Max-Planck-Institut für Ornithologie

Max Planck Institute for Ornithology

Seewiesen Colloquia

Speaker invited by: Research Group Goerlitz

Thursday, 7th August 2014, 13:00 h, in House 4, Lecture Room

The ecological economics of insect-eating bats

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Modern agricultural landscapes are highly disturbed, unstable, and experience episodic eruptions of highly destructive pest insects that are difficult to predict. Whereas the biological control literature tends to dismiss generalist predators such as bats as effective agents for pest control- it is not enough to eat lots of pests their populations must be suppressed- I suggest that agricultural systems create an ideal "playground" for bats where they provide multiple services with unanticipated value. With Brazilian free-tailed bats as the model system, I argue that in addition to crop protection, the skill sets that bats possess allow them to integrate and stabilize highly disturbed agro-ecosystems. As highly mobile, generalist predators, that persist in the environment on alternate food when pest populations are low and recruit rapidly to exploit pests when pest populations surge, the natural capital of bats exists not only in avoiding costs of damage to crops, but as "option values" that result from the bats continuing presence. These values fluctuate in time and space due to natural, technological, and socio-economic factors.

Who is Gary McCracken?

1976	PhD Ecology and Evolutionary Biology, Cornell University, USA
1976 – 1978	Post-Doctoral Fellow, Department of Biology, University of San Diego, USA
1978 – 1979	Post-Doctoral Fellow, Department of Biology, University of Rochester, USA
1979	Assistant Professor, Zoology and Graduate Program in Ecology, University of Tennessee, USA
1985	Associate Professor, Zoology and Program in Ecology, University of Tennessee
1990	Professor, Zoology and Ecology and Evolutionary Biology, University of Tennessee.
2008 – 2013	Professor and Head, Ecology and Evolutionary Biology, University of Tennessee

Selected publications:

- *Federico P, Hallam TG, McCracken GF, et al.* 2008. Brazilian free-tailed bats (Tadarida brasiliensis) as insect pest regulators in transgenic and conventional cotton crops. Ecological Applications 18: 826-837.
- *McCracken, G.F. E. Gillam, J. Westbrook, et al.* 2008. Brazilian free-tailed bats (Tadarida brasiliensis: Molossidae: Chiroptera) at high altitude: links to migratory insect populations. Integrative & Comparative Biology 48:107-118.
- *Gillam, E.H.; McCracken, G.F; Westbrook, J.K. et al.* 2009. Bats aloft: variation in echolocation call structure at high altitudes. Behav. Ecol. Sociobiol. 64:69-79.
- *Hallam, T.G. and G.F. McCracken.* 2011. Culling and the management of the panzootic White Nose Syndrome in hibernating bats. Conservation Biology 25: 189-194.
- *Boyles, J.G., Cryan, PM, McCracken G.F., and Kunz T.H.* 2011. Economic importance of bats to agriculture. Science 332: 341-342.
- *McCracken, G.F., J.K. Westbrook, V.A. Brown, et al.* 2012. Bats track and exploit insect pest populations. PLoS ONE. 7(8).e43839
- *Lopez-Hoffman, L., R. Wiederholt, ...G.F. McCracken, et al.* 2014. Market forces & technological substitutes cause fluctuations in the value of bat pest-control services for cotton. PLoS One 9(2).e87912

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