





Insanity or reality: mammals of Jabal Moussa Biosphere Reserve

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A unique biodiversity

Jabal Moussa Biosphere Reserve (JM) is a unique reserve in its landscape, topography and biodiversity. It is a typical Mediterranean scrubland biome (towards the north of Lebanon), with different elevations starting from 450m to 1600 m. Its unique, harsh, and difficult to reach terrain gives the reserve its majestic look that is not found in other reserves in Lebanon. These characteristics helped Jabal Moussa by itself to be naturally a protected area from any uncontrolled and destructive human activities, or even from any minimal biodiversity disturbance. An important indicator and reflection of this observation is the activity of many shy and nocturnal animals such as foxes, stone martins and striped hyenas at sunset period. Indeed, the activity of these animals rarely starts before dark unless the area is peaceful and undisturbed. In addition, the location of the reserve in a rural area resulted in its fauna's richness. Quality rather than quantity is what describes Jabal Moussa best: it is the biodiversity richness rather than the size that qualifies the reserve.

The mammal survey in JM was initiated in 2006 with little hopes of finding rich mammal diversity. Hence, the protection of this small mountain was of little interest. Surprisingly, a mere preliminary survey has turned the picture upside down and this reserve became a corner stone in its importance.

Shortly after, a comprehensive baseline survey started in 2007, which was supposed to last only for 12 months; however, was extended to 18 months. The survey was not an easy task to conduct. Long steep trails, no roads, not easily accessible rocky terrain, time consumed for crossing the forest, were all obstacles faced by our team in this survey. Previous baselines surveys for mammals in most of the Lebanese reserves were drawn but nothing is comparable to JM. To work on this reserve, either you have to be a priest, be insane or passionately seeking the truth! I am not a priest, so only the other two options remain! When you start walking in Jabal Moussa, in this very remote area that is inaccessible by car and not even an ATV (All Terrain Vehicle), you have to proceed once you started; there is "No Way Back!", "No Retreat... No Surrender"...



The Mkery and his mule helped us carry bait and equipment

The survey's equipment that had to be carried up included camera traps, baits, traps, the bat box, the GPS, a professional camera with its lenses, binoculars, water cans, a laptop, in addition to all the different kinds of food to be used as baits for camera traps. With all the excitement and enthusiasm to discover this Jabal (Mountain), we carried on our back all these necessary equipment for long distances, several hours, climbing steep hills, walking hard dusty roads, bushy areas that made the work on this survey more challenging and exciting, as if revealing a secret... How did our ancestors manage to move in such harsh conditions?

Later on, the same old means were followed: asking for a Mkery (mule driver) (Plate 1) with his mule to help in carrying the bait and other materials. This was an experience by itself! On our way, and with the mountain accent of the Mkery, and the stories told by him, the walks turned out to be less tiring and enjoyable. The way he was leading his mule and caring for it was astonishing... it felt as if he had an old rare Cadillac! This cannot be expressed in words you have to witness it yourself.

The richest Lebanese reserve

This reserve, that was underestimated, proved to be the richest in Lebanon in its mammal diversity. That is why voluntarily and with enthusiasm, this survey was extended to 18 months. As you'll discover later, working on this reserve was not insanity but its richness made the work very challenging and pushed for more work to be done.

The survey aimed at gathering information on the mammal species in JM and prioritizing their conservation. It started in 2007 by meetings with elderly members of the surrounding community to gather some facts on the past and present green cover, mammal diversity, status and trends. During these meetings, most elderly had a common view that mammals were previously more abundant, and living in balance and in harmony with people. They identified more than 30 mammal species that used to live in the reserve. Moreover, they all had the same opinion that most species are endangered and that their population is decreasing due to hunting, logging and quarries. As was expressed by an old person from Ghbaleh:

"The forest was so diverse. It contained big trees (called "Defran" in Arabic) that were used in building the houses; they were so big that one tree could cover the roof of a house. Charcoal business helps in regulating the forest growth and the economy of local people while maintaining the biodiversity.

Wolves were very abundant in the past. Three to four people had to protect a flock of sheep or goats due to the large number of wolves that were present. But now due to orchards and the excessive use of pesticides, human disturbance and hunting, their number decreased drastically. Hyenas were not seen before; they appeared after the war 25 years ago. Bears, antelopes, porcupines, badgers, jackals, hyrax, stone martin, hedgehogs, squirrels, rabbits, weasels, besides a lot of rodents and bats still exist but not in the same abundance as before."

A glance at the biodiversity

Following the interviews and meetings, a field survey was conducted through (i) trail walks, looking for the “black gold”: animal scats and footprints, (ii) night drives which were not effective due to the inaccessibility of the reserve, (iii) bat detectors, (iv) rodents’ traps, and (v) camera traps, which proved to be the most effective technique in this kind of forests.

The different and diverse micro-ecosystems and landscapes in this small reserve provide different habitats for different species. Among those species, some will be cited below with few comments:

Squirrels are among the species that could find a safe and cozy place to establish their family. One of the camera traps disturbed the privacy of a couple of squirrels who were flatterring each other, which ended joyfully, and they lived happily ever after...



Glancing, flatterring, and mating. A couple of squirrels at Jabal Moussa (© M. Abi-Said)

The rocky landscape above Nahr ed dahab provides a nice, safe and sun-bathing place for the **rock hyrax**. It was never seen or documented before in the natural forests of Lebanon for a group of rock hyrax, including adult and juvenile, to gather for socializing and sharing lunch.



A family of rock hyrax at the bait set for the camera traps (© M. Abi-Said)



The pregnant wolf photographed in Jabal Moussa, and her cub (© M. Abi-Said)

The story does not end here: **wolves** -that for a long time have not been documented in the country- were observed, with a pregnant female that found JM a safe, peaceful and undisturbed environment to raise her cubs.

The nocturnal solitary **striped hyenas** in JM went out in couples before sunset.



A couple of striped hyenas going out before sunset: a behavior not documented in Lebanon before (© M. Abi-Said)

Even though common or urban wild mammals like **foxes and martins** were present in JM, they were not over-populated as they are in other regions of Lebanon. Even **wild boars** that infested most Lebanese areas were not common, only one or two were photo-trapped.

A very clear and obvious reflection of a restored natural balance is to be remarked in the reserve. It is not only the mammals that are already documented in Lebanon that were found in JM, but also a new species of rodent for Lebanon *Gerbillus dasyurus gallagheri* **Wagner's gerbil** was discovered.

Besides the wild species, livestock's presence in the reserve in late summer and fall 2007, gives an added value to the Lebanese heritage and culture of JM. The presence of livestock in the reserve has its own important role as long as it stays under control, and coordinated by shepherds. One of their essential roles is fighting forest fires and seed dispersal, in addition to their help in attracting some predators to the reserve. However, the presence of other domestic animals like cats and dogs could have a negative impact on the fauna of the reserve, as domestic cats might breed with wild cats, and domestic dogs with wolves, and hybrid species will appear resulting in the extinction of pure wild breeds. Moreover, the presence of these animals could affect other fauna species like birds and rodents.

The results obtained from the preliminary survey (to date) do show that the area is of large importance for biodiversity conservation in Lebanon. It is of the highest importance for species conservation due to the **presence of globally threatened species that are critically endangered in Lebanon namely: wolves, hyraxes, hyenas, weasels and bats.**

JM being an integral part of the Lebanese territory, mammals and biodiversity in its territory generally face the same threats as in other nature reserves; such as logging, quarries, forest fires, and the famous uncontrolled Lebanese sport, hunting. Animal poisoning practiced by shepherds to protect their livestock is an additional threat facing mammals. Another factor that should be taken into consideration is the negative human impact caused by special massive visits: JM contains a religious place that is visited during the cross feast day (14 September each year) where several activities occur, which unintentionally are causing disturbances to wildlife in the reserve. However, none of these threats is major or stays unsolvable. Through formal and informal awareness programs, local people participation, and a well-designed management program, these disturbances can be prevented, or at least minimized.

Finally, it is notable that Jabal Moussa reserve is probably the smallest forest reserve (1250 ha - core area) in Lebanon, however the richest compared to the biggest reserve as far as mammals are concerned. Hence, it deserves to be treated as a special protected area. A Species/Habitat Conservation Area also allows more leeway for the involvement of local communities in the management of the forests through having a say in controlling the extraction of forest resources and allowing some level of community co-management that prevents potential conflict between the reserve and the local communities. Increasing law enforcement, exposing and involving local people through awareness programs on the importance of JM biodiversity in every aspect of their well-being besides monitoring ecotourism activities, will benefit the conservation efforts. Ecotourism could be constructive if it is well programmed and very destructive if it is looked at from one angle only. Hence a monitoring program along with well-designed activities for ecotourism, and an applied research project are essential for the sustainability of the reserve.

