

---

Article

# Importance of mesohabitat for nest-site selection in breeding Eagle Owls (*Bubo bubo*): a multi-scale model

Ezra Hadad<sup>1</sup>, Dan Malkinson<sup>2,3</sup>, Reuven Yosef<sup>4\*</sup>, Gilad Weil<sup>1</sup>, Motti Charter<sup>2,3</sup>

<sup>1</sup> Israel Nature and Parks Authority, 3 Am Ve'Olam St., Jerusalem, 95463 (ezra.hadad9@gmail.com, g\_weil@npa.org.il, weilgilad@gmail.com)

<sup>2</sup> Department of Geography and Environmental Studies, University of Haifa, Mount Carmel, Haifa 3498838, Israel (dmalk@geo.haifa.ac.il)

<sup>3</sup> Shamir Research Institute, Katzrin 1290000, Israel. (mcharter@geo.haifa.ac.il, ORCID 0000-0003-3861-6356)

<sup>4</sup> Ben Gurion University of the Negev, Eilat Campus, P. O. Box 272, Eilat 8810201, Israel (ryosef60@gmail.com)

\* Correspondence: author, E-mail: ryosef60@gmail.com; ORCID 0000-0003-4331-9866 Mobile: +972-537671290

**Table S1. ESM:** Analysis of land use - land cover on nesting success of eagle owls (*Bubo bubo*) at 1-5 km scales. "Gadash" denotes low crop fields.

1 km buffer				
R <sup>2</sup> Adj	0.0921			
Term	Estimate	Std Er- ror	t Ratio	Prob> t
Intercept	-3.2218	23.4583	-0.1400	0.8912
built	0.0022	0.0076	0.2900	0.7694
disturbed	0.0008	0.0077	0.1100	0.9123
outcrops	0.0016	0.0075	0.2100	0.8347
grasslands	0.0019	0.0075	0.2500	0.8015
shrublands	0.0010	0.0075	0.1300	0.8941
maqius	0.0015	0.0075	0.2100	0.8371
planted_forest	0.0013	0.0074	0.1700	0.8670
gadash	0.0015	0.0075	0.2000	0.8431
orchards	0.0013	0.0075	0.1800	0.8597
2 km buffer				
R <sup>2</sup> Adj	0.0889			
Term	Estimate	Std Er- ror	t Ratio	Prob> t
Intercept	3.4517	4.0672	0.8500	0.3993
built	0.0000	0.0004	0.0400	0.9712
disturbed	-0.0007	0.0004	-1.5700	0.1212
outcrops	-0.0002	0.0005	-0.4600	0.6460
grasslands	-0.0001	0.0003	-0.1600	0.8735
shrublands	-0.0003	0.0003	-0.9100	0.3669
maqius	-0.0001	0.0003	-0.3200	0.7537
planted_forest	-0.0003	0.0003	-0.8100	0.4185
gadash	-0.0002	0.0003	-0.4800	0.6331
orchards	-0.0002	0.0004	-0.5400	0.5907
3 km buffer				
R <sup>2</sup> Adj	0.0533			
Term	Estimate	Std Er- ror	t Ratio	Prob> t
Intercept	5.0242	2.9163	1.7200	0.0898
built	-0.0001	0.0001	-0.8600	0.3924
disturbed	-0.0004	0.0002	-1.6900	0.0955
outcrops	-0.0003	0.0002	-1.3100	0.1935

grasslands	-0.0001	0.0001	-0.7100	0.4830
shrublands	-0.0002	0.0001	-1.4500	0.1512
maqius	-0.0001	0.0001	-1.0800	0.2842
planted_forest	-0.0002	0.0001	-1.4300	0.1573
gadash	-0.0001	0.0001	-1.0200	0.3129
orchards	-0.0002	0.0001	-1.2500	0.2165

## 4 km buffer

R<sup>2</sup> Adj 0.0556

Term	Estimate	Std Er- ror	t Ratio	Prob> t
Intercept	5.4612	2.5136	2.1700	0.0336
built	-0.0001	0.0001	-1.6100	0.1134
disturbed	-0.0001	0.0001	-0.6800	0.4992
outcrops	-0.0002	0.0001	-1.5100	0.1370
grasslands	-0.0001	0.0001	-0.8300	0.4121
shrublands	-0.0001	0.0001	-1.4000	0.1655
maqius	-0.0001	0.0001	-1.6400	0.1061
planted_forest	-0.0001	0.0001	-1.3800	0.1721
gadash	-0.0001	0.0001	-1.2400	0.2204
orchards	-0.0001	0.0001	-1.3400	0.1838

## 5 km buffer

R<sup>2</sup> Adj 0.0721

Term	Estimate	Std Er- ror	t Ratio	Prob> t
Intercept	5.4318	2.3438	2.3200	0.0237
built	-0.0001	0.0000	-1.9600	0.0541
disturbedLands	0.0000	0.0001	-0.1600	0.8768
outcrops	-0.0001	0.0001	-1.2700	0.2089
grasslands	0.0000	0.0000	-0.7600	0.4511
shrublands	-0.0001	0.0000	-1.2700	0.2099
maqius	-0.0001	0.0000	-1.7700	0.0821

**Table S2. ESM:** Analysis of land use - land cover on mean annual number of fledglings, at 1-5 km scales. "Gadash" denotes low crop fields.

1 km buffer				
R <sup>2</sup> Adj	0.0921			
Term	Estimate	Std Er- ror	t Ratio	Prob> t
Intercept	-3.2218	23.4583	-0.1400	0.8912
built	0.0022	0.0076	0.2900	0.7694
disturbed	0.0008	0.0077	0.1100	0.9123
outcrops	0.0016	0.0075	0.2100	0.8347
grasslands	0.0019	0.0075	0.2500	0.8015
shrublands	0.0010	0.0075	0.1300	0.8941
maqius	0.0015	0.0075	0.2100	0.8371
planted_forest	0.0013	0.0074	0.1700	0.8670
gadash	0.0015	0.0075	0.2000	0.8431
orchards	0.0013	0.0075	0.1800	0.8597
2 km buffer				
R <sup>2</sup> Adj	0.0889			
Term	Estimate	Std Er- ror	t Ratio	Prob> t
Intercept	3.4517	4.0672	0.8500	0.3993
built	0.0000	0.0004	0.0400	0.9712
disturbed	-0.0007	0.0004	-1.5700	0.1212
outcrops	-0.0002	0.0005	-0.4600	0.6460
grasslands	-0.0001	0.0003	-0.1600	0.8735
shrublands	-0.0003	0.0003	-0.9100	0.3669
maqius	-0.0001	0.0003	-0.3200	0.7537
planted_forest	-0.0003	0.0003	-0.8100	0.4185
gadash	-0.0002	0.0003	-0.4800	0.6331
orchards	-0.0002	0.0004	-0.5400	0.5907
3 km buffer				
R <sup>2</sup> Adj	0.0533			
Term	Estimate	Std Er- ror	t Ratio	Prob> t
Intercept	5.0242	2.9163	1.7200	0.0898
built	-0.0001	0.0001	-0.8600	0.3924
disturbed	-0.0004	0.0002	-1.6900	0.0955

outcrops	-0.0003	0.0002	-1.3100	0.1935
grasslands	-0.0001	0.0001	-0.7100	0.4830
shrublands	-0.0002	0.0001	-1.4500	0.1512
maqius	-0.0001	0.0001	-1.0800	0.2842
planted_forest	-0.0002	0.0001	-1.4300	0.1573
gadash	-0.0001	0.0001	-1.0200	0.3129
orchards	-0.0002	0.0001	-1.2500	0.2165

## 4 km buffer

R<sup>2</sup> Adj 0.0556

Term	Estimate	Std Er- ror	t Ratio	Prob> t
Intercept	5.4612	2.5136	2.1700	0.0336
built	-0.0001	0.0001	-1.6100	0.1134
disturbed	-0.0001	0.0001	-0.6800	0.4992
outcrops	-0.0002	0.0001	-1.5100	0.1370
grasslands	-0.0001	0.0001	-0.8300	0.4121
shrublands	-0.0001	0.0001	-1.4000	0.1655
maqius	-0.0001	0.0001	-1.6400	0.1061
planted_forest	-0.0001	0.0001	-1.3800	0.1721
gadash	-0.0001	0.0001	-1.2400	0.2204
orchards	-0.0001	0.0001	-1.3400	0.1838

## 5 km buffer

R<sup>2</sup> Adj 0.0721

Term	Estimate	Std Er- ror	t Ratio	Prob> t
Intercept	5.4318	2.3438	2.3200	0.0237
built	-0.0001	0.0000	-1.9600	0.0541
disturbedLands	0.0000	0.0001	-0.1600	0.8768
outcrops	-0.0001	0.0001	-1.2700	0.2089
grasslands	0.0000	0.0000	-0.7600	0.4511
shrublands	-0.0001	0.0000	-1.2700	0.2099
maqius	-0.0001	0.0000	-1.7700	0.0821
planted_forest	0.0000	0.0000	-1.3100	0.1934
gadash	0.0000	0.0000	-1.2600	0.2133
orchards	-0.0001	0.0001	-1.1300	0.2635