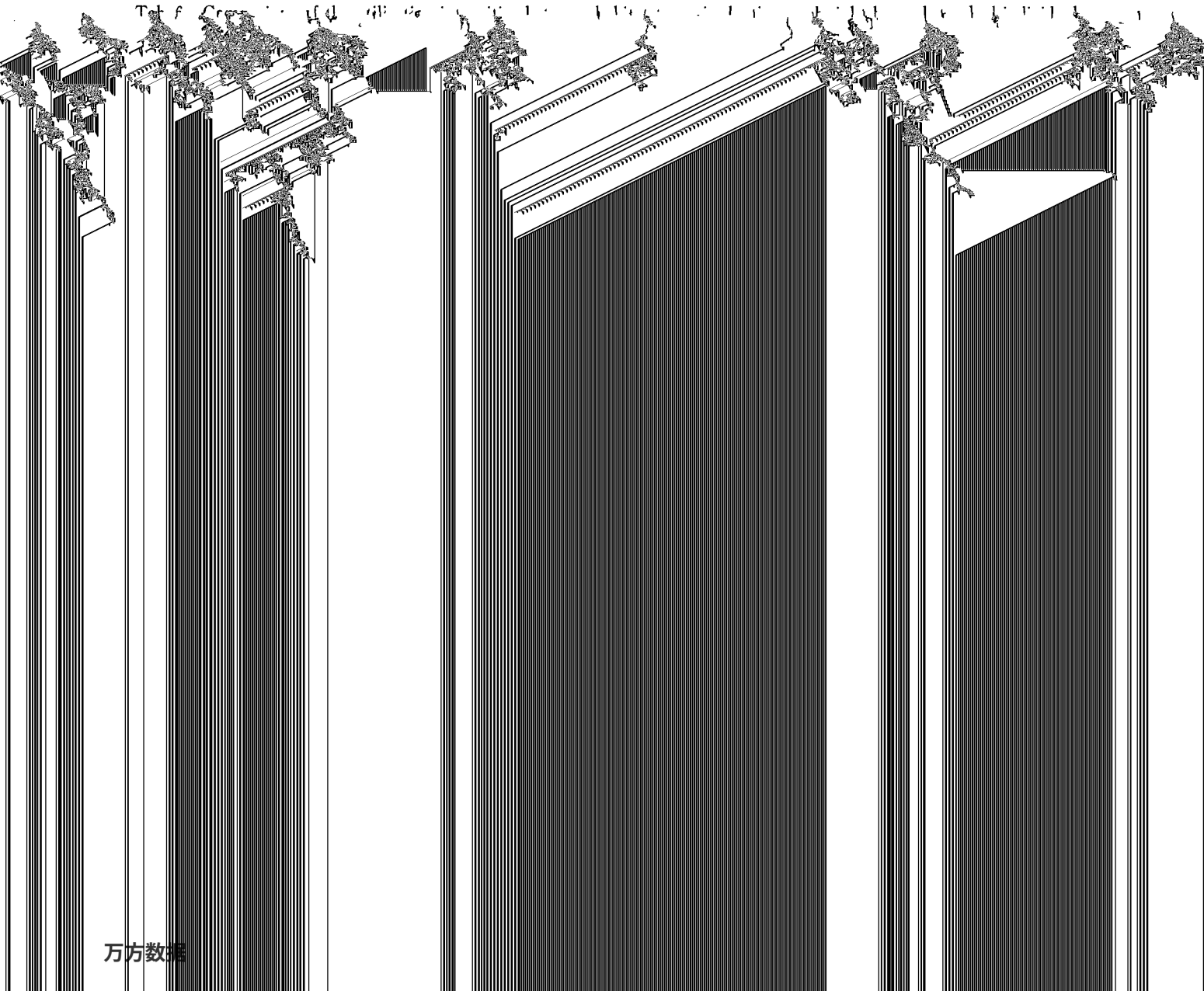
6 只在上海浦东东滩地区活动个体(4 只斑嘴鸭和 2 只绿头鸭)的主要活动范围都集中在以大治河入海口为中心的广大滩涂和周边区域(图 1). 所有个体的平均活动面积为(22.206 ± 33.264) km^2 (95% MCP)或(15.073 ± 25.390) km^2 (95% FKE)(表 3),且物种之间没有显著差异.

表 5 监测个体全天各种栖息地中 GPS 位点的分布

Tab. 5 Distribution of GPS locations of each tracked individual in the four types of habitat

监测区域	监测时间	BZ001	BZ002	BZ003	BZ005	LT001	LT003	总计
滩涂	24 h	41.4±9.3	18.0±4.4	13.1±4.9	57.6±7.0	13.0±2.8	24.1±22.8	109.1±19.6
	07:00~18:59	42.0±1.4	19.8±3.5^a	13.3±2.1	58.3±3.6	13.2±3.3	3.6±3.4^a	94.8±9.2
	19:00~06:59	40.8±7.3	16.3±4.8^b	13.0±6.8	56.9±9.4	12.8±2.2	44.7±12.5^b	123.4±16.6
沟渠	24 h	36.8±4.0	13.8±5.7	3.2±2.1	30.1±5.9	2.8±1.1	40.4±14.6	90.3±16.6
	07:00~18:59	37.8±3.1	14.9±5.1	4.7±1.9^a	6.1±3.8^a	3.4±1.2^a	51.9±4.3^a	100.3±9.4
	19:00~06:59	35.7±4.7	12.8±6.5	1.7±0.8^b	34.2±4.8^b	2.3±0.6^b	28.9±11.9^b	80.4±16.6
农田	24 h	—	36.0±10.3	28.8±26.6	3.7±3.4	—	10.0±9.5	77.8±30.3
	07:00~18:59	—	32.5±10.7	6.5±3.1^a	2.3±0.7	—	18.1±5.4^a	59.2±16.2
	19:00~06:59	—	39.5±8.8	51.0±19.8^b	5.1±4.4	—	1.8±3.7^b	96.5±30.1
内陆水体	24 h		—	34.6±29.7	—	—	—	34.7±29.7
	07:00~18:59		—	61.3±4.0^a	—	—	—	61.3±4.0
	19:00~06:59		—	8.0±16.8^b	—	—	—	8.1±17.1

表 6 监测个体各种栖息地类型昼夜间利用强度的比较



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Spatial Behavior and Habitat Use of *Anas poecilorhyncha* and *A. platyrhynchos* in Winter at Dongtan Wetland of Pudong, Shanghai

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