CV: Dr. Motti Charter

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**Citizenship**: Israeli and US (Duel)

# Army Service

**Israeli Defense Force (2001):** Completed active duty and am presently in first sergeant first class in the reserves.

# Current Employment: Shamir Research Institute. Researcher.

#  University of Haifa- Research Associate

# Education

**Post doctorate: (2016- 2017)**

* Studying how movement in barn owls is influenced by breeding success, diet and morphology in the Movement Ecology Lab of the Hebrew University (Prof. Ran Nathan).

**Post doctorate: (2012- 2017)**

* Studied at the University of Haifa under the supervision of Prof. Ido Izhaki and Prof. Alexandre Roulin (University of Lausanne). The Swiss funded research dealt

with how color traits in barns is related to breeding, hunting (movement) and diet.

**Post doctorate: (2010- 2011)**

* Studied at the Tel Aviv University under the supervision of Dr. Yossi Leshem. Studied whether occupation and breeding success of barn varied, in different regions and locations.

**PhD: (2005- 2010)**

* Studied towards, and completed, a PhD degree in Zoology from the Tel Aviv University under the supervision of Dr. Yossi Leshem, Prof. Amotz Zehavi, and Prof. Ido Izhaki. Concentrated on competitive and predator-prey interactions between breeding birds.

**Master’s Degree: (2001-2004)**

* Studied towards, and completed, a Master’s degree in Zoology from the Tel Aviv University under the supervision of Dr. Yossi Leshem and Amos Bouskila. Researched the biology of the common kestrel (*Falco tinnunculus*) in an agricultural landscape with an emphasis on and their reproductive biology and their role as a biological pest control of rodents.

**University of Massachusetts at Amherst: (1995-1999)**

* Bachelor of Science in Animal Science/Pre-Vet

## Cum Laude

**Ben Gurion University of the Negev at Beer Sheva: (summer 97- spring 98)**

* Studied abroad for two semesters in Israel with a course focus in ecology and liberal arts.

**Research Interests: (Short)**

My general interest is in wildlife ecology, specifically in population and community dynamics, movement ecology, and evolutionary biology. I am interested in how different biotic and abiotic factors affect breeding success in birds. I have been studying for the past 10 years competitive interactions (both native and invasive species species), reproductive behavior of breeding birds and predator-prey interactions and the evolution of color traits in barn owls. To this end I have researched diurnal (common kestrels) and nocturnal raptors (barn owls and long-eared owls), song birds (great tits and house sparrow), and invasive species (ringed-parakeet and common myna). I also am interested in applied research (using drone to monitor rodents in agriculture) and eco-system services (using birds as biological pest control of different pests). Lastly as hobby, I enjoy citizen science and STEM educational projects to introduce middle and high school students to academic research.

# Experience

**Barn Owl Nesting Box Scheme Israel (2007- Present):**

**Scientific Coordinator**

* Responsible for coordinating a national research project involving a team of bird banders, naturalist, and ornithologists, who monitor breeding parameters and other aspects of barn owl biology in 2600 barn owl nesting boxes.

**Girls in STEM research on barn owls (2015- Present):**

**Project Creator and Leader**

* An interdisciplinary US Embassy funded project to teach middle school girls how to use scientific method in research project. 21 schools participate in the project.

**Project Bird Box Israel (**[**www.birdboxisrael.org**](http://www.birdboxisrael.org)**) (2014- Present):**

**Project Creator and Leader**

* An interactive project of University of Haifa that supplies bird boxes to farmers and schools to promote environmental education.

**USAID MERC project of "Using barn owl and kestrels as biological pest control agents of rodents", (2006- 2009):**

**Israel team leader**

* A joint, Israel-Jordan-Palestine Authority research project. In charge of the research in Israel and participate in the joint meeting and research with Jordanians and Palestinians.

**GAIA Project, (2010- Present):**

**Education scientific coordinator**

* Coordinates scientific research projects in 6 schools in Israel. The project is base hands research that the children take an active role in environmental change.

**Global Owl Project (**[**www.globalowlproject.com**](http://www.globalowlproject.com/)**) (2006- Present):**

**Israel Team Leader**

* Responsible for coordinator research on owls in Israel. Blood samples are collected and compared to owls from Europe and USA.

**Global Owl Trust (**[**www.owls.org**](http://www.owls.org/)**) (2008 to present):**

**Representative, Israel**

* Represent Global Owl Trust in Israel.

 **Leading Elementary School Project (Spring 2004 to 2006):**

* Taught two 5th grade classes in Tel Aviv weekly as part of a project called “Spreading Wings”, which I help to establish. The class was created as an introductory course to ornithology. The course emphasis was on the common kestrel as well as on raptor.

 **Pest Control Adviser (2002- Present):**

* Advises farmers in Israel and abroad (USA, Haiti, Uruguay, Turkey, Serbia, and Jordan) on the applications of implementing raptors in biological pest control of rodents.

 **Teaching Middle School (Spring 2004 to 2008):**

* Taught ornithology and computer science to four seventh grade classes in the Shevah Mofet Middle School, Israel.

 **Owl Biologist (summer 1999):**

* Studied as part of a research team the demography survey on Northern Spotted Owls within the Central Cascades of Oregon. Collected information on adult and juvenile owl survival rates, reproductive rates, finite rate of population change, and other population characteristics.

**Publications**

1. Sivan Toledo, Yotam Orchan, David Shohami, **Motti Charter**, Ran Nathan. 2018. Physical-Layer Protocols for Lightweight Wildlife Tags with Internet-of-Things Transceivers. In *Proc. IEEE WoWMoM* The 19th IEEE International Symposium on a Wolrd of Wireless, Mobile, and Multimedia Networks (WOWMOM)
2. **Charter M.**, Izhaki I., and A Roulin 2018. The presence of kleptoparasitic fledglings is associated with a reduced breeding success in the host family in the barn owl. Journal of Avian Biology. <https://doi.org/10.1111/jav.01770>
3. Goldshtein A., Markman S., Leshem Y., Puchinsky M., and **M. Charter**. 2018. Nest Site Interference Competition with House Sparrows Affects Breeding Success and Parental Care in Great Tits. Journal of Ornithology <https://doi.org/10.1007/s10336-018-1541-4>
4. **Charter M.**, Izhaki I., Leshem, Y., Meyrom K., and A Roulin 2017. The relationship between weather and reproduction of the barn owl *Tyto alba* in a semi-arid agricultural landscape in Israel. Avian Biology Research 10: 253-258.
5. Roulin A., Mansour AR, Spiegel B., **Charter M.**, Dreiss A., and Y Leshem. 2017. “Nature Knows No Boundaries”: The role of nature conservation in peacebuilding. Trends in Ecology & Evolution 32: 305-310.
6. Vaugoyeau, M...… **Charter M.** et al. 2016. Interspecific variation in the relationship between clutch size, laying date and intensity of urbanization in four species of hole-nesting birds. Ecology and Evolution 6:5907-2920.
7. **Charter, M.,** Izhaki, I., Ben Mocha and S. Kark 2016. Nest-site competition between invasive and native cavity nesting birds and its implication for conservation. Journal of Environmental Management 181:129–134
8. Weller, A., Orchan, Y., Nathan, R., **Charter, M.,** Weiss, A.J. and Toledo, S. 2016. Characterizing the Accuracy of a Self-Synchronized Reverse-GPS Wildlife Localization System. ACM/IEEE International Conference on Information Processing in Sensor Networks.
9. Burri, R., Antoniazza, S., Gaigher, A., Ducrest, A. L., Simon, The European Barn Owl Network\*, C., Fumagalli, L., Goudet, L., and Roulin, A. 2015. The genetic basis of color‐related local adaptation in a ring‐like colonization around the Mediterranean. Evolution 70: 140–153\*Listed within article as part of the barn owl network
10. Hadad E., Weil G., and **M. Charter** 2015. The importance of natural habitats as Short-toed Eagle (*Circaetus gallicus*) breeding sites. Avian Bird Research. 8: 160–166
11. **Charter M.**, Izhaki I., Leshem, Y., Meyrom K., and A Roulin 2015. Relationship between barn owl diet and reproductive success in the Middle East. Journal of Arid Environments. 122: 59–63
12. **Charter M.**, Leshem Y, Izhaki I., Peleg O. and A Roulin 2015. Pheomelanin-based colouration is correlated with indices of flying strategies in the barn owl. Journal of Ornithology. 156:309–312
13. Hadad E., Roulin A. and M. **Charter 2015**. A record of communal nesting in the Barn Owl (*Tyto alba*). Wilson Journal of Ornithology 127: 114–119
14. Møller, A.P.… **Charter M.** et al. . 2014. Variation in clutch size in relation to nest size in birds. Ecology and Evolution 4: 3583–3595
15. Peleg O\*. **Charter M.**\*, Leshem Y, Izhaki I., Peleg O. and A Roulin 2014. Conditional association between melanism and personality in Israeli barn owls. Bird Study.\*equal contribution. Bird Study 61:572–577
16. Møller, A.P.… **Charter M.** et al. 2014. Clutch size variation in Western Palearctic secondary hole-nesting passerine birds in relation to nest box design. Methods in Ecology and Evolution. 5:353–362
17. **Charter M**., Izhaki, I., Leshem Y. 2013. Asymmetric seasonal nest site competition between Great Tit and House Sparrows. Journal of Ornithology 154:173–181
18. **Charter M.,** Leshem Y, Meyrom K., Peleg O. and A Roulin 2012. The importance of micro-habitat in the breeding of Barn Owls *Tyto alba*. Bird Study 59: 368–371
19. **Charter M.**, Izhaki, I., Leshem Y, and A Roulin 2012. Diet and breeding success of long-eared owls in a semi-arid environment. Journal of Arid Environments 85:142–144
20. **Charter M.**, Peleg O., Leshem Y. and A Roulin 2012. Similar patterns of local barn owl adaptation in the Middle East and Europe with respect to melanic coloration. Biological Journal of the Linnean Society 106:447–454
21. Lambrechts M.M., …. **Charter M.** et al. 2012. Nest-box design for the study of diurnal raptors and owls is still an overlooked point in ecological, evolutionary and conservation studies: a review. Journal of Ornithology 153:23–34
22. **Charter M.**, Izhaki, I. and Y. Leshem 2011. Predation or facilitation? An experimental assessment of whether generalist predators affect the breeding success of passerines. Journal of Ornithology 153:533–539
23. **Charter M.**, Leshem, Y., and I. Izhaki 2010. Does nest basket size affect Long-eared Owl and Eurasian Kestrel breeding performance? Journal of Raptor Research 44:314–317
24. **Charter M.**, Izhaki, I. and Y. Leshem. 2010. Effects of the risk of competition and predation in large secondary cavity breeders. Journal of Ornithology 151:791–795
25. **Charter M.,** Leshem Y., Halevi, S., M. and I. Izhaki. 2010. Nest box use by Great Tits in semi–arid rural residential gardens. Wilson Journal of Ornithology 122(3): 604–608
26. **Charter M.**, Meyrom K., Leshem Y., Aviel S., Izhaki I., and Y. Motro 2010. Does nest box location and orientation affect occupation rate and breeding success of Barn Owls *Tyto alba* in a semi-arid environment? Acta Ornithologgy 44:115–119
27. Meyrom K., Motro Y., Leshem Y., Aviel S., Izhaki I., Argyle F. and **M. Charter 2009**. Nest-box use by the Barn Owl *Tyto alba* in a biological pest control program in the Beit She'an valley, Israel. Ardea 97(4): 463–467
28. **Charter M.**, Leshem Y. and S. Halevi. 2009. Use of nest baskets by Long- eared Owls *Asio otus* in Israel. Sandgrouse. 31:36–37
29. **Charter, M.**, Izhaki, I., Meyrom, K., Motro, Y. and Y. Leshem 2009. Diets of Barn Owls differ in the same agricultural region. Wilson Journal of Ornithology 121: 378–383
30. **Charter, M.**, Leshem, Y., Ezer, A., Aviel S. and V. Chikatunov 2008. The first record of use of a nest box by Hoopoe Upupa epops in Israel. Acrocephalus 29 (137):105–107
31. Meyrom, K., Leshem, Y. and **M. Charter**. 2008. Barn Owl *Tyto alba* breeding success in man- made structures in the Jordan Rift valley, Israel. Sandgrouse 30: 134–137
32. **Charter M.**, Leshem Y., Izhaki I. and S. Halevi. 2008. A case of polygamy or co-operative breeding in the Common Kestrel (*Falco tinnunculus*) in Israel. Sandgrouse 30: 164–165
33. Kiat, Y., Perlman, G., Balaban, A.., Leshem, Y., Izhaki, I. and **M. Charter** (2008). Feeding specialization of urban Long-eared Owls, *Asio otus* (Linnaeus, 1758), in Jerusalem, Israel. Zoology in the Middle East 43:49–54
34. **Charter M.**, Izhaki I., Bouskila, A. and Y. Leshem. 2007. The effect of different nest types on the breeding success of Eurasian Kestrels (*Falco tinnunculus*) in a rural ecosystem. J. Raptor Res. 41(2):143–149
35. **Charter M.**, Izhaki I., Bouskila, A., and Y. Leshem. 2007. Breeding success of the Eurasian Kestrel (*Falco tinnunculus*) nesting on buildings in Israel. J. Raptor Res. 41(2):139–143
36. **Charter M.**, Izhaki I., Shapira L. and Y. Leshem. 2007. Diets of Urban Breeding Barn Owls (*Tyto Alba*) in Tel Aviv, Israel. Wilson Journal of Ornithology 119:484–485
37. **Charter, M.**, Leshem, Y., Izhaki, I., Guershon, M. and Y. Kiat. 2006. The diet of the Little Owl, *Athene noctua*, in Israel. Zoology in the Middle East. 39:31–40
38. **Charter, M.** and Y. Leshem. 2006. First documented case of Lesser Kestrel *Falco naumanni* breeding in an open nest in Israel. Sandgrouse 28:77–78
39. **Charter, M.** and H. K. Mienis. 2005. Snails in pellets and prey remains of kestrels *Falco tinnunculus* in Israel. Triton 12:31–32
40. **Charter, M.** Bouskila, A, and Y. Leshem 2005. Second clutches by Common Kestrels *Falco tinnunculus* breeding on buildings in Israel. Sandgrouse 27:165–167
41. **Charter, M.**, Bouskila, A, Aviel, S., and Y. Leshem 2005. First Record of Eurasian Jackdaw (*Corvus monedula*) Parasitism by the Great Spotted Cuckoo (Clamator glandarius) in Israel. Wilson Journal of Ornithology 117(2):201–204

**Accepted for Publication**

1. **Charter M.**, Izhaki I., Meyrom K., and A Roulin 2018. The relationship between intra–guild diet overlap and breeding in barn owls. Journal of Population Ecology.

**Submitted for Publication**

1. Pape Møller, A, **Charter, M.** et al.. Effects of interspecific co-existence on laying date and clutch size in two species of hole-nesting birds. J. Anim Ecol.
2. Peleg O., Nir S. , Roulin A. , Leshem Y, Meyrom K, Shaul A , Izhaki I , and. M. **Charter M.** Three decades of satisfied Israeli farmers: Barn owls (*Tyto alba*) as biological pest control of rodents.Proceedings of the 28th vertebrate pest conference, 26th Vertebrate Pest Conference.

**Abstracts**

1. **Charter M.**, Leshem Y., and A. Bouskila. 2003. Internet survey of nesting biology of common kestrels (*Falco tinnunculus*) . Isr. J. Zool 50:104
2. **Charter M.**, Leshem Y., Bouskila A., and S. Aviel. 2003. Great spotted cuckoos (*Clamator glandarius*) parasitizes a new host in Israel. Isr. J. Zool 50:104
3. **Charter M.**, Leshem Y., and A. Bouskila. 2005. Effects of predation and competition on the breeding success of common kestrels (*Falco tinnunculus*). Isr. J. Zool. 51:61
4. Leshem Y., Aviel S., Merom K., **Charter M.**, Motro Y., Alon D., and I. Yitzhaki. 2007. The Barn Owl and Common Kestrel as biological pest controllers in agricultural fields from a local to regional project. Isr. J. Ecol. Evol. 52:
5. **Charter M**., Aviel S., Abu Rashid M., Atrash I., Alon D., Labinger Z., Izhaki I., Y. Leshem (2007). Raptors as biological pest control agents of rodents in agriculture: Conservation, rodent control and cooperation in the Middle East. World Owl Conference 2007.
6. **Charter M.**, Aviel S., Meyrom K, Motro Y., Alon D. and Y. Leshem (2010). Raptors as biological pest controllers in agricultural fields from a local to regional project. 25th International Congress in Brazil.
7. **Charter M.**, Leshem. Y. and K. Meyrom (2011). The use of Barn owls as biological control agents - video; Regional cooperation in the Middle East and applications to Long-eared Owl programs. 2011 **International Conference on the Survey, Monitoring and Conservation of the Long-eared Owl Asio otus.**
8. **Charter M.**, Izhaki, I. and Y. Leshem. **International Conference on the Survey, Monitoring and Conservation of the Long-eared Owl *Asio otus*.** (2011) **International Conference on the Survey, Monitoring and Conservation of the Long-eared Owl Asio otus.**
9. **Charter M**, Y. Leshem, A. Roulin, and Izhaki, I. (2012) The barn owl project in Israel: from applied to scientific. The 21st international conference of Zoology (ICZ) Haifa.
10. **Charter M**, I. Izhaki, Y. Leshem, K. Meyrom, and A. Roulin (2013), and Does Barn Owl breeding vary between Europe and Middle East? European Ornithological Union Conference Norwich UK.
11. **Charter M** (2013). International seminar on environmental friendly agriculture pest management, Taiwan. What we know about barn owls breeding and nest box use: a model of an applied project.

**Books**

Children’s book, “Yoni the tits nest” הקן של יוני הירגז**י**

**Awards**

2014—Inducted in the “World Owl Hall of Fame” and received the “Special Achievement Award” for his work in owl research and conservation in Israel during the “International Festival of Owls” in the Minnesota USA

**Reviewer for the following Journals**

* Acta Ornithologica
* Acrocephalus
* Biological Conservation
* Ibis
* Journal of Arid Environments
* Journal of Field Ornithology
* Journal of Raptor Research
* Movement Ecology
* New Zealand Journal of Zoology
* Sandgrouse
* Western Birds
* Wildlife Biology
* Wilson Journal of Ornithology

**Students Supervised**

Undergraduate Projects

Tel Aviv University:Aya Goldstein, Chen Shemesh, Gilad Rotem,Hadas Sele, Inbal Segev, Karen Zrehan, Karina Gitim, Lev Shapira, Lior Halporon, Maria Novaslov, Maya Peter, Or Comay, Or Donis, Einat Rokach, Peter Mitzkin, Rotem Stern, Shahar Ben Cohen, Shay Levin, Shay Levy, Shir Ven Asher, Yuval Cohen, Gilad Person, Tomer Chen, Noy Lempert, Anna Azem, Adar Feldman.

Tel Hai College: Lior Lazar, Noa Nimri, Raphi Eitelberg.

MSc

Current student: Dor Keshet (University of Haifa). In cooperation with Ido Izhaki and Dan Malkinson.

Gabe Rozman (Hebrew University).In cooperation with Ran Nathan.

Past students: Aya Goldstein, Maya Peter, Ori Peleg

**Selected Media Coverage**

1. **Owls for peace: how conservation science is reaching across borders in the Middle East 2018.** Nature 554, 22-23 (2018) [doi: 10.1038/d41586-018-01388-5](https://www.nature.com/articles/d41586-018-01388-5?utm_source=feedburner&utm_medium=feed&utm_campaign=Feed%3A+nature%2Frss%2Fcurrent+%28Nature+-+Issue%29)
2. **Owls replace pesticides in Israel- BBC news:** <http://news.bbc.co.uk/2/hi/sci/tech/8004426.stm>
3. [**The Israeli-Jordan barn owl love that knows no borders-BBS news:**](https://www.youtube.com/watch?v=GM8qWpXhVpw)<https://www.youtube.com/watch?v=GM8qWpXhVpw>
4. [**From ammunition crates to owl nests**- Jerusalem Post:](http://www.jpost.com/Health-and-Sci-Tech/From-ammunition-crates-to-owl-nests)

 <http://www.jpost.com/Health-and-Sci-Tech/From-ammunition-crates-to-owl-nests>

1. [**Barn owls and kestrels: biological pest control agents**:](http://eco-library.theplanetfixer.org/docs/pest-control/barn-owls-and-kestrels-for-biological-pest-control-agents.pdf)

<http://eco-library.theplanetfixer.org/docs/pest-control/barn-owls-and-kestrels-for-biological-pest-control-agents.pdf>

1. [**ילדי הגנים מתגייסים להצלת הציפור(ערוץ 2 חדשות)**http://www.mako.co.il/news-channel2/Channel-2-Newscast-q3\_2017/Article-2a618109e558d51004.htm](http://www.mako.co.il/news-channel2/Channel-2-Newscast-q3_2017/Article-2a618109e558d51004.htm)
2. [Selected](file:///D%3A%5CUsers%5CMoti%20Charter%5CDocuments%5CMotti_Charter%5CReference%5CSelected) video clips: <http://www.birdboxisrael.org/Movies-and-media.html>
3. [**מסביב לשעון: מציצים לתנשמות ולבזים**](http://www.ynet.co.il/articles/0%2C7340%2CL-4527770%2C00.html) **(in Hebrew)**

[http://www.ynet.co.il/articles/0,7340,L-4527770,00.html](http://www.ynet.co.il/articles/0%2C7340%2CL-4527770%2C00.html)

1. **תיעוד ראשון: תנשמת אמצה גוזלים יתומים** (in Hebrew) <http://www.nrg.co.il/online/1/ART2/484/641.html>
2. [**ציפור פולשת ומזיקה מתפשטת עד צפון רמת הגולן והערבה על חשבון מינים מקומיים**](http://www.haaretz.co.il/news/science/.premium-1.3184851)

<http://www.haaretz.co.il/news/science/.premium-1.3184851>

1. **נלחמים בעכברים בשדה - עם רחפנים** <https://www.mako.co.il/news-israel/health-q1_2018/Article-7ca5f85cac82261004.htm>
2. **לונדון את קירשנבאום מה עושות התנשמות בלילה** <https://youtu.be/z821C7qOv9Q>
3. **ערב חדש עם תנשמות**<https://youtu.be/ef6KRS58zOg>

**Funds**

200,000 NIS: 2010-2013. KKL. The use of great tits as biological pest control agents of *Thaumetopoea wilkinsoni* in pine forest. In cooperation with Yossi Leshem and Shai Markman.

200,000 NIS. 2010-2012. Hoopoe Foundation. The use of barn owl and kestrel as biological pest control agents: National project.

60,000 NIS. 2012-2013. Hoopoe Foundation. Study the effect of invasive avian species on native cavity breeders. In cooperation with Aya Goldstein, Yossi Leshem and Shai Markman.

27,000 NIS 2013- 2014. Hoopoe Foundation. Use of GPS tags in barn owls. In cooperation with Ido Izhaki.

107,550 CHF. 2012-2015. Addax & Oryx Foundation. Owls as peacemakers in the Middle East. In cooperation with Ido Izhaki and Alexandre Roulin.

15,000 NIS. 2012-2013- Emek Yizreel Regional Council. Long-eared owls breeding in agriculture. In cooperation with Ido Izhaki

157,000 NIS. 2015-2017 – KKL funded a study of the breeding and movement ecology of long-eared owl. In cooperation with Ido Izhaki.

$100,000. 2016-2018- USA embassy fund a project for Girls in STEM research on barn owls. In cooperation with Ido Izhaki.

390,000. 2018-2021 Northern Research and Development. Using drones to moitor agriclutral pests.

$40,000. 2018- BARD workshop in cooperation with Matthew Johnson (Humboldt State University), Roger Baldwin (UC Davis), and Sara Kross (Sacramento State University).

200,000 NIS. 2018-2021- KKL funded study on using RFID PIT tags to study kleptoparasite nestlings, nest box use and prey deliveries in barn owls.