

Supplementary material

Tracking the Stejneger's stonechat *Saxicola stejnegeri* along the East Asian– Australian Flyway from Japan via China to Southeast Asia

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Appendix 1. Details of the captured individuals and their estimates

Table A1. Details of the 12 individuals that returned.

ID ¹	Breeding site ²		Captured date ³		Body weight (g) ⁴		End date of geolocator ⁵	Onset of migration ⁶	End of Migration ⁷	# stop-over sites ⁸	Cumulative days spent during the migration ⁹		Non-breeding ground ¹⁰	
	Long.	Lat.	2014	2015	2014	2015					Stop-over sites	Active migration	Long.	Lat.
782	141.53	43.13	2014/5/9	2015/4/23	14.4	13.8	2015/2/20 16:11	2014/10/7	2014/11/19	3	35.5	7.5	110.4	24.5
787	141.59	43.13	2014/5/12	2015/5/14	15.7	15.1	2015/1/22 3:41	2014/10/10	2014/12/9	5	53.1	7.0	106.1	25.8
789	141.47	43.17	2014/5/8	2015/5/10	15	14.3	2015/4/12 7:09	2014/10/13	2014/12/14	4	54.1	8.0	105.2	15.8
792	141.50	43.14	2014/5/9	2015/6/5	15.9	15.3	2015/1/28 19:42	2014/9/28	2014/11/28	4	52.5	8.5	104.1	15.5
797	141.59	43.13	2014/5/13	2015/6/29	15	14	2015/2/23 3:52	2014/9/29	2014/11/19	3	43.5	7.5	110.5	25.9
806	141.58	43.12	2014/5/10	2015/5/12	15	14.7	2015/2/13 15:16	2014/10/26	2014/12/29	3	56.0	8.0	106	13.4
810	141.58	43.12	2014/5/10	2015/5/14	15.5	15.3	2015/3/5 15:50	2014/10/7	2014/12/2	4	46.0	10.0	106.3	12.9
812	141.58	43.12	2014/5/11	2015/5/11	14	14.5	2015/2/10 7:32	2014/10/9	2014/11/22	3	35.5	8.5	103.3	15.2
813	141.58	43.12	2014/5/11	2015/5/14	14.7	14.5	2015/2/7 7:33	2014/10/14	2014/12/9	4	47.5	8.5	107	13.4
826	141.56	43.13	2014/5/18	2015/6/28	14	13.7	2015/3/13 13:40	2014/10/2	2014/12/11	4	57.5	12.5	100.3	14.2
827	141.56	43.12	2014/5/18	2015/5/13	14.7	15.5	2015/2/21 7:45	2014/10/6	2014/11/22	3	38.0	9.0	108.1	13.9
831	141.47	43.17	2014/5/15	2015/4/23	15.4	14.8	2015/3/14 7:53	2014/10/15	2014/11/26	3	29.5	12.5	105.5	16.3

Note: All returning individuals were male. They were recaptured at the same places where they were initially captured in 2014. All geolocators recorded the light-level data since 27 April, 2014.

¹ Geolocator ID.

² Latitude and longitude of captured location measured by hand-held GPS (Oregon 450TC; Garmin, Topeka, KS, USA).

³ Dates of capture in 2014 and 2015.

⁴ Body weight measured at capture.

⁵ End dates of geolocation due to dead battery.

⁶ Estimated dates of departure from breeding grounds.

⁷ Estimated dates of arrival at non-breeding grounds.

⁸ Number of stop-over sites.

⁹ Cumulative days spent at stop-over sites or in active migration.

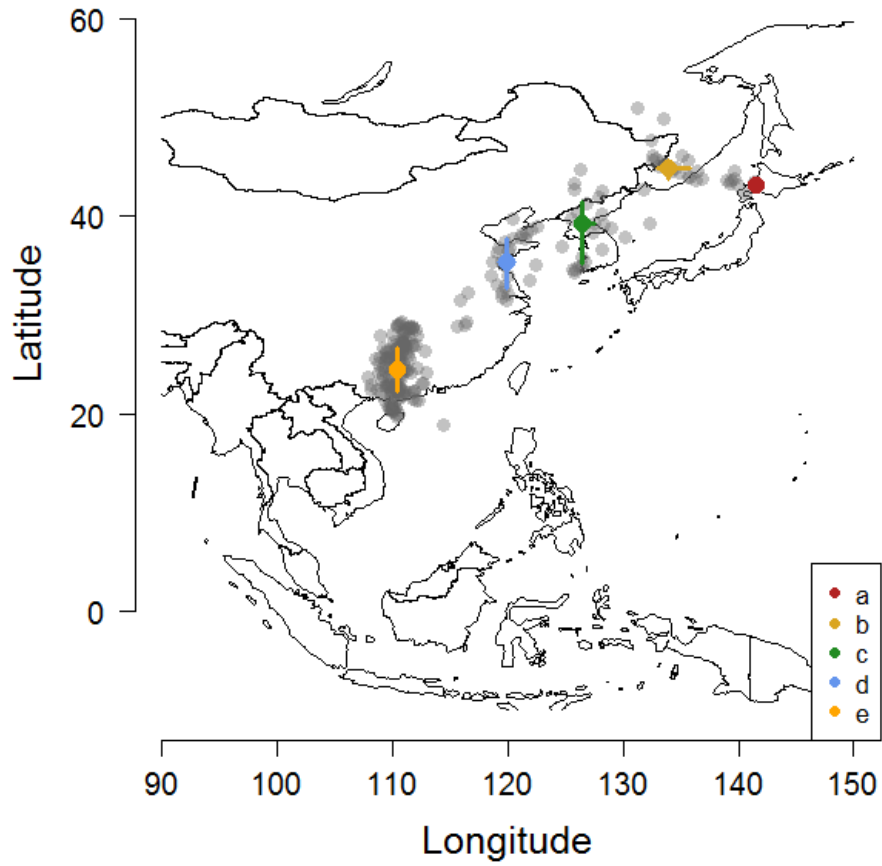
¹⁰ Estimated locations of non-breeding grounds.

Fig. A1. Estimated locations at each sunset and sunrise event and major stop-over sites, breeding grounds, and non-breeding grounds.

Grey dots represent the locations of sunset and sunrise events. Colored sites marked by letters are breeding grounds (with “a”), major stop-over sites, and non-breeding grounds (south most locations). Lengths of vertical and horizontal bars for colored dots represent the estimation uncertainty (25% and 75% percentiles of the MCMC posterior estimates) in longitude and latitude, respectively.

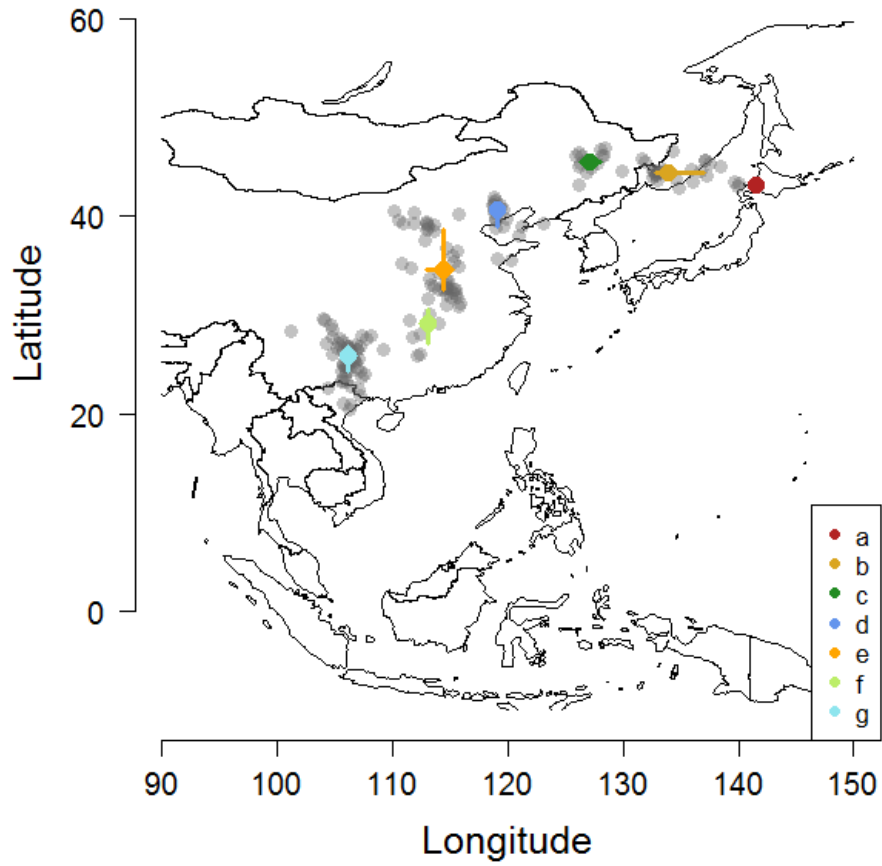
Tables below the figure show arrival and departure dates at each major site, days spent at each site, and estimated longitude and latitude. Distance from the breeding site is also shown. Site numbers coded by “mig” indicate migration times between two stop-over sites.

782



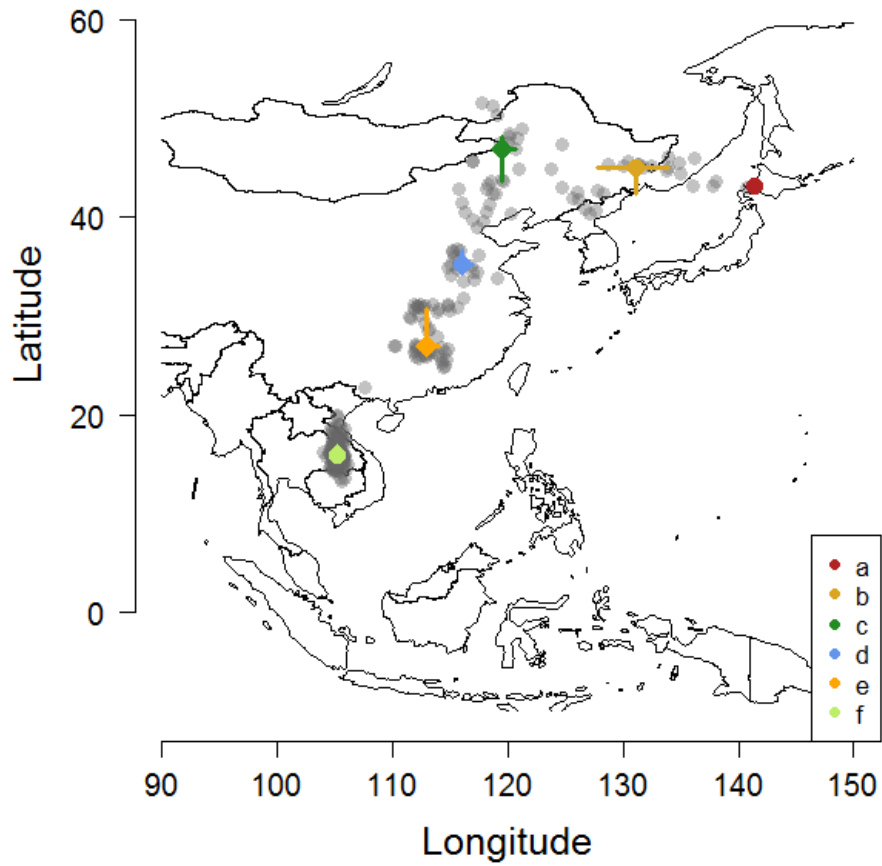
Site	Arrival	Departure	Days	Lon	Lat	Distance
a	NA	2014/10/7	NA	141.5	43.1	NA
mig1	2014/10/7	2014/10/10	3.01	NA	NA	632.8
b	2014/10/10	2014/10/23	12.51	134	44.9	NA
mig2	2014/10/23	2014/10/24	1.51	NA	NA	892.1
c	2014/10/24	2014/11/3	9.5	126.4	39.2	NA
mig3	2014/11/3	2014/11/4	1.51	NA	NA	721.1
d	2014/11/4	2014/11/18	13.51	119.8	35.4	NA
mig4	2014/11/18	2014/11/19	1.51	NA	NA	1512.9
e	2014/11/19	2015/2/11	83.53	110.4	24.5	NA

787



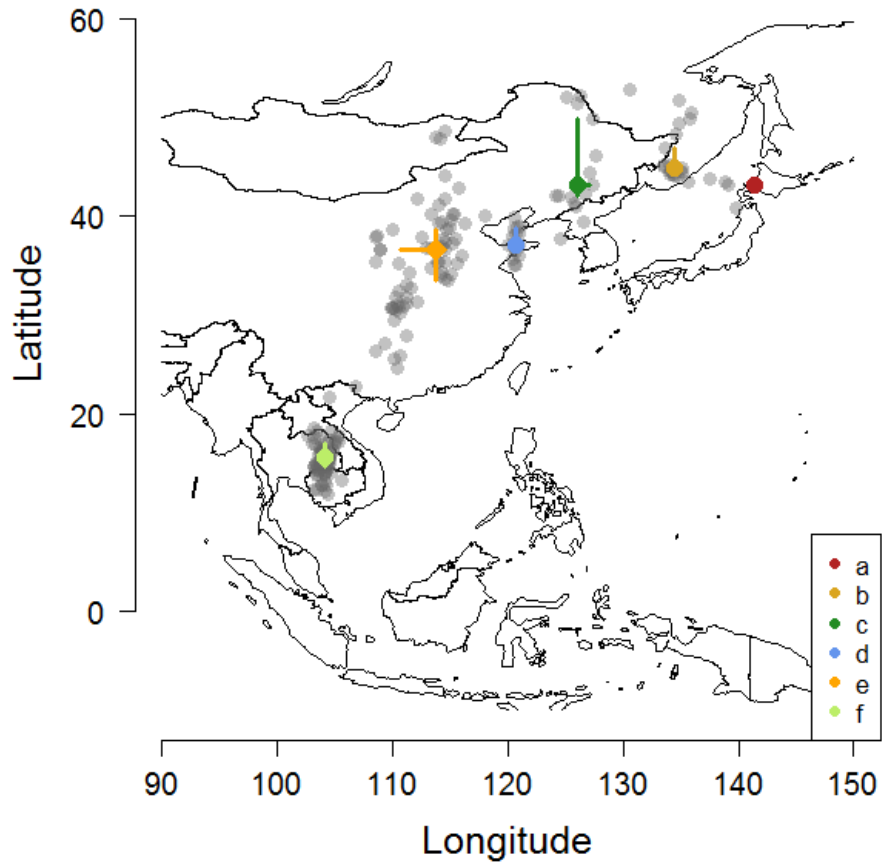
Site	Arrival	Departure	Days	Lon	Lat	Distance
a	NA	2014/10/10	NA	141.6	43.1	NA
mig1	2014/10/10	2014/10/11	1	NA	NA	627.8
b	2014/10/11	2014/10/23	12.52	134	44.4	NA
mig2	2014/10/23	2014/10/24	1	NA	NA	559.1
c	2014/10/24	2014/11/1	7.51	127.1	45.6	NA
mig3	2014/11/1	2014/11/2	1.52	NA	NA	861.4
d	2014/11/2	2014/11/12	10.01	119	40.6	NA
mig4	2014/11/12	2014/11/14	1.51	NA	NA	781.2
e	2014/11/14	2014/12/4	20.01	114.4	34.6	NA
mig5	2014/12/4	2014/12/5	0.99	NA	NA	613.5
f	2014/12/5	2014/12/8	3	113.1	29.2	NA
mig6	2014/12/8	2014/12/9	1.51	NA	NA	787.8
g	2014/12/9	2015/1/15	36.52	106.1	25.8	NA

789



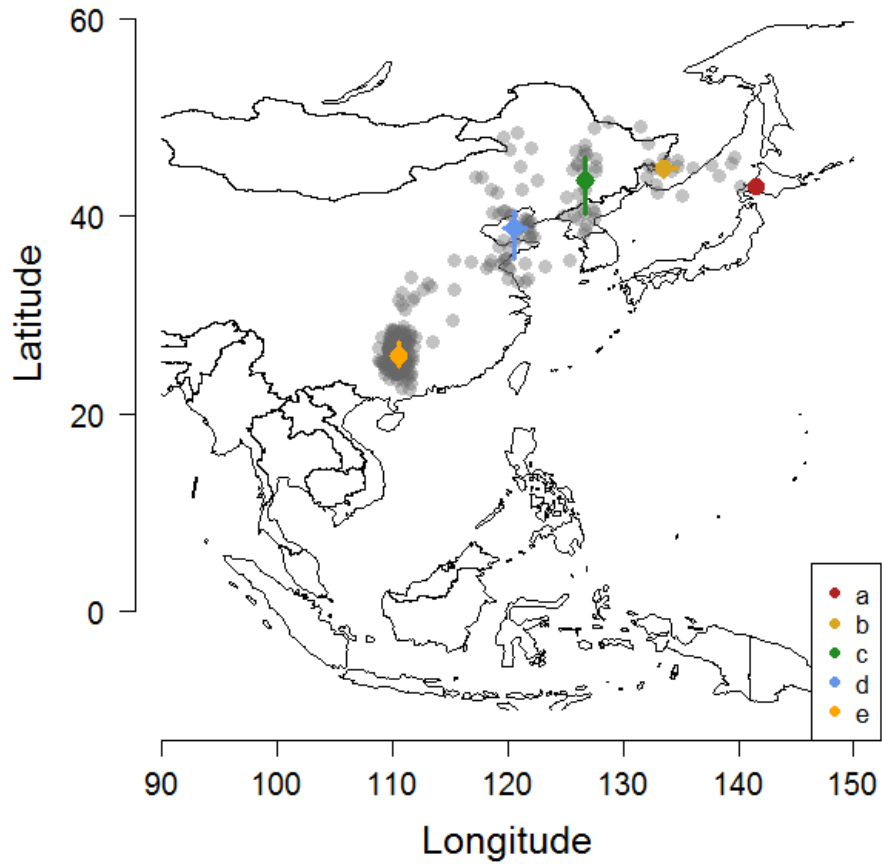
Site	Arrival	Departure	Days	Lon	Lat	Distance
a	NA	2014/10/13	NA	141.4	43.1	NA
mig1	2014/10/13	2014/10/15	1.5	NA	NA	842.4
b	2014/10/15	2014/10/26	11.53	131.2	45	NA
mig2	2014/10/26	2014/10/27	1.02	NA	NA	930.8
c	2014/10/27	2014/11/6	10.01	119.5	47	NA
mig3	2014/11/6	2014/11/9	2.51	NA	NA	1345.6
d	2014/11/9	2014/11/22	13	116	35.2	NA
mig4	2014/11/22	2014/11/23	1	NA	NA	959.3
e	2014/11/23	2014/12/12	19.51	112.9	27	NA
mig5	2014/12/12	2014/12/14	1.51	NA	NA	1479.3
f	2014/12/14	2015/2/14	62.02	105.2	15.8	NA

792



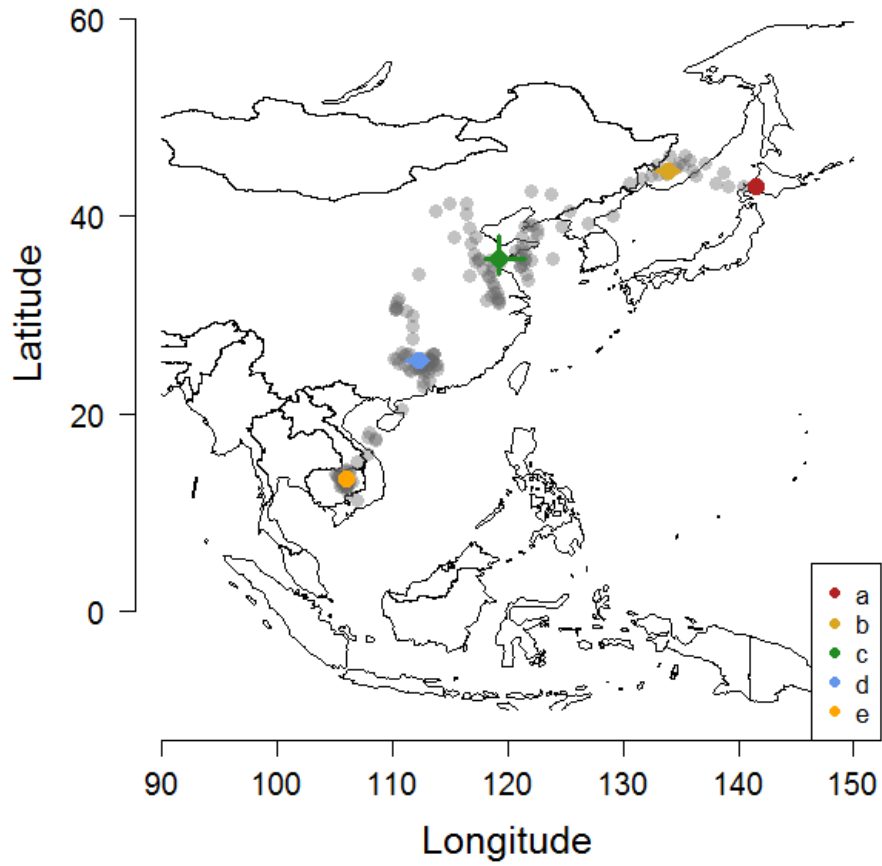
Site	Arrival	Departure	Days	Lon	Lat	Distance
a	NA	2014/9/28	NA	141.5	43.1	NA
mig1	2014/9/28	2014/10/1	3.01	NA	NA	602.6
b	2014/10/1	2014/10/9	7.99	134.4	44.9	NA
mig2	2014/10/9	2014/10/11	1.53	NA	NA	701.5
c	2014/10/11	2014/10/17	6	126	43.1	NA
mig3	2014/10/17	2014/10/18	1.52	NA	NA	810.5
d	2014/10/18	2014/10/26	8.01	120.6	37.1	NA
mig4	2014/10/26	2014/10/27	1.01	NA	NA	615.7
e	2014/10/27	2014/11/27	30.52	113.7	36.7	NA
mig5	2014/11/27	2014/11/28	1	NA	NA	2544
f	2014/11/28	2015/1/18	51.04	104.1	15.5	NA

797



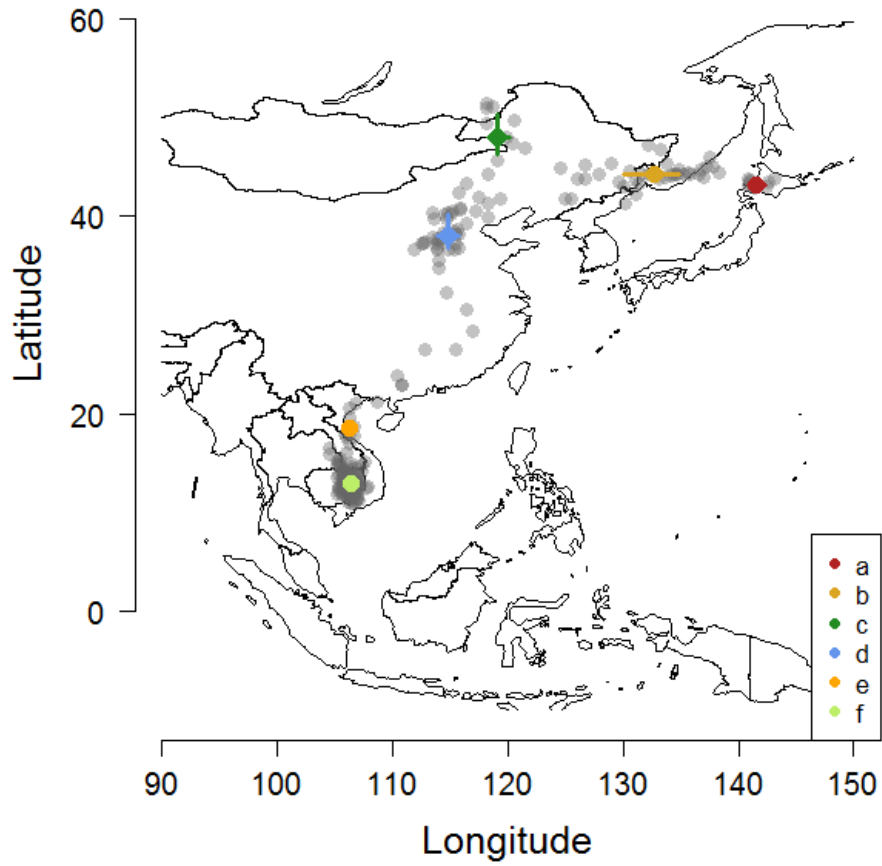
Site	Arrival	Departure	Days	Lon	Lat	Distance
a	NA	2014/9/29	NA	141.5	43.1	NA
mig1	2014/9/29	2014/10/1	2.51	NA	NA	663.3
b	2014/10/1	2014/10/7	6	133.6	44.9	NA
mig2	2014/10/7	2014/10/9	1.51	NA	NA	568.7
c	2014/10/9	2014/10/22	13.5	126.7	43.6	NA
mig3	2014/10/22	2014/10/23	1.01	NA	NA	747.2
d	2014/10/23	2014/11/16	24.01	120.6	38.7	NA
mig4	2014/11/16	2014/11/19	2.52	NA	NA	1710.1
e	2014/11/19	2015/2/15	88.03	110.5	25.9	NA

806



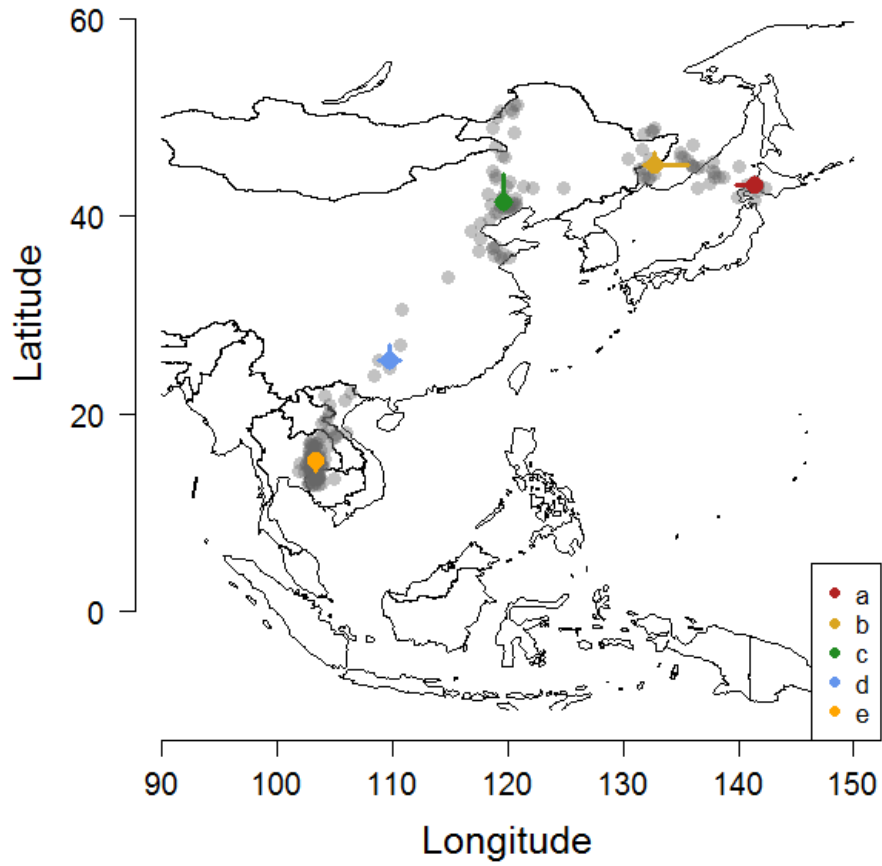
Site	Arrival	Departure	Days	Lon	Lat	Distance
a	NA	2014/10/26	NA	141.6	43.1	NA
mig1	2014/10/26	2014/10/30	4.52	NA	NA	637.7
b	2014/10/30	2014/11/4	5.01	133.9	44.5	NA
mig2	2014/11/4	2014/11/6	1.52	NA	NA	1585.3
c	2014/11/6	2014/12/3	27.03	119.2	35.7	NA
mig3	2014/12/3	2014/12/4	1.02	NA	NA	1322.8
d	2014/12/4	2014/12/28	24	112.3	25.4	NA
mig4	2014/12/28	2014/12/29	1.01	NA	NA	1489.9
e	2014/12/29	2015/1/17	19.02	106	13.4	NA

810



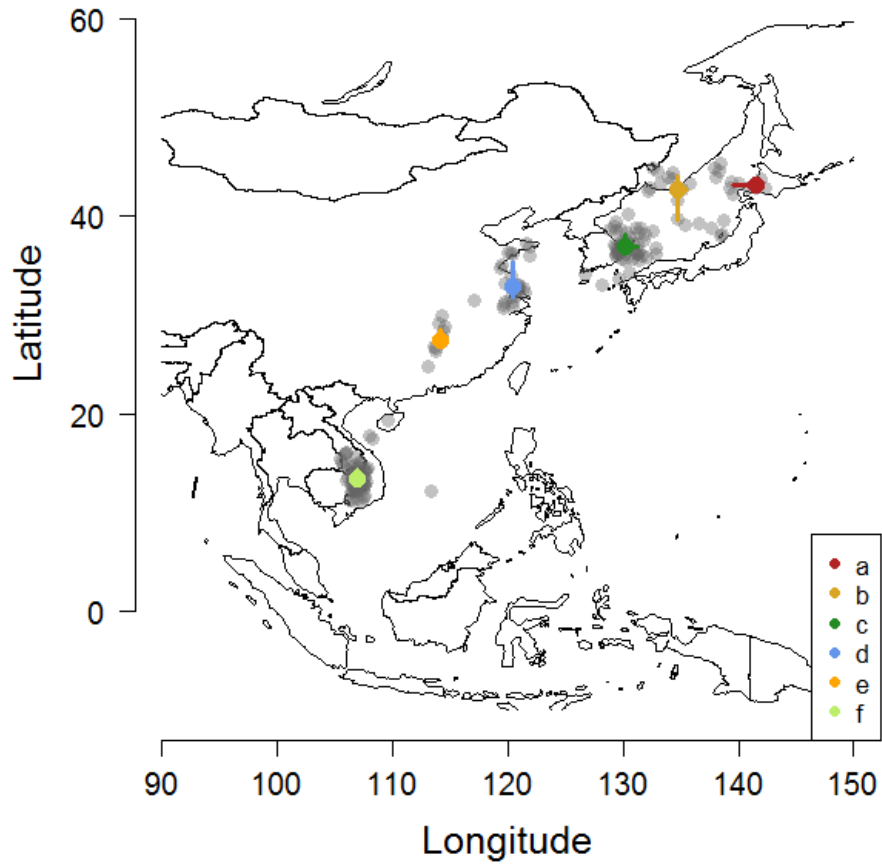
Site	Arrival	Departure	Days	Lon	Lat	Distance
a	NA	2014/10/7	NA	141.5	43.1	NA
mig1	2014/10/7	2014/10/10	3	NA	NA	718.9
b	2014/10/10	2014/10/26	15.53	132.7	44.2	NA
mig2	2014/10/26	2014/10/27	1.51	NA	NA	1129.8
c	2014/10/27	2014/11/1	5	119.1	48	NA
mig3	2014/11/1	2014/11/2	1.01	NA	NA	1166.5
d	2014/11/2	2014/11/23	20.51	114.8	38	NA
mig4	2014/11/23	2014/11/26	3.02	NA	NA	2315.5
e	2014/11/26	2014/12/1	5	106.2	18.6	NA
mig5	2014/12/1	2014/12/2	1	NA	NA	634.6
f	2014/12/2	2015/1/31	60.02	106.3	12.9	NA

812



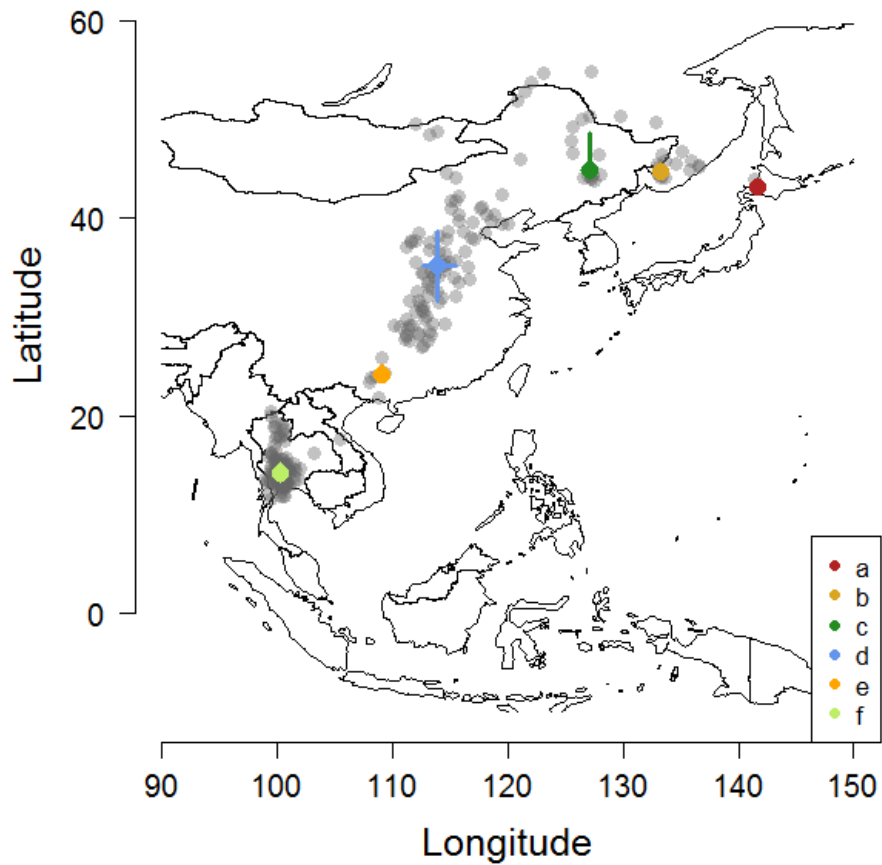
Site	Arrival	Departure	Days	Lon	Lat	Distance
a	NA	2014/10/9	NA	141.4	43.1	NA
mig1	2014/10/9	2014/10/12	3.51	NA	NA	735.8
b	2014/10/12	2014/10/22	10	132.7	45.3	NA
mig2	2014/10/22	2014/10/24	1.52	NA	NA	1139.2
c	2014/10/24	2014/11/16	23.52	119.6	41.5	NA
mig3	2014/11/16	2014/11/19	2.52	NA	NA	2011
d	2014/11/19	2014/11/21	2.01	109.7	25.4	NA
mig4	2014/11/21	2014/11/22	1	NA	NA	1316.8
e	2014/11/22	2015/1/25	64.02	103.3	15.2	NA

813



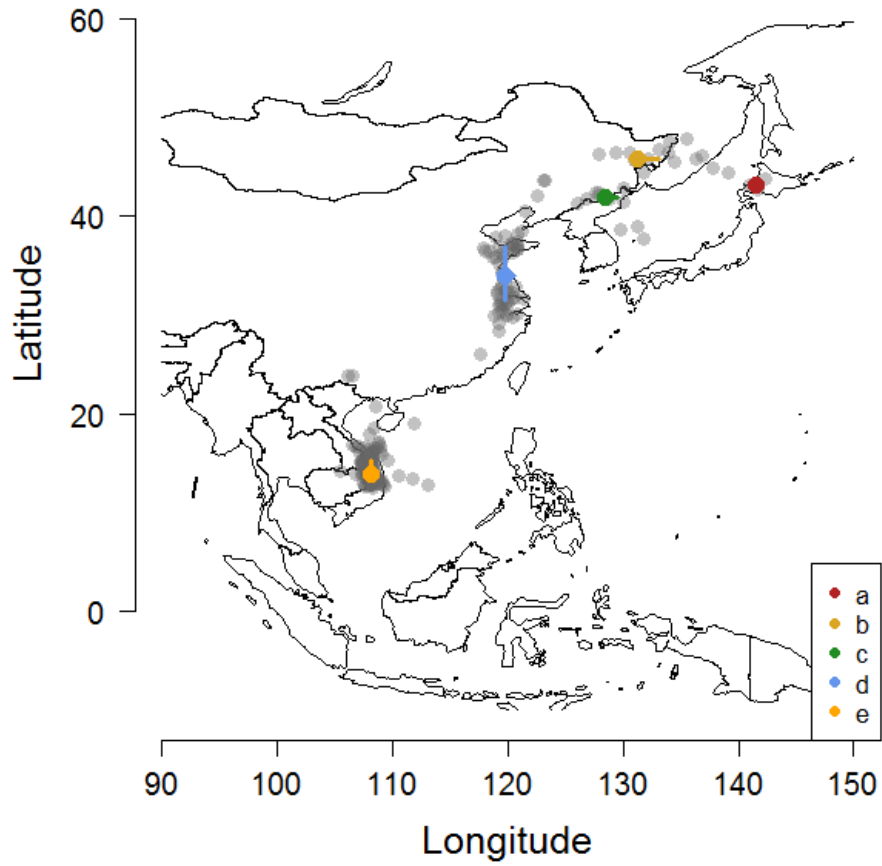
Site	Arrival	Departure	Days	Lon	Lat	Distance
a	NA	2014/10/14	NA	141.5	43.2	NA
mig1	2014/10/14	2014/10/17	3.5	NA	NA	547.1
b	2014/10/17	2014/10/22	5	134.8	42.8	NA
mig2	2014/10/22	2014/10/24	1.51	NA	NA	765.2
c	2014/10/24	2014/11/19	26.01	130.2	36.9	NA
mig3	2014/11/19	2014/11/20	1.51	NA	NA	998.7
d	2014/11/20	2014/12/2	11.51	120.4	32.9	NA
mig4	2014/12/2	2014/12/3	1.02	NA	NA	846.5
e	2014/12/3	2014/12/8	5	114.2	27.5	NA
mig5	2014/12/8	2014/12/9	1.51	NA	NA	1738.8
f	2014/12/9	2015/1/23	45.02	107	13.4	NA

826



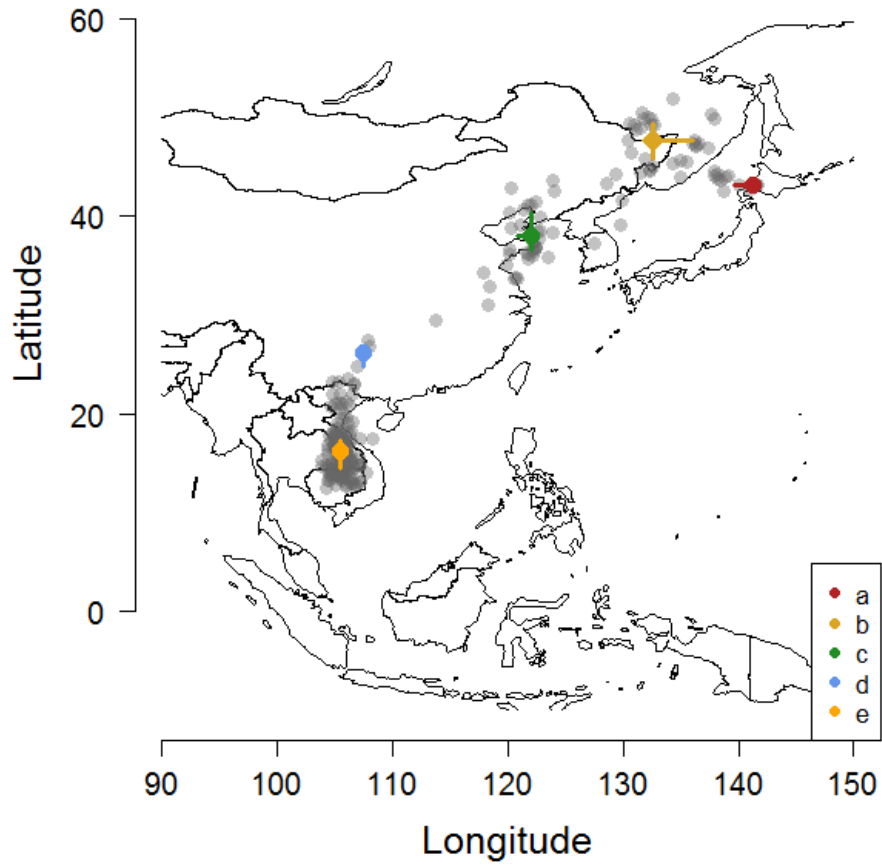
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a	NA	2014/10/2	NA	141.6	43.1	NA
mig1	2014/10/2	2014/10/4	2.52	NA	NA	691.2
b	2014/10/4	2014/10/10	5.5	133.3	44.8	NA
mig2	2014/10/10	2014/10/11	1.51	NA	NA	489.3
c	2014/10/11	2014/10/18	7.01	127.1	45	NA
mig3	2014/10/18	2014/10/22	3.52	NA	NA	1562.5
d	2014/10/22	2014/12/3	42.01	113.9	35.2	NA
mig4	2014/12/3	2014/12/7	4.03	NA	NA	1322.9
e	2014/12/7	2014/12/10	3	109	24.1	NA
mig5	2014/12/10	2014/12/11	1.51	NA	NA	1431.3
f	2014/12/11	2015/2/14	64.52	100.3	14.2	NA

827



Site	Arrival	Departure	Days	Lon	Lat	Distance
a	NA	2014/10/6	NA	141.6	43.1	NA
mig1	2014/10/6	2014/10/10	4.51	NA	NA	878.6
b	2014/10/10	2014/10/16	6.01	131.2	45.8	NA
mig2	2014/10/16	2014/10/17	1	NA	NA	488.8
c	2014/10/17	2014/10/20	2.51	128.4	41.9	NA
mig3	2014/10/20	2014/10/21	1.51	NA	NA	1157.7
d	2014/10/21	2014/11/20	29.51	119.8	34	NA
mig4	2014/11/20	2014/11/22	2.03	NA	NA	2529.7
e	2014/11/22	2015/2/16	86.02	108.1	13.9	NA

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Site	Arrival	Departure	Days	Lon	Lat	Distance
a	NA	2014/10/15	NA	141.2	43.1	NA
mig1	2014/10/15	2014/10/18	3.51	NA	NA	844.2
b	2014/10/18	2014/11/1	14.01	132.6	47.7	NA
mig2	2014/11/1	2014/11/5	4.03	NA	NA	1380.9
c	2014/11/5	2014/11/19	13.5	122	38	NA
mig3	2014/11/19	2014/11/23	4.04	NA	NA	1898.3
d	2014/11/23	2014/11/25	2	107.4	26.2	NA
mig4	2014/11/25	2014/11/26	1	NA	NA	1119.5
e	2014/11/26	2015/2/16	82.02	105.5	16.3	NA

Appendix 2. Land-use in the Far East.

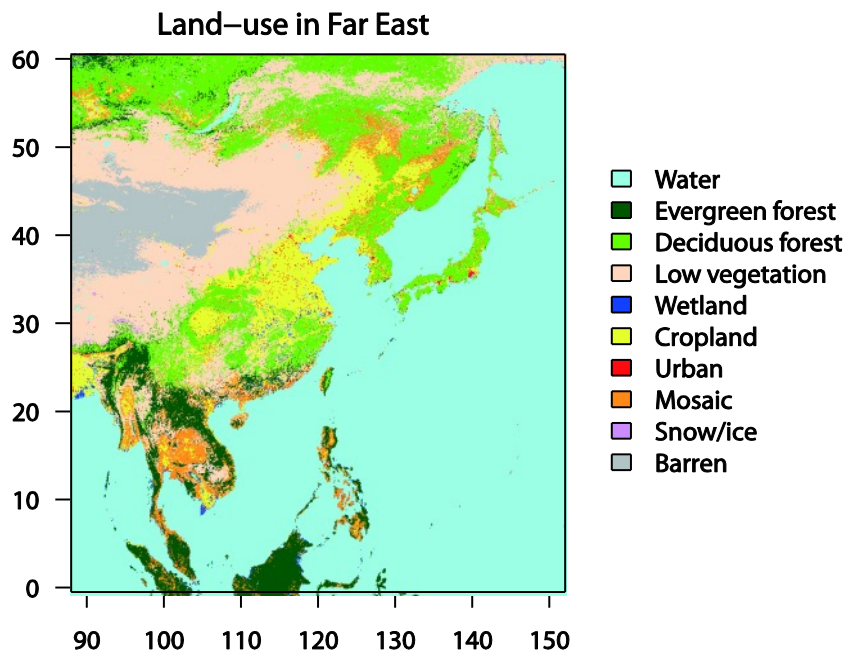


Fig. A1. Land-use in the Far East (0.5 km resolution).

This land-use map was constructed from data provided by Broxton et al. (2014). Although the original map used 17 legends (land-use types), we used 10 aggregated legends to enhance readability (e.g., we aggregated evergreen needle- and broad-leaf forests into evergreen forest). Low vegetation includes closed shrublands, open shrublands, woody savannas, savannas, and grasslands. Mixed forests were merged into deciduous forests. Cropland/natural vegetation mosaic is shown as “mosaic”. Source data are available from: http://landcover.usgs.gov/global_climatology.php.

References

Broxton, P. D., Zeng, X., Sulla-Menashe, D. and Troch, P. A. 2014. A global land cover climatology using MODIS Data. - *J. Appl. Meteor. Climatol.* 53: 1593–1605.