

Effects of Poplar Ecological Retreat on habitat suitability for migratory birds in China's Dongting Lake wetland

Running head: Impacts of wetland restoration on migrant birds

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Table S1 Landsat images used in this study. Hydrologic year: from April to next March.

Hydrologic year	Date	Path/Row	Sensor
2014	2014/12/17	123/40	ETM+
	2014/12/8	124/40	ETM+
2015	2016/2/6	123/40	ETM+
	2016/2/5	124/40	OLI
2016	2016/11/28	123/40	OLI
	2016/12/5	124/40	OLI
2017	2017/12/17	123/40	OLI
	2018/1/9	124/40	OLI
2018	2018/11/26	123/40	ETM+
	2018/11/25	124/40	OLI
2019	2020/2/9	123/40	OLI
	2020/1/31	124/40	OLI

Table S2 The weight of each factor for evaluate the habitat suitability of different migratory birds (Wu et al., 2019; Tang et al., 2016). Habitat variables include environmental variables (land cover type, altitude and slope) and human disturbances (distance to residential area and distance to road).

Birds	Habitat variable	Analytic hierarchy process (AHP)							Entropy weight method		General weights		
		Rule layer	Scheme layer				AHP weight	Entropy	Entropy weight				
			Human disturbance	Environmental variable									
Anatidae	Land cover type	Human disturbance	Distance to road	1	1	Environmental variable	Land cover type	Altitude	Slope	0.3690	0.9832	0.7079	0.538
	Altitude					Land cover type	1	7	5	0.0472	0.9974	0.1089	0.078
	Slope									0.0838	0.9979	0.0892	0.087
	Distance to residential areas									0.2500	0.9989	0.0473	0.149
	Distance to road									0.2500	0.9989	0.0466	0.148
Charadriidae	Land cover type	Environmental variable	Distance to residential area	1	1	Environmental variable	Land cover type	Altitude	Slope	0.3889	0.9788	0.7538	0.571
	Altitude					Land cover type	1	7	7	0.0556	0.9974	0.0918	0.074
	Slope									0.0556	0.9979	0.0752	0.065
	Distance to residential areas									0.2500	0.9989	0.0399	0.145
	Distance to road									0.2500	0.9989	0.0393	0.145
Ardeidae	Land cover type	Habitat variable	Distance to residential area	1	1	Environmental variable	Land cover type	Altitude	Slope	0.3989	0.9855	0.6767	0.538
	Altitude					Land cover type	1	9	7	0.0484	0.9974	0.1206	0.084
	Slope									0.0527	0.9979	0.0987	0.076
	Distance to residential areas									0.2500	0.9989	0.0524	0.151
	Distance to road									0.2500	0.9989	0.0516	0.151
Laridae	Land cover type	Habitat variable	Distance to residential area	1	1	Environmental variable	Land cover type	Altitude	Slope	0.4091	0.9841	0.6962	0.553
	Altitude					Land cover type	1	9	9	0.0455	0.9974	0.1133	0.079
	Slope									0.0455	0.9979	0.0928	0.069
	Distance to residential areas									0.2500	0.9989	0.0493	0.15
	Distance to road									0.2500	0.9989	0.0485	0.149

Table S3 Correlation Coefficient between Each Index of the HL (S-DL) and their polar area.

Birds	Grade	HL			S-DL		
		TA	LPI	MPS	TA	LPI	MPS
Anatidae	Poorly	-0.789 ^{0.062}	0.144 ^{0.785}	0.258 ^{0.622}	0.426 ^{0.400}	0.630 ^{0.180}	0.531 ^{0.278}
	Generally	-0.166 ^{0.753}	-0.324 ^{0.532}	-0.376 ^{0.462}	0.906^{0.013}	0.322 ^{0.534}	0.483 ^{0.332}
	Moderately	0.244 ^{0.641}	0.192 ^{0.715}	-0.199 ^{0.705}	-0.895^{0.016}	0.056 ^{0.916}	0.142 ^{0.789}
	Highly	-0.148 ^{0.780}	-0.429 ^{0.396}	-0.068 ^{0.898}	-0.351 ^{0.495}	-0.093 ^{0.861}	-0.296 ^{0.569}
Charadriidae	Poorly	0.281 ^{0.590}	-0.781 ^{0.067}	-0.275 ^{0.598}	-0.577 ^{0.231}	0.697 ^{0.123}	-0.383 ^{0.454}
	Generally	-0.083 ^{0.876}	-0.359 ^{0.484}	-0.371 ^{0.469}	-0.009 ^{0.986}	0.009 ^{0.987}	-0.241 ^{0.646}
	Moderately	0.259 ^{0.620}	0.387 ^{0.449}	-0.203 ^{0.700}	-0.064 ^{0.904}	0.107 ^{0.840}	-0.456 ^{0.363}
	Highly	-0.115 ^{0.828}	-0.619 ^{0.190}	-0.872^{0.023}	0.200 ^{0.704}	0.313 ^{0.546}	-0.171 ^{0.747}
Ardeidae	Poorly	-0.037 ^{0.945}	-0.410 ^{0.420}	-0.062 ^{0.906}	0.231 ^{0.660}	0.893^{0.017}	0.483 ^{0.332}
	Generally	-0.050 ^{0.924}	-0.277 ^{0.595}	-0.645 ^{0.167}	0.859^{0.029}	0.114 ^{0.830}	0.542 ^{0.267}
	Moderately	-0.415 ^{0.414}	0.132 ^{0.804}	-0.033 ^{0.950}	-0.851^{0.032}	-0.304 ^{0.557}	-0.267 ^{0.608}
	Highly	0.248 ^{0.636}	0.348 ^{0.499}	0.162 ^{0.759}	-0.050 ^{0.925}	0.107 ^{0.841}	-0.593 ^{0.215}
Laridae	Poorly	-0.889^{0.018}	-0.838^{0.037}	-0.811^{0.050}	-0.789 ^{0.062}	-0.305 ^{0.557}	0.332 ^{0.520}
	Generally	-0.125 ^{0.813}	0.372 ^{0.468}	0.174 ^{0.741}	0.133 ^{0.801}	0.578 ^{0.230}	0.404 ^{0.428}
	Moderately	-0.388 ^{0.448}	-0.801 ^{0.056}	-0.063 ^{0.905}	-0.597 ^{0.211}	-0.185 ^{0.725}	0.064 ^{0.905}
	Highly	0.488 ^{0.326}	0.462 ^{0.356}	-0.181 ^{0.732}	0.352 ^{0.493}	0.306 ^{0.555}	0.018 ^{0.973}

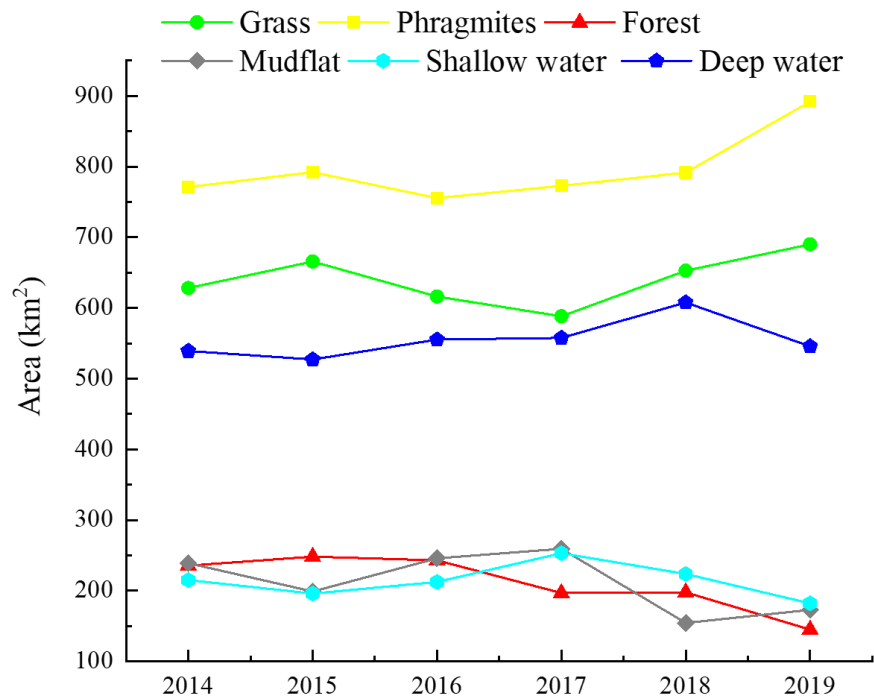


Fig. S1 Area dynamics of different land cover types in DL.

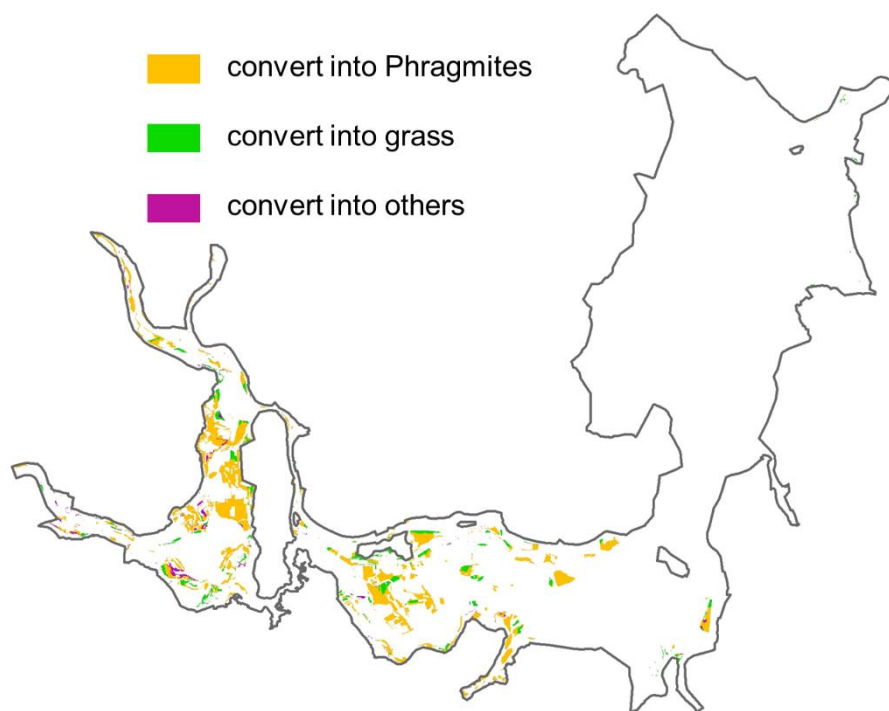


Fig. S2 Transformation of land cover in PER region.

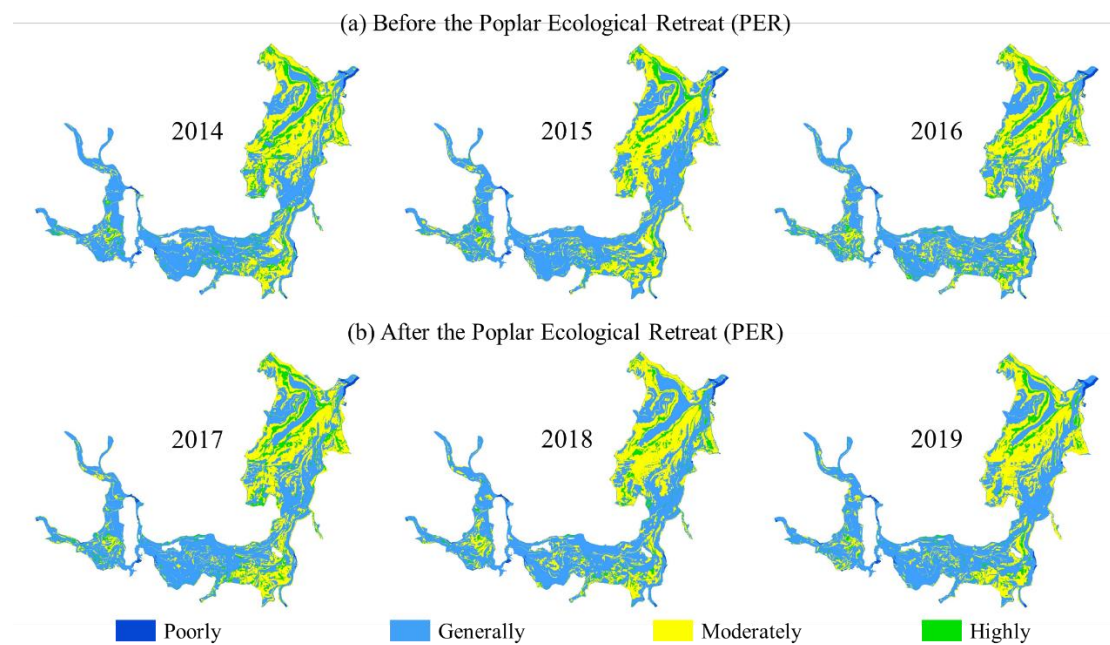


Fig. S3 The habitat suitability maps for Charadriidae of (a) before PER (b) after PER.

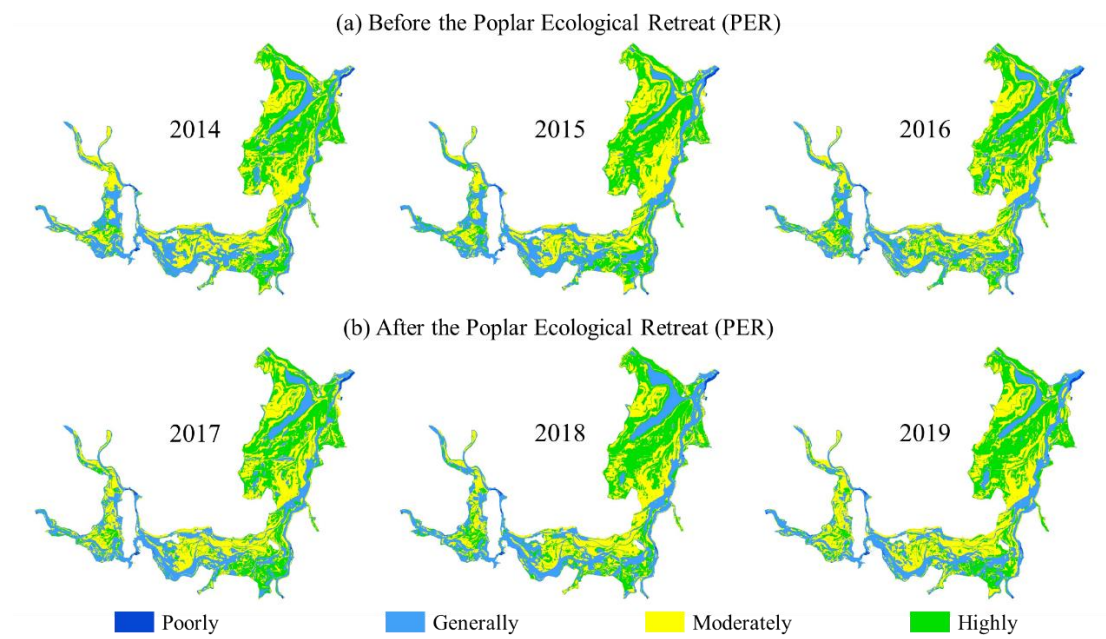


Fig. S4 The habitat suitability maps for Ardeidae of (a) before PER (b) after PER.

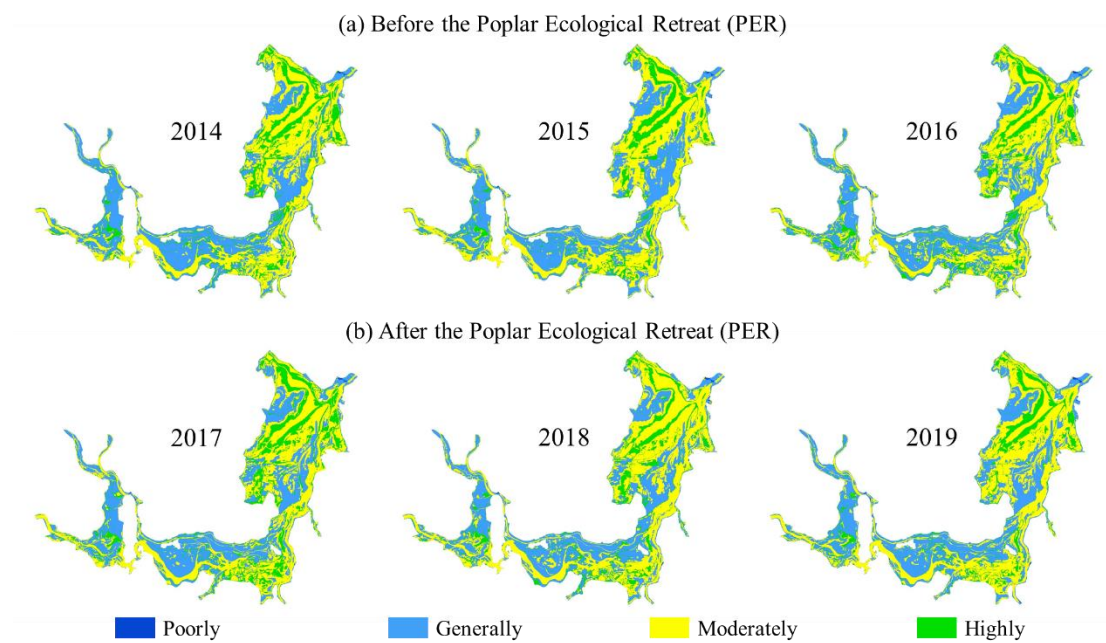


Fig. S5 The habitat suitability maps for Laridae of (a) before PER (b) after PER.

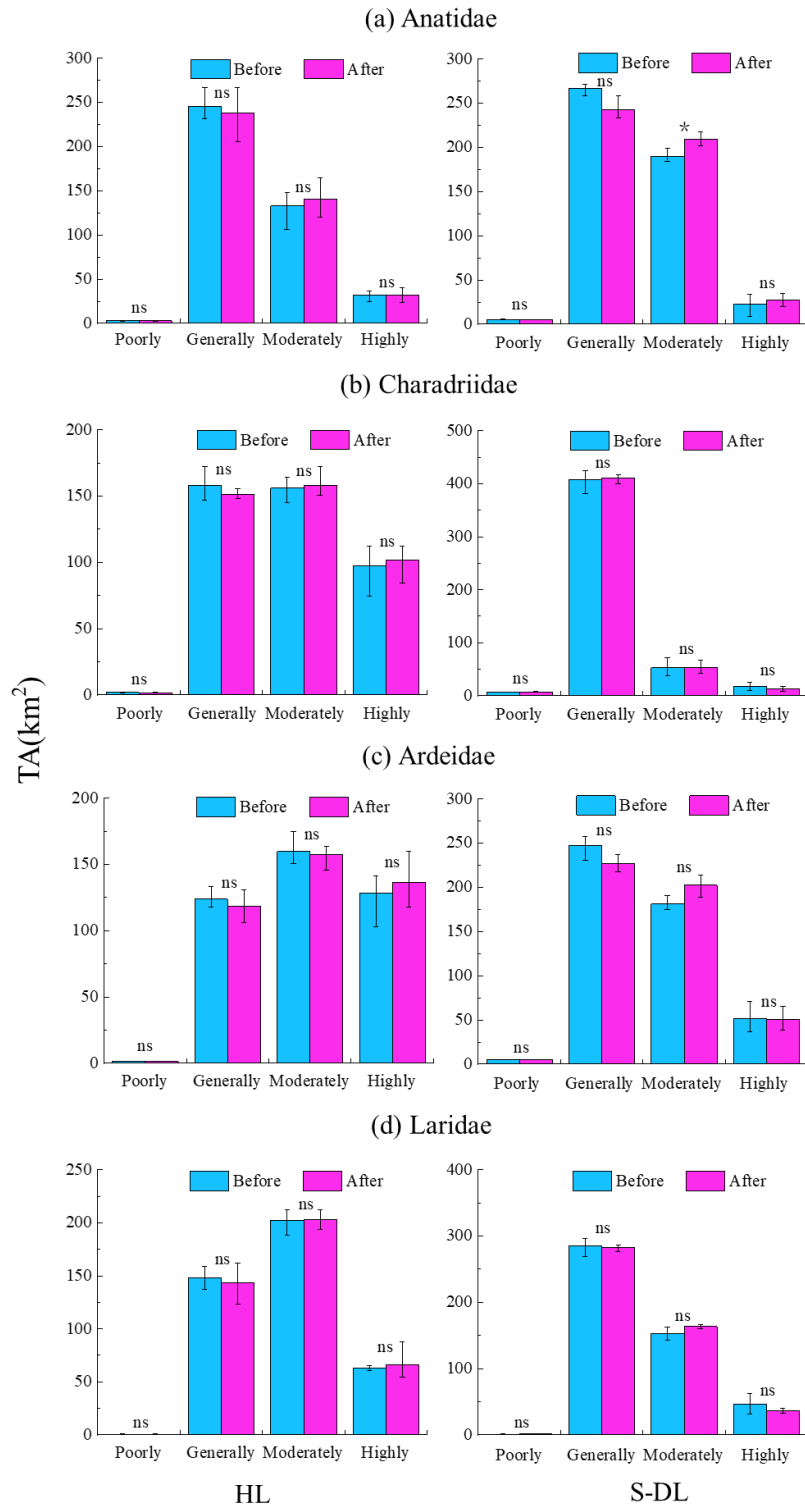


Fig. S6 The TA (total area) of each grade of habitat suitability for (a) Anatidae, (b) Charadriidae, (c) Ardeidae and (d) Laridae of before PER and after PER in HL and S-DL respectively. Error bars around the mean represent the maximum and minimum values of this group of data respectively.

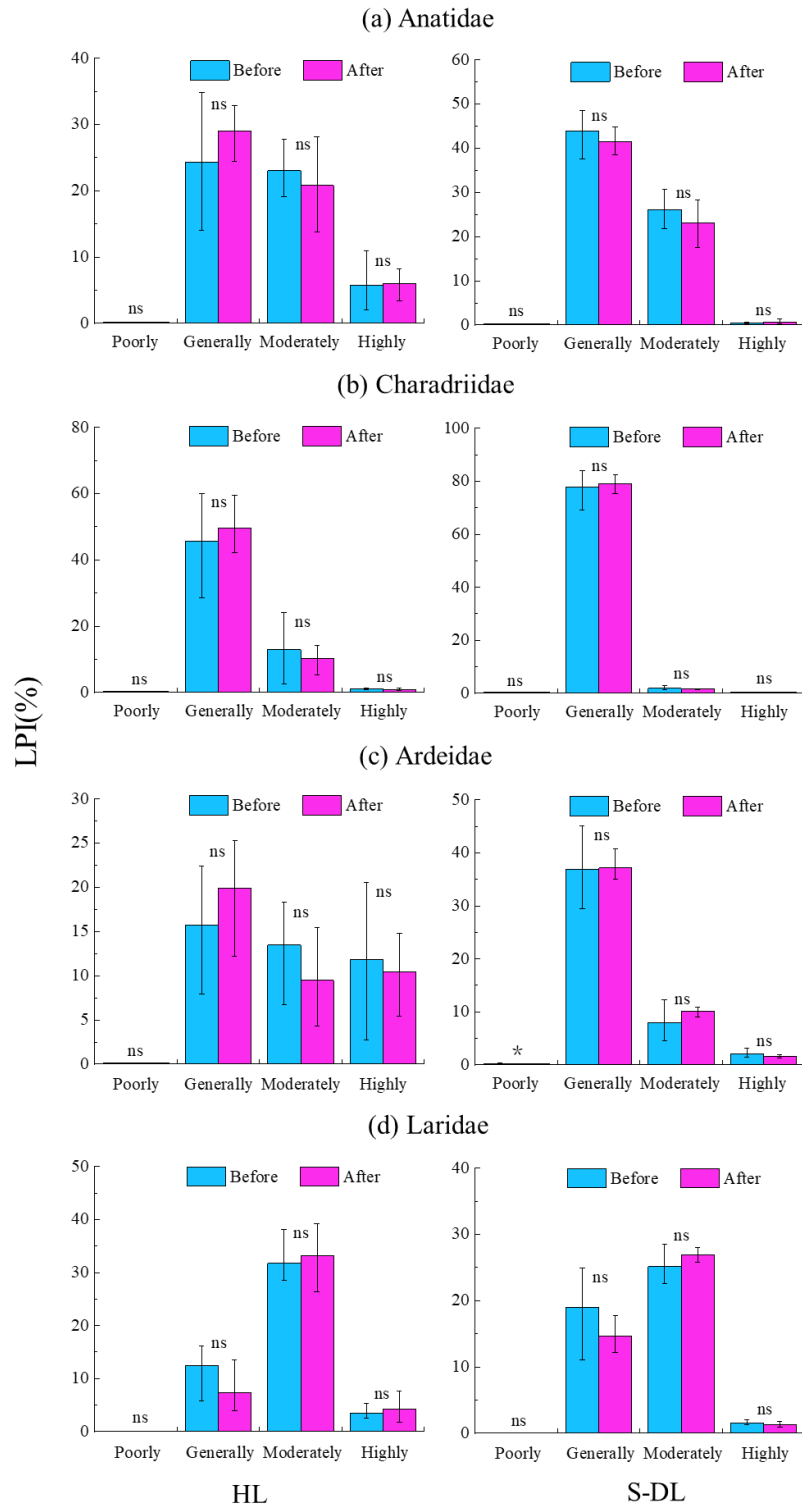


Figure. S7 The LPI (Largest patch index) of each grade of habitat suitability for (a) Anatidae, (b) Charadriidae, (c) Ardeidae and (d) Laridae of before PER and after PER in HL and S-DL respectively. Error bars around the mean represent the maximum and minimum values of this group of data respectively.

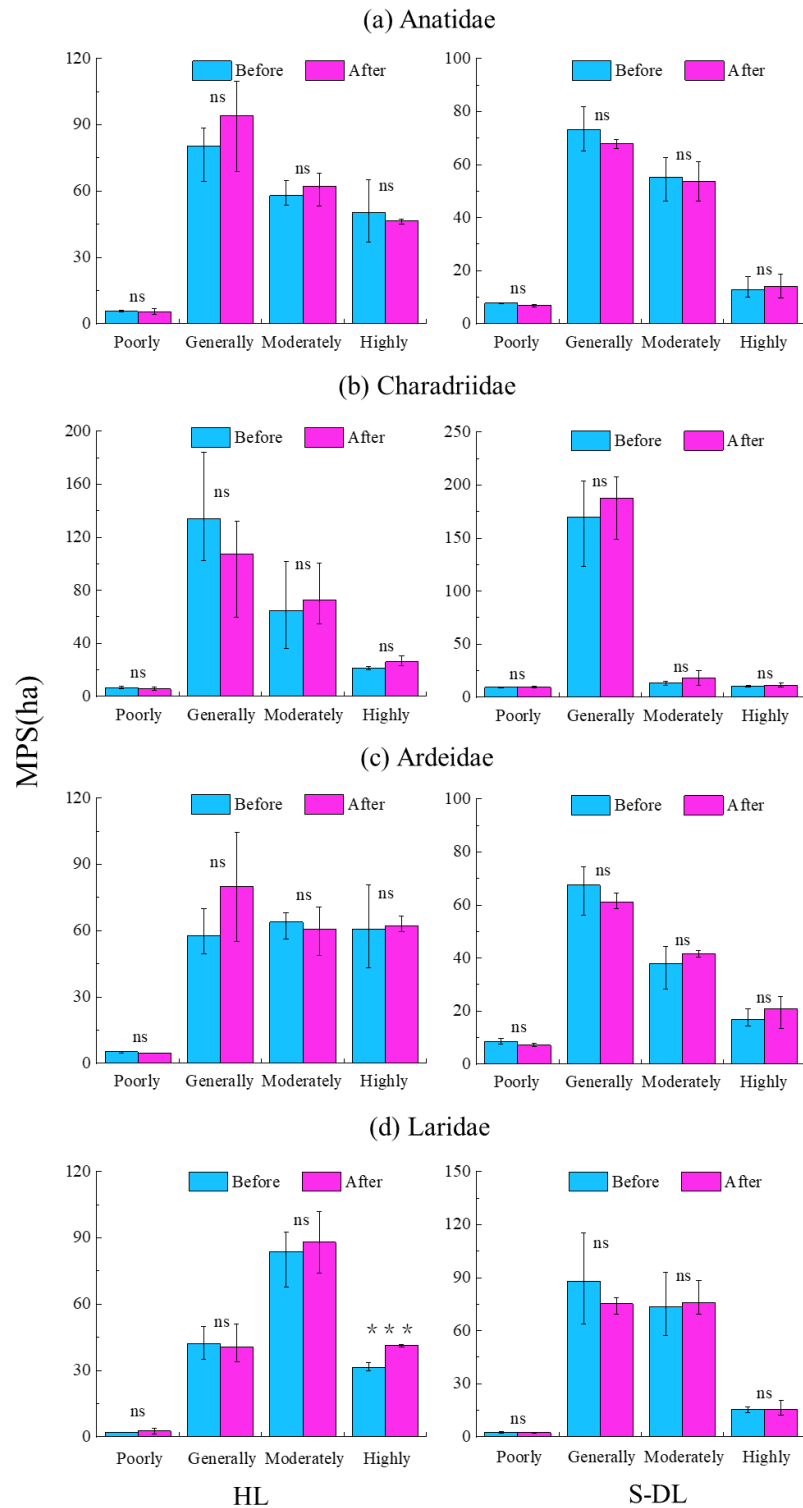


Fig. S8 The MPS (Mean patch size) of each grade of habitat suitability for (a) Anatidae, (b) Charadriidae, (c) Ardeidae and (d) Laridae of before PER and after PER in HL and S-DL respectively. Error bars around the mean represent the maximum and minimum values of this group of data respectively.

References

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